DEPARTMENT OF DEFENSE
FY 2006/FY 2007 BUDGET ESTIMATES

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MISSILE DEFENSE AGENCY

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Missile Defense Agency
Fiscal Year (FY) 2006/FY 2007 Budget Estimates
FY 2004 through FY 2011 Appropriation Summary
R-1 Exhibit
($ Thousands)

Line Number	Program Element	Budget Project	Program	Budget Activity	FY04 Actual	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY06-11 Total
		RDT&E											
29	**0603175C**		Ballistic Missile Defense Technology	03	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,154,736
		0502	Advanced Technology Development	03	203,551	226,795	131,783	177,338	184,744	193,263	201,706	209,363	1,098,197
		0503	Laser/LADAR Technology	03	20,328	0	0	0	0	0	0	0	0
		0602	Program-Wide Support	03	2,886	4,350	4,458	7,539	12,485	11,928	10,729	9,400	56,539
Budget Activity 03 Total				03	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,154,736
68	**0603879C**		Advanced Concepts, Evaluations and Systems	04	132,701	159,878	0	0	0	0	0	0	0
		0501	Advanced Concepts, Evaluations and Systems (ACES)	04	132,701	159,878	0	0	0	0	0	0	0
69	**0603881C**		Ballistic Missile Defense Terminal Defense Segment	04	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	4,892,073
		0907	Terminal High Altitude Area Defense (THAAD) Block 2006/2008	04	717,889	759,677	1,046,082	931,000	779,407	352,976	0	0	3,109,465
		0007	Terminal High Altitude Area Defense (THAAD) Block 2010	04	0	0	0	0	0	168,000	635,068	394,998	1,198,066
		0401	Israeli Arrow Program	04	135,644	152,048	77,616	79,494	77,539	77,723	79,340	80,987	472,699
		0602	Program-Wide Support	04	7,261	16,663	19,912	24,182	22,728	18,620	16,874	9,527	111,843
70	**0603882C**		Ballistic Missile Defense Midcourse Defense Segment	04	3,711,708	4,501,459	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	19,908,052
		0708	Ground-Based Midcourse Defense (GMD) Block 2004 Test Bed/Initial Defensive Capability (IDC)	04	1,357,320	850,505	0	0	0	0	0	0	0
		0808	Ground-Based Midcourse Defense (GMD) Block 2004/2006 Development	04	1,587,103	2,468,118	2,224,349	2,232,055	330,912	233,703	0	0	5,021,109
		0908	Ground-Based Midcourse Defense (GMD) Block 2008 Development	04	0	0	73,682	281,000	1,425,476	1,176,220	338,466	213,500	3,508,344
		0008	Ground-Based Midcourse Defense (GMD) Block 2010	04	0	0	0	188,885	717,000	654,831	1,557,354	1,349,209	4,467,279
		0709	AEGIS Ballistic Missile Defense Block 2004	04	605,993	942,975	101,177	15,000	0	0	0	0	116,177
		0809	AEGIS Ballistic Missile Defense Block 2006	04	24,418	121,494	574,766	546,817	69,000	15,000	0	0	1,205,583
		0909	AEGIS Ballistic Missile Defense Block 2008	04	0	0	135,158	354,233	636,729	546,069	205,208	44,039	1,921,436
		0009	AEGIS Ballistic Missile Defense Block 2010	04	0	0	0	0	20,000	185,000	576,260	644,000	1,425,260
		0402	Japanese Cooperative Program	04	51,775	71,283	24,800	52,791	112,500	131,500	129,500	100,000	551,091
		0515	Multiple Kill Vehicles	04	0	0	82,000	219,645	272,900	306,500	308,200	113,500	1,302,745
		0602	Program-Wide Support	04	85,099	47,084	50,264	55,565	66,331	66,690	68,634	81,634	389,118
71	**0603883C**		Ballistic Missile Defense Boost Defense Segment	04	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	4,438,803
		0710	Airborne Laser (ABL) Block 2004	04	463,132	457,900	0	0	0	0	0	0	0
		0810	Airborne Laser (ABL) Block 2006	04	0	0	464,867	629,761	0	0	0	0	1,094,628
		0910	Airborne Laser (ABL) Block 2008	04	0	0	0	0	601,294	669,120	0	0	1,270,414
		0010	Airborne Laser (ABL) Block 2010	04	0	0	0	0	0	0	791,930	1,163,040	1,954,970
		0602	Program-Wide Support	04	12,779	18,279	18,996	18,967	19,499	21,687	19,500	20,142	118,791
73	**0603884C**		Ballistic Missile Defense Sensors	04	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	6,013,504
		0812	Space Tracking and Surveillance System (STSS) Block 2006	04	262,786	255,839	231,230	208,204	64,467	11,122	7,704	7,070	529,797
		0912	Space Tracking and Surveillance System (STSS) Block 2008	04	0	0	0	45,200	29,319	24,092	14,066	13,762	126,439
		0012	Space Tracking and Surveillance System (STSS) Block 2010	04	12,100	47,833	0	0	0	0	0	0	0
		R112	Space Tracking and Surveillance System (STSS) Block 2012	04	0	0	535	167,045	440,000	579,000	737,000	773,000	2,696,580
		0403	Russian-American Observation Satellite(s) Program (RAMOS)	04	27,562	0	0	0	0	0	0	0	0
		0811	Ballistic Missile Defense Radars Block 2004/2006	04	110,018	260,519	272,243	263,367	60,437	92,953	0	0	689,000
		0911	Ballistic Missile Defense Radars Block 2008	04	0	0	8,100	274,600	564,491	345,473	118,679	114,800	1,426,143
		0011	Ballistic Missile Defense Radars Block 2010	04	0	0	9,400	15,700	19,000	101,000	165,863	84,565	395,528
		0602	Program-Wide Support	04	5,348	13,106	8,321	21,595	36,294	32,494	25,896	25,417	150,017

Missile Defense Agency
Fiscal Year (FY) 2006/FY 2007 Budget Estimates
FY 2004 through FY 2011 Appropriation Summary
R-1 Exhibit
($ Thousands)

Line Number	Program Element	Budget Project	Program	Budget Activity	FY04 Actual	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY06-11 Total
74	**0603886C**		Ballistic Missile Defense System Interceptors	04	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	5,675,472
		0013/R113	Ballistic Missile Defense Interceptor Block 2010/2012	04	100,652	267,411	218,749	420,160	604,631	961,096	1,189,257	1,453,512	4,847,405
		R216	Space Test Bed	04	0	0	0	0	44,997	149,998	247,995	229,993	672,983
		0602	Program-Wide Support	04	14,017	12,404	10,909	24,740	27,615	26,243	31,575	34,002	155,084
75	**0603888C**		Ballistic Missile Defense Test and Targets	04	612,333	718,049	617,456	676,388	600,273	634,868	652,773	661,152	3,842,910
		0304	Test & Evaluation	04	334,564	239,064	187,919	188,451	181,662	198,485	204,416	210,774	1,171,707
		0704	Test & Evaluation Block 2004	04	41,328	143,375	0	0	0	0	0	0	0
		0804	Test & Evaluation Block 2006	04	2,201	20,557	169,996	139,392	2,600	0	0	0	311,988
		0904	Test & Evaluation Block 2008	04	0	0	686	71,918	203,831	140,389	3,225	0	420,049
		0004	Test & Evaluation Block 2010	04	0	0	0	0	0	68,981	208,628	144,351	421,960
		R104	Test & Evaluation Block 2012	04	0	0	0	0	0	0	100	69,899	69,999
		0305	Targets & Countermeasures Core	04	17,393	19,423	19,825	20,478	20,354	20,714	20,955	21,464	123,790
		0705	Targets & Countermeasures Block 2004	04	182,708	176,407	0	0	0	0	0	0	0
		0805	Targets & Countermeasures Block 2006	04	0	112,984	222,194	208,246	0	0	0	0	430,440
		0905	Targets & Countermeasures Block 2008	04	0	0	10,293	37,991	177,463	163,430	0	0	389,177
		0005	Targets & Countermeasures Block 2010	04	0	0	0	0	4,188	32,379	200,479	204,974	442,020
		0602	Program-Wide Support	04	34,139	6,239	6,543	9,912	10,175	10,490	14,970	9,690	61,780
76	**0603889C**		Ballistic Missile Defense Products	04	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,022,640
		0701	Command and Control, Battle Management and Communications (C2BMC) Block 2004	04	92,457	154,001	22,536	16,200	0	0	0	0	38,736
		0801	Command and Control, Battle Management and Communications (C2BMC) Block 2006	04	52,480	24,033	142,138	153,042	23,801	16,700	0	0	335,681
		0901	Command and Control, Battle Management and Communications (C2BMC) Block 2008	04	687	10,798	75,900	100,000	197,026	166,031	65,745	56,075	660,777
		0001	Command and Control, Battle Management and Communications (C2BMC) Block 2010	04	0	0	0	11,500	60,600	104,566	217,755	223,633	618,054
		0702	Hercules Block 2004	04	4,575	0	0	0	0	0	0	0	0
		0802	Hercules Block 2006	04	26,956	37,161	7,521	0	0	0	0	0	7,521
		0902	Hercules Block 2008	04	22,532	46,095	52,096	48,755	23,881	13,319	0	0	138,051
		0002	Hercules Block 2010	04	0	0	11,000	18,451	42,000	52,000	65,071	65,856	254,378
		0703	Joint Warfighter Support Block 2004	04	32,748	24,178	0	0	0	0	0	0	0
		0803	Joint Warfighter Support Block 2006	04	0	0	56,518	66,047	0	0	0	0	122,565
		0903	Joint Warfighter Support Block 2008	04	0	0	0	0	61,571	62,774	0	0	124,345
		0003	Joint Warfighter Support Block 2010	04	0	0	0	0	0	0	64,887	68,564	133,451
		0204	Joint National Integration Center (JNIC)	04	53,830	71,367	76,895	80,688	82,661	84,736	85,925	86,581	497,486
		0602	Program-Wide Support	04	23,684	16,197	10,548	15,299	17,621	16,473	16,634	15,020	91,595
77	**0603890C**		Ballistic Missile Defense System Core	04	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,101,305
		0101	Systems Engineering & Integration	04	271,916	241,293	112,790	115,879	116,353	115,984	127,932	134,356	723,294
		0105	Countermeasures/Counter-Countermeasures (CM/CCM)	04	19,511	29,557	24,700	26,522	26,700	27,700	23,028	23,366	152,016
		0201	Command and Control, Battle Management and Communications Core	04	18,311	1,667	0	0	0	0	0	0	0
		0102	Intelligence and Security	04	16,568	20,659	21,294	23,346	25,727	27,286	27,892	28,510	154,055
		0103	Producibility & Manufacturing Technology	04	28,267	36,254	27,313	36,211	38,597	41,564	42,462	43,378	229,525
		0202	Hercules Core	04	20,955	0	0	0	0	0	0	0	0
		0104	BMD Information Management Systems	04	37,535	61,453	125,257	184,869	166,755	156,754	140,597	145,213	919,445
		0106	Modeling & Simulation	04	0	0	103,680	106,497	108,090	110,120	111,397	112,713	652,497
		0107	Safety, Quality and Mission Assurance	04	0	0	19,694	20,800	21,123	21,890	20,654	21,143	125,304
		0602	Program-Wide Support	04	36,684	8,946	12,278	24,318	29,067	29,636	26,717	23,153	145,169
78	**0603891C**		Special Programs - MDA	04	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
		0501	Special Programs - MDA	04	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
Budget Activity 04 Total				04	7,085,626	8,424,724	7,522,292	9,277,721	9,510,585	9,726,763	9,969,036	9,903,482	55,909,879

Missile Defense Agency
Fiscal Year (FY) 2006/FY 2007 Budget Estimates
FY 2004 through FY 2011 Appropriation Summary
R-1 Exhibit
($ Thousands)

Line Number	Program Element	Budget Project	Program	Budget Activity	FY04 Actual	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY06-11 Total
132	**0605502C**		Small Business Innovative Research - MDA	06	146,030	0	0	0	0	0	0	0	0
		0510	Statutory & Mandated Programs	06	146,030	0	0	0	0	0	0	0	0
149	**0901585C**		Pentagon Reservation	06	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	54,621
		0605	Pentagon Reservation Maintenance Reserve Fund (PRMRF)	06	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	54,621
150	**0901598C**		Management Headquarters - MDA	06	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	555,734
		0601	Management Headquarters	06	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	555,734
Budget Activity 06 Total				06	254,381	127,538	116,713	111,029	105,042	105,104	85,982	86,485	610,355
RDT&E Total				06	7,566,772	8,783,407	7,775,246	9,573,627	9,812,856	10,037,058	10,267,453	10,208,730	57,674,970
		MILCON											
	0603882C		Ballistic Missile Defense Midcourse Defense Segment	NA	20,000	19,560	0	0	0	0	0	0	0
		0808	Ground-Based Midcourse Defense (GMD) Block 2004/2006 Development	NA	20,000	19,560	0	0	0	0	0	0	0
	0603888C		Ballistic Missile Defense Test and Targets	NA	4,440	2,769	4,901	7,782	8,009	8,251	8,589	8,940	46,472
		0304	Ballistic Missile Defense Test & Targets	NA	4,440	2,769	4,901	7,782	8,009	8,251	8,589	8,940	46,472
MILCON Total				NA	24,440	22,329	4,901	7,782	8,009	8,251	8,589	8,940	46,472
PROGRAM TOTAL *					7,591,212	8,805,736	7,780,147	9,581,409	9,820,865	10,045,309	10,276,042	10,217,670	57,721,442

* Includes funds in PE 0904903D.

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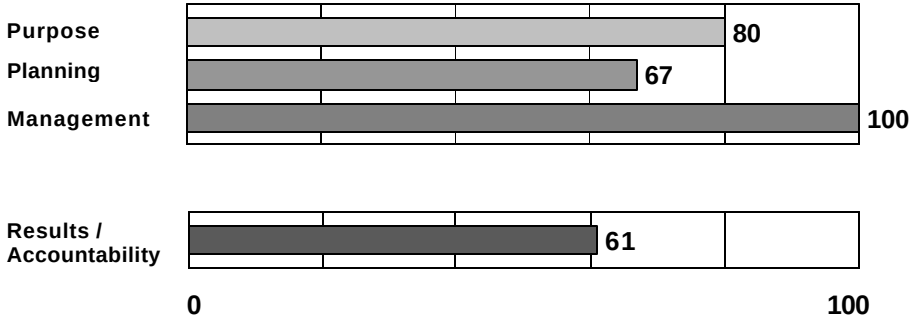
Program: *Missile Defense*

Agency: *Department of Defense--Military*

Bureau:



Key Performance Measures from Latest PART	*Year*	*Target*	*Actual*
Long-term Measure: Succesfully demonstrate Engagement Sequence Groups (ESGs), which represent different combinations of interceptors, sensors, & targets. The following are required: 2004 - demonstrate operational GBI in-flight engagement; complete IDO; 2005 - demonstrate 3 ESGs (GBI engage on CD/UEWR, GBI Launch on Aegis, GBI Engage on Aegis); 2006 - demonstrate 7 ESGs	2004	Reach IDO	2005
	2005	Demo 3 ESG	
	2007	Demo 7 ESG	
Long-term Measure: Block development and deployment cost targets: Cost effectively field new "Blocks" of missile defense capabilities. Funding targets represent total cost of the missile deployment block from the year of approval through final completion. Note: Block 04 completes deployment at the end of 2005; Block 06 completes at the end of 2010.	2005	<$7.4B	
	2010	<$16.0B	
Annual Measure: Accomplish planned annual major test requirements. Major tests are currently defined as in-flight intercepts involving GMD, AEGIS, or THAAD programs. Annual tests are measured from those planned at the start of a fiscal year compared to those accomplished.	2004	4 major tests	1 major test
	2005	9 major tests	

Rating: *Moderately Effective*

Program Type: *Capital Assets and Service Acquisition*

Program Summary:

The DoD missile defense program consists of various systems and capabilities developed and deployed by the Missile Defense Agency (MDA) and military services. This program acquires and operates active defenses against short, medium, and long-range missiles in a global, multi-layered defensive system. The PART evaluation addresses MDA, the U.S. Army, and DoD oversight performance.

The previous assessment of missile defense found the program was adequately defining its future goals and establishing effective management practices. However, program goals and objectives were at risk due to a lack of future funding for operating and sustaining missile defense systems, and failure to fully fund approved deployments of new capabilities. These future year funding shortfalls (DoD plans and balances all its investment programs five to six years in advance) put at risk the ability of DoD to meet its approved goals. In addition, the previous assessment found that plans for transferring mature missile defense systems from MDA to the military services were not likely to be effective and needed considerable additional work. Finally, earlier reviews did not fully assess DoD's ability to meet its missile defense technical capability goals. The first significant goal occurred in October, 2004 and was evaluated in this review. In response to these previous assessments, the program has taken to following steps:

- DoD has aggressively worked to fully fund operations and support costs, and has been successful in coordinating service and MDA budgeting responsibilities.
- DoD continues to fund only two years deployment costs per each "block" of missile defense deployments, even if significant portions of those deployments require four to five years of funding to fully implement. This policy continues to put at risk the completion of approved missile defense deployments.
- MDA did not meet its testing goals in 2004 for the Ground Based Mid-Course Defense system, the main element of their first operational deployment.

In response to these findings, DoD will:

1. Fund production/deployment of approved "blocks" of missile defense capabilities through the DoD Future Years Defense Plan or provide alternate goals.
2. Re-examine technical performance goals that are representative of MDA's developmental "engagement sequence groups", and update these goals, as necessary.
3. Continue development of transition plans for moving mature missile defense capabilities from MDA to the military services.

Program Funding Level (in millions of dollars)

2004 Actual	2005 Estimate	2006 Estimate
8,618	10,044	8,567

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Missile Defense Agency

Fiscal Year 2006 (FY06)

Budget Estimate

Overview

Missile Defense Agency
Fiscal Year 2006 (FY 06) Budget Estimate
Overview

Outline

This budget overview summarizes our FY06 budget submission to Congress. It also may serve informed readers as a stand-alone, top-level description of the Ballistic Missile Defense (BMD) Program. The overview describes our priorities, the budget structure, management and oversight processes, and program goals. It also includes Future Years Defense Program (FYDP) highlights.

I. Introduction

II. Program Highlights

III. Significant Changes from FY05 Budget Submission

IV. Block Highlights

V. President's Budget Submission and Organization

VI. Summary

VII. Acronym List

MISSILE DEFENSE AGENCY
FY 2006 BUDGET ESTIMATE OVERVIEW

I. INTRODUCTION

The Missile Defense Agency (MDA) is developing an integrated, layered Ballistic Missile Defense System (BMDS) to defend the United States, its deployed forces, allies and friends against ballistic missiles of all ranges and in all phases of flight. In 2004, we began fielding the initial elements of this System. In 2005 and beyond, we will improve the performance capability by fielding additional components as they are completed and developing new capability for integration into the System in future Blocks. Our proposed program of work described in this budget (for FY 2006 through 2011, in conjunction with the remainder of our FY05 efforts) will achieve five objectives:

- Complete development, initial fielding, and verification of Block 2004;
- Provide BMDS sustainment and Warfighter (Combatant Commanders) support;
- Build a totally integrated capability for Block 2006 and beyond based on a strong core research and spiral development program;
- Execute an increasingly complex test program; and
- Establish a robust international foundation for missile defense.

This budget overview describes how we plan to achieve these objectives and is intended to summarize and accompany the budget submission.

II. PROGRAM HIGHLIGHTS

In this section, we address the major objectives of our program of work. In subsequent sections we describe significant changes from the FY05 budget submission, we provide highlights of planned capability improvements by Block, and we address our Budget Structure and Organization.

Initial Fielding. The FY06 MDA budget submission is focused on expanding and improving our initial ballistic missile defense capability. Our first objective is to complete the development, fielding and verification of the Block 2004 BMD system. The first interceptors, upgraded radars and command and control, battle management and communication elements of this system are in place in Alaska, California, and Colorado. The BMDS is currently in a “shakedown” period, similar to when the commissioning crew takes a new warship to sea to learn what adjustments and corrections should be made prior to its entry into the operational fleet. During this

time, we are training crews, testing components and simulating operational conditions in coordination with the combatant commanders to learn about the system's capabilities and limitations. If necessary, the system could be used to defend against a limited ballistic missile attack during the "shakedown" period. Once "shakedown" is complete, the Secretary of Defense will establish designated readiness conditions to control the operational status of the BMDS while still permitting further development and testing.

During 2005, we will further mature our midcourse segment capabilities by adding Ground-Based Interceptors (GBIs) in Alaska, the first Standard Missile-3 sea-based interceptors on Aegis BMD Engagement Cruisers, more Aegis BMD Surveillance and Tracking Destroyers, and an Upgraded Early Warning Radar at Fylingdales in the United Kingdom. We will also improve our sensor network by fielding the Sea-Based X-Band Radar and the first transportable Forward Based X-Band Radar (FBX-T). Figure 1 lists the assets we will have fielded by the end of 2005.

2005

Initial Protection vs North Korea
Partial Coverage vs Mid-East
Protect Deployed Forces

Fixed Site Interceptors	• 16 Ground-Based Interceptors, Alaska • 2 Ground-Based Interceptors, California
Fixed Site Sensors	• Cobra Dane radar, Alaska • Beale radar, California • Fylingdales Radar, United Kingdom
Mobile/ Transportable Sensors	• 1 Sea-Based X-Band Radar, Alaska • 1 Forward-Based X-Band Radar • 10 Aegis Search & Track Destroyers
Mobile Interceptors	• 2 Aegis Engagement Cruisers* • 8 Standard Missile-3s** • 281 Patriot PAC-3

* Engagement ships can perform Search & Track Function
** Planned deliveries

Figure 1.

Warfighter Support. MDA is developing and delivering a ballistic missile defense capability to the warfighter. The Army National Guard's 100th Missile Defense Brigade, Air Force's Space Warfare Center and the Navy crews manning ships in the Pacific Fleet are on station operating the systems that have been fielded. This fielded BMD System will undergo additional operationally realistic

testing, but must also be sustained in order to support combatant commanders. Last year, the Secretary of Defense directed MDA and the Services to fund the sustainment of the BMDS throughout the FYDP; MDA is taking steps to meet this guidance by:

- Fully funding Contractor Logistics Support in this budget submission to ensure system developers are accountable to fully support fielded components after delivery.
- Establishing 10 operations and support centers around the United States.
- Cooperating with the Services to develop Inter-Service Support Agreements (ISSAs) to ensure the remainder of BMDS operations and support requirements are funded.
- Working closely with Combatant Commanders on the concept of concurrent testing and operations so both activities are fully supported.
- Developing tools for the Combatant Commanders, such as the BMDS Handbook, that facilitate operator training.
- Helping to define, through the Doctrine, Organization, Training, Material, Leadership, Personnel, and Facilities (DOTMLPF) methodology, the support necessary to make the BMDS useful to the Combatant Commands.

Improving the BMDS and Achieving Integration. MDA is developing and fielding an *integrated*, *layered* BMDS to defend against threats of *all ranges*, in *all phases* of flight. The program of work defined in this budget submission is a balance of fielding and development efforts to address the challenges and uncertainties of a real and growing threat, including:

- Keeping pace with current rogue nation threat missile inventories.
- Keeping pace with increasing threat complexity.
- Countering attacks designed to circumvent our current system.
- Maintaining a program that can address emerging threats.

We are fielding capability incrementally over the FYDP. After achieving our initial fielding in Block 2004, we will continue to add Ground-Based Interceptors (GBIs) in Alaska and, potentially, in Europe to meet the long-term threat; we will deploy Standard Missile-3 interceptors on an increasing number of Aegis BMD cruisers and destroyers and add the Terminal High Altitude Area Defense (THAAD) capability beginning in 2008 to meet the short and mid range threats. These interceptors, along with additional radars, will help us keep pace with the size of the rogue nation threat. The radars we are fielding will also allow us to address the complexity of the threat by improving our capability to discriminate warheads from decoys and other countermeasures. We are upgrading additional radars in the United States to make our system more capable against asymmetric threats, such as shorter range missiles being launched off the U.S. coast, and we are beginning to field the Space Tracking and Surveillance System (STSS), which will improve our capability against all threats.

We also have a robust development effort to address challenges and uncertainties in the future. Two of our largest development efforts are the Airborne Laser and the Kinetic Energy Interceptor (KEI). ABL is our primary boost phase development program, a capability that will introduce a new layer to the BMDS -- destroying a missile in its boost phase, before it can deploy warheads and/or countermeasures. KEI is a multiuse interceptor being designed to the most stressing scenario – intercept of a threat missile in the boost/ascent phase of flight. This scenario requires that the interceptor be capable of very high acceleration – to get to the target while the threat missile is still in the boost phase of flight. This scenario also drives us to an interceptor with long range and transportability – traits that are beneficial for engaging longer range ballistic missiles in all phases of their flight trajectory. KEI will contribute to our ability to address the growing rogue threat, as well as asymmetric and emerging threats. We are also funding the Multiple Kill Vehicle effort focused on using miniaturization technology to develop an interceptor capable of engaging more than one potential target with multiple kill vehicles. MKV helps address the midcourse countermeasure challenge by destroying multiple credible threat objects in a single engagement. We continue to pursue other programs involving innovative discrimination techniques to improve our ability to discern warheads from countermeasures.

An integrated, layered system achieves maximum effectiveness and limits the vulnerability of the overall system. In last year's budget submission, we introduced the concept of the Engagement Sequence Group as a tool to achieve BMDS integration. An ESG identifies the combination of weapons and sensors that must work together to detect, track and intercept an enemy missile – the complete kill chain from the time the threat missile is first detected through the intercept of the target – and thereby defines how BMDS components are integrated. This integration dramatically expands the detection and engagement zones beyond what could be achieved by a single element. Figure 2 is a conceptual diagram of an engagement sequence.

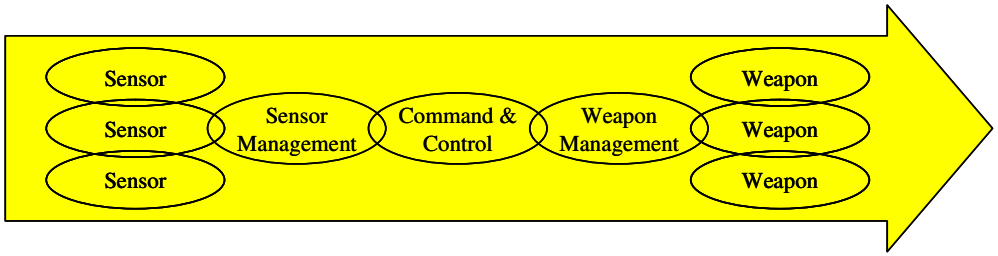

Figure 2. Components of an Engagement Sequence

"Ground Based Interceptor Engage on Aegis (AN/SPY-1) BMD Surveillance and Tracking Radar" ("GBI Engage on Aegis") describes the scenario where an interceptor is launched and targeted based on track data from the Aegis radar, and "Ground Based Interceptor Engage on Cobra Dane Radar" describes a GBI launched and targeted based on track data from the Cobra Dane upgraded early warning radar. Both of these are engagement sequence capabilities included in the initial fielded BMDS. "GBI Engage on Cobra Dane" occurs entirely within the Ground Based Midcourse element. "GBI Engage on Aegis" crosses element "boundaries."

As the BMDS evolves, engagement sequences will increase both in number and in complexity. A fully integrated system allows for multiple kill chains vice a single kill chain. Integration is a critical system-level activity because there are *multiple* contractors developing *multiple* components that must operate as a *single, integrated BMDS*.

Figure 3 below provides a notional listing of the increasing number of ESGs we are working to introduce in successive Blocks.

Block 2004	Block 2006	Block 2008
• GBI Engage On Cobra Dane (CD)/ Upgraded Early Warning Radar (UEWR)	• GBI Engage On CD/UEWR	• GBI Engage On CD/UEWR
• GBI Engage On Aegis Radar	• GBI Engage On Aegis Radar	• GBI Engage On Aegis Radar
• GBI Launch On Aegis Radar	• GBI Launch On Aegis Radar	• GBI Launch On Aegis Radar
	• GBI Launch On CD/UEWR	• GBI Launch On CD/UEWR
	• GBI Launch On Forward Based X-Band Radar (FBX-T)	• GBI Launch On FBX-T
	• GBI Engage On FBX-T	• GBI Engage On FBX-T
	• GBI Launch On Sea Based X-Band Radar (SBX)	• GBI Launch On SBX
	• GBI Engage On SBX	• GBI Engage On SBX
	• Standard Missiile-3 (SM-3) Engage On Aegis Radar	• SM-3 Engage On Aegis Radar
	• SM-3 Launch On Remote Aegis Radar	• SM-3 Launch On Remote Aegis Radar
		• GBI Launch On Space Tracking and Surveillance System (STSS)
		• GBI Launch On Terminal High Altitude Area Defense (THAAD) Radar
		• GBI Engage On THAAD Radar
		• GBI Launch On Defense Support Program-Space Based Infrared System (DSP-SBIRS)
		• THAAD Interceptor Engage On THAAD Radar
		• SM-3 Launch On FBX-T

Figure 3. Notional Engagement Sequences Through Block 2008

Robust Testing. The BMDS is comprised of ground-, sea-, air- and space-based components. MDA develops and incrementally fields the BMDS to provide the Warfighter with a useful capability as soon as practical while recognizing the need to further test and improve the system as technologies are matured and the operators become more familiar with system operation and capabilities. Our testing program follows a similar spiral approach. We assess capabilities and performance based on operational test objectives. This incremental approach enables MDA, Operational Test Authorities (OTAs), the Director, Operational Test & Evaluation (DOT&E), and Combatant Commanders to characterize the effectiveness and suitability of the system at every stage in its development and fielding. Continuous testing of the BMD System as a whole provides the basis to make sound decisions on the program as a whole.

To implement this approach, MDA, the OTAs, and DOT&E signed the Integrated Master Test Plan (IMTP) on December 6, 2004. The Integrated Master Test Plan establishes the framework for BMDS ground and flight testing in a particular Block. It is an overarching document that describes the BMDS test environment, supporting test organizations, developmental and operational test

programs and management of MDA test resources. It is the basis for detailed BMDS test planning and execution. The IMPT also defines the criteria by which the OTAs will assess each system test. In turn, DOT&E will use these assessments as the primary technical basis for its report to Congress. These criteria are test realism, effectiveness, suitability, survivability and safety.

The Director of the Responsible Test Organization (RTO) plans, programs, budgets, executes and manages the BMDS test and assessment program. The RTO's principal agent for implementing the IMTP is the Director of the Combined Test Force (CTF). The CTF consolidates the personnel, processes, and fiscal resources across MDA, including the Elements into a single, cohesive team to execute the BMDS test program. Data and information from the MDA test program support characterization and assessment of the BMDS. The CTF also includes the OTA Liaison Group (OLG), which includes representatives from the Army Test & Evaluation Command, the Air Force Operational Test & Evaluation Center, the Navy Operational Test & Evaluation Force, and the Joint Interoperability Test Command. The Liaison Group is located at MDA, but members report directly to their respective OTA. This relationship with the CTF maintains the representatives' independence and provides continuous two-way communication channels to facilitate interaction and cooperation. The Liaison Group is the primary conduit for the OTAs to insert operational test objectives into the BMD System test planning process. The OLG participates in all BMDS test planning and analysis functions in which the OTAs have a vested interest. In addition, MDA's interaction and coordination with the missile defense user community (USSTRATCOM, USNORTHCOM, and JTAMDO) supports test planning and execution. Concurrent testing and operation provides for close coordination of development and support activities (e.g. testing, maintenance, training, and upgrades) for operational BMDS elements, while also maintaining readiness to execute missile defense operations. USSTRATCOM approves the use of any component of the BMDS operational system under its control through the Asset Management process. This includes using operational crews for testing and upgrade. The CTF Test Managers coordinate with USSTRATCOM/ USNORTHCOM through the Asset Management process to ensure planned test events requiring use of operational assets impose minimum impact to the operational capability of the BMD system.

This budget submission is the first in which we describe our plan to fully implement a "top down" integrated system-wide test program. The BMDS test program "top-down" process is based upon criteria established by the MDA System Engineer to include engagement sequence groups, system test objectives, and overall system design. MDA uses these criteria to create an integrated system-level test approach, bringing together the contributions of the various BMDS elements into combined test events. Additionally, in the past year, MDA conducted a Heritage Review on the IFT-13C interceptor which examined all aspects of the booster and kill vehicle and identified risks and problems that could affect mission success. The review's overarching recommendations were to increase emphasis on testing in anticipated operational conditions to the maximum extent practical, ensuring quality control and discipline by establishing and following proper procedures.

The MDA strategy for test, verification, and assessment focuses on Engagement Sequence Groups. MDA's Test and Evaluation program includes: formal hardware and software testing as part of the Element development and manufacturing activity, simulation and live check-out at the component level, and stimulation and exercise of the communications infrastructure and messaging functions of and between the components. The MDA evaluates the BMDS based on demonstrated performance and associated statistical analysis using modeling and simulation along with ground and flight testing. Modeling and simulation provides data to plan tests, support test rehearsal, provide performance prediction, perform post-flight assessment, and explore scenarios where flight testing is either impractical or impossible. M&S provides insight into test design, potential range and operational constraints, test execution rehearsal, expansion of the demonstrated performance envelope to additional threat representations, and efficient replication of actual flight tests. M&S tools used for performance verification are anchored in ground and flight test results and undergo formal verification, validation, and accreditation to provide confidence in the analytic results.

System Ground Tests provide data for BMDS performance prediction, performance assessment/verification, risk-reduction testing for flight tests, modeling and simulation anchoring, and exploration of scenarios where flight testing is either impractical or impossible. Ground testing allows examination of mature designs, identification and efficient correction of performance anomalies, and simulation of a wide spectrum of environmental conditions. System Ground Test tools include Integrated Missile Defense Wargames and Missile Defense Integration Exercises.

Flight testing provides data to further characterize the BMDS, anchor M&S tools, and demonstrate BMDS operational capability. While flight tests are conducted in realistic operational environments, each test examines a single scenario and has environmental and safety constraints.

FY05 Test Plan. Our FY05 Test Plan includes three system flight tests employing GMD: a demonstration of operational interceptor configuration; an intercept using Aegis Long Range Surveillance and Track (LRS&T) Radar; certification of the Beale Upgraded Early Warning Radar (UEWR). Furthermore, we plan to conduct three system tests employing Aegis BMD: an intercept of a short range target with the tactical Aegis BMD configuration; an intercept of a medium range, separating target; and an intercept of a medium range target using cueing from another Aegis ship. Other projected flight tests include THAAD early Development Testing (DT), PAC-3 DT/OT (Operational Testing) and Arrow system tests. We also plan to conduct ground tests and wargames to demonstrate interoperability, evaluate performance and develop doctrine, tactics, techniques and procedures.

FY06 Test Plan. The BMDS FY06 Test Plan includes four system flight tests involving our long-range interceptor capabilities: an intercept from Vandenberg AFB using the Beale UEWR; a simulated interceptor engaging a target using data from the Sea-based X-band radar; a GBI engaging a target based on data from an Aegis Ballistic Missile Defense radar; and two GBIs engaging two targets using Aegis BMD radar data. We also plan to conduct three flight tests verifying the ability of the system to engage

targets using the Aegis BMD sea-based interceptor capability: a planned intercept in a cooperative research test with Japan; a planned intercept of two targets in a combined developmental and operational test; and a planned intercept of two separating targets in a combined developmental and operational test using a non-organic source to cue the firing Aegis ship. Other projected flight tests include two Terminal High Altitude Area Defense (THAAD) system-level developmental tests, four Patriot combined developmental and operational tests, two Arrow system flight tests, and critical measurements and countermeasures flight tests. We also plan to conduct ground tests, wargames and modeling and simulation to demonstrate interoperability, assess performance and specification compliance, and develop doctrine, tactics, techniques and procedures.

International Participation. Ballistic missile defense is – and must be – global. The missile threat is worldwide, and missile defense is a central aspect of U.S. counterproliferation efforts. The global nature of the threat requires that we work closely with our allies to develop and field missile defenses that will discourage our adversaries from acting aggressively and protect our collective interests from threat missiles should they be used.

International participation remains an essential part of our program. In the past year, we have made significant progress within existing relationships, as well as important first steps in developing others. During 2005, we will finish work on the Fylingdales Upgraded Early Warning Radar in the United Kingdom (UK), and we have reached an accord with the Kingdom of Denmark on upgrading the Early Warning Radar in Thule, Greenland. Both radars are key components for defeating long-range ballistic missile threats emerging from the Middle East. The MDA is working closely with the UK Missile Defence Centre (established by the United Kingdom Ministry of Defence), to explore and facilitate future cooperation. The North Atlantic Treaty Organization (NATO) also continues to examine its missile defense needs. In the past year, NATO initiated a study focused on developing a requirement for missile defense of NATO territory, the results of which will complement an earlier study examining defense of NATO deployed forces. Israel remains a strong partner in missile defense, and Australia has announced its support for the BMDS, and signed a BMD Framework Memorandum of Understanding to work cooperatively with the United States on sensors.

The Government of Japan has announced plans to deploy a multi-layered missile defense capability. Their plans include upgrading their Patriot battalions to a PAC-3 capability and upgrading their four Aegis destroyers to a BMD capability. Other cooperative efforts include the joint development of an improved Standard Missile-3 interceptor that is capable of defeating long-range ballistic missiles. This program in particular has been designed in keeping with the President's direction to structure programs to promote international cooperation.

Our Future Years Defense Program also includes funding beginning in FY07 to begin exploring potential locations for an interceptor site in Europe. Such a capability would contribute to our primary mission to protect the United States, while having the additional benefit of defending our allies, friends and deployed forces.

III. SIGNIFICANT CHANGES FROM FY05 BUDGET SUBMISSION.

The following is a summary of the significant program changes reflected in this year's budget compared to our FY05 submission.

Planned Fielding. The program of work described in this submission includes the next increment of missile defense capability to be delivered in Block 2006. By the end of 2007, we will have added up to 10 more Ground Based Interceptors at Fort Greely and an Upgraded Early Warning Radar at Thule, Greenland to increase the our ability to engage threats originating from the Middle East. We will also field another transportable Forward Based X-Band Radar that could be located in Asia to enhance our regional tracking capability and make our fielded interceptors more effective. We continue to upgrade Aegis cruisers and destroyers, and we will deliver additional SM-3 sea-based interceptors to enhance our ability to protect deployed forces and defend against asymmetric threats. Figure 4 describes the capability we plan to have fielded by the end of Block 2006.

2007

Full Protection Against Mid-East
Expand Coverage to Allies & Friends
Expand Coverage of Deployed Forces

Fixed Site Interceptors	• Up to 26 Ground-Based Interceptors, Alaska • 2 Ground-Based Interceptors, California
Fixed Site Sensors	• Cobra Dane radar, Alaska • Beale radar, California • Fylingdales Radar, United Kingdom • Thule radar, Greenland
Mobile/ Transportable Sensors	• 1 Sea-Based X-Band Radar, Alaska • 2 Forward-Based X-Band Radar • 6 Aegis Search & Track Destroyers
Mobile Interceptors	• 3 Aegis Engagement Cruisers* • 8 Aegis Engagement Destroyers* • 28 Standard Missile-3s** • 512 Patriot PAC-3

* Engagement ships can perform Search & Track Function
** Planned deliveries

Figure 4.

The FY06-07 budget also supports several fielding efforts that will be delivered later in the FYDP. We will begin expanding Fort Greely to accommodate as many as 40 GBIs, and we will begin preparing for a potential third Ground Based Interceptor site overseas. As part of this effort, we are preserving the option to increase the number of Ground Based Interceptors to 50, the final ten of which would be fielded at the overseas site, or at Fort Greely. These additional interceptors will enhance protection of the United States against attacks from the Middle East, as well as provide protection of our allies and friends. Continued fielding of the Standard Missile-3 will raise the inventory to more than 100 by the end of the FYDP, and fielding of the Terminal High Altitude Area Defense includes two fire units with 48 total interceptors by 2011. These components are critical to protecting deployed forces and contribute to providing protection of the U.S. against asymmetric attacks. Planned upgrades to radars at Otis and Eglin Air Force Bases, which begin in FY06-07, will also enhance our engagement capability against asymmetric threats, and the fielding of the first satellites of the Space Tracking and Surveillance System will improve the ability of our interceptors to engage all threats, including rogue nation threats, asymmetric threats, and potential emerging threats.

Kinetic Energy Interceptor. We have substantially restructured KEI to focus near term efforts on demonstrating key capabilities and therefore reduce the risk associated with the program. The resulting program is funded at a considerably lower level compared to the one submitted in last year's budget and the planned fielding of a land-based capability has been delayed one year to 2013. The restructured program remains a key boost phase alternative, but because of ABL's recent test successes, KEI will serve primarily as a risk reduction for the boost phase. KEI's contribution extends beyond the boost phase, however. It is a high-acceleration interceptor with a burnout velocity comparable to the GBI, which allows us to defend a larger area with this weapon. The mobility of this very capable interceptor will increase the overall flexibility of the BMDS in all phases. We expect to have our first booster flight test in 2008, one year later than last year's plan. Decisions on sea-based capability and international efforts have been deferred until initial concepts are demonstrated. The space test bed effort is still included in the restructured program with funding beginning in FY08. The overall reduction to KEI funding is approximately $5B from FY06-09. As this element matures and capability is demonstrated, outyear funding will be evaluated and adjusted.

21" Full Caliber Round Standard Missile-3 (SM-3). We have included funding for a joint cooperative development program with Japan to upgrade the Standard Missile. Funding totals $545M across the Future Years Defense Program. Japan is expected to fund this development effort at a comparable level. The Department is currently in the final stages of discussion with the Japanese on the commitment of resources for this program.

Multiple Kill Vehicles (MKV) Program. The MKV program, previously funded as an advanced technology effort, is now broken out in a separate project in this budget. MKV is developing the capability to employ several small kill vehicles within a single interceptor missile to destroy multiple objects within a volume of space, or volume kill. MKV is part of a broad effort within the BMD program to address countermeasures. The MKV program is funded at $82M in FY06 and a total of $1.3B across the FYDP.

IV. BLOCK HIGHLIGHTS

A Block is a biennial increment of the BMDS that provides an integrated set of capabilities that has been tested as part of the BMDS and assessed for its military utility. Once assessed, elements and components are available for fielding, as directed. This may occur at any time during the Block.

Transfer Plans (In Accordance With Section 223). We are working closely with the Services and the Combatant Commanders to ensure the system that is fielded can be sustained and supported when it is transferred. Consistent with the President's guidance, we are fielding systems that, at this point, require continued development and developmental testing. Under these conditions, it would not be prudent for us to transfer management of any particular element to a Service. We have committed, however, to continued work with the Services to ensure a mutually agreeable transfer process is achieved.

Block 2004. There is only modest funding in this budget submission for Bock 2004 activity, which completes the initial element fielding, including BMDS sustainment, development and testing of the Aegis BMD weapon system, and configuration testing for Command and Control, Battle Management and Communications (C2BMC). Funding for Block 2004 is detailed in Table 1.

Block 2004 Funding FY04-11 ($M Then-Year)

Project	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FYDP FY 06-11
C2BMC Block 2004	92	154	23	16					**39**
Hercules Block 2004	5								
Joint Warfighter Support Block 2004	33	24							
Test & Evaluation Block 2004	41	143							
Targets & CM Block 2004	183	176							
THAAD Block 2004	667								
GMD Block 2004	1357	955	279	375					**654**
Aegis BMD Block 2004	606	943	101	15					**116**
ABL Block 2004	463	458							
Total	**3448**	**2854**	**403**	**406**	**0**	**0**	**0**	**0**	**809**

Table 1. Funding for Block 2004

The following table provides an estimate of the production rate capacity of the facilities that will produce the capabilities being fielded in Block 2004.

	Production Rate Capacity
Ground Based Interceptors (GBI)	**One per month**
Standard Missile 3 (SM-3)	**One per month**

Table 2. Block 2004 Production Rates

Block 2006. Our program of work for Block 2006 focuses on fielding additional capability, integrating the capability to achieve maximum effectiveness and continued development of follow-on systems. Funding for Block 2006 is detailed in Table 3. Major initiatives in Block 2006 are:

1) Expansion of the Block 2004 initial fielding, to include:

- Additional Ground-Based Interceptors at Fort Greely, Alaska;
- Additional sea-based interceptors and Aegis BMD ships;
- Upgraded Early Warning Radar at Thule, Greenland;
- Additional Forward Based X-Band Radars.

2) Completion of the Space Tracking and Surveillance System ground segment, and the launch of two satellites, which will provide risk reduction data for the BMDS acquisition, tracking and discrimination function.

3) Begin the integration of the laser component of the Airborne Laser into the first ABL weapon system testbed and initiation of ground testing of this testbed. Initiate design of the second ABL aircraft.

4) THAAD begins a first series of flight tests beginning in FY05 and continuing through FY07. The first of these tests are controlled test flights and radar and seeker characterization tests. The first intercept test is planned for FY06.

Block 2006 Funding FY04-11 ($M Then-Year)									
Project	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FYDP FY 06-11
C2BMC Block 2006	52	24	142	153	24	17			**336**
Hercules Block 2006	27	37	8						**8**
Joint Warfighter Support Block 2006			57	66					**123**
Test & Evaluation Block 2006	2	21	170	139	3				**312**
Targets & CM Block 2006		113	222	208					**430**
THAAD Block 2006	15		795	339					**1134**
GMD Block 2006	1607	2383	1945	1857	331	234			**4367**
Aegis BMD Block 2006	24	121	575	547	69	15			**1206**
ABL Block 2006			465	630					**1095**
BMDS Radars Block 2006	145	261	272	263	60	93			**689**
STSS Block 2006	263	256	231	208	64	11	8	7	**530**
Total	**2136**	**3216**	**4881**	**4411**	**551**	**369**	**8**	**7**	**10228**
Defense-Wide Resources					-423	-358			**-781**
MDA Total Less Defense-Wide Resources	**2136**	**3216**	**4881**	**4411**	**129**	**11**	**8**	**7**	**9447**

Table 3. Funding for Block 2006

The following table provides an estimate of the production rate capacity of the facilities that will produce the capabilities being fielded in Block 2006.

	Production Rate Capacity
Ground Based Interceptors (GBI)	**One per month**
Standard Missile 3 (SM-3)	**Two per month**
THAAD Radar	**Two per year**
Forward Deployable Radar	**Two per year**

Table 4. Block 2006 Production Rates

Block 2008. Block 2008 expands our ability to protect the United States, deployed forces, allies and friends. In particular, it increases our capability against medium and intermediate range ballistic missiles. It also continues our development efforts to ensure we are prepared to address future challenges. Funding for Block 2008 is detailed in Table 5. The most significant Block 2008 efforts include:

1) Expansion of fielded capabilities with

- Additional Ground-Based Interceptors at Fort Greely, Alaska;
- Additional sea-based interceptors;
- First Terminal High Altitude Area Defense fire unit;
- An Upgraded Early Warning Radar at Otis AFB
- Upgrading a radar at Eglin AFB, Florida;
- Add two X-Band Dish Radars; and
- Upgrading an existing X-Band Dish Radar.

2) Continued ground and flight testing of the first ABL aircraft and initiating acquisition of a second ABL airframe.

3) Introduction of ground segment and software upgrades to the Space Tracking and Surveillance System. Upgrades will be based on data gathered from satellites launched in Block 2006.

Block 2008 Funding FY04-11 ($M Then-Year)									
Project	**FY04**	**FY05**	**FY06**	**FY07**	**FY08**	**FY09**	**FY10**	**FY11**	**FYDP FY 06-11**
C2BMC Block 2008	1	11	76	100	197	166	66	56	**661**
Hercules Block 2008	23	46	52	49	24	13			**138**
Joint Warfighter Support Block 2008					62	63			**124**
Test & Evaluation Block 2008	0		1	72	204	140	3		**420**
Targets & CM Block 2008			10	38	177	163			**389**
THAAD Block 2008		760	252	592	779	353			**1976**
GMD Block 2008			74	281	1425	1176	338	214	**3508**
Aegis BMD Block 2008			135	354	637	546	205	44	**1921**
ABL Block 2008					601	669			**1270**
BMDS Radars Block 2008			8	275	564	345	119	115	**1426**
STSS Block 2008				45	29	24	14	14	**126**
Total	**23**	**817**	**607**	**1806**	**4700**	**3660**	**745**	**442**	**11961**
Defense-Wide Resources					-375	-258	-397	-357	**-1387**
MDA Total Less Defense-Wide Resources	**23**	**817**	**607**	**1806**	**4325**	**3402**	**349**	**85**	**10574**

Table 5. Funding for Block 2008

The following table provides an estimate of the production rate capacity of the facilities that will produce the capabilities being fielded in Block 2008.

	Production Rate Capacity
Ground Based Interceptors (GBI)	**One per month**
Standard Missile 3 (SM-3)	**Two per month**
THAAD Interceptors	**Three per month**
THAAD Radar	**Two per year**
Forward Deployable Radar	**Two per year**

Table 6. Block 2008 Production Rates

Block 2010. Fielding and development efforts will continue in Block 2010. Funding for Block 2010 is detailed in Table 7. Significant Block 2010 efforts include:

1) Expanded capability will include additional sea-based interceptors, and an additional THAAD fire unit, 10 additional Ground-Based Interceptors, a potential third site for fielding of these GBIs, and an Upgraded Early Warning Radar at Clear Air Station in Alaska. Funding for the Block 2010 GBIs and the potential third site starts in FY07.

2) Airborne Laser program focuses on the second ABL weapons system test bed, including taking delivery of the aircraft, beginning necessary modifications, and initiating fabrication of weapon components.

Block 2010 Funding FY04-11 ($M Then-Year)									
Project	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FYDP FY 06-11
C2BMC Block 2010				12	61	105	218	224	**618**
Hercules Block 2010			11	18	42	52	65	66	**254**
Joint Warfighter Support Block 2010							65	69	**133**
Test & Evaluation Block 2010						69	209	144	**422**
Targets & CM Block 2010					4	32	200	205	**442**
THAAD Block 2010						168	635	395	**1198**
GMD Block 2010				189	717	655	1557	1349	**4467**
Aegis BMD Block 2010					20	185	576	644	**1425**
ABL Block 2010							792	1163	**1955**
BMDS Radars Block 2010				1	3	85	150	69	**308**
STSS Block 2010	12	48							
BMDS Interceptor Block 2010	101								
EO/IR Block 2010			9	14	16	16	16	16	**88**
Total	**113**	**48**	**20**	**235**	**863**	**1367**	**4483**	**4343**	**11311**
Defense-Wide Resources					-713	-758	-860	-422	**-2753**
MDA Total Less Defense-Wide Resources	**113**	**48**	**20**	**235**	**150**	**609**	**3623**	**3921**	**8558**

Table 7. Funding for Block 2010

Block 2012. We have a considerable investment in Block 2012 capability in this budget submission comprised primarily of our Kinetic Energy Interceptor program and the Space Tracking and Surveillance System (STSS) program. Funding for Block 2012 is in Table 8. Significant efforts in Block 2012:

1) The Kinetic Energy Interceptor program has been restructured to focus on critical technology demonstrations and the development of an initial land-based capability. During FY05-07, the program will focus on static booster firings, culminating in a booster flight test in FY08. A kill vehicle test is scheduled for FY09, and a full interceptor integration test is planned for FY11. This program will result in a Block 2012 capability of one land-based fire unit with ten interceptors. A sea-based capability could follow sometime thereafter depending on funding levels in the program.

2) The STSS launch schedule will depend on the satellite configuration, but the first satellite is projected to be launched early in Block 2012. We are planning to initiate the acquisition of a modest STSS constellation beginning in FY06 after the delivery of the Block 2006 payloads. This effort will begin contractor constellation and satellite design work.

Block 2012 Funding FY04-11 ($M Then-Year)									
Project	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FYDP FY 06-11
Test & Evaluation Block 2012							0	70	**70**
STSS Block 2012			1	167	440	579	737	773	**2697**
BMDS Interceptor Block 2012		267	219	420	605	961	1189	1454	**4847**
Total	**0**	**267**	**219**	**587**	**1045**	**1540**	**1926**	**2296**	**7614**
Defense-Wide Resources					-440	-579	-737	-962	**-2718**
MDA Total Less Defense-Wide Resources	**0**	**267**	**219**	**587**	**605**	**961**	**1189**	**1334**	**4896**

Table 8. Funding for Block 2012

Block 2014. We are planning to start a competitive concept design for a space testbed in FY08. In FY09, we will select a contractor team(s) to continue into the Space Testbed Development and Test phase, during which the contractor will develop the spacecraft housing, modify the KEI C2BMC component, qualify a kill vehicle for space operations and develop axial stage interceptor motors. Funding for Block 2014 is detailed in Table 9.

Block 2014 Funding FY04-11 ($M Then-Year)									
Project	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FYDP FY 06-11
Space-Based Test Bed					45	150	248	230	**673**
Totals	**0**	**0**	**0**	**0**	**45**	**150**	**248**	**230**	**673**

Table 9. Funding for Block 2014

Mission Area Investments. There is a significant amount of non-Block funding in our FYDP, which we refer to as Mission Area Investment. These efforts allow us to implement the BMDS across Blocks, expand capabilities in future Blocks; and develop capabilities not yet foreseen as part of a current or future Block. Mission Area Investments include: System Engineering and Integration, Test and Targets, International Programs, Advanced Concept Development (Advanced Systems), and other investment areas identified below. Funding for Mission Area Investments is detailed in Table 10.

Mission Area Investments Funding FY04-11 ($M Then-Year)									
Project	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FYDP FY 06-11
System Engineering	169	241	113	116	116	116	128	134	**723**
C2BMC	18	2							
Test & Targets	532	362	418	430	427	450	454	464	**2644**
International Programs	215	223	102	132	190	209	209	181	**1024**
MKV			82	220	273	307	308	114	**1303**
Special Programs	133	160	350	483	826	1097	1015	1244	**5015**
Advanced Systems	245	227	132	177	185	193	202	209	**1098**
SBIR/STTR	142								
Producibility & Manufacturing Technology	28	36	27	36	39	42	42	43	**230**
Safety, Quality & Mission Assurance			20	21	21	22	21	21	**125**
BMD Information Management Systems	38	61	125	185	167	157	141	145	**919**
Intelligence & Security	17	21	21	23	26	27	28	29	**154**
Program-Wide Support	226	143	142	202	242	234	232	228	**1280**
Headquaters Management	108	128	117	111	105	105	86	86	**610**
Totals	**1871**	**1604**	**1649**	**2137**	**2617**	**2959**	**2865**	**2899**	**15126**

Table 10. Funding for Mission Area Investments

V. PRESIDENT'S BUDGET SUBMISSION AND ORGANIZATION

We have been executing the BMDS Program in accordance with Secretary of Defense direction that progress in developing a missile defense system will be based on the successful demonstration of a useful capability. Specifically, he directed the Missile Defense Agency to plan and execute the program such that efforts can be truncated or stopped if results are unsatisfactory so those funds can be shifted to support or accelerate more successful efforts. Our program of work continues this approach to BMDS development. The benefit of this approach, which we call knowledge-based funding, is our ability to pursue multiple promising programs, assess progress towards achieving our development goals and retain flexibility to make decisions to truncate, stop or accelerate any one program.

Our knowledge-based funding approach is based on "knowledge points," or key performance demonstrations for our programs. Successful demonstrations will lead to increased investment and earlier fielding potential. On the other hand, unsuccessful demonstrations might lead to a redirection of funds toward more mature efforts or fielded assets. Knowledge-based funding allows us

to use our budgetary resources in the most efficient and responsible manner. This budget represents our recommended approach to development and fielding to address the full range of near-term and far-term ballistic missile threats based on the knowledge we have today.

To carry out more efficiently the development and fielding of the BMDS we continue to make improvements in program execution. For example, we are proposing to maximize the effective use of our appropriated funds by managing contingent termination liability at the BMD system level, rather than contract by contract. While this will not generate additional funds, it will permit certain missile defense contractors to use more effectively the funds obligated on their contracts to execute congressionally approved program content. MDA will monitor individual programs and allow this approach on a case-by-case basis, and will ensure sufficient unencumbered funds (i.e. un-obligated funds, or obligated funds that have not been paid to, or earned by, the contractor) are available at all times to pay potential contingent termination costs. Such contingent termination costs could include costs listed in the DoD Federal Acquisition Regulation Supplement and other termination costs that are contingent in nature, and are reasonable, allowable, and allocable to the contract. To accomplish this, MDA has implemented a detailed funds accounting and reconciliation process across the BMDS enabling it to track accurately both contingent termination liability and availability of all unencumbered BMDS program funding.

Table 11 below provides a breakdown of Program Element funding by fiscal year across the FYDP.

PE Title	PE Number	FY06	FY07	FY08	FY09	FY10	FY11	FY06-11 Total
BMD Core	0603890C	447	538	532	531	521	532	3101
BMD Products	0603889C	455	510	509	517	516	516	3023
BMD Test & Targets	0603888C	622	684	608	643	661	670	3889
Terminal	0603881C	1144	1035	880	617	731	486	4892
Midcourse	0603882C	3266	3946	3651	3316	3184	2546	19908
Boost	0603883C	484	649	621	691	811	1183	4439
Sensors	0603884C	530	996	1214	1186	1069	1019	6014
BMDS Interceptor	0603886C	230	445	677	1137	1469	1718	5675
Technology	0603175C	136	185	197	205	212	219	1155
Special Programs	0603891C	350	483	826	1097	1015	1244	5015
Mgmt Hq/PRMRF	0901598C/ 0901585C	117	111	105	105	86	86	610
	Block Total	**7780**	**9581**	**9821**	**10045**	**10276**	**10218**	**57721**
Defense-Wide Resources	0904903D			-1951	-1953	-1994	-1741	-7639
MDA Total Less Defense-Wide Resources		**7780**	**9581**	**7870**	**8093**	**8283**	**8476**	**50083**

Table 11. Funding By Program Element

Table 12 provides a breakdown of Program Element funding by Block for funds included in this budget submission.

PE Title	PE Number	BMDS Funding for FYDP 06-11 ($M Then-Year)							
		Capability Blocks						Mission Area Invest	PE Total
		Block 2004	Block 2006	Block 2008	Block 2010	Block 2012	Block 2014		
BMD Core	0603890C							3101	3101
BMD Products	0603889C	39	466	923	1006			589	3023
BMD Test & Targets	0603888C		742	809	864	70		1404	3889
Terminal	0603881C		1134	1976	1198			585	4892
Midcourse	0603882C	770	5573	5430	5893			2243	19908
Boost	0603883C		1095	1270	1955			119	4439
Sensors	0603884C		1219	1553	396	2697		150	6014
BMDS Interceptor	0603886C					4847	673	155	5675
Technology	0603175C							1155	1155
Special Programs	0603891C							5015	5015
Mgmt Hq/PRMRF	0901598C/ 0901585C							610	610
	Block Total	**809**	**10228**	**11961**	**11311**	**7614**	**673**	**15126**	**57721**
Defense-Wide Resources	0904903D		-781	-1387	-2753	-2718			-7639
MDA Total Less Defense-Wide Resources		**809**	**9447**	**10574**	**8558**	**4896**	**673**	**15126**	**50083**

Table 12. Mapping Program Elements to Blocks

VI. SUMMARY

The Missile Defense Agency remains committed to the mission of developing and fielding an integrated, layered ballistic missile defense system to protect the nation, our deployed forces, allies and friends. We believe this ballistic missile defense program effectively balances capabilities across boost, midcourse and terminal segments to address evolving threats. The proposed program balances development and fielding efforts within the funds provided, preserves flexibility for alternative option paths as development efforts are proven, and provides for incremental improvements to the BMDS over time.

Significant challenges remain. We have made great progress over the last several years, but much more remains to be done. We need to test and improve the capabilities of our fielded systems to address current threats. Our adversaries continue to build and evolve capabilities that our missile defense system will have to defeat in the future.

VII. ACRONYMS

ABL	Airborne Laser
ACD	Adversary Capabilities Document
AFB	Air Force Base
AFOTEC	Air Force Operational Test & Evaluation Center
AOR	Area of Responsibility
ATEC	Army Test & Evaluation Command
BMDS	Ballistic Missile Defense System
BOCA	BMDS On-Alert Capability Assessment
C2	Command and Control
C2BM	Command and Control, Battle Management
C2BMC	Command and Control, Battle Management and Communication
CM	Countermeasures
CM/CCM	Countermeasures / Counter-Countermeasures
CMCM	Critical Measures and Countermeasures
COCOM	Combatant Commander
CONOPS	Concept of Operations
CTF	Combined Test Force
CVAP	Capability Verification Assessment Plan
CVAR	Capability Verification Assessment Report
DMTP	Development Master Test Plan
DoD	Department of Defense
DOT&E	Director, Operational Test & Evaluation
DSP	Defense Support Program
DT	Development Test
DT/OT	Development Test/Operational Test
ECS	Element Capability Specification
EKV	Exoatmospheric Kill Vehicle
ESG	Engagement Sequence Group
FASP	Fly Along Sensor Package

FDR	Forward Deployable Radar
FFRDC	Federally Funded Research and Development Center
FM	Flight Mission
FMA	Foreign Military Assistance
FY	Fiscal Year
FYDP	Future Years Defense Program
GBI	Ground Based Interceptor
GMD	Ground-Based Midcourse Defense
HAA	High Altitude Airship
HEL	High Energy Laser
ICS	Interface Control Specification
IDC	Initial Defensive Capability
IDO	Initial Defensive Operations
IFT	Integrated Flight Test
IMDWG	Integrated Missile Defense Wargame
IMTP	Integrated Master Test Plan
IPP	Impact Point Prediction
IRBM	Intermediate Range Ballistic Missile
ISSA	Inter-Service Support Agreement
JITC	Joint Interoperability Test Command
JROC	Joint Requirements Oversight Council
KEI	Kinetic Energy Interceptor
KW	Kinetic Warhead
LADAR	Laser Radar
LPP	Launch Point Prediction
LRBM	Long-Range Ballistic Missile
LRS&T	Long Range Surveillance and Tracking
MDA	Missile Defense Agency
MDIE	Missile Defense Integration Exercise
MDSG	Missile Defense Support Group
MKV	Multiple Kill Vehicle

MRBM	Medium-Range Ballistic Missile
MUA	Military Utility Assessment
NATO	North Atlantic Treaty Organization
NFIRE	Near-Field Infrared Experiment
NSPD	National Security Presidential Directive
O&M	Operations and Maintenance
OLG	OTA Liaison Group
OMB	Office of Management and Budget
OPTEVFOR	Navy's Operational Test & Evaluation Force
OTA	Operational Test Authority
PAC	PATRIOT Advanced Capability
PAM	Planning and Allocation Matrix
PART	Program Assessment Rating Tool
PE	Program Element
PEO	Program Executive Office
PMS	Program Management Support Office
R&D	Research & Development
RDT&E	Research, Development, Test and Evaluation
REO	Responsible Engineering Organization
RTO	Responsible Test Organization
SBIRS	Space-Based Infrared System
SBX	Sea-Based X-Band Radar
SCS	System Capability Specification
SE	Systems Engineering
SEC	Senior Executive Council
SETA	Scientific, Engineering and Technical Assistance
SM	Standard Missile
SOG	Statement of Goals
SRBM	Short-Range Ballistic Missile
STSS	Space Tracking & Surveillance System
T&E	Test and Evaluation

THAAD	Terminal High Altitude Area Defense
TOG	Technical Objectives and Goals
TOO	Target of Opportunity
UARC	University Affiliated Research Centers
UCP	Unified Command Plan
UEWR	Upgraded Early Warning Radar
USNORTHCOM	United States Northern Command
USSTRATCOM	United State Strategic Command
WBS	Work Breakdown Structure

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Missile Defense Agency
Fiscal Year (FY) 2006/2007 Budget Estimates

Program Elements Not Providing R Exhibits Due to Classification

0603879C **Advanced Concepts, Evaluations and Systems**
0603891C **Special Programs - MDA**

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Missile Defense Agency
Congressional Reporting Requirements

Budget Documentation	**Page**	**Statutory/Reporting Requirement**
0603882C, GMD, Project 0808 0603882C, Aegis, Project 0709 0603884C, Sensors, Project 0811 0603889C, C2BMC, Project 0701 0603889C, MOC, Project 0803	Page 36 of 150 Page 85 of 150 Page 46 of 74 Page 10 of 128 Page 95 of 128	*BMDS OPERATIONS*; FY05 Appropriations Conference Report H.R. 4613; H. Report 108-622, page 356.
FY 2006 Budget Estimate Overview	IV. BLOCK HIGHLIGHTS, Transfer Plans (in accordance with Section 223) Page 14.	*Sec. 223a. Ballistic Missile Defense Programs: Procurement;* National Defense Authorization Act FY04 (H.R. 1588, H. Rpt. 108-354, pp. 30-31)
FY 2006 Budget Estimate Overview FY 2006 Budget Estimate Overview	IV. BLOCK HIGHLIGHTS, Block 2004 Production Rates, page 15, Block 2006 Production Rates page 16, Block 2008 Production Rates page 18. IV. BLOCK HIGHLIGHTS, Transfer Plans (in accordance with Section 223) Page 14.	*Sec. 223a. Oversight of Procurement of BMDS Elements;* National Defense Authorization Act FY04 (H.R. 1588, H. Rpt. 108-354, pp. 613-614.)

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Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/03 Advanced Technology Development (ATD)**	R-1 NOMENCLATURE **0603175C Ballistic Missile Defense Technology**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total PE Cost	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763
0502 Advanced Technology Development	203,551	226,795	131,783	177,338	184,744	193,263	201,706	209,363
0503 Laser/LADAR Technology	20,328	0	0	0	0	0	0	0
0602 Program-Wide Support	2,886	4,350	4,458	7,539	12,485	11,928	10,729	9,400

Note:
In FY 2004, the Laser Technology Project, 0503, was moved into the 0502 Project, Advanced Technology Development.

In FY 2006, the Multiple Kill Vehicle funding is moved to Project 0515 in the BMD Midcourse DefenseProgram Element 0603882C.

A. Mission Description and Budget Item Justification

The mission of the Missile Defense Agency (MDA) is to develop an integrated layered Ballistic Missile Defense System (BMDS) to defend the United States, its deployed forces, friends and allies from ballistic missiles of all ranges and in all phases of flight. In late 2004 the United States fielded a limited capability to defeat a ballistic missile threat. Continuing through the Future Years Defense Plan (FYDP), the breadth and depth of this initial capability will be expanded by adding and networking forward-deployed sensors, interceptors at sea and on land, and layers of increasingly capable weapons and sensors. Today's MDA activities are focused on five objectives: 1) complete development, initial fielding, and verification of Block 2004; 2) provide BMDS sustainment and Warfighter (Combatant Commanders) support; 3) develop a totally integrated capability for Block 2006 and beyond based on a strong core research and development program and improving the BMDS incrementally over time to meet future challenges; 4) execute an increasingly complex test program; and 5) establish a robust international foundation for missile defense.

MDA identifies BMDS capabilities, architectures and element contributions to counter the threat and organizes them by Engagement Sequence Groups (ESGs). These ESGs describe a combination of weapons, sensors and Command and Control, Battle Management, and Communications (C2BMC) capabilities that must work together to detect, track and intercept an enemy missile; the complete kill chain from the time the threat missile is first detected through the intercept of the target. Through ESGs, the MDA Systems Engineer identifies the necessary interfaces required to deliver a usable configuration of the BMDS. ESGs are also useful in helping the operator plan and train for operation of that capability, and they provide a means to track and test future improvements to the system.

The BMD Technology Program Element (PE) funds the development of new system concepts and key components to support two-year block upgrades and capability improvements. The PE consists of four primary areas: Sensing Systems, Engagement Systems, High Altitude Airship Advanced Concept Technology Demonstration, and Innovative Technology and Analysis. The Sensing Systems area focuses efforts on Discriminating Sensor Technology, Electro-optical Infrared Passive Technology, Radar Systems Technology, Early Launch Detection and Tracking, and Microsatellites. The Engagement Systems technology area focuses efforts on Multiple Kill Vehicles and Laser Technology. The High Altitude Airship Advanced Concept Technology Demonstration program is working towards a prototype platform that will eventually lead to the deployment of a fully operational High Altitude Airship. The Innovative Technology and Analysis program efforts include the Advanced Systems Innovation Cell and the Missile Defense Science, Technology, and Research program. All of the efforts in the BMD Technology PE are supported by a strong team of government personnel and support contractors.

Program-Wide Support provides funding for common support functions across the entire program such as strategic planning, program integration, cost estimating, contracting, and financial management to include preparation of financial statements, reimbursement of financial services provided by DFAS, internal review and audit, earned-value management, and program assessment. Includes costs for both government civilians performing these functions as well as support contractors providing government staff augmentation in these areas. Applies to costs at the MDA HQ as well as its Executing Agents in the Services: Army Space and Missile Defense Command, Army PEO Space and Missile Defense, Office of Naval Research, and various Air Force laboratory and acquisition activities. Other costs include physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and

similar operating expenses at the various MDA Executing Agent locations, which at the MDA HQ are generally funded from the Management Headquarters Program Element (0901598C). Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

B. Program Change Summary	FY 2004	FY 2005	FY 2006	FY 2007
Previous President's Budget (FY 2005 PB)	225,268	204,320	199,468	246,291
Current President's Budget (FY 2006 PB)	226,765	231,145	136,241	184,877
Total Adjustments	1,497	26,825	-63,227	-61,414
Congressional Specific Program Adjustments	0	23,950	0	0
Congressional Undistributed Adjustments	0	2,875	0	0
Reprogrammings	1,628	0	0	0
SBIR/STTR Transfer	-131	0	0	0
Adjustments to Budget Years	0	0	-63,227	-61,414

The FY 2004 Ballistic Missile Defense Technology Program Element budget request in the FY 2005 budget compared to the FY 2006 budget showed an increase of $1,497,000. This resulted from a transfer of $131,000 to the Small Business Innovative Research Program; and a reprogramming of $1,628,000 based on Agency priorities.

The FY 2005 Ballistic Missile Defense Technology Program Element budget request in the FY 2005 budget compared to the FY 2006 budget showed an increase of $26,825,000. This increase reflects Congressional Specific Program Adjustments of $23,950,000 and Congressional Undistributed Adjustments of $2,875,000.

In FY 2006 and FY 2007:

- MKV effort transitioned to Project 0515 in the BMD Midcourse Defense PE (0603882C) in FY 2006.
- Advanced Concept Technology Demonstration (ACTD) prototype demonstration efforts slowed on the High Altitude Airship.
- Discriminating Sensor Technology project terminates after AMOR testing.
- Reduced Laser Technology efforts.
- Reduced SETA support and government salary funding for technology programs.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/03 Advanced Technology Development (ATD)**	R-1 NOMENCLATURE **0603175C Ballistic Missile Defense Technology**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0502 Advanced Technology Development	203,551	226,795	131,783	177,338	184,744	193,263	201,706	209,363
RDT&E Articles Qty	0	0	0	0	0	0	0	0

Note: In FY 2006, the Multiple Kill Vehicles program funding will move from Project 0502 (Engagement Systems area) to the BMD Midcourse Program Element, 0603882C in Project 0515, Multiple Kill Vehicles.

A. Mission Description and Budget Item Justification

The Advanced Technology Development program develops technology to counter missiles in all phases of flight by investing in technologies according to engineering discipline: Sensing Systems, Engagement Systems, High Altitude Airships, and Innovative Technology and Analysis.

The Sensing Systems Technology area focuses on active electro-optical (EO) sensors, passive electro-optical and infrared sensors (EO/IR), radar systems technologies, concepts for Early Launch Detection and Tracking (ELDT), and micro satellites.

- The EO/IR Active Sensors task, under the Discriminating Sensor Technology (DST) program, is developing advanced laser radar (LADAR) technology for insertion in future kinetic kill vehicle and surveillance systems. LADAR technology, coupled with passive sensors, can provide improved system discrimination performance by providing target features currently unavailable.
- EO/IR Passive Sensors task develops basic technologies in components and materials focused on enhancing the capabilities of the BMDS. Examples include:
  - Multi-color focal plane arrays
  - Silicon substrates for Mercury-Cadmium-Telluride (HgCdTe) infrared sensors
  - Very long wave infrared (VLWIR) sensors
- The Radar Systems Technology program integrates and tests next-generation transmitters, receivers, antennas, signal processors, and software to demonstrate technologies to insert in BMDS radars in future blocks, as well as enable new concepts in radar.
- The ELDT task develops, integrates, and tests electro-optical and radio-frequency concepts for detecting and tracking missile launches through clouds. These technologies will help enlarge the battlespace by adding time for decision makers and battle management.
- The Micro Satellite task is investigating small satellite concepts, payloads, and applications for future BMDS technology demonstrations.

The Engagement Systems Technology area consists of: Advanced Discrimination Initiative (ADI), Multiple Kill Vehicles (MKVs) and the Laser Technology Program (LTP).

- The MKV program develops multiple, lightweight, sophisticated, and lethal interceptors on a single-carrier vehicle that is compatible with existing launch systems.
- The ADI was a cross-Agency effort to modify BMD System weapons and sensors to defeat adversary countermeasures and increase overall system effectiveness in the midcourse phase.
- The Laser Technology program consists of the following:
  - Strategic Illuminator Laser- A multi-kilowatt brassboard illuminator system that will significantly advance the state-of-the-art in high-power laser illuminator brightness, reliability, and packaging. Contracts were awarded in April 2003 on the basis of a Broad Agency Announcement (BAA) to three responsive contractors for a four month concept development phase (Phase I). Following a Conceptual Design Review, Phase II for brassboard design was exercised in September 2003 providing continued funding to Northrop Grumman for 18 months of effort.
  - Small Laser Amplifier for Ladar - A powerful small laser transmitter (hundreds of watts) suitable for insertion on a missile defense platform with tight weight and volume constraints. Contracts were awarded in May 2003 on the basis of a BAA to two responsive contractors, Northrop Grumman and Coherent Technologies Inc., for a 12 month concept development phase (Phase I).

- Advanced Inertial Reference Unit - A device for highly accurate laser pointing and tracking. Contract was awarded in April 2003 on the basis of a BAA to Applied Technology Associates for a 12 month concept development and gyro survey phase (Phase I).
- Advanced Detectors - Improved detectors for laser radars, with increased sensitivity and bandwidth. Contract was awarded in May 2003 on the basis of a BAA to four responsive contractors (Raytheon, SAIC, Sensors Unlimited, and VOXTEL) for a 6 month concept development phase (Basic contract) of a wave front sensor/tracker and a ranging camera.
- Angle-Angle Range Doppler Imager - Combine the capabilities angle-angle range and coherent Doppler ladars to achieve both direct detection and coherent detection to enhance discrimination and aimpoint selection on stressing target objects such as tumbling reentry vehicles and decoys. MIT/LL began work on this project in January 2004.
- Advanced Chemical Oxygen-Iodine Laser (COIL) Technology - A new concept for a high performance singlet delta oxygen generator has been developed based on a high surface area flat jet of hydrogen peroxide that increases the specific surface area for chemical reactions. Contract awarded to Directed Energy Solutions in May 2004.

The Airship program is MDA's participation in the High Altitude Airship (HAA) Advanced Concept Technology Demonstration (ACTD) and supports the development of uninhabited, long-endurance platform to carry a wide range of BMD assets.

The Innovative Technology and Analysis area consists of the Advanced Systems Innovation Cell (ASIC), Innovative Science and Technology (IS&T) and technical analysis.

The SBIR Team oversees the MDA SBIR Evaluation and Debriefing process for all MDA Phase I and Phase II proposals. The Team also monitors Advanced Systems (AS) Phase I and Phase II SBIR Contracts.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Sensing Systems Technology	51,352	73,349	66,774	78,685
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- Upgraded range-resolved Doppler imaging LADAR breadboard to full power and commenced integration of other discriminating seeker capabilities (TRL 3-4).
- Completed development of several focal plane arrays for both space surveillance and seeker applications, including simultaneous two-color arrays. Transitioned final development of a radiation hardened long-wave infrared focal plane array to the Space Tracking and Surveillance System and the Manufacturing and Producibility deputate. Completed development of two different infrared cameras based on Quantum Well Infrared Photodetector (QWIP) technology for Airborne Laser search and track improvements.
- Continued development of a 10-Kelvin cryocooler using pulse tube technology for space surveillance application. This technology would enable space surveillance systems to extend into the very long wave infrared, increasing capability against colder targets and extending the useful range (TRL 2).
- Continued development of next-generation transmitters, receivers, antennas, signal processors, and software for improvements in BMDS radars. Continued design and technical analysis of advanced antenna technologies; performed distributed aperture coherence tests; delivered high voltage S-Band power amplifier chips based on GaAs technology and transitioned further development and packaging of this technology to the Navy.
- Completed initial studies of possible micro satellite uses for BMDS. Completed conceptual design of experiments in missile defense functionalities such as sensing, precision guidance and propulsion, and communications.
- Continued investigation into electro-optical and radio-frequency methods for Early Launch Detection and Tracking. Participated in several flight tests, gathering data for proof-of-principle.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/03 Advanced Technology Development (ATD)**	R-1 NOMENCLATURE **0603175C Ballistic Missile Defense Technology**

FY 2005 Planned Accomplishments:

- Test upgraded range-resolved Doppler imaging LADAR breadboard at full power. Integrate LADAR with passive sensors and beam pointing system; test fully functional active/passive discriminating sensor with breadboard-level fidelity (TRL 4). Commence design of a flyable brassboard discriminating sensor based on this technology.
- Characterize infrared cameras based on Quantum Well Infrared Photodetector (QWIP) technology for Airborne Laser search and track improvements. Pursue development of next generation infrared sensors based on Type II Superlattice and PbSnTe materials for very long wavelength operation. Continue investigations into growing HgCdTe on Silicon substrates, allowing for larger format arrays and diversity in the industrial base for HgCdTe substrate materials.
- Complete development of a 10-Kelvin cryocooler using pulse tube technology for space surveillance applications. Commence laboratory characterization and testing of this technology (TRL 3-4).
- Continue development of next-generation transmitters, receivers, antennas, signal processors, and software for improvements in BMDS radars. Continue design and technical analysis of advanced antenna technologies; further demonstrate distributed aperture coherence; complete development of high voltage X-Band power amplifier chips based on GaAs technology. Commence development of transmit/receive modules based on packaging of wide-bandgap materials in conjunction with DARPA.
- Commence initial design of micro satellite experiments in missile defense functionalities such as sensing, precision guidance and propulsion, and communications. Mature designs to preliminary design review (PDR) level for possible flight experiments with Space Test Program.
- Continue investigation into electro-optical and radio-frequency methods for Early Launch Detection and Tracking (ELDT). Participate in all available flight tests as well as dedicated static tests in order to continue gathering data for proof-of-principle. Commence initial system engineering and design for prototypical ELDT sensors.
- Start initial conceptual studies into the use of spectral sensing techniques for real-time BMDS assessment of hit-to-kill effectiveness. Commence gathering of phenomenology data.

FY 2006 Planned Program:

- Pursue improvements in Quantum Well Infrared Photodetector (QWIP) technology for possible space surveillance applications. Continue development of next generation infrared sensors based on Type II Superlattice and PbSnTe materials for very long wavelength operation. Continue investigations into growing HgCdTe on Silicon substrates, allowing for larger format arrays and diversity in the industrial base for HgCdTe substrate materials.
- Continue laboratory characterization and testing of 10-Kelvin cryocooler technology (TRL 4).
- Continue development of next-generation transmitters, receivers, antennas, signal processors, and software for improvements in BMDS radars. Continue design and technical analysis of advanced antenna technologies; deliver low-power-density antenna arrays. Continue development of transmit/receive modules based on packaging of wide-bandgap materials in conjunction with DARPA.
- Complete designs and commence fabrication of micro satellites for experiments in missile defense functionalities such as sensing, precision guidance and propulsion, and communications for flight experiments with DoD/USAF Space Test Program to demonstrate capabilities for future BMDS.
- Continue investigation into electro-optical and radio-frequency methods for Early Launch Detection and Tracking (ELDT). Participate in all available flight tests as well as dedicated static tests in order to continue gathering phenomenology data. Complete design and commence fabrication of prototypical ELDT sensors.
- Start design of spectral sensing systems for real-time BMDS assessment of hit-to-kill effectiveness. Continue gathering of phenomenology date for proof-of-principle.

FY 2007 Planned Program:

- Pursue improvements in Quantum Well Infrared Photodetector (QWIP) technology for possible space surveillance applications. Continue development of next generation infrared sensors based on Type II Superlattice and PbSnTe materials for very long wavelength operation. Continue investigations into growing HgCdTe on Silicon substrates, allowing for larger format arrays and diversity in the industrial base for HgCdTe substrate materials. Test delivered arrays in environments relevant to their application.
- Continue laboratory endurance testing of 10-Kelvin cryocooler technology (TRL 4).

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/03 Advanced Technology Development (ATD)**	R-1 NOMENCLATURE **0603175C Ballistic Missile Defense Technology**

- Continue development of next-generation transmitters, receivers, antennas, signal processors, and software for improvements in BMDS radars. Continue design and technical analysis of advanced antenna technologies; test and characterize low power density arrays in a radar testbed. Continue development of transmit/receive modules based on packaging of wide-bandgap materials in conjunction with DARPA.
- Complete designs and commence fabrication of micro satellites for experiments in missile defense functionalities such as sensing, precision guidance and propulsion, and communications for flight experiments with DoD/USAF Space Test Program to demonstrate capabilities for future BMDS.
- Complete fabrication of prototypical Early Launch Detection and Tracking (ELDT) sensors in both electro-optical and radar. Utilize prototypes in all available flight tests. Complete design and commence fabrication of prototypical ELDT sensors.
- Complete design of spectral sensing systems for real-time BMDS assessment of hit-to-kill effectiveness. Continue gathering of phenomenology data.

	FY 2004	FY 2005	FY 2006	FY 2007
Engagement Systems Technology	54,862	76,560	39,433	46,116
RDT&E Articles (Quantity)	0	0	0	0

Note: In FY 2006, the Multiple Kill Vehicles program funding will move from project 0502 (Engagement Systems area) to the BMD Midcourse Program Element, 0603882C in project 0515, Multiple Kill Vehicles.

FY 2004 Accomplishments:

- Selected one contractor team to begin Multiple Kill Vehicle (MKV) system development.
- Conducted MKV kill vehicle seeker, divert propulsion, and avionics component breadboard demonstrations.
- Conducted second MKV system design review to ensure kill vehicle and carrier vehicle compatibility.
- Performed advanced studies and engineering tests to improve ADI and related concepts, and developed other advanced counter-countermeasure capabilities.
- Completed an Engineering Change Proposal for insertion of Advanced Discrimination into the Ground Based Midcourse Defense System.
- Performed Ground Testing of Advanced Discrimination.

FY 2005 Planned Accomplishments:

- Conduct critical design review for the MKV hover test vehicle.
- Purchase long lead items for MKV kill vehicle hover test in FY 2006.
- Conduct MKV kill vehicle seeker, divert propulsion, and avionics brassboard demonstrations.
- Conduct MKV weapon control algorithm and software development.
- Continue execution of Strategic Illuminator, Compact Laser Radar Amplifier, Advanced Inertial Reference Unit, Advanced Detectors, and Angle-Angle-Range Doppler Imaging LADAR through prototype demonstration to termination.
- Select one to three technology base projects in FY 2005 for execution in FY 2006.
- Conduct a Concept Design Review for ADI, Block 2008/2010 capability in BMDS.
- Complete disposition of Capistrano Test Site equipment from the former Spaced Based Laser program in FY 2005.

- Strategic Illuminator Laser- Following first light using a single gain medium and first light at full power (1QFY05), a Preliminary Design Review will be conducted (2QFY05) and the breadboard demonstration will be completed in July 2005.
- Small Laser Amplifier for Ladar - Following a Program Review in 1QFY05, both contractors enter Phase IIb, breadboard fabrication. Anticipate completion of breadboards and testing at half power by the end of FY2005.
- Advanced Inertial Reference Unit - Following breadboard completion and a successful Critical Design Review in 1QFY05, Option 2 was exercised with program plan formulation and fabrication of the prototype device to follow.
- Advanced Detectors - Phase 2 commences with detector batch production and camera integration (detector and read-out). Additional modeling & simulation of the system will be conducted.
- Angle-Angle-Range Resolved Doppler Imager (AARDI) - Complete waveform generator and range-Doppler resolution demonstration. Integrate amplifier into breadboard for Angle-Angle Doppler capability and demonstrate system operation.
- Advanced Chemical Oxygen-Iodine Laser (COIL) Technology - Complete testing of nozzle at current rate and scale up facility for increased flow, conduct hot flow test and produce test report to conclude the project.
- Oxygen Laser - Develop and demonstrate a diode pumped liquid oxygen laser that reduces the complexity and bulk of high energy production compared to COILs by using the liquid oxygen for both lasing medium and heat dissipation. Contract to be awarded to Directed Energy Solutions in early FY05.
- Ultra-Sensitive Detectors - Initiate program, conduct design optimization and risk reduction.

FY 2006 Planned Program:

- Strategic Illuminator Laser - Fabricate brassboard tactical prototype and initiate high power brassboard lasing tests
- Small Laser Amplifier for Ladar - Complete program, deliver completed amplifiers to government/Federally Funded Research and Development Center (FFRDC) candidates including Advanced Systems Discriminating Seeker Technology program and MIT/Lincoln Laboratory for evaluation.
- Advanced Inertial Reference Unit - Complete program, deliver completed assembly to government/contractor facilities for evaluation as an ABL enhancement
- Advanced Detectors - Complete program; deliver completed cameras to government field site for evaluation.
- Ultra-Sensitive Detectors - Continue Program, complete design phase and begin fabrication and demonstration.
- Oxygen Laser - Initiate Phase II on the basis of results of Phase I, which will support evaluation of the potentially high combat payoff of the system
- AARDI ladar - Complete program. Test integrated AARDI breadboard at MIT/Lincoln Laboratory
- Advanced COIL Technology - Continue experiments with high-energy fuels and novel injection approaches at the Air Force Research Laboratory
- Continue the Laser Technology Program by selecting a new project for initiation in FY06 after competitive review of available investment opportunities by MDA-led government team, or upgrade existing project into a major project with higher annual value.

FY 2007 Planned Program:

- Strategic Illuminator Laser - Complete program. Deliver to government field facility for independent test and evaluation
- Oxygen Laser - Continue Phase II to develop subscale tactical laser system (if Phase II adopted).
- Ultra-Sensitive Detectors - Complete program, deliver units to government field site (probable: Air Force Research Laboratory) for evaluation
- Advanced COIL Technology - Complete experiments with high-energy fuels and evaluate for insertion onto ABL aircraft.
- Continue Laser Technology Program by selecting a new project in FY06 and Initiate FY07 based on available funds and technological opportunity.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/03 Advanced Technology Development (ATD)**	R-1 NOMENCLATURE **0603175C Ballistic Missile Defense Technology**

	FY 2004	FY 2005	FY 2006	FY 2007
High Altitude Airship	50,534	24,332	16,844	41,186
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

Executing Agent for High Altitude Airship ACTD (goal TRL 4-7). The objective of this ACTD is to demonstrate the engineering feasibility and potential military utility of an unmanned, untethered, gas filled, solar powered airship that can fly at 65,000 feet. The prototype airship developed under this effort should be capable of continuous flight for up to a month while carrying a multi-mission payload.

FY 2005 Planned Accomplishments:

The prototype airship design and risk reduction phase culminated with a Critical Design Review in early October 2004. The next phase of the program, the airship prototype development, build, and demonstration phase, will begin in November 2004 and will continue through the remainder of FY 2005.

FY 2006 Planned Program:

The airship prototype development, build, and demonstration phase continues through FY 2006 with subsystem integration and ground level testing.

FY 2007 Planned Program:

The airship prototype development, build, and demonstration phase will continue through 2007 when flight tests should demonstrate remote C2 link connectivity, sensor and communications package utilization, and flight/payload integration capability.

	FY 2004	FY 2005	FY 2006	FY 2007
Innovative Technology and Analysis	4,235	9,296	7,732	10,351
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- The Advanced Systems Innovation Cell (ASIC) is the focal point for review of all internally and externally generated new ideas submitted to MDA. This team of experts (government, industry and academic) evaluates new ballistic missile defense concepts and technologies determining their technical feasibility, initial capability, and maintains cognizance over leading edge concepts. The team seeks new and innovative concepts via a Federal Business Opportunities Broad Agency Announcement (BAA) for integrated systems and for technical improvements in boost, midcourse, and terminal phases of missile defense.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/03 Advanced Technology Development (ATD)**	R-1 NOMENCLATURE **0603175C Ballistic Missile Defense Technology**

FY 2005 Planned Accomplishments:

- Continue to execute ASIC planned program. Fund additional innovative ideas.
- Missile Defense Science, Technology and Research (MSTAR): MSTAR is MDA's University Research Program. It seeks to incorporate innovative research at the University level into ballistic missile defense, as well as to provide training for future missile defense scientists and engineers. MSTAR seeks new and innovative concepts via a Federal Business Opportunities Broad Agency Announcement (BAA) for research and for technical improvements in boost, midcourse, and terminal phases of missile defense.
- Release the MSTAR BAA to solicit proposals from academic institution and plan to review, select, and award in 6-9 months.

FY 2006 Planned Program:

- Continue to execute ASIC planned program. Fund additional innovative ideas.
- Missile Defense Science, Technology and Research (MSTAR): MSTAR is MDA'S University Research Program. It seeks to incorporate innovative research at the University level into ballistic missile defense, as well as to provide training for future missile defense scientists and engineers. MSTAR seeks new and innovative concepts via a Federal Business Opportunities Broad Agency Announcement (BAA) for research and for technical improvements in boost, midcourse, and terminal phases of missile defense.
- Release the MSTAR BAA to solicit proposals from academic institution and plan to review, select, and award in 6-9 months.

FY 2007 Planned Program:

- Continue to execute ASIC planned program. Fund additional innovative ideas.
- Missile Defense Science, Technology and Research (MSTAR): MSTAR is MDA'S University Research Program. It seeks to incorporate innovative research at the University level into ballistic missile defense, as well as to provide training for future missile defense scientists and engineers. MSTAR seeks new and innovative concepts via a Federal Business Opportunities Broad Agency Announcement (BAA) for research and for technical improvements in boost, midcourse, and terminal phases of missile defense.
- Release the MSTAR BAA to solicit proposals from academic institution and plan to review, select, and award in 6-9 months.

	FY 2004	FY 2005	FY 2006	FY 2007
Statutory and Mandated	3,503	3,715	1,000	1,000
RDT&E Articles (Quantity)	0	0	0	0

Note: The SBIR/STTR, Historically Black Colleges and Universities/Minority Institutions (HBCU/MI) and Technology Applications projects are all covered within the BMD Technology PE Statutory and Mandated program.

FY 2004 Accomplishments:

- Continued to fund HBCU/MI.
- Continued providing technology maturation techniques, such as commercialization reviews and outreach, which helped leverage outside resources and provided a strong foundation essential for scaling up MDA-funded technology to address system capabilities.
- Continued program support for the administration of the SBIR/STTR Program.
- Established investment strategy and formulation of SBIR/STTR Technology Roadmaps

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/03 Advanced Technology Development (ATD)**	R-1 NOMENCLATURE **0603175C Ballistic Missile Defense Technology**

FY 2005 Planned Accomplishments:

- Continue to fund HBCU/MI.
- Continue providing technology maturation techniques, such as commercialization reviews and outreach, which help leverage outside resources and provide a strong foundation essential for scaling up MDA-funded technology to address system capabilities.
- Continue program support for the administration of the SBIR/STTR Program.

FY 2006 Planned Program:

- Continue to fund HBCU/MI.
- Continue providing technology maturation techniques, such as commercialization reviews and outreach, which help leverage outside resources and provide a strong foundation essential for scaling up MDA-funded technology to address system capabilities.

FY 2007 Planned Program:

- Continue to fund HBCU/MI.
- Continue providing technology maturation techniques, such as commercialization reviews and outreach, which help leverage outside resources and provide a strong foundation essential for scaling up MDA-funded technology to address system capabilities.

	FY 2004	FY 2005	FY 2006	FY 2007
Congressional Action	39,065	39,543	0	0
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- Provided Congressionally-mandated funding for:
  - Massively Parallel Optical Interconnects for Microsatellites
  - Silicon Carbide Wide Bandgap Research - Wide Bandgap Optoelectronics
  - AEOS MWIR Adaptive Optics
  - Advanced RF Technology Development
  - SiC Mirrors - Porous Silicon
  - Tulane Center for Missile Defense
  - Extended FootPrint Program
  - Advanced Metalized Gelled Propellants
  - Chemical Vapor Deposition of Organic Materials
  - Center for Optical Devices
  - Improved Materials for Optical Memories

- Multiple Target Tracking Optical Sensor Array Technology
- Kinetic Energy Anti-Satellite Technology

FY 2005 Planned Accomplishments:

- Provide Congressionally-mandated funding for:
  - Advanced Processing Architecture
  - Next-Again-Generation Radiation Hard CMOS
  - Ultra-Thin Integrated Electronics Miniaturization Trusted Foundry
  - Massively Parallel Optical Interconnects for Microsatellites
  - Center for Optical Logic Devices
  - Silicon Carbide Wide Bandgap Research
  - Multiple Target Tracking Optical Sensor Array Technology (MOST)
  - Advanced RF Technology Development
  - SiC Thick Film Mirror Coatings
  - Porous Silicon
  - Tulane Missile Defense
  - Improved Materials for Optical Memories
  - Army Counterspace Technology Testbed

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/03 Advanced Technology Development (ATD)**	R-1 NOMENCLATURE **0603175C Ballistic Missile Defense Technology**

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

D. Acquisition Strategy

BMD Technology does not have any major performers that qualify for this category based on the Financial Management Regulations.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/03 Advanced Technology Development (ATD)**	R-1 NOMENCLATURE **0603175C Ballistic Missile Defense Technology**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0503 Laser/LADAR Technology	20,328	0	0	0	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0	0

Note: In FY 2005, the Laser Technology Project, 0503, moved into the Advanced Technology Development Project, 0502.

A. Mission Description and Budget Item Justification

The Laser Technology program focuses on developing lasers and related component technology for low power applications including tracking, weapon guidance, and imaging, while investing in high-energy laser technologies that could lead to future ABL improvements. The emphasis on low-power systems is driven by their considerable potential to improve and support MDA's hit-to-kill weapons. Having selected concepts and awarded contracts for four focused technology projects in FY 2003, the Agency will continue these through FY 2004, and initiate new projects in FY 2005. The projects will be drawn from proposals solicited from the laser and electro-optics industry and supported by BMDS element evolutionary block upgrades. Selected programs include:

- Strategic Illuminator for rugged long-range tracking and wavefront sensing device to support Airborne Laser upgrades and strategic surveillance applications.
- Compact laser radar (LADAR) amplifier for kill vehicles to enhance target discrimination at extended range.
- Advanced inertial reference unit for precision pointing knowledge for acquisition, tracking, and pointing applications.
- Advanced low-noise, fast detectors for tracking, ranging, imaging, and laser wavefront sensing.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Laser Technology	20,328	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

Note: In FY 2005, Laser Technology moved into the Advanced Technology Development Project 0502.

FY 2004 Accomplishments:

- Strategic Illuminator - The contractor designed a densely packaged, rugged, high radiance, solid-state laser. Tasks included breadboarding the electronics, developing a light weight power supply and designing a blowdown chiller that all fit together in a compact volume.
- Compact Laser Radar Amplifier - Following Preliminary and Critical Design Reviews (in 1QFY04 and 3QFY04, respectively), Phase II for breadboard fabrication was exercised providing funding for one contractor to continue with this 12 month effort.
- Advanced Inertial Reference Unit - Following Preliminary and Critical Design Reviews (in 1QFY04 and 4QFY04, respectively), Phase II for breadboard fabrication of a prototype device was exercised providing funds to one contractor to continue this 12 month effort.
- Advanced Detectors - Following Critical Design Review in November 2003, Option I was exercised providing continued funding to two contractors for 12 month efforts to produce a wave front sensor/tracker and a ranging camera.
- Angle-Angle-Range Resolved Doppler Imager - Designed and experimented on a revolutionary photon-counting laser radar capable of both direct detect and Doppler measurements.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/03 Advanced Technology Development (ATD)**	R-1 NOMENCLATURE **0603175C Ballistic Missile Defense Technology**

- Advanced Chemical Oxygen-Iodine Laser (COIL) Technology - Conducted experiments to increase specific power (watts/kg) of COIL devices for future Airborne Laser blocks.
- Up to three technology base projects were selected for selection in FY 2004 for execution in FY 2005. In addition to these projects, in FY 2004, approximately $7.4 million was used to cover costs associated with Capistrano Test Site deactivation.

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
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Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/03 Advanced Technology Development (ATD)**	R-1 NOMENCLATURE **0603175C Ballistic Missile Defense Technology**

D. Acquisition Strategy

BMD Technology does not have any major performers that qualify for this category based on the Financial Management Regulations.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/03 Advanced Technology Development (ATD)**	R-1 NOMENCLATURE **0603175C Ballistic Missile Defense Technology**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0602 Program-Wide Support	2,886	4,350	4,458	7,539	12,485	11,928	10,729	9,400
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

Program-Wide Support provides funding for common support functions across the entire program such as strategic planning, program integration, cost estimating, contracting, and financial management to include preparation of financial statements, reimbursement of financial services provided by DFAS, internal review and audit, earned-value management, and program assessment. Includes costs for both government civilians performing these functions as well as support contractors providing government staff augmentation in these areas. Applies to costs at the MDA HQ as well as its Executing Agents in the Services: Army Space and Missile Defense Command, Army PEO Space and Missile Defense, Office of Naval Research, and various Air Force laboratory and acquisition activities. Other costs include physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses at the various MDA Executing Agent locations, which at the MDA HQ are generally funded from the Management Headquarters Program Element (0901598C). Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Civilian Salaries and Support	2,886	4,350	4,458	7,539
RDT&E Articles (Quantity)	0	0	0	0

See Section A: Mission Description and Budget Item Justification

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/03 Advanced Technology Development (ATD)**	R-1 NOMENCLATURE **0603175C Ballistic Missile Defense Technology**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/03 Advanced Technology Development (ATD)**	R-1 NOMENCLATURE **0603175C Ballistic Missile Defense Technology**

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Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total PE Cost	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512
0907 Terminal High Altitude Area Defense (THAAD) Block 2006/2008	717,889	759,677	1,046,082	931,000	779,407	352,976	0	0
0007 Terminal High Altitude Area Defense (THAAD) Block 2010	0	0	0	0	0	168,000	635,068	394,998
0401 Israeli Arrow Program	135,644	152,048	77,616	79,494	77,539	77,723	79,340	80,987
0602 Program-Wide Support	7,261	16,663	19,912	24,182	22,728	18,620	16,874	9,527
Amount Included in PE 0904903D	0	0	0	0	0	-174,900	-328,000	-60,500
Total PE Cost Reflected in R-1	860,794	928,388	1,143,610	1,034,676	879,674	442,419	403,282	425,012

Note:

THAAD (Project 0907): The ramp up in FY06 restores work deferred to this timeframe due to the Pratt & Whitney explosions. These efforts include test missile hardware for flight and ground testing, targets and range operations to conduct 4 flight tests, Radar #2 fabrication/assembly/integration/test and component qualification testing. Also included is the associated accounting allocation of indirect costs against these efforts.

Implementation of the new BMDS baseline approach directed the reallocation of funding among Blocks. Project 0707 (FY04 - FY06) and Project 0807 (FY04 - FY08) were realigned and collapsed into Project 0907. Project 0807 (FY09 - FY10) was realigned and collapsed into Project 0007.

A. Mission Description and Budget Item Justification

The mission of the Missile Defense Agency (MDA) is to develop an integrated layered Ballistic Missile Defense System (BMDS) to defend the United States, its deployed forces, friends and allies from ballistic missiles of all ranges and in all phases of flight. In late 2004 the United States fielded a limited capability to defeat a ballistic missile threat. Continuing through the Future Years Defense Plan (FYDP), the breadth and depth of this initial capability will be expanded by adding and networking forward-deployed sensors, interceptors at sea and on land, and layers of increasingly capable weapons and sensors. Today's MDA activities are focused on five objectives: 1) complete development, initial fielding, and verification of Block 2004; 2) provide BMDS sustainment and Warfighter (Combatant Commanders) support; 3) develop a totally integrated capability for Block 2006 and beyond based on a strong core research and development program and improving the BMDS incrementally over time to meet future challenges; 4) execute an increasingly complex test program; and 5) establish a robust international foundation for missile defense.

MDA identifies BMDS capabilities, architectures and element contributions to counter the threat and organizes them by Engagement Sequence Groups (ESGs). These ESGs describe a combination of weapons, sensors and Command and Control/Battle Management Communications (C2BMC) capabilities that must work together to detect, track and intercept an enemy missile - the complete kill chain from the time the threat missile is first detected through the intercept of the target. Through ESGs, the MDA Systems Engineer identifies the necessary interfaces required to deliver a usable configuration of the BMDS. ESGs are also useful in helping the operator plan and train for operation of that capability, and they provide a means to track and test future improvements to the system.

As part of the total BMDS, the Terminal Defense Segment (TDS) Program Element (PE) funds the Terminal-related element portions of Blocks 2008 and 2010 and other Terminal-related mission area investment activities. The TDS elements and activities include Terminal High Altitude Area Defense (THAAD) and the Israeli Arrow Program. The Patriot Advanced Capability (PAC) 3 element is also a part of the Terminal Defense mission; however, it is funded by the U.S. Army beginning in FY 2004. The BMDS elements in Terminal Defense pursue development and selective upgrades of missile defense capabilities that engage short to medium-range ballistic missiles in the late mid-course and terminal phase of their trajectory.

Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

The Terminal Defense Elements provide the final opportunity to engage short to medium-range ballistic missiles not engaged or destroyed in the boost or mid-courses of trajectory. The THAAD, AEGIS BMD, and fielded Patriot Systems provide the only capability to defend deployed U.S. forces from short to medium-range ballistic missiles, and protect broadly dispersed assets and population centers or selected U.S. sites (Homeland Defense) from short to medium-range ballistic missile attacks. The THAAD element enhances the MDA TDS by deepening, complementing, and extending the BMDS battlespace and capability to engage and negate ballistic missiles and asymmetric threats in both the late mid-course (exo-atmospheric engagements) and terminal phase (endo-atmospheric engagements) of their trajectory and adds significant capability to the BMDS as the threat missiles transition from the mid-course to terminal phase.

The MDA System Engineering & Integration (SE&I) Team's principal focus is the trade-space and design parameters necessary to develop an integrated BMD System. Conversely, the THAAD program's principal focus is the engineering and development of the THAAD weapon system and achieving desired performance within the integrated BMDS. Collaborative Engineering ensures that ESGs are part of an integrated system design. The THAAD element contributes to the BMDS by providing THAAD Interceptor Engage On THAAD Radar (Cobra Dane (CD)/Upgraded Early Warning Radars (UEWR)/Sea-Based X-Band Radar (SBX)), and THAAD Interceptor Launch On Remote Sensor ESG capabilities. When integrated into the BMDS with the BMDS C2BMC, AEGIS BMD and PATRIOT Systems, the rapidly deployable THAAD element improves the BMDS overall effectiveness by engaging missiles as they transition from exo- to endo- atmospheric flight. The flow down of BMDS capability specifications from the Missile Defense Agency Systems Engineering & Integration efforts will guide the integration of the TDS into the BMDS and the BMDS C2BMC architecture.

MDA's Responsible Test Organization (RTO) structure centralizes authority and responsibility for all BMDS testing. The RTO develops the BMD System test plans, test infrastructure, range support teams, resources and test policy (described further in PE 060388C - BMD Tests and Targets). The Combined Test Force (CTF) consolidates the personnel, processes, and fiscal resources across MDA, including elements into a unified cohesive team to execute the BMDS test program.

Consistent with the MDA block management framework, the THAAD system element consists of Blocks 2006/2008, and 2010:

Block 2006/2008: THAAD spiral development has begun with the design and development of a significant, fundamental capability against short to medium-range Ballistic Missiles (BMs) and asymmetric threats and exo/high endo intercept capability against a limited target set. This will accomplish the following: (1) Test Missile with Exo and High Endo Algorithms; (2) Radar with Initial Discrimination Capability; and (3) C2BMC with Limited Tactical Digital Information Link and Defense Design Planner. Development through FY 2006 will lay a foundation for THAAD Interceptor Engage on THAAD Radar ESG capability. This initial phase also provides the capability for other BMDS Elements (AEGIS BMD, PATRIOT) to conduct engagement sequences with THAAD data over Link-16. The initial series of flight tests for the THAAD Interceptor Engage on THAAD Radar ESG begins in FY 2005 and continues into FY 2007 with a total of 8 flight tests. The five major components (missiles, launchers, radars, THAAD C2BMC, and THAAD-specific support equipment) will be integrated into the THAAD element and the BMDS.

Block 2006 development evolves to achieve a more robust radar discrimination, intercept capability in stressing Exo and Endo battlespace; salvo firing doctrine; and the ability to operate in a full spectrum of tactical missile environments and survivability. To facilitate tactical employment by soldiers, it also includes THAAD C2BMC embedded training, automated defense planning, and extensive interoperability using Link-16 and United States Message Text Format (USMTF) message set with BMDS and forward base engagement coordination with other BMDS elements. In the Block 2006 timeframe, THAAD ESG development adds THAAD Interceptor Engage on THAAD Radar (CD/UEWR/SBX) and the capability for other BMDS Elements to conduct engagement sequences to the BMDS baseline ESGs, including AEGIS BMD Launch On THAAD, AEGIS BMD Engage On THAAD, Ground Based Interceptor (GBI) Launch On THAAD and GBI Engage On THAAD via BMDS. Collaborative radar hardware and software development efforts are provided to support the THAAD and Forward Based X-Band-Transportable (FBX-T) radars. The second series of Flight tests begins in FY 2007 and continues into FY 2009 with a total of 9 flight tests. The THAAD element has the flexibility to evolve to the MDA objective of putting the BMDS on alert and conducting concurrent testing and operations and performing logistics and sustainment; thereby providing a Block 2006 THAAD capability to the BMDS. The THAAD Element will provide coordinated engagements with BMDS via the BMDS C2BMC network.

Block 2006/2008 development culminates in demonstrated THAAD capabilities in both endo and exo-atmospheric battlespace against the full spectrum of adversarial capabilities. In addition, development will include improved survivability, crew operator training capability and upgrades to provide for RF-linked launchers for improved defended area and defense against Intermediate Range Ballistic Missiles (IRBMs), capability to launch THAAD interceptors from other BMDS elements and expanding the system's capability to provide THAAD sensor data to the BMDS. This adds the THAAD Launch On Remote Sensor ESG and will be tested in the THAAD System Integration Laboratory (SIL). The Block 2006/2008 development is the foundation for the acquisition and

delivery of Block 2008 THAAD Fire Unit #1 to support operational assessment and fielding of a BMDS capability useful to the combatant commanders and services. The Fire Unit #1 consists of 24 missiles, 3 launchers, 1 radar and 1 C2BMC.

Block 2010: Block 2010 is the next incremental capability delivered as part of THAAD's evolutionary acquisition/development strategy. This block continues the concept of a rapidly deployable configuration to support the TDS mission as well as supporting the strategic surveillance, tracking and fire control missions through Block 2010 enhanced sensor and interceptor capability. Block

2010 leverages Block 2008 development by initiating development of kill vehicle and booster improvements that significantly increase performance of the endo and exo intercept against long range threats. In short, Block 2010 provides the initiation of the next generation THAAD capability that provides rapidly mobile components to extend and deepen BMDS capability against all ballistic missile threats. Block 10 adds the THAAD Interceptor engage on remote sensor ESG. THAAD Fire Unit #2 consists of 24 missiles, 3 launchers, 1 C2BMC and 1 radar.

The Arrow system (developed jointly by the U.S. and Israel) is another one of the TDS' mission area investments and provides Israel an indigenous capability to defend against short and medium range ballistic missiles and helps ensure U.S. freedom of action in future contingencies. Arrow also provides protection against ballistic missile attacks to U.S. forces deployed to the region. The Arrow program consists of the following major efforts: The Arrow System Improvement Program (ASIP) is a block upgrade of the Arrow Weapon System to enhance its capabilities against evolving regional threats. The program also includes the development of Arrow co-manufacturing capability, co-production of the interceptor and the enhancement of Arrow's interoperability with U.S. ballistic missile defense systems (BMDS) via Joint Tactical Information Data System (JTIDS)/Link-16 common communication architecture. The ASIP will develop upgrades to the existing Arrow Weapon System to allow Arrow to address more stressing ballistic missile threats. Related Arrow activities include Caravan Flight test campaign in the U.S., the Israeli Test Bed (ITB), and studies via the Israeli Systems Architecture and Integration (ISA&I) effort that assess the Arrow performance relative to existing and emerging threats.

Program-Wide Support provides funding for common support functions across the entire program such as strategic planning, program integration, cost estimating, contracting, and financial management to include preparation of financial statements, reimbursement of financial services provided by DFAS, internal review and audit, earned-value management, and program assessment. Includes costs for both government civilians performing these functions as well as support contractors providing government staff augmentation in these areas. Applies to costs at the MDA HQ as well as its Executing Agents in the Services: Army Space and Missile Defense Command, Army PEO Space and Missile Defense, Office of Naval Research, and various Air Force laboratory and acquisition activities. Other costs include physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses at the various MDA Executing Agent locations, which at the MDA HQ are generally funded from the Management Headquarters Program Element (0901598C). Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

B. Program Change Summary	FY 2004	FY 2005	FY 2006	FY 2007
Previous President's Budget (FY 2005 PB)	874,527	937,748	993,048	1,117,657
Current President's Budget (FY 2006 PB)	860,794	928,388	1,143,610	1,034,676
Total Adjustments	-13,733	-9,360	150,562	-82,981
Congressional Specific Program Adjustments	0	6,500	0	0
Congressional Undistributed Adjustments	0	-15,860	0	0
Reprogrammings	-6,220	0	0	0
SBIR/STTR Transfer	-7,513	0	0	0
Adjustments to Budget Years	0	0	150,562	-82,981

THAAD Projects 0707, 0807, and 0907:

- Congressional reductions in FY05 for a Flight Test Slip and Program Management were compounded by an existing budget shortfall from the Pratt & Whitney incident and transition of work to Aerojet. The overall affect resulted in a program replan with major impacts, e.g., Flight Test program slips, Deferral of Radar #2, deferral of test missile hardware for flight and ground testing, and missile Qualification Testing slips.
- Adjustments in FY07 were due to rephasing the funding profile for the Block 2008 Fire Unit #1.

Arrow Project 0401: Congressional plus up in FY05 will be used to procure approximately 32 Arrow interceptors in the U.S. and Israel.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0907 Terminal High Altitude Area Defense (THAAD) Block 2006/2008	717,889	759,677	1,046,082	931,000	779,407	352,976	0	0
RDT&E Articles Qty	1	8	4	9	23	24	0	0

Note:
Implementation of the new BMDS baseline approach directed the reallocation of funding among Blocks. Project 0707 (FY04 - FY06), Project 0807 (FY04 - FY11) were realigned and collapsed into Project 0907.

A. Mission Description and Budget Item Justification

The Terminal High Altitude Area Defense (THAAD) is an element of the Terminal Defense Segment (TDS) of the Ballistic Missile Defense System (BMDS). The Terminal Defense Elements provide the final opportunity to engage all ranges of ballistic missiles not engaged or destroyed in the boost or mid-course phase of trajectory. The THAAD element contributes to the BMDS by providing THAAD Interceptor Engage on THAAD Radar (Cobra Dane (CD)/Upgraded Early Warning Radars (UEWR)/Sea-Based X-Band Radar (SBX)) and THAAD Interceptor Launch On Remote Sensor capability. THAAD enhances the Missile Defense Agency's (MDA's) TDS by deepening, complementing, and extending the BMDS battlespace and capability to engage and negate ballistic missiles and asymmetric threats in both the late mid-course and terminal phases of their trajectory. THAAD's highly mobile capability provides BMDS the ability to defend against short to medium-range ballistic missiles and asymmetric threats for protection of U.S. and allied armed forces, broadly dispersed assets and population centers and selected U.S. sites (Homeland Defense) against ballistic missile attacks.

THAAD, in conjunction with the fielded Patriot System, provide the Terminal Defense System layer and supports the MDA objective of enhancing the BMDS capability. Five major components (missiles, launchers, radars, THAAD Command and Control / Battle Management and Communication (C2BMC), and THAAD-specific support equipment) will be integrated into the THAAD element and the BMDS. The THAAD program follows the MDA capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks. When integrated into the BMDS Test Bed with BMDS Command & Control Battle Management Communications (C2BMC), Aegis BMD and PATRIOT Systems, the rapidly deployable THAAD element improves the BMDS overall effectiveness by engaging missiles as they transition from exo- to endo- atmospheric flight. The program addresses MDA Systems Engineering and Integration gap analysis of Engagement Support Groups (ESGs), identifying and documenting both element and component capabilities. The flow-down of BMDS capability specifications from the MDA Systems Engineering and Integration efforts will guide the integration of the TDS into the BMDS and the BMDS C2BMC architecture.

Block 2006/2008: THAAD spiral development has begun with the design and development of a significant, fundamental capability against short to medium-range Ballistic Missiles (BMs) and asymmetric threats and exo/high endo intercept capability against a limited target set. This will accomplish the following: (1) Test Missile with Exo and High Endo Algorithms; (2) Radar with Initial Discrimination Capability; and (3) C2BMC with Limited Tactical Digital Information Link and Defense Design Planner. Development through FY 2006 will lay a foundation for THAAD Interceptor Engage on THAAD Radar ESG capability. This initial phase also provides the capability for other BMDS Elements (AEGIS BMD, PATRIOT) to conduct engagement sequences with THAAD data over Link-16. The initial series of flight tests for the THAAD Interceptor Engage on THAAD Radar ESG begins in FY 2005 and continues into FY 2007 with a total of 8 flight tests. The five major components (missiles, launchers, radars, THAAD C2BMC, and THAAD-specific support equipment) will be integrated into the THAAD element and the BMDS.

Block 2006 development evolves to achieve a more robust radar discrimination, intercept capability in stressing Exo and Endo battlespace; salvo firing doctrine; and the ability to operate in a full spectrum of tactical missile environments and survivability. To facilitate tactical employment by soldiers, it also includes THAAD C2BMC embedded training, automated defense planning, and extensive interoperability using Link-16 and United States Message Text Format (USMTF) message set with BMDS and forward base engagement coordination with other BMDS elements. In the Block 2006/2008 timeframe, THAAD ESG development adds THAAD Interceptor Engage on THAAD Radar (CD/UEWR/SBX) and the capability for other BMDS Elements to conduct engagement sequences to the BMDS baseline ESGs, including AEGIS BMD Launch On THAAD, AEGIS BMD Engage On THAAD, Ground Based Interceptor (GBI) Launch On THAAD and GBI Engage On THAAD via BMDS. Collaborative radar hardware and software development efforts are provided to support the THAAD and Forward Based X-Band-Transportable (FBX-T) radars. The second series of Flight tests begins in FY 2007 and continues into FY 2009 with a total of 9 flight tests. The THAAD element has the flexibility to evolve to the MDA objective of putting the BMDS on alert

and conducting concurrent testing and operations and performing logistics and sustainment; thereby providing a Block 2006 THAAD capability to the BMDS. The THAAD Element will provide coordinated engagements with BMDS via the BMDS C2BMC network.

Block 2006/2008 development culminates in demonstrated THAAD capabilities in both endo and exo-atmospheric battlespace against the full spectrum of adversarial capabilities. In addition, development will include improved survivability, crew operator training capability and upgrades to provide for RF-linked launchers for improved defended area and defense against Intermediate Range Ballistic Missiles (IRBMs), capability to launch THAAD interceptors from other BMDS elements and expanding the system's capability to provide THAAD sensor data to the BMDS. This adds the THAAD Launch On Remote Sensor ESG and will be tested in the THAAD System Integration Laboratory (SIL). The Block 2006/2008 development is the foundation for the acquisition and delivery of Block 2008 THAAD Fire Unit #1 to support operational assessment and fielding of a BMDS capability useful to the combatant commanders and services. The Fire Unit #1 consists of 24 missiles, 3 launchers, 1 radar and 1 C2BMC.

RDT&E Articles for Development Tests (DT):

- FY 2004 (Delivery Schedule): 1 Radar for a total of 1 RDT&E article
- FY 2004 (Buy Schedule): 7 Full-up Missiles; 4 Launchers; 1 THAAD C2BMC (2 Tactical Station Groups (TSGs)) for a total of 12 RDT&E articles
- FY 2005 (Delivery Schedule): 3 Full-up Missiles; 4 Launchers and 1 THAAD C2BMC for a total of 8 RDT&E articles
- FY 2005 (Buy Schedule): 7 Full-up Missiles and 1 Radar for a total of 8 RDT&E Articles
- FY 2006 (Delivery Schedule): 4 Full-up Missiles
- FY 2006 (Buy Schedule): 7 Full-up Missiles and 2 THAAD C2BMCs (4 Tactical Station Groups (TSGs)) for a total of 9 RDT&E articles
- FY 2007 (Delivery Schedule): 7 Full-up Missiles; 1 Radar and 1 THAAD C2BMC (2 TSGs) for a total of 9 RDT&E Articles
- FY 2007 (Buy Schedule): 7 Full-up Missiles and 3 Launchers for a total of 10 RDT&E articles
- FY 2008 (Delivery Schedule): 14 Full-up Missiles, 1 C2BMC (2 TSGs) and 1 Launcher for a total of 16 articles
- FY 2009 (Delivery Schedule): 2 Launchers

RDT&E Articles for Fire Unit #1:

- FY 2007 (Fire Unit Buy Schedule): 24 Missiles; 3 Launchers; 1 THAAD C2BMC; 1 Radar for a total of 29 RDT&E Articles
- FY 2008 (Fire Unit Delivery Schedule): 3 Missiles; 3 Launchers and 1 C2BMC (2 TSGs) for a total of 7 articles
- FY 2009 (Fire Unit Delivery Schedule): 21 Missiles and 1 Radar for a total of 22 articles

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Missile	321,088	334,819	410,267	240,654
RDT&E Articles (Quantity)	0	3	4	7

The ramp up in FY06 restores work deferred to this timeframe due to the Pratt & Whitney explosions. These efforts include test missile hardware for flight and ground testing, targets and range operations to conduct 4 flight tests, Radar #2 fabrication/assembly/integration/test and component qualification testing. Also included is the associated accounting allocation of indirect costs against these efforts.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

FY 2004 Accomplishments:

- Supported completion of Element Design Readiness Review
- Initiated fabrication, assembly and test of hardware for flight testing
- Initiated System Integration Laboratory (SIL) Hardware-in-the-Loop (HWIL) activities for Missile
- Delivered Missile software (Build 4.0 for Flight Test 1)
- Initiated upgrades to the Missile software
- Initiated buy of 7 Full-up Missiles

FY 2005 Planned Accomplishments:

RDT&E Articles: Deliver 3 Full-up Missiles

- Complete Missile Environments Phase I Ground Test
- Complete Missile assembly qualification for flight testing
- Conduct SIL HWIL integration activities of hardware and software in preparation for flight testing
- Support Flight Test Program at White Sands Missile Range (WSMR)
- Continue fabrication, assembly and test of hardware for flight tests
- Deliver Missile software for integrated element flight testing
- Continue upgrades to the Missile software
- Initiate buy of 7 Full-up Missiles

FY 2006 Planned Program:

RDT&E Articles: Deliver 4 Full-Up Missiles

- Support four flight tests
- Support Flight Test Program at WSMR and Pacific Missile Range Facility (PMRF)
- Continue SIL HWIL integration activities of hardware and software in preparation for flight testing
- Continue fabrication, assembly, and test of hardware for flight test
- Continue upgrades to the Missile software
- Complete missile qualification testing
- Initiate fabrication, assembly, and test of missile hardware in preparation for Insensitive Munitions (IM) testing and missile rounds required for Missile Block Qualification Testing (BQT)
- Initiate upgrades to missile software for Launch on Remote Engagement Sequence Group
- Initiate buy of 7 Full-Up Missiles

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

FY 2007 Planned Program:

RDT&E Articles: Deliver 7 Full-Up Missiles

- Support four flight tests
- Continue SIL HWIL integration activities of hardware and software in preparation for flight testing
- Continue fabrication, assembly, and test of hardware for flight test and BQT
- Complete Missile Block Process Validation
- Complete final release of Block 2008 Missile software
- Initiate buy of 7 Full-Up Missiles

	FY 2004	FY 2005	FY 2006	FY 2007
Radar	144,042	140,385	186,940	131,625
RDT&E Articles (Quantity)	1	0	0	1

The ramp up in FY06 restores work deferred to this timeframe due to the Pratt & Whitney explosions. These efforts include test missile hardware for flight and ground testing, targets and range operations to conduct 4 flight tests, Radar #2 fabrication/assembly/integration/test and component qualification testing. Also included is the associated accounting allocation of indirect costs against these efforts.

FY 2004 Accomplishments:

RDT&E Articles: Delivered 1 Radar

- Completed the manufacture of Radar #1 and delivered to White Sands Missile Range (WSMR)
- Initiated Radar Integration at WSMR
- Supported completion of Element Design Readiness Review
- Continued Radar hardware and software development for first integrated element test at WSMR
- Initiated System Integration Laboratory (SIL) Hardware-in-the-Loop (HWIL) activities for Radar
- Delivered Radar Test Bed to the THAAD SIL and THAAD Technical Evaluation Center
- Delivered Engineering Release of Radar software to the THAAD SIL
- Initiated upgrades to the Radar software
- Delivered Build 4 of the Radar Simulation Model
- Collaborative radar hardware and software development efforts are provided to support the THAAD and Forward Based X-Band-Transportable (FBX-T) radars

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FY 2005 Planned Accomplishments:

- Conduct SIL HWIL integration activities for hardware and software in preparation for flight testing
- Complete Integration of Radar #1
- Initiate design of tactical Prime Power Unit (PPU)
- Deliver Radar software for first integrated element test at WSMR
- Continue upgrades to the Radar software
- Deliver Build 5 of the Radar Simulation Model
- Track targets of opportunity and dedicated radar risk reduction flights
- Complete radar metric calibration
- Complete Alternating Current/Direct Current Qualification Test
- Conduct Radar Block Process Validation
- Conduct Radar Software Build 4.2 Design Readiness Review
- Initiate buy of 1 Radar (production of Transmit/Receive Modules and Transmit/Receive Integrated Multi-Channel Microwave Modules)

FY 2006 Planned Program:

- Continue manufacturing and assembly of 1 Radar (Radar #2)
- Continue Build 4.2 Software development
- Continue development of PPU
- Conduct PPU Critical Design Review and initiate build of first PPU
- Track Targets of Opportunity
- Continue Radar Requirements Verification
- Support Flight Test program at WSMR and Pacific Missile Range Facility (PMRF)
- Initiate software upgrades for expanding the system's capability to provide THAAD sensor data to the BMDS
- Initiate software capability for Joint Technical Architecture compliance

FY 2007 Planned Program:

RDT&E Articles: Deliver 1 Radar

- Complete integration of Radar #2 at WSMR
- Initiate Radar E3 testing at WSMR
- Deliver Engineering Release of Build 4.2 Software
- Support flight testing
- Continue development of PPU
- Deliver Final Release of Build 4.2 Software
- Continue development of software upgrades for expanding the system's capability to provide THAAD sensor data to the BMDS
- Initiate build of second Radar PPU

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	FY 2004	FY 2005	FY 2006	FY 2007
Launcher	25,059	22,352	19,438	18,885
RDT&E Articles (Quantity)	0	4	0	0

FY 2004 Accomplishments:

- Supported Element Design Readiness Review
- Supported initial Element Detailed Test Readiness Investigation
- Completed TACOM HEMTT Qual
- Completed C2BMC/Missile/Launcher Software Beta Tests
- Delivered Launcher Checkout Software Build 1.0 Engineering Release
- Initiated buy of 4 Launchers

FY 2005 Planned Accomplishments:

RDT&E Articles: Deliver 4 Launchers

- Support Short Hot Launch (SHotL) test
- Support Element production planning and flight testing
- Complete final release of Launcher software Build 3 for first integrated Element test at WSMR
- Continue fabrication, assembly, and test of Launcher hardware
- Deliver hardware and software to System Integration Laboratory (SIL) Hardware-in-the-Loop (HWIL) activities for Launcher
- Deliver launcher hardware to White Sands Missile Range (WSMR) for flight testing
- Support flight test program at WSMR
- Continue development of Launcher software upgrade
- Conduct Software upgrade Design Readiness Review
- Complete Launcher Block Process Validation

FY 2006 Planned Program:

- Continue SIL HWIL integration activities of hardware and software in preparation for flight testing
- Support Fire Unit planning
- Assist in standup of operations for Flight Testing at Pacific Missile Range Facility (PMRF)
- Support Flight Test Program at WSMR and PMRF
- Continue development of Launcher software upgrade
- Initiate design and development Launcher Hardware and Software for Launch on Remote and Remoted Launcher capabilities

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APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

FY 2007 Planned Program:

- Continue SIL HWIL integration activities of hardware and software in preparation for flight testing
- Support conduct of flight testing at PMRF
- Complete final release of Launcher software Build 4 and deliver to the SIL
- Continue to support Fire Unit development, fabrication and integration
- Support Launcher Block Qualification Tests
- Continue design and development of Launcher Hardware and Software for Launch on Remote and Remoted Launcher capabilities
- Initiate buy of 3 Launchers

	FY 2004	FY 2005	FY 2006	FY 2007
C2BMC	51,279	60,663	84,875	45,198
RDT&E Articles (Quantity)	0	1	0	1

The ramp up in FY06 restores work deferred to this timeframe due to the Pratt & Whitney explosions. These efforts include test missile hardware for flight and ground testing, targets and range operations to conduct 4 flight tests, Radar #2 fabrication/assembly/integration/test and component qualification testing. Also included is the associated accounting allocation of indirect costs against these efforts.

FY 2004 Accomplishments:

- Supported completion of Element Design Readiness Review
- Initiated fabrication, assembly, and test of THAAD C2BMC hardware
- Continued THAAD C2BMC software development
- Completed C2BMC/Launcher Pre-System Integration Laboratory (SIL) interface testing
- Initiated SIL Hardware-in-the-Loop (HWIL) activities for THAAD C2BMC
- Delivered THAAD C2BMC Test Bed and Build 4 Engineering Release to SIL
- Continued with the architectural design phase for the defined Build 5 functionality
- Initiated buy of 1 THAAD C2BMC Tactical Station Groups (2 TSGs)

FY 2005 Planned Accomplishments:

RDT&E Articles: Deliver 1 THAAD C2BMC (2 TSGs)

- Continue SIL HWIL integration of C2BMC hardware and software
- Support Flight Test Program at White Sands Missile Range (WSMR)
- Complete fabrication, assembly, integration, and test of THAAD C2BMC TSGs
- Complete Final Release of THAAD C2BMC Software Build 4 and deliver to SIL

- Conduct Software Build 5 Design Readiness Review
- Continue development of software upgrades
- Complete Block Process Validation of C2BMC

FY 2006 Planned Program:

- Support Flight Test Program at WSMR and Pacific Missile Range Facility (PMRF)
- Continue integration and test of THAAD C2BMC hardware
- Maintain software development environment and test tools
- Continue development of C2BMC Software Build 5
- Perform tactical software maintenance for C2BMC Software Build 4
- Initiate software upgrades for Launch on Remote, Remoted Launchers and expanding the system's capability to provide THAAD sensor data to the BMDS
- Initiate buy of 2 C2BMCs (4 TSGs)

FY 2007 Planned Program:

RDT&E Articles: Deliver 1 C2BMC (2 TSGs)

- Continue fabrication, assembly, integration and test of C2BMC hardware
- Complete one C2BMC (2 TSGs)
- Complete C2BMC Software Build 5 Engineering Release and deliver to SIL for integration
- Continue supporting flight testing at PMRF
- Continue C2BMC Build 4 tactical software maintenance
- Complete Final Release of C2BMC Software Build 5 and deliver to SIL for integration
- Continue software upgrades for Launch on Remote, Remoted Launchers and expanding the system's capability to provide THAAD sensor data to the BMDS

	FY 2004	FY 2005	FY 2006	FY 2007
Integrated Logistics Support (ILS)	18,712	21,304	46,810	44,550
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- Conducted Soldier in the Loop training to support soldier participation in the Flight Test Program
- Conducted supportability analysis and Logistics Management Information (LMI) validation
- Developed draft supportability strategy
- Procured Government Furnished Equipment (GFE) to support program requirements
- Conducted C17 Roll-on/Roll-off transportation demonstration

- Developed/Delivered Ground Test Unit Ship Set (GTUSS), a Preliminary Design Readiness Review Flight Test Ship Set (FTSS) modified to transport the Ground Test Units
- Developed/Delivered a modified FTSS to transport Flight Test Missile Rounds
- Positioned Contractor Logistics Support (CLS) Team at White Sands Missile Range (WSMR) to support flight tests and range operations
- Supported Radar integration at WSMR
- Developed/Delivered Active Leak Sensor System (ALSS) to meet safety/transportation requirements
- Developed/Delivered Draft Integrated Electronic Technical Manual/Electronic Technical Manual (IETM/ETM)
- Reviewed CLS requirements for Pacific Missile Range Facility (PMRF) test flights and Ground Test Support requirements at CONUS sites
- Established Performance Based Logistics (PBL) strategy
- Developed Missile Round Sling (MRS) for loading
- Developed MANPRINT Management Plan

FY 2005 Planned Accomplishments:

- Continue development of Interim Contractor Support System (ICSS)
- Continue to conduct Soldier-in-the-Loop Training and training course development for soldier participation in flight test program
- Support flight and ground test program utilizing CLS at WSMR
- Conduct System Operator Trainer Course
- Continue development of Draft Integrated IETM/ETM
- Continue development of PBL strategy
- Support Peculiar Support Equipment (PSE) Battery Support Center (BSC) development
- Update Packaging, Handling, Storage and Transportation (PHS&T) documentation
- Continue supportability analysis and LMI validation
- Continue to procure GFE to support program requirements
- Complete Basis of Issue Plan/Qualitative Quantitative Personnel Requirements Information (BOIP/QQPR)
- Obtain Air Certification Approval for all THAAD Components
- Obtain Certificate of Equivalency for ground transport of Missile Round
- Obtain Interim Hazard Classification for ground transport of Missile Round
- Complete Explosive Ordnance Disposal (EOD) procedures
- Complete Supply Support Strategy
- Complete Business Case Analysis (BCA) and Core Depot Assessment (CDA) Integrated Product Teams (IPTs) to support PBL
- Complete Interim Instruction Facility

FY 2006 Planned Program:

- Complete Missile Round Trainer Development
- Continue to conduct Soldier-in-the-Loop Training
- Deliver Classroom Explosive Ordnance Disposal System Trainer (CEST) and Practical Explosive Ordnance Disposal System Trainer (PEST)
- Continue LMI validation

- Develop and procure training devices and PSE
- Continue development of Integrated ICSS
- Continue development of BCA/CDA
- Continue to develop PBL strategy
- Conducting System Operator Trainer Course
- Continue development of Integrated Logistics Support (ILS) documentation and training for Soldier in the Loop
- Continue CLS Support for flight testing at WSMR and Pacific Missile Range Facility (PMRF)
- Planning for Block 2008 demonstrations, assessments, and training
- Procure GFE for program requirements

FY 2007 Planned Program:

- Continue procuring GFE to support program requirements
- Continue CLS support of flight tests at PMRF
- Support government Block Qualification Testing
- Continue LMI Validation
- Continue to develop PBL strategy
- Conduct integration of BSC and ICSS
- Continue conducting THAAD Soldier training courses
- Develop non-embedded training devices
- Review/update training devices/courses
- Update ICSS hardware and software
- Review/Update PSE, Supportability Strategy, IETM/ETM and CLS Plan

	FY 2004	FY 2005	FY 2006	FY 2007
Weapon Sys Engr & Integ Team	51,571	56,640	97,567	81,309
RDT&E Articles (Quantity)	0	0	0	0

The ramp up in FY06 restores work deferred to this timeframe due to the Pratt & Whitney explosions. These efforts include test missile hardware for flight and ground testing, targets and range operations to conduct 4 flight tests, Radar #2 fabrication/assembly/integration/test and component qualification testing. Also included is the associated accounting allocation of indirect costs against these efforts.

FY 2004 Accomplishments:

- Completed Element Design Readiness Review
- Assessed capabilities using comprehensive, end-to-end digital simulation
- Supported Flight Test mission planning

- Completed development/integration of the System Integration Laboratory (SIL) Hardware-in-the-Loop (HWIL) facility
- Began integration of Components in the SIL HWIL for FT-1
- Continued participation in wargames, exercises and interoperability demonstrations
- Ensured program integration with BMDS Test Bed
- Planned the integration and implementation of THAAD and its components in the BMDS System Engineering & Integration

FY 2005 Planned Accomplishments:

- Initiate SIL HWIL environment development
- Perform System Analysis Scenarios and Designs
- Perform Parametric Performance Assessments
- Support Flight Test mission planning
- Complete integration of an autonomous THAAD system in the SIL HWIL facility
- Support pre-flight testing in the SIL HWIL facility
- Support Flight Test Program at White Sands Missile Range (WSMR)
- Begin validation of the end-to-end digital simulation using Flight Test data
- Support Flight Test data analysis
- Begin validation of the SIL HWIL facility using Flight Test data
- Initial SIL HWIL integration of Final Release of Missile Software Build 6.0, Launcher Software Build 3, C2BMC Software Build 4 and Radar Software Build 4.1 for integrated flight testing
- Provide Weapon System Engineering support for the Radar Software Build 4.2 and THAAD C2BMC Software Build 5 Missile Software Build 7.0 and Launcher Software Build 4 Design Readiness Reviews
- Continue participating in wargames, exercises and interoperability demonstrations
- Update assessment of Element capability using comprehensive, end-to-end digital simulation
- Continue program integration with BMDS System Engineering & Integration

FY 2006 Planned Program:

- Support Flight Test Program at WSMR and Pacific Missile Range Facility (PMRF)
- Continue supporting pre-flight testing in the SIL HWIL facility
- Continue supporting Flight Test data analysis
- Continue validation of the end-to-end digital simulation using Flight Test data
- Continue participating in wargames, exercises and interoperability demonstrations
- Perform System analysis in support of flight test scenarios
- Perform Parametric Performance Assessments
- Planning the integration and implementation of THAAD and its components in the BMDS System Engineering & Integration
- Support Flight Test mission planning
- Plan integration of THAAD into BMDS Test Bed
- Perform Systems Engineering support for Launch on Remote, Remoted Launchers, and expanding the system's capability to provide THAAD sensor data to the BMDS

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
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FY 2007 Planned Program:

- Perform System Analysis in support of flight testing
- Perform System Engineering for Fire Unit
- Support pre-flight testing in the SIL HWIL facility
- Continue validation of the end-to-end digital simulation using Flight test data
- Initiate element characterization analysis
- Planning the integration and implementation of THAAD and its components in the BMDS System Engineering & Integration
- Conduct Element analysis and validation in support of Design Readiness Review
- Initiate SIL HWIL environments development
- Support Flight Test mission planning
- Initial SIL HWIL integration of Final Release of Missile Software Build 7.0, Launcher Software Build 4, C2BMC Software Build 5 and Radar Software Build 4.2 for integrated flight testing
- Integrate THAAD into the BMDS Test Bed
- Continue Systems Engineering support for Launch on Remote, Remoted Launchers, and expanding the system's capability to provide THAAD sensor data to the BMDS

	FY 2004	FY 2005	FY 2006	FY 2007
Test and Evaluation	37,826	79,644	146,866	168,539
RDT&E Articles (Quantity)	0	0	0	0

The ramp up in FY06 restores work deferred to this timeframe due to the Pratt & Whitney explosions. These efforts include test missile hardware for flight and ground testing, targets and range operations to conduct 4 flight tests, Radar #2 fabrication/assembly/integration/test and component qualification testing. Also included is the associated accounting allocation of indirect costs against these efforts.

FY 2004 Accomplishments:

- Completed Pacific Missile Range Facility (PMRF) THAAD Military Construction facilities
- Emplaced THAAD Radar for integration and testing at White Sands Missile Range (WSMR)
- Delivered Launch and Test Support Equipment (L&TSE) to WSMR for range integration
- Continued planning for flight testing
- Continued planning for Block Qualification Testing (BQT) and Missile drop test
- Continued planning for Live Fire Test & Evaluation (LFT&E), full-scale Sled test, and sub-scale Light Gas Gun (LGG) test planning
- Conducted Test Planning in preparation for flight testing

FY 2005 Planned Accomplishments:

- Continue PMRF Activation
- Conduct Flight Tests at WSMR

- Continue planning for BQT
- Continue Missile Drop Test Planning
- Continue planning for LFT&E program
- Initiate Transfer of L&TSE and range integration
- Initiate component integration planning to support flight tests at PMRF
- Initiate Target integration planning for flight testing
- Continue Test Planning and Range Operations for flight testing

FY 2006 Planned Program:

- Continue Flight Tests at WSMR and PMRF
- Perform Data Analysis on Flight Tests
- Complete PMRF range activation
- Continue planning for BQT
- Conduct LFT&E tests
- Complete L&TSE and range integration
- Continue target integration planning for flight testing
- Continue Test Planning and Range Operations for flight testing
- Continue planning Fire Unit #1 Operational Assessment
- Initiate planning for Element demonstrations

FY 2007 Planned Program:

- Conduct flight tests at PMRF
- Continue performing Data Analysis on Flight Tests
- Initiate component BQT efforts
- Continue LFT&E testing
- Continue target integration planning for flight testing
- Continue Test Planning and Range Operations for flight testing
- Continue target and range facility planning
- Continue planning Fire Unit 1 Operational Assessment
- Continue planning for Element demonstrations

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

	FY 2004	FY 2005	FY 2006	FY 2007
Sys Level Prog Mgmt	68,312	43,870	53,319	39,240
RDT&E Articles (Quantity)	0	0	0	0

The ramp up in FY06 restores work deferred to this timeframe due to the Pratt & Whitney explosions. These efforts include test missile hardware for flight and ground testing, targets and range operations to conduct 4 flight tests, Radar #2 fabrication/assembly/integration/test and component qualification testing. Also included is the associated accounting allocation of indirect costs against these efforts.

FY 2004 Accomplishments:

- Provided management, leadership, and planning for all Block 2008 activities
- Participated in Element Design Readiness Review
- Provided leadership and direction to program
- Provided salaries, travel, training, supplies, rental and project-wide support

FY 2005 Planned Accomplishments:

- Provide management, leadership, and planning for all Block 2008 activities
- Provide salaries, travel, training, supplies, rental and project-wide support
- Support Flight Test Program at White Sands Missile Range (WSMR)
- Continue to provide guidance and management to program

FY 2006 Planned Program:

- Provide management, leadership, and planning for all Block 2008 activities
- Provide salaries, travel, training, supplies, rental and project-wide support
- Support Flight Test Program at WSMR and Pacific Missile Range Facility (PMRF)
- Continue to provide guidance and management to program

FY 2007 Planned Program:

- Provide management, leadership, and planning for all Block 2008 activities
- Continue to support Flight Test Program at PMRF
- Continue to provide guidance and management to program
- Provide salaries, travel, training and project-wide support

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
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	FY 2004	FY 2005	FY 2006	FY 2007
Fire Unit #1	0	0	0	161,000
RDT&E Articles (Quantity)	0	0	0	0

FY 2007 Planned Program:

- Initiate the fabrication and assembly of Missiles, Radar, Launchers, and THAAD C2BMC and initial spares for the Block 2008 Fire Unit
- Provide Interim Contractor Support (ICS) Contract
- Develop Materiel Fielding Plan
- Conduct Fielding Staging Site Preparation
- Develop Materiel Release Documents
- Update all training materials
- Procure Government Furnished Equipment (GFE) to support Fire Unit
- Procure Battery Support Center (BSC) and Integrated Contract Support System (ICSS)
- Develop and procure of Tactical Active Leak Sensor System (ALSS)
- Develop Objective Instructional Facility
- Plan for System Integration Check-Out (SICO)/New Equipment Training (NET)
- Develop Automated Information System (AIS) for Automated Identification Technology (AIT)
- Establish New Materiel Introductory Team (NMIT)/NET Team
- Initiate buy of 24 Missiles, 3 Launchers, 1 THAAD C2BMC, and 1 Radar for a total of 29 RDT&E Articles

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956

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	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

D. Acquisition Strategy

THAAD follows the capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks. The THAAD Block 2006/2008 program is already on contract with Lockheed Martin Space Systems Company (LMSSC), Sunnyvale, CA. The 103-month Cost Plus Award Fee (CPAF) contract was awarded effective August 4, 2000, and is 62% complete. In FY 2006 a Sole Source, CPAF/Cost Plus Incentive Fee (CPIF) 48-month Contract will be awarded to LMSSC for development upgrades to add THAAD capability to Launch on Remote, Remote Launchers and report non-threatening ballistic missiles. The Fire Unit #1 contracts are targeted to be awarded in FY 2007 and will consist of the following: (1) Sole Source, Indefinite Delivery, Indefinite Quantity (ID/IQ) Delivery Order contract to Raytheon for Radar hardware and (2) Sole Source, ID/IQ Delivery Order contract to LMSSC as the element integrator and to procure missile, launcher, C2BMC and Peculiar Support Equipment hardware. In addition, there will be a sole source Delivery Order Contract to LMSSC for Contractor Logistics Support for the Fire Unit targeted to be awarded in FY08. Block 2006/2008 development activities, as well as the acquisition of the Fire Unit, will provide a significant capability to protect deployed U.S. and allied forces, specified civilian population centers, or selected sites within the U.S.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Missile										
Prime Contract	SS/CPAF	LMSSC/ CA, TX, AL, MA, NH, IL, FL & MD	314,638	315,464	1/2Q	363,327	1/2Q	182,631	1/2Q	1,176,060
Radar										
Prime Contract	SS/CPAF	LMSSC and Raytheon/ Huntsville, AL; Bedford, MA, & Texas	142,630	131,768	1/2Q	165,594	1/2Q	101,957	1/2Q	541,949
Launcher										
Prime Contract	SS/CPAF	LMSSC/ Huntsville, AL & Lufkin, TX	24,389	19,793	1/2Q	15,947	1/2Q	14,323	1/2Q	74,452
C2BMC										
Prime Contract	SS/CPAF	LMSSC and Raytheon/ Huntsville, AL	49,407	54,573	1/2Q	73,555	1/2Q	33,623	1/2Q	211,158
Integrated Logistics Support (ILS)										
Prime Contract	SS/CPAF	LMSSC/ Huntsville, AL	10,092	11,843	1/2Q	29,676	1/2Q	30,080	1/2Q	81,691
Weapon Sys Engr & Integ Team										
Prime Contract	SS/CPAF	LMSSC/ Sunnyvale, CA & Huntsville, AL	34,941	32,415	1/2Q	60,000	1/2Q	39,139	1/2Q	166,495
Test and Evaluation										

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603881C Ballistic Missile Defense Terminal Defense Segment

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Prime Contract	SS/CPAF	LMSSC/ Sunnyvale, CA; Huntsville, AL; NM & HI	22,169	30,798	1/2Q	49,407	1/2Q	42,549	1/2Q	144,923
Sys Level Prog Mgmt										
Prime Contract	SS/CPAF	LMSSC/ Sunnyvale, CA	38,609	20,498	1/2Q	29,784	1/2Q	17,929	1/2Q	106,820
Fire Unit #1										
Prime Contract	SS	LMSSC & Raytheon/ CA, TX, AL, MA, NH, IL, FL & MD	0	0	N/A	0	N/A	161,000	1/2Q	161,000
Subtotal Product Development			636,875	617,152		787,290		623,231		2,664,548

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Missile										
SETA	C	Multiple to include BAE, TSI & L3/ Huntsville, AL & Salt Lake City, UT	4,638	5,303	1/2Q	4,418	1/2Q	5,043	1/2Q	19,402
OGA	MIPR	Multiple to include RDEC & SMDC/ Huntsville, AL	7,955	6,292	1/2Q	10,221	1/2Q	10,615	1/2Q	35,083
MDA Program Support	C	MDA/ Arlington, VA	0	7,760	1/2Q	32,301	1/2Q	42,365	1/2Q	82,426
Radar										
SETA	C	Multiple to include Dynetics & GA Tech/ Huntsville, AL and GA	1,406	2,347	1/2Q	3,118	1/2Q	4,143	1/2Q	11,014
OGA	MIPR	Multiple to include CECOM, RDEC & SMDC/ Ft. Monmouth NJ and Huntsville, AL	2,805	3,095	1/2Q	3,759	1/2Q	3,909	1/2Q	13,568
MDA Program Support	C	MDA/ Arlington, VA	0	3,175	1/2Q	14,469	1/2Q	21,616	1/2Q	39,260
Launcher										
SETA	C/FFP	Dynetics/ Huntsville, AL	670	816	1/2Q	853	1/2Q	871	1/2Q	3,210

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
OGA	MIPR	RDEC & SMDC/ Huntsville, AL	479	1,266	1/2Q	1,359	1/2Q	1,413	1/2Q	4,517
MDA Program Support	C	MDA/ Arlington, VA	0	477	1/2Q	1,279	1/2Q	2,278	1/2Q	4,034
C2BMC										
SETA	C	Multiple to include CSC & Dynetics/ Silver Spring, MD & Huntsville, AL	1,251	633	1/2Q	499	1/2Q	515	1/2Q	2,898
OGA	MIPR	Multiple to include NRDEC, RDEC & SMDC/ Natick MA & Huntsville, AL	1,591	4,142	1/2Q	4,532	1/2Q	4,671	1/2Q	14,936
MDA Program Support	C	MDA/ Arlington, VA	0	1,315	1/2Q	6,289	1/2Q	6,389	1/2Q	13,993
Integrated Logistics Support (ILS)										
SETA	C	Multiple to include Dynetics, TSA & BAE/ Huntsville, AL & Rockville, MD	3,653	1,100	1/2Q	3,200	1/2Q	3,200	1/2Q	11,153
OGA	MIPR	Multiple to include IMMC & USAADASCH/ Huntsville, AL & Ft. Bliss	5,194	8,076	1/2Q	11,916	1/2Q	7,345	1/2Q	32,531
MDA Program Support	C	MDA/ Arlington, VA	0	285	1/2Q	2,018	1/2Q	3,925	1/2Q	6,228

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Weapon Sys Engr & Integ Team										
SETA	C	Multiple to include Dynetics, TSA and L3/ Huntsville, AL & Salt Lake City, UT	12,161	5,700	1/2Q	4,704	1/2Q	4,788	1/2Q	27,353
OGA	MIPR	Multiple to include RDEC & SMDC/ Huntsville, AL	5,155	17,744	1/2Q	28,218	1/2Q	31,609	1/2Q	82,726
MDA Program Support	C	MDA/ Arlington, VA	0	781	1/2Q	4,645	1/2Q	5,773	1/2Q	11,199
Test and Evaluation										
OGA	MIPR	Multiple to include WSMR, PMRF, ATEC,RDEC & SMDC/ NM, HI, VA, & Huntsville, AL	3,893	26,273	1/2Q	47,524	1/2Q	62,382	1/2Q	140,072
MDA Program Support	C	MDA/ Arlington, VA	0	742	1/2Q	4,169	1/2Q	8,656	1/2Q	13,567
Sys Level Prog Mgmt										
SETA	C	Multiple to include Dynetics, BAE, & L3/ Huntsville, AL Rockville, MD & Salt Lake City, UT	13,654	4,197	1/2Q	3,627	1/2Q	3,948	1/2Q	25,426

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
MDA Program Support	C	MDA/ Arlington, VA	0	494	1/2Q	2,581	1/2Q	4,078	1/2Q	7,153
Subtotal Support Costs			64,505	102,013		195,699		239,532		601,749

Remarks

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Test and Evaluation										
Government Test Planning/Targets	MIPR	Multiple such WSMR, PMRF & SMDC/ NM, HI & Huntsville, AL	12,409	21,831	1/2Q	45,766	1/2Q	54,952	1/2Q	134,958
Subtotal Test and Evaluation			12,409	21,831		45,766		54,952		134,958

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603881C Ballistic Missile Defense Terminal Defense Segment

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Sys Level Prog Mgmt										
Internal Operating Budget	MIPR	THAAD/ Huntsville, AL	4,100	18,681	1/2Q	17,327	1/2Q	13,285	1/2Q	53,393
Subtotal Management Services			4,100	18,681		17,327		13,285		53,393
Remarks										
Project Total Cost			717,889	759,677		1,046,082		931,000		3,454,648
Remarks										

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Testing Milestones																																
Conduct Block 2008 FT-01																																
Conduct Block 2008 FT-02																																
Conduct Block 2008 FT-04																																
Conduct Block 2008 FT-05																																
Conduct Block 2008 FTT-06-1																																
Conduct Block 2008 FTT-06-2																																
Conduct Block 2008 FTT-06-3																																
Conduct Block 2008 FTT-06-4																																
Conduct Block 2008 FTT-06-5 (SALVO)																																
Conduct Block 2008 FTT-06-6																																
Conduct Block 2008 FTT-08-1																																
Conduct Block 2008 FTT-08-2																																
Conduct Block 2008 FTT-08-3 (DUEL)																																
Conduct Block 2008 FTT-08-4																																
Conduct Block 2008 FTT-08-5																																
Testing Milestones																																
Conduct Block 2008 FTT-08-6																																
Conduct Block 2008-FT-03																																

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
BLOCK 2008																																
Element Design Readiness Review (DRR)	▲																															
Radar #1 Delivered to WSMR		▲																														
FT-01 Missile S/W Final Release Integrated at SIL				▲																												
Soldier-in-the-Loop Training Course 1				▲																												
Active Leak Sensor Prototype Delivered to Troy, AL				▲																												
FT-01 Missile Delivered to WSMR						△																										
C2BMC Tactical Station Grp (TSG) Delivered to WSMR						△																										
Launcher S/W B3 Final Release Integrated at SIL						△																										
Launcher Delivered to WSMR						△																										
Radar #1 Integration and Test Complete						△																										
Radar B4.2 S/W Design Readiness Review (DRR)						△																										
FT-02 Missile S/W Final Release Integrated at SIL						△																										
Radar S/W B4.1V Final Release Integrated at SIL						△																										
C2BMC S/W B4 Final Release Integrated at SIL							△																									
FT-02 Missile Delivered to WSMR							△																									
C2BMC B5 S/W Design Readiness Review (DRR)								△																								
Radar S/W B4.1 Final Release Integrated at SIL								△																								

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
BLOCK 2008																																
FT-03 Missile Delivered to WSMR								Δ																								
Soldier-in-the-Loop Training Course 2								Δ																								
FT-04 Missile Delivered to WSMR									Δ																							
Pacific Missile Range Facility Activation										Δ																						
FT-05 Missile Delivered to Range										Δ																						
FTT-06-1 Missile Delivered to Range											Δ																					
FTT-06-2 Missile Delivered to Range												Δ																				
FTT-06-3 Missile Delivered to Range													Δ																			
Radar B4.2 S/W Final Release Integrated at SIL														Δ																		
FTT-06-4 Missile Delivered to Range														Δ																		
Radar #2 Delivered To WSMR for Integration															Δ																	
FTT-06-5 Missiles (2) Delivered to range															Δ																	
Insensitive Munitions/Hazards Testing																Δ		Δ														
Missile S/W B7.0 Final Release Integrated at SIL																Δ																
Launcher B4 S/W Final Release Integrated at SIL																Δ																
Radar #2 Integration Complete at WSMR																Δ																
C2BMC B5 S/W Final Release Integrated at SIL																Δ																
FTT-06-6 Missile Delivered to Range																Δ																
FTT-08-1 Missile Delivered																	Δ															

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
BLOCK 2008																																
Radar #2 E3 Testing Complete																	Δ															
Deliver Prime Power Unit (PPU) #1																	Δ															
FTT-08-2 Missile Delivered																		Δ														
FTT-08-3 Missiles (2) Delivered to Range																		Δ														
Radar Data Collection Mission #2																		Δ														
Radar #2 Available for Block Qualification Test																		Δ														
FTT-08-4 Missile Delivered																			Δ													
FTT-08-5 Missile Delivered																			Δ													
FTT-08-6 Missile Delivered																			Δ													
Radar Prime Power Unit #2 Delivered																				Δ												
Radar B4.2 Final Maintenance Release																					Δ											
Element Demonstrations																						Δ	——	Δ								
Element Weapon System Characterization																							Δ									

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Testing Milestones								
Conduct Block 2008 FT-01		2Q-3Q						
Conduct Block 2008 FT-02		4Q						
Conduct Block 2008 FT-04			2Q					
Conduct Block 2008 FT-05			2Q					
Conduct Block 2008 FTT-06-1			4Q	1Q				
Conduct Block 2008 FTT-06-2				1Q-2Q				
Conduct Block 2008 FTT-06-3				1Q-3Q				
Conduct Block 2008 FTT-06-4				3Q-4Q				
Conduct Block 2008 FTT-06-5 (SALVO)				4Q	1Q			
Conduct Block 2008 FTT-06-6					1Q			
Conduct Block 2008 FTT-08-1					3Q			
Conduct Block 2008 FTT-08-2					3Q			
Conduct Block 2008 FTT-08-3 (DUEL)						1Q		
Conduct Block 2008 FTT-08-4						1Q		
Conduct Block 2008 FTT-08-5						2Q		
Conduct Block 2008 FTT-08-6						3Q		
Conduct Block 2008-FT-03			1Q					
BLOCK 2008								
Element Design Readiness Review (DRR)	1Q							
Radar #1 Delivered to WSMR	2Q							
WSMR Activation Complete	2Q							
L&TSE #1 Integrated at SIL	3Q							
Range Safety Qual Test Complete	3Q							
FT-01 Missile S/W Engr Release Integrated at SIL	3Q							
FT-01 Missile S/W Final Release Integrated at SIL	4Q							
Radar S/W B4.1 Engr Release Integrated at SIL	4Q							
C2BMC S/W B4 Engr Release Integrated at SIL	4Q							
Soldier-in-the-Loop Training Course 1	4Q							
Active Leak Sensor Prototype Delivered to Troy, AL	4Q							
Launcher S/W B3 Eng Release Integrated at SIL		1Q						

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
FT-01 Missile Delivered to WSMR		2Q						
Kill Vehicle (KV) Flight Qual Tests		2Q						
Missile Environments Phase I		2Q						
C2BMC Tactical Station Grp (TSG) Delivered to WSMR		2Q						
Launcher S/W B3 Final Release Integrated at SIL		2Q						
FT-02 Missile S/W Engr Release Integrated at SIL		1Q						
Launcher Delivered to WSMR		2Q						
Radar #1 Integration and Test Complete		2Q						
Radar B4.2 S/W Design Readiness Review (DRR)		2Q						
FT-02 Missile S/W Final Release Integrated at SIL		2Q						
Radar S/W B4.1V Final Release Integrated at SIL		2Q						
C2BMC S/W B4 Final Release Integrated at SIL		3Q						
FT-02 Missile Delivered to WSMR		3Q						
C2BMC B5 S/W Design Readiness Review (DRR)		4Q						
Radar S/W B4.1 Final Release Integrated at SIL		4Q						
FT-03 Missile Delivered to WSMR		4Q						
Soldier-in-the-Loop Training Course 2		4Q						
FT-04 Missile Delivered to WSMR			1Q					
Pacific Missile Range Facility Activation			2Q					
FT-05 Missile Delivered to Range			2Q					
FTT-06-1 Missile Delivered to Range			3Q					
FTT-06-2 Missile Delivered to Range			4Q					
FTT-06-3 Missile Delivered to Range				1Q				
Radar B4.2 S/W Engr Release Integrated at SIL				1Q				
Radar B4.2 S/W Final Release Integrated at SIL				2Q				
FTT-06-4 Missile Delivered to Range				2Q				
C2BMC B5 S/W Engr Release Integrated at SIL				2Q				
C2BMC Block Qualification Test (BQT)				2Q-4Q	1Q-4Q	1Q		
Launcher Block Qualification Test (BQT)				2Q-4Q	1Q-4Q	1Q		
Radar #2 Delivered To WSMR for Integration				3Q				

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Missile S/W B7.0 Engr Release Integrated at SIL				3Q				
Launcher B4 S/W Engr Release Integrated at SIL				3Q				
FTT-06-5 Missiles (2) Delivered to range				3Q				
Insensitive Munitions/Hazards Testing				4Q	1Q-2Q			
Missile S/W B7.0 Final Release Integrated at SIL				4Q				
Launcher B4 S/W Final Release Integrated at SIL				4Q				
Radar #2 Integration Complete at WSMR				4Q				
C2BMC B5 S/W Final Release Integrated at SIL				4Q				
FTT-06-6 Missile Delivered to Range				4Q				
Missile Block Qualification Test				4Q	1Q-2Q			
FTT-08-1 Missile Delivered					1Q			
Radar #2 E3 Testing Complete					1Q			
Deliver Prime Power Unit (PPU) #1					1Q			
FTT-08-2 Missile Delivered					2Q			
FTT-08-3 Missiles (2) Delivered to Range					2Q			
Radar Data Collection Mission #2					2Q			
Radar #2 Available for Block Qualification Test					2Q			
Radar Block Qualification Test					2Q-4Q	1Q-3Q		
FTT-08-4 Missile Delivered					3Q			
FTT-08-5 Missile Delivered					3Q			
FTT-08-6 Missile Delivered					3Q			
Radar Prime Power Unit #2 Delivered					4Q			
Radar B4.2 Final Maintenance Release						1Q		
Element Demonstrations						2Q-4Q		
Element Weapon System Characterization						3Q		

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0007 Terminal High Altitude Area Defense (THAAD) Block 2010	0	0	0	0	0	168,000	635,068	394,998
RDT&E Articles Qty	0	0	0	0	0	0	7	22

Note:
Implementation of the new BMDS baseline approach directed the reallocation of funding among Blocks. Project 0807 (FY09 - FY10) was realigned and collapsed into Project 0007.

A. Mission Description and Budget Item Justification

The Terminal High Altitude Area Defense (THAAD) is an element of the Terminal Defense Segment (TDS) of the Ballistic Missile Defense System (BMDS). The Terminal Defense Elements provide the final opportunity to engage all ranges of ballistic missiles not engaged or destroyed in the boost or mid-course phase of trajectory. Block 2010 THAAD further enhances the MDA TDS by deepening, complementing, and extending the BMDS battlespace and capability to engage and negate ballistic missiles and asymmetric threats in both the late mid-course and terminal phases of their trajectory. The Block 2010 THAAD highly mobile capability provides BMDS the ability to defend against all ranges of ballistic missiles and asymmetric threat; and protects U.S. and allied armed forces, broadly dispersed assets and population centers and selected U.S. sites (Homeland Defense) against ballistic missile attacks. The Block 2010 THAAD Element provides coordinated engagements with BMDS via the BMDS Command and Control Battle Management Communications (C2BMC) network. THAAD, in conjunction with the fielded Patriot System, provides the Terminal Defense layer. Five major components (missiles, launchers, radars, THAAD Command C2BMC, and THAAD-specific support equipment) will be integrated into the THAAD element and BMDS. THAAD follows the MDA's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks. The program addresses MDA System Engineering and Integration gap analysis of Engagement Sequence Groups (ESGs), identifying and documenting both element and component capabilities.

Block 2010: Block 2010 is the next incremental capability delivered as part of THAAD's evolutionary acquisition/development strategy. This block continues the concept of a rapidly deployable configuration to support the TDS mission as well as supporting the strategic surveillance, tracking and fire control missions through Block 2010 enhanced sensor and interceptor capability. Block 2010 leverages Block 2008 functionality by initiating development of kill vehicle and booster improvements that significantly increase performance of the endo and exo intercept against long range threats. In short, Block 2010 provides the initiation of the next generation THAAD capability that provides rapidly mobile components to extend and deepen BMDS capability against all ballistic missile threats. Block 2010 adds the THAAD Interceptor engage on remote sensor ESG. THAAD Fire Unit #2 consists of 24 missiles, 3 launchers, 1 C2BMC and 1 radar.

RDT&E Articles for Fire Unit #2:

FY 2009 (Fire Unit Buy Schedule): 24 Missiles; 3 Launchers; 1 C2BMC (2 TSGs); 1 Radar for a total of 29 RDT&E Articles
FY 2010 (Fire Unit Delivery Schedule): 3 Missiles; 3 Launchers and 1 C2BMC (2 TSGs) for a total of 7 articles
FY 2011 (Fire Unit Delivery Schedule): 21 Missiles and 1 Radar for a total of 22 articles

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Funding in this Project is not programmed until FY 2009.	0	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

D. Acquisition Strategy

THAAD follows the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks. Block 2010 development activities could be used to provide a significant capability to protect deployed U.S. and allied forces, dispersed assets, specified population centers, or wide areas of the U.S. The Block 2010 Acquisition Strategy is still being developed. The Fire Unit #2 contracts are targeted to be awarded in FY 2009 and will consist of the following: (1) Sole Source, Indefinite Delivery/Indefinite Quantity (ID/IQ) Delivery Order contract to Raytheon for Radar hardware and (2) Sole Source, ID/IQ Delivery Order contract to LMSSC as the element integrator and to procure missile, launcher, C2BMC and Peculiar Support Equipment hardware. In addition, there will be a sole source Delivery Order Contract to LMSSC for Contractor Logistics Support for the Fire Unit Targeted to be awarded in FY08. Block 2010 development activities, as well as the acquisition of the Fire Unit, will provide a significant capability to protect deployed U.S. and allied forces, specified civilian population centers, or selected sites within the U.S.

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Program Milestones																																
Block 10/12 Authority to Proceed (ATP)																									Δ							

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Program Milestones								
Block 10/12 Authority to Proceed (ATP)							1Q	
Component PDRs Complete							2Q	
Element Preliminary Design Review (PDR)							3Q	

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0401 Israeli Arrow Program	135,644	152,048	77,616	79,494	77,539	77,723	79,340	80,987
RDT&E Articles Qty	45	44	8	8	7	0	0	0

A. Mission Description and Budget Item Justification

This project provides funding for the Arrow system development, to include the Arrow System Improvement Program (ASIP), testing of the Arrow Weapon System in the U.S., enhancement of Arrow interoperability with U.S. ballistic missile defense systems, Israeli Systems Architecture and Integration (ISA&I) studies to assess Arrow's effectiveness against emerging threats, and Israeli Test Bed (ITB) experiments to evaluate human-in-the-loop battle management and command, control, and communications. The United States derives considerable benefits from its participation in these projects. The presence of a ballistic missile defense system in Israel developed under this project helps ensure U.S. freedom of action in future contingencies and provides protection against ballistic missile attacks to U.S. forces deployed to the region. The cooperative effort also provides risk reduction and alternative technologies for U.S. ballistic missile defense programs as well as phenomenology and kill assessment data. The ASIP effort will enhance the performance of the Arrow Weapon System (AWS) to defeat longer-range and more robust Tactical Ballistic Missile (TBM) threats expected to be introduced in the Middle East in the near future. The ASIP also includes baseline testing of the AWS at a U.S. test range against today's existing TBM threats as well as testing of the enhanced AWS against longer range threats. The ITB and ISA&I efforts will continue to support AWS and ASIP development as well as to define future missile defense architectures to maintain pace with emerging threats.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Arrow System Improvement Program (ASIP)	49,617	56,632	56,213	58,021
RDT&E Articles (Quantity)	7	1	1	1

FY 2004 Accomplishments:

RDT&E Articles: (Seven Missiles Total) Three Block 3 Arrow test missiles for intercept testing, and two liquid fuel test missile targets and two air-launched short-range target missiles for U.S. Arrow testing.

- Conducted Arrow developmental flight test in Israel in preparation for intercept testing in the U.S. against representative regional Tactical Ballistic Missile (TBM) threats.
- Conducted developmental flight test in Israel. Continue ASIP Phase II to develop and test technologies to improve Arrow Weapon System performance to defend Israel from emerging TBM threats.
- Continued enhancing Arrow interoperability.
- Obtained Joint Interoperability Test Command certification of the IMDA interoperability enhancements.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

FY 2005 Planned Accomplishments:

RDT&E Articles: (One Missiles Total) One Block 3 Arrow test missile for intercept testing.

- Continue ASIP Phase II to develop and test technologies to improve Arrow Weapon System performance to defend Israel for emerging TBM threats.
- Conduct Arrow flight test in Israel.
- Continue enhancing Arrow interoperability development and validation to include engagement coordination.

FY 2006 Planned Program:

RDT&E Articles: (One Missile Total) One Block 3 Arrow test missile for intercept testing.

- Complete ASIP Phase II to develop activities to improve Arrow Weapon System performance to defend Israel for emerging TBM threats.
- Conduct Arrow flight test in Israel.
- Continue enhancing Arrow interoperability development and validation to include engagement coordination.

FY 2007 Planned Program:

RDT&E Articles: (One Missile Total) One Block 3.5 Arrow II test missile for intercept testing.

- Begin Verification and validation, Phase III of the ASIP program.
- Conduct Block 3.5 Arrow flight tests in Israel.

	FY 2004	FY 2005	FY 2006	FY 2007
Arrow Enhanced Component Production	4,680	0	0	0
RDT&E Articles (Quantity)	1	0	0	0

FY 2004 Accomplishments:

RDT&E Articles: One proof of concept co-produced Arrow II missile.

- Complete the development of Arrow production capability to produce Arrow components in the U.S. to accelerate Israeli acquisition of Arrow interceptor missiles.
- Provide components to Israel for final interceptor integration.
- Produce sufficient component quantities in the U.S. to qualify production processes and transition Arrow co-production of the Arrow Missile Production Program (AMPP).

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

	FY 2004	FY 2005	FY 2006	FY 2007
Israeli Test Bed (ITB)	3,535	3,535	3,535	3,535
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- Conduct ITB experiments to support development of centralized battle management. Assess Arrow interoperability between Israeli and U.S. missile defense systems.
- Provide support to U.S. European Command and Israeli Air Force (EUCOM/IAF) to conduct ITB experiments.
- Support the addition of the operational AWS and block upgrades into the combined Operations Plan (OPLAN)
- Combined Standard Operating Procedures (CSOP).
- Conduct experiments of planned Arrow block upgrades to the AWS and assess their impacts on EUCOM/IAF combined operations.

FY 2005 Planned Accomplishments:

- Conduct ITB experiments to support development of centralized battle management.
- Evaluate ASIP performance specifications against future threats and assess Arrow enhanced interoperability between Israeli and U.S. missile defense systems.
- Support EUCOM/IAF revisions to the combined OPLAN and CSOP.
- Conduct experiments of planned Arrow block upgrades to the AWS and assess their impacts on EUCOM/IAF combined operations.

FY 2006 Planned Program:

- Conduct ITB experiments to support development of centralized battle management.
- Evaluate ASIP performance specifications against future threats and assess Arrow enhanced interoperability between Israeli and U.S. missile defense systems.
- Support EUCOM/IAF revisions to the combined OPLAN and CSOP.
- Conduct experiments of planned Arrow block upgrades to the AWS and assess their impacts on EUCOM/IAF combined operations.

FY 2007 Planned Program:

- Conduct ITB experiments to support development of centralized battle management.
- Evaluate ASIP performance specifications against future threats and assess Arrow enhanced interoperability between Israeli and U.S. missile defense systems.
- Support EUCOM/IAF revisions to the combined OPLAN and CSOP.
- Conduct experiments of planned Arrow block upgrades to the AWS and assess their impacts on EUCOM/IAF combined operations.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

	FY 2004	FY 2005	FY 2006	FY 2007
Israeli Systems Architecture and Integration (ISA&I)	2,010	2,041	2,080	2,147
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- Develop initial Israeli Missile Defense System (IMDS) architecture and system level design.

FY 2005 Planned Accomplishments:

- Assess IMDS performance against emerging regional TBM threats.
- Refine growth path options necessary for the Arrow missile defense system to remain an effective ballistic missile defense for the State of Israel.
- Evaluate Israeli architecture studies to assess near-term U.S. missile defense systems and their impact on contributing to future Israeli missile defense architectures.

FY 2006 Planned Program:

- Assess IMDS performance against emerging regional TBM threats.
- Refine growth path options necessary for the Arrow missile defense system to remain an effective ballistic missile defense for the State of Israel.
- Evaluate Israeli architecture studies to assess near-term U.S. missile defense systems and their impact on contributing to future Israeli missile defense architectures.

FY 2007 Planned Program:

- Assess IMDS performance against emerging regional TBM threats.
- Refine growth path options necessary for the Arrow missile defense system to remain an effective ballistic missile defense for the State of Israel.
- Evaluate Israeli architecture studies to assess near-term U.S. missile defense systems and their impact on contributing to future Israeli missile defense architectures.

	FY 2004	FY 2005	FY 2006	FY 2007
Program Support	862	840	788	791
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- Develop and maintain ASIP and co-production security plans and classification guides. Support interoperability assessment and risk reduction testing.
- Manage and support ITB modifications and experiments.
- Complete documentation of background/foreground data rights for ASIP, Arrow co-production, and update the ITB Master Technology List.
- Maintain security plans and classification guides.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

FY 2005 Planned Accomplishments:

- Continue documentation of background/foreground data rights for ASIP, Arrow co-production, and ITB.
- Maintain security plans and classification guides.
- Manage and support ITB modifications and experiments. Support Israeli and U.S. Missile Defense System integration and related test activities.

FY 2006 Planned Program:

- Continue documentation of background/foreground data rights for ASIP, Arrow co-production, and ITB.
- Maintain security plans and classification guides.
- Manage and support ITB modifications and experiments. Support Israeli and U.S. Missile Defense System integration and related test activities. FY 2007:
- Continue documentation of background/foreground data rights for ASIP, Arrow co-production, and ITB.
- Maintain security plans and classification guides.
- Manage and support ITB modifications and experiments. Support Israeli and U.S. Missile Defense System integration and related test activities.

FY 2007 Planned Program:

- Continue documentation of background/foreground data rights for ASIP, Arrow co-production, and ITB.
- Maintain security plans and classification guides.
- Manage and support ITB modifications and experiments. Support Israeli and U.S. Missile Defense System integration and related test activities.

	FY 2004	FY 2005	FY 2006	FY 2007
Arrow Missile Production	74,940	89,000	15,000	15,000
RDT&E Articles (Quantity)	37	43	7	7

FY 2004 Accomplishments:

RDT&E Articles: Thirty seven (37) Arrow II missiles.

- Cooperatively produce Arrow missiles to meet Israel's defense requirements.
- The cooperative production program will consist of the manufacture of certain Arrow components in the U.S. with other components manufactured in Israel.
- Missile final assembly will take place in Israel.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

FY 2005 Planned Accomplishments:

RDT&E Articles: Forty three Arrow II missiles.

- Cooperatively produce Arrow missiles to meet Israel's defense requirements.
- The cooperative production program will consist of the manufacture of certain Arrow components in the U.S. with other components manufactured in Israel.
- Missile final assembly will take place in Israel.

FY 2006 Planned Program:

RDT&E Articles: Seven Arrow II missiles.

- Cooperatively produce Arrow missiles to meet Israel's defense requirements.
- The cooperative production program will consist of the manufacture of certain Arrow components in the U.S. with other components manufactured in Israel.
- Missile final assembly will take place in Israel.

FY 2007 Planned Program:

RDT&E Articles: Seven Arrow II missiles.

- Cooperatively produce Arrow missiles to meet Israel's defense requirements.
- The cooperative production program will consist of the manufacture of certain Arrow components in the U.S. with other components manufactured in Israel.
- Missile final assembly will take place in Israel.

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
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PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
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PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

D. Acquisition Strategy

ASIP - Israel Ministry of Defense (IMoD) contracts on behalf of U.S. government to IAI and other ASIP contractors. MDA Targets Office contracts for production and instrumentation of targets for U.S. flight testing.

Arrow Enhanced Components Production - IMoD contracts on behalf of U.S. government to IAI. IAI subcontracts to Boeing for development of U.S. production capability.
Arrow Missile Production - IMoD contracts on behalf of U.S. government to IAI. IAI subcontracts to Boeing for manufacture of U.S. components. IAI manufactures Israeli components and performs final assembly.

Israeli Test Bed - SMDC contracts to Tadiran.

Israeli System Architecture and Integration - MDA contracts to WALES, Ltd.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Arrow System Improvement Program (ASIP)										
Arrow System Improvement Program (ASIP)	FFP	IAI/ Israel	151,617	56,632	1Q	56,213	1Q	58,021	1Q	322,483
Arrow Enhanced Component Production										
Arrow Enhanced Component Production	FFP	Boeing/IAI/ Ala/Israel	43,335	0	N/A	0	N/A	0	N/A	43,335
Israeli Test Bed (ITB)										
Israeli Test Bed (ITB)	FFP	Tadiran/ Israel	9,135	3,535	1Q	3,535	1Q	3,535	1Q	19,740
Israeli Systems Architecture and Integration (ISA&I)										
Israeli Systems Architecture and Integration (ISA&I)	FFP	Wales, Ltd/ Israel	5,421	2,041	1Q	2,080	1Q	2,147	1Q	11,689
Arrow Missile Production										
Arrow Missile Production	FFP	Boeing/IAI/ Ala/Israel	0	89,000	2Q	15,000	2Q	15,000	2Q	119,000
Subtotal Product Development			209,508	151,208		76,828		78,703		516,247

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Program Support										
Program Support	FFP	Various/ Ala/Va	5,862	840	1Q	788	1Q	791	1Q	8,281
Subtotal Support Costs			5,862	840		788		791		8,281

Remarks

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation										

Remarks

IV. Management Services Cost ($ in Thousands)

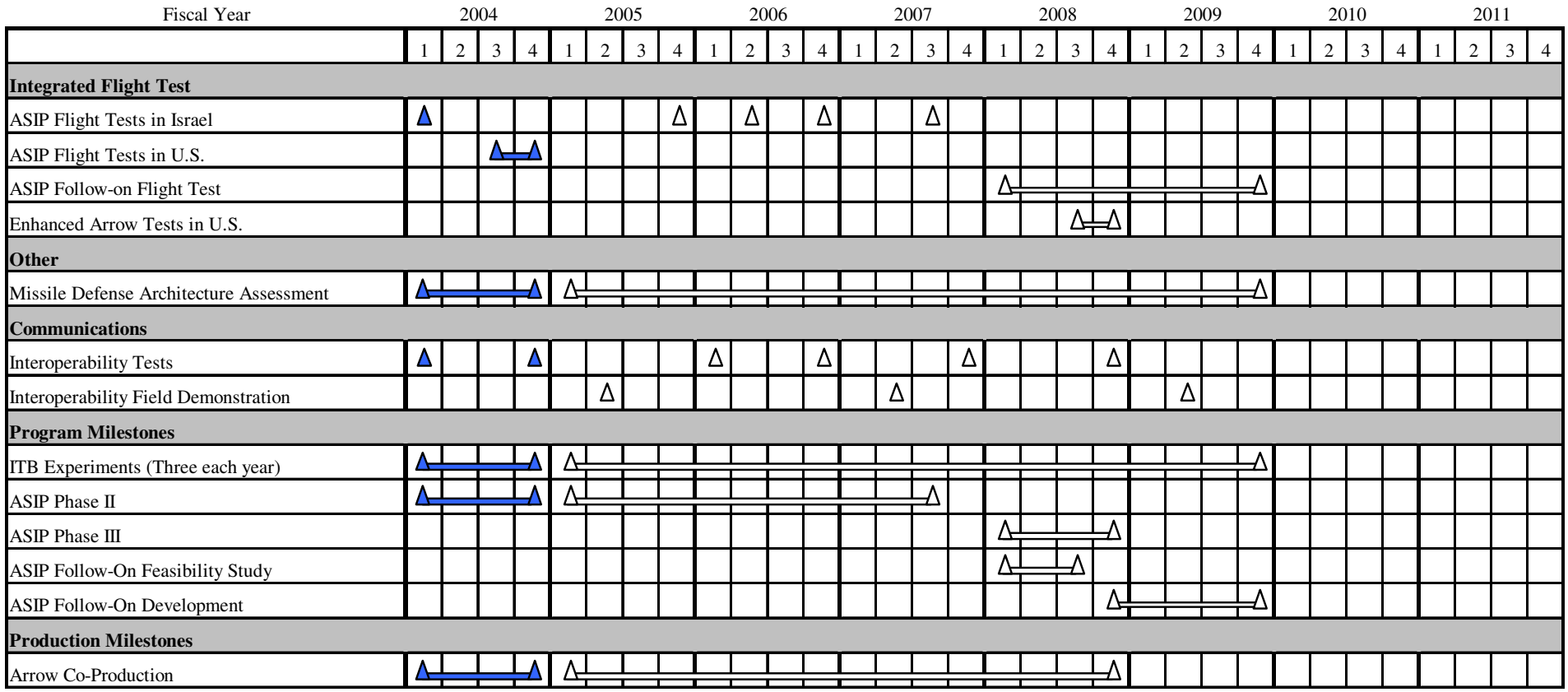
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

Project Total Cost			215,370	152,048		77,616		79,494		524,528

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**



Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603881C Ballistic Missile Defense Terminal Defense Segment

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Integrated Flight Test								
ASIP Flight Tests in Israel	1Q	4Q	2Q,4Q	3Q				
ASIP Flight Tests in U.S.	3Q-4Q							
ASIP Follow-on Flight Test					1Q-4Q	1Q-4Q		
Enhanced Arrow Tests in U.S.					3Q-4Q			
Other								
Missile Defense Architecture Assessment	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q		
Communications								
Interoperability Tests	1Q,4Q		1Q,4Q	4Q	4Q			
Interoperability Field Demonstration		2Q		2Q		2Q		
Program Milestones								
ITB Experiments (Three each year)	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q		
ASIP Phase II	1Q-4Q	1Q-4Q	1Q-4Q	1Q-3Q				
ASIP Phase III					1Q-4Q			
ASIP Follow-On Feasibility Study					1Q-3Q			
ASIP Follow-On Development					4Q	1Q-4Q		
Production Milestones								
Arrow Co-Production	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q			

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0602 Program-Wide Support	7,261	16,663	19,912	24,182	22,728	18,620	16,874	9,527
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

Program-Wide Support provides funding for common support functions across the entire program such as strategic planning, program integration, cost estimating, contracting, and financial management to include preparation of financial statements, reimbursement of financial services provided by DFAS, internal review and audit, earned-value management, and program assessment. Includes costs for both government civilians performing these functions as well as support contractors providing government staff augmentation in these areas. Applies to costs at the MDA HQ as well as its Executing Agents in the Services: Army Space and Missile Defense Command, Army PEO Space and Missile Defense, Office of Naval Research, and various Air Force laboratory and acquisition activities. Other costs include physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses at the various MDA Executing Agent locations, which at the MDA HQ are generally funded from the Management Headquarters Program Element (0901598C). Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Civilian Salaries and Support	7,261	16,663	19,912	24,182
RDT&E Articles (Quantity)	0	0	0	0

See Section A: Mission Description and Budget Item Justification

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603881C Ballistic Missile Defense Terminal Defense Segment**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total PE Cost	3,711,708	4,501,459	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882
0708 Ground-Based Midcourse Defense (GMD) Block 2004 Test Bed/Initial Defensive Capability (IDC)	1,357,320	850,505	0	0	0	0	0	0
0808 Ground-Based Midcourse Defense (GMD) Block 2004/2006 Development	1,587,103	2,468,118	2,224,349	2,232,055	330,912	233,703	0	0
0908 Ground-Based Midcourse Defense (GMD) Block 2008 Development	0	0	73,682	281,000	1,425,476	1,176,220	338,466	213,500
0008 Ground-Based Midcourse Defense (GMD) Block 2010	0	0	0	188,885	717,000	654,831	1,557,354	1,349,209
0709 AEGIS Ballistic Missile Defense Block 2004	605,993	942,975	101,177	15,000	0	0	0	0
0809 AEGIS Ballistic Missile Defense Block 2006	24,418	121,494	574,766	546,817	69,000	15,000	0	0
0909 AEGIS Ballistic Missile Defense Block 2008	0	0	135,158	354,233	636,729	546,069	205,208	44,039
0009 AEGIS Ballistic Missile Defense Block 2010	0	0	0	0	20,000	185,000	576,260	644,000
0402 Japanese Cooperative Program	51,775	71,283	24,800	52,791	112,500	131,500	129,500	100,000
0515 Multiple Kill Vehicles	0	0	82,000	219,645	272,900	306,500	308,200	113,500
0602 Program-Wide Support	85,099	47,084	50,264	55,565	66,331	66,690	68,634	81,634
Amount Included in PE 0904903D	0	0	0	0	-1,238,075	-983,950	-745,721	-551,163
Total PE Cost Reflected in R-1	3,711,708	4,501,459	3,266,196	3,945,991	2,412,773	2,331,563	2,437,901	1,994,719

Note:
Project 0515 was previously funded in the BMD Technology Program Element, 0603175C within project 0502 in Engagement Systems.

A. Mission Description and Budget Item Justification

The Administration and the Congress have committed to deploying a ballistic missile defense system as soon as technologically possible. In response to Presidential direction, MDA fielded an initial defensive capability in 2004 to address known threats. We began with the most mature components - a small number of sensors and interceptors and a fire control system - forming the foundation of an integrated and layered ballistic missile defense system (BMDS). The fielded system is limited, intended to support comprehensive development and testing while providing defense of the United States against attack by a limited number of ballistic missiles. Our objective remains a single integrated layered system with diverse basing options.

We have balanced fielding decisions with a comprehensive development program to deliver the maximum operational capability within the resources provided. The FY 2006 biennial budget submission, to include the FYDP years, emphasizes full integration of BMDS elements and components - that is, making the system work better as a single system - as well as continued development of capabilities that will close performance gaps in our current configuration. This program is balanced and funded to meet a broad spectrum of potential threats: 1) the size of the rogue nation threat; 2) the complexity of the rogue nation threat; 3) aggressive tactics to circumvent our current posture; and 4) the emergence of new threats. The Administration is committed to defending the American people against new threats of the 21st century and has called out deployment of effective missile defenses as an essential element of that effort.

In the course of the past year, MDA has reviewed its overall approach to developing and fielding a BMDS - an integrated, layered defense against threats of all ranges, in all phases of flight. This approach is critical to achieving the highest performance defense and ensuring the defense is not vulnerable to any particular threat. The midcourse phase of flight offers, for the time being, the most significant leverage to engage the threat. From a time perspective, the midcourse phase is comparatively long thereby allowing defenses extended sensor viewing time and multiple engagement

opportunities. The Midcourse PE is the nation's first line of defense - that is, it is largely in this PE that the initial defensive capability is being fielded, and it is in this PE that MDA will address one of its primary concerns about the future, keeping pace with the rogue nation threat. MDA is also doing as much as possible to address threat complexity in this PE.

MDA identifies BMDS capabilities, architectures and element contributions to counter the threat and organizes them by Engagement Sequence Groups (ESGs). These ESGs describe a combination of weapons, sensors and Command and Control/Battle Management Communications (C2BMC) capabilities that must work together to detect, track and intercept an enemy missile - the complete kill chain from the time the threat missile is first detected through the intercept of the target. Through ESGs, the MDA Systems Engineer identifies the necessary interfaces required to deliver a usable configuration of the BMDS. ESGs are also useful in helping the operator plan and train for operation of that capability, and they provide a means to track and test future improvements to the system.

The primary elements of the Midcourse PE are the Ground Based Missile Defense element and the Aegis Ballistic Missile Defense element. Over the course of time covered by this budget submission, the GMD and Aegis BMD programs will field significant capability against the rogue nation threat. MDA will continue to add to, and improve, this capability. As we move forward, these two programs will combine with other efforts to address key concerns about the future, namely threat complexity and size. Efforts new to this PE that will continue to add to, and improve the BMDS capability are the Multiple Kill Vehicle program, Project 0515, (previously funded in the Advanced Technology PE) and an improved Standard Missile-3 (SM-3) variant program co-developed with Japan, funded within Project 0402.

Block 2004 includes eight BMDS Engagement Sequence Groups involving the Midcourse Defense Segment: Ground Based Interceptor (GBI) Engage on Aegis, GBI Launch on Aegis, GBI Engage on Cobra Dane, GBI Engage on UEWRs (Beale and Fylingdales), GBI Engage on Sea-Based X-Band radar, GBI Launch on Forward-Based X-Band - Transportable radar (FBX-T), and SM-3 Engage on Remote Aegis. Block 2006 incorporates the following additional BMDS ESGs: GBI Engage on UEWR (Thule), GBI Launch on DSP/SBIRS, GBI Engage on FBX-T and SM-3 Launch on FBX-T. Block 2008 incorporates two additional BMDS ESGs (Launch/Engage on EO/IR, and Launch/Engage on THAAD). Robustness and capability of the BMDS will be enhanced as the number of operationally available ESGs increases. In addition, continuing development activities in interceptor surveillance testing, EKV and Sea-Based X-band (SBX) radar upgrades, and improved interceptor/booster performance enable improvements to all ESGs and increase warfighter confidence.

The BMDS Test Bed will incorporate capabilities to evaluate (1) countermeasures, (2) multiple target and interceptor launch sites, (3) flexible engagement scenarios, (4) enhanced test infrastructure, and (5) a wide range of sea and land-based radar sensors. The flow down of Ballistic Missile Defense System (BMDS) capability specifications resulting from Missile Defense National Team efforts in Command and Control, Battle Management, and Communications (C2BMC) and Systems Engineering & Integration will guide the integration of Targets and Countermeasures, Test and Evaluation, and Program Operations Support into the BMD System, the BMDS C2BMC architecture, and the BMD Test Bed.

Consistent with the MDA block management framework, the Ground-based Midcourse Element of the BMDS consists of Blocks 2004, 2006, 2008, and 2010:

- Block 2004 represents the early development and fielding of the IDC including ground-based interceptors, an upgraded Cobra Dane radar, upgraded Early Warning Radars, a Sea-Based X-Band (SBX) radar, In-Flight Interceptor Communications System (IFICS) data terminals (IDT), Fire Control and Communication Nodes, and communications networks including fiber and satellite communications systems.
- Block 2006 includes continued development and fielding of ground-based capabilities, integrated testing of the multi-layered BMDS components and addressing the concept of a rotating pool of interceptors to ensure latest capabilities are fielded. The fielding of additional ground-based interceptors, UEWRs, and IDTs in Block 2006 broadens the area of coverage of the initial BMDS. Additionally, efforts include the development of enhanced capabilities to detect, track, intercept, and defeat ballistic missile threats.
- Block 2008 (covered under Project 0908) includes continued development and fielding of ground-based capabilities, integrated testing of the multi-layered BMDS components and continued development of enhanced ground-based interceptor capabilities, countermeasures mitigation, multi-sensor fusion, and additional GFC capabilities.
- The Block 2010 (covered under Project 0008) further supports the continuing development, testing, and fielding of new and evolving BMDS technologies.

The Aegis Ballistic Missile Defense (Aegis BMD) element of the BMDS builds upon the existing Aegis Weapons System (AWS) and the Standard Missile (SM) infrastructure deployed in Aegis cruisers and destroyers. U.S. Navy Surface Combatants will have the capability to detect, track, intercept, and destroy Short Range Ballistic Missiles (SRBMs) to Intermediate Range Ballistic Missiles (IRBMs) in the terminal and midcourse phases of the battlespace while forward deployed or on Fleet Missile Defense Patrol in defense of the nation, deployed U.S. forces, friends, and allies. The

extent of Aegis BMD capability against short range missiles in the terminal phase is being explored. System development and testing is integrated with the BMDS Test Bed and architecture fully supporting the Missile Defense Agency's (MDA) capability based acquisition approach for BMD. Each technological advance in Aegis BMD will be evaluated by the Government and industry team for upgrades to the BMDS Test Bed/architecture in accordance with annual MDA decision reviews.

Aegis BMD Element objectives include the following: 1) Provide BMD from configured Aegis cruisers and destroyers against short through intermediate range ballistic missiles using capability based spiral development. 2) Demonstrate through live fire testing (using SM-3 guided missiles controlled by the Aegis BMD modified AWS) each hit-to-kill capability improvement against more challenging ballistic missile targets. 3) Integrate the forward sensor capabilities of the Aegis AN/SPY-1 Radar into the BMDS. 4) Demonstrate forward sensor capabilities in Ground-based Midcourse Defense (GMD) Integrated Flight Tests (IFTs). 5) Modify existing Aegis cruisers and destroyers and provide SM-3 missiles. 6) Develop and demonstrate enhanced discrimination capabilities. 7) Conduct a Short Range Ballistic Missile (SRBM) low exoatmospheric experiment to test the ability to expand the Aegis BMD element engagement volume to lower engagement altitudes. 8) Continue the U.S./Japan Cooperative Research. 9) Expand the Aegis based defense of ballistic missiles by integrating and testing the BMDS interceptor being developed by the Missile Defense Agency (MDA). 10) Initiate US/Japan Cooperative Development of the 21`` SM-3 Full Caliber Round. These objectives are funded across Blocks 2004, 2006, 2008, and 2010:

- Block 2004 effort provides a surveillance component to BMDS initial defensive operations and provides the capability to engage ballistic missiles from both Aegis cruisers and Aegis destroyers.
- Block 2006 focuses on development of improved prototype radar discrimination and increased Aegis Weapon System - BMDS integration.
- Block 2008 - focuses on development of a fully integrated Aegis Weapon System.
- Block 2010 - integrates with the Navy developed Aegis Open Architecture System.

The Japan Cooperative Program has two components: Japan Cooperative Research - continues cooperative research in Ballistic Missile Defense with the Japan Defense Agency (JDA); Japan Cooperative Development - continues cooperative research with Japan to develop the 21`` SM-3 Full Caliber Round (FCR).

The Multiple Kill Vehicles (MKV) program is the Missile Defense Agency's transformational weapon system development program to deal with midcourse discrimination, specifically: target selection amid uncertainty and countermeasures. The MKV payload is anticipated to be ready for initial fielding in the 2012-2014 time frame and will go through a rigorous development and test program. The MKV system consists of a Carrier Vehicle loaded with a complement of small intercepting kill vehicles, each about the size of a loaf of bread. The exact number of kill vehicles carried is restricted information, but can be substantially greater than 10 when MKV is launched by a Ground-Based Midcourse Interceptor. Work to adapt the MKV payload to smaller, more mobile boosters such as kinetic energy interceptors has also begun. MKV has the ability to destroy large numbers of targets using a single engaging interceptor missile. This reduces the burden on sensors and algorithms, which no longer need to be programmed to select one, best target. This dramatically alters the statistical probability of kill in favor of the defender and provides for early, decisive engagement of an adversary complex.

Program-Wide Support provides funding for common support functions across the entire program such as strategic planning, program integration, cost estimating, contracting, financial management to include preparation of financial statements, reimbursement of financial services provided by DFAS, internal review and audit, earned-value management, and program assessment. Includes costs for both government civilians performing these functions as well as support contractors providing government staff augmentation in these areas. Applies to costs at the MDA HQ as well as its Executing Agents in the Services: Army Space and Missile Defense Command, Army PEO Space and Missile Defense, Office of Naval Research, and various Air Force laboratory and acquisition activities. Other costs include physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses at the various MDA Executing Agent locations, which at the MDA HQ are generally funded from the Management Headquarters Program Element (0901598C). Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

B. Program Change Summary	FY 2004	FY 2005	FY 2006	FY 2007
Previous President's Budget (FY 2005 PB)	3,724,066	4,384,775	3,067,800	3,087,147
Current President's Budget (FY 2006 PB)	3,711,708	4,501,459	3,266,196	3,945,991
Total Adjustments	-12,358	116,684	198,396	858,844
Congressional Specific Program Adjustments	0	245,700	0	0
Congressional Undistributed Adjustments	0	-129,016	0	0
Reprogrammings	17,048	0	0	0
SBIR/STTR Transfer	-29,406	0	0	0
Adjustments to Budget Years	0	0	198,396	858,844

Increased funding in FY06 and FY07 due to new investments in the Multiple Kill Vehicles (MKV) Program (Project 0515) as an outgrowth of earlier technology efforts funded from Program Element 0603175C (Project 0502); 21" SM-3 Japanese Cooperative Development effort (Project 0402); and additional investments in GMD Projects 0808, 0908, and 0008 to provide additional interceptors and an upgraded Early Warning Radars (EWR) at Otis AFB, MA.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0708 Ground-Based Midcourse Defense (GMD) Block 2004 Test Bed/Initial Defensive Capability (IDC)	1,357,320	850,505	0	0	0	0	0	0
RDT&E Articles Qty	45	45	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

The mission of the Missile Defense Agency (MDA) is to develop an integrated layered Ballistic Missile Defense System (BMDS) to defend the United States, its deployed forces, friends and allies from ballistic missiles of all ranges and in all phases of flight. In late 2004 the United States fielded a limited capability to defeat a ballistic missile threat. Continuing through the Future Years Defense Plan (FYDP), the breadth and depth of this initial capability will be expanded by adding and networking forward-deployed sensors, interceptors at sea and on land, and layers of increasingly capable weapons and sensors. Today's MDA activities are focused on six objectives: 1) complete development, fielding, and transition to alert of Block 2004; 2) provide warfighter support and sustainment for BMDS; 3) develop a totally integrated BMDS for Block 2006 and beyond; 4) improve the BMD system through incremental improvements and Block upgrades over time; 5) conduct an increasingly robust integrated test program concurrent with operations; and 6) build an international foundation for missile defense.

The Ground-Based Midcourse (GMD) segment of the BMDS is a key component of the Initial Defensive Capability (IDC) and all future BMDS Blocks being fielded by MDA. It consists of ground-based interceptors, sensors, and fire control systems fielded in multiple locations. The GMD employs hit-to kill technologies to intercept ballistic missiles in the midcourse phase of flight to defend the homeland, deployed forces, friends, and allies. The elements being developed and fielded of the Midcourse segment will comprise most of the critical components in meeting the MDA goals in the near-term.

GMD system capability is measured by Engagement Sequence Groups (ESG) which define the sequence of events used to enable the weapon to engage a target. The ESGs provide the structure for measuring the level of performance and integration maturity of the GMD system within the BMDS. Engagement sequence identifies the sensors that support four functions (acquire/cue, commit, update, and discriminate) required to launch the GMD GBI against a target. Consistent with the BMDS block development strategy, additional ESGs are incorporated into blocks as sensor systems become available. Block 2004 includes seven BMDS Initial Defensive Capability (IDC) ESGs (Engage on AEGIS, Launch on AEGIS, Engage on Cobra Dane, Engage on UEWRs (Beale and Fylingdales), Engage on Sea-Based X-Band radar, and Launch on Forward-Based X-Band radar (FBX)). Block 2006 incorporates at least three additional BMDS IDC ESGs (Engage on UEWR (Thule), Launch on DSP/SBIRS, and Engage on Forward-Based X-Band radar (FBX)). Block 2008 incorporates two additional BMDS IDC ESGs (Launch/Engage on EO/IR, and Launch/Engage on THAAD). Block 2010 will add increased capability for existing GMD BMDS ESGs through incorporation of advanced sensor discrimination, improved hit-to-kill and more flexible fire control strategies within GMD fire control and C2BMC. ESGs are embedded into GMD Integrated Test Program. Possible measures of effectiveness include: defended area, launch area denied, probability of engagement success, battlespace, track times, quality of engagement sequence, and depth of fire. Robustness and capability of the BMDS will be enhanced as the number of operationally available ESGs increases. In addition, continuing development activities including GBI surveillance testing, EKV and GMD fire control upgrades, and improved GBIs enable improvements to all ESGs and increase warfighter confidence.

The GMD Block 2004 effort provides for the fielding of the IDC directed by the President in December 2002. The IDC initiative provides missile fields and infrastructure, ground based interceptors, In-Flight Interceptor Communication System (IFICS) Data Terminals (IDT), communication networks, and sensors. The GMD system employs hit-to kill technologies to intercept ballistic missiles in the midcourse phase of flight to defend the homeland, deployed forces, friends, and allies. Block 2004 will deliver and field the initial infrastructure, field the initial increment of interceptors, and provide for initial sustainment infrastructure for the IDC.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

The Block 2004 is being completed in two phases. The first phase, the initial BMDS Test Bed with a limited defensive capability, was completed on September 30, 2004. The second phase provides an enhanced capability and additional assets that can also be utilized for the BMDS Test Bed. It is to be completed in December 2005. The IDC consists of:

- Missile Fields and Infrastructure. The IDC consists of two (2) missiles fields at Fort Greely, AK and operational silos at Vandenberg AFB, CA. The BMDS Test Bed provides for the construction of the first missile field with operating infrastructure at Fort Greely, which is to be completed in 2004. Six (6) common silos, launch site components, and command launch equipment will be fielded in the first missile field. The IDC initiative provides for the construction of the second missile field at Fort Greely, which is to be completed in 2005. Ten (10) common silos, launch site components, and command launch equipment will be fielded in the second missile field. Additionally, IDC provides for the modification of four (4) common silos, launch site components, and command launch equipment at Vandenberg AFB in 2004.
- Ground Based Interceptors (GBI). The IDC consists of up to 20 GBI. A GBI consists of a booster and exoatmospheric kill vehicle (EKV). The BMDS Test Bed provides up to ten (10) boosters and five (5) EKVs to field an initial five (5) GBIs at Fort Greely in 2004. The IDC initiative provides an additional ten (10) boosters and fifteen (15) EKVs to field up to four (4) GBIs at Vandenberg AFB, CA, in 2004, and up to eleven (11) additional GBIs at Fort Greely in 2005.
- IDTs. The IDC consists of five (5) IDTs at multiple sites. The BMDS Test Bed provides an IDT at Fort Greely, Shemya (AK), and VAFB in 2004 and an onboard IDT on the Sea-Based X-Band Radar to be fielded in 2005. The IDC initiative provides for an IDT at a NE Tier location in 2008. An additional IDT is located at the Reagan Test Site (RTS) as part of the BMDS Test Bed and will continue to support the BMDS flight test program.
- GMD Communications Network (GCN). The GCN consists of fiber optic land lines interconnected to satellite communications, both DSCS and MILSTAR. The CONUS Net connects Fort Greely and VAFB to the Joint National Integration Center (JNIC) at Shriever AFB as well as Hardware-in-the-Loop facilities in Huntsville. The BMDS Test Bed provides two (2) GMD Fire Control and Communications (GFC/C) Nodes located at Fort Greely and Shriever AFB. The IDC initiative provides a Communications Node Equipment (CNE) extension at a NE CONUS location. The Shriever AFB and GCN are also connected to the Cheyenne Mountain Operations Center (CMOC) through remote workstations. The BMDS Test Bed provides satellite communications systems consisting of DSCS terminals at Fort Greely and Shemya and a MILSTAR terminal at Fort Greely. An additional DSCS terminal is located at the Reagan Test Site (RTS) as part of the BMDS Test Bed and will continue to support the BMDS flight test program.
- All components are integrated into the BMDS C2BMC Element in order to provide the deliberate planning tools and crisis action tools to evolve courses of action based upon a common view of the threat, available global resources, and warning order objectives.
- Sensors. The IDC consists of radars at multiple sites. The BMDS Test Bed provides for an upgraded Cobra Dane radar on Shemya, an Upgraded Early Warning Radar at Beale AFB in 2004 and a Sea-Based X-Band radar in 2005, and communications interface to the Aegis SPY-1 radars. The IDC initiative provides for an Upgraded Early Warning Radar at Fylingdales, United Kingdom in 2005. An additional prototype X-band radar, Ground-Based Radar Prototype (GBR-P), is located at the Reagan Test Site (RTS) as part of the BMDS Test Bed and will continue to support the flight test program.

Block 2004 provides a robust, flexible Test Bed to support the continuing development and testing of new and evolving BMDS technologies. This concurrent operations and testing capability supports a wide range of flight and ground test scenarios, multiple basing modes, and phenomenology. This multi-part Test Bed leverages initial GMD developmental hardware and software assets to validate the IDC operational concept and to provide increased realism for BMDS testing. The BMDS Test Bed will incorporate capabilities to evaluate: countermeasures; a wide range of sea and land-based radar sensors; more realistic test and evaluation through geographically dispersed assets and an operationally representative environment to check out component hardware and software integration, multiple target and interceptor test launch sites, flexible engagement scenarios, full spectrum of testing to demonstrate system performance including distributed, integrated ground testing; enhanced test infrastructure; and validation of construction, transportation, site activation, and logistics concepts supporting future fielding options.

The flow down of Ballistic Missile Defense System (BMDS) capability specifications resulting from Systems Engineering efforts in Command and Control, Battle Management, and Communications (C2BMC) and Systems Engineering & Integration will guide the integration of Targets and Countermeasures, Test and Evaluation, and Program-Wide Support into the BMD System, the BMDS C2BMC architecture, and the BMD Test Bed.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Ground-Based Interceptor (GBI)	233,706	10,273	0	0
RDT&E Articles (Quantity)	27	0	0	0

The Ground-Based Interceptor consists of an Exoatmospheric Kill Vehicle (EKV) and a Boost Vehicle.

FY 2004 Accomplishments:

RDT&E Test Articles: Acquisition of five (5) EKVs, ten (10) dual booster strategy boost vehicles, (6) six common silos and (6) six sets of associated command launch support equipment was initiated in FY 2002 for delivery in FY 2004.

- Completed acquisition of five (5) interceptors for Fort Greely.
- Completed acquisition of six (6) common silos, launch site components for Fort Greely.
- Completed acquisition of command launch equipment and other support equipment for Fort Greely.
- Completed assembly, integration, and installation in silos of 5 Ground-Based Interceptors at Fort Greely.
- Initiated silo/interceptor/launch systems ground testing, system level simulation, and verification, validation, and accreditation activities.
- Continued to incorporate the products of the Dual Booster Strategy.

FY 2005 Planned Accomplishments:

- Continues silo/interceptor/launch systems ground testing, system level simulation, and verification, validation, and accreditation activities.
- Continues to incorporate the products of the Dual Booster Strategy.

	FY 2004	FY 2005	FY 2006	FY 2007
Cobra Dane Upgrade	34,812	0	0	0
RDT&E Articles (Quantity)	0	1	0	0

Cobra Dane is an existing radar at Shemya, AK used to detect and track ballistic missile launches. This project upgrades both hardware and software to improve overall performance, execute BMDS tasking and connect to the BMDS.

FY 2004 Accomplishments:

- Completed follow-on software upgrade build.
- Completed installation and initial checkout.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

FY 2005 Planned Accomplishments:

RDT&E Test Articles: Acquisition of hardware and software upgrades to the Cobra Dane Radar was initiated in FY 2002 for delivery in FY 2005.

- Completes final checkout (Initial COBRA DANE upgrade complete).

	FY 2004	FY 2005	FY 2006	FY 2007
GMD Fire Control & Communications	45,763	7,239	0	0
RDT&E Articles (Quantity)	8	1	0	0

The GMD Fire Control and Communications (GFC/C) component enables integrated control and operation of the GMD Element within the BMDS. The communications component consists of (1) GMD Communications Network (GCN) and (2) the In-Flight Interceptor Communications System (IFICS). The GCN includes fiber optic land lines connected to satellite communications, both DSCS and Milstar. The DSCS terminals will be acquired and installed at Fort Greely and Shemya. Based on congressional directions, completion of the installation of the two DSCS terminals at Shemya has been accelerated into FY04 as a risk reduction effort for the IDC. The GCN also consists of an existing DSCS terminal at RTS supporting flight test requirements. A Milstar terminal will be installed at Fort Greely.

FY 2004 Accomplishments:

RDT&E Test Articles: Acquisition of IFICS Data Terminals (IDT), one (1) for Shemya and one (1) for Greely, was initiated in FY 2002 for delivery in FY 2004. Acquisition of a third IFICS Data Terminal (IDT) was initiated for Vandenberg AFB in FY 2003 for delivery in FY 2004. An additional IDT is acquired for the SBX and is included in that accomplishment narrative. Acquisition of GMD Fire Control and Communications Nodes for Fort Greely and Shriever AFB with remote operator workstations at Cheyenne Mountain Operations Center (CMOC) was initiated in FY 2002 for delivery in FY 2004. Acquisition of an External System Interface (initially for the Aegis SPY-1 radar) was initiated in FY 2003 for delivery in FY 2004. Acquisition of two DSCS terminals for Shemya and one (1) for Fort Greely, was initiated in FY 2003 for delivery in FY 2004.

- Completed installation and checkout at Fort Greely.
- Completed acquisition of IDTs for Shemya and Fort Greely. - Completed initial IDT installation and checkout, Shemya and Fort Greely.
- Completed acquisition of relocatable IDT at VAFB.
- Completed External System Interface (ESI) acquisition, installation, and checkout for AEGIS.
- Completed acquisition of GCN communication equipment and network for CONUS Ring.
- Completed acquisition of GMD Fire Control and Communications Remote Work Stations.
- Completed acquisition of GMD Fire Control and Communications Node equipment.
- Acquired and completed the installation of the two DSCS terminals at Shemya (per congressional direction) and one terminal at Fort Greely.
- Continued installation of a Milstar terminal at Fort Greely.

FY 2005 Planned Accomplishments:

RDT&E Test Articles: Acquisition of a Milstar terminal for Fort Greely, was initiated in FY 2003 for delivery in FY 2005.

- Completes installation of a Milstar terminal at Fort Greely.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

	FY 2004	FY 2005	FY 2006	FY 2007
Element Engineering and Integration	29,786	10,624	0	0
RDT&E Articles (Quantity)	0	0	0	0

GMD Element Engineering provides engineering and analysis support for building and integration of the components of the 2004 Test Bed. Defines element-level capabilities, test requirements and objectives, and develops element-level assessments. Provides engineering, integration, and operations planning supporting the Initial Defensive Capability. Continues the integration of component/element systems and sustains the planning effort for future fielding options. Continues to support and complement the BMDS Systems Engineering capability by providing detailed insight and analysis into component technical and design-specific issues.

FY 2004 Accomplishments:

- Conducted sub-system checkout (SSCO) assessments for Shemya (Cobra Dane), Boulder, Buckley, Vandenberg Air Force Base (VAFB), ESI (Aegis Weapon System Radar), Beale UEWR, Fort Greely Interceptor site, and Test IDT capability.
- Conducted Test Bed systems integration and checkouts (SICO).
- Completed acquisition and installation of Embedded Test Node hardware.

FY 2005 Planned Accomplishments:

- Completes system integration test and checkout.

	FY 2004	FY 2005	FY 2006	FY 2007
Element Test & Evaluation (T&E)	14,636	3,078	0	0
RDT&E Articles (Quantity)	0	0	0	0

GMD Test and Evaluation provides critical risk reduction and measurement of system performance for all GMD element components. It utilizes a comprehensive infrastructure of ground-test facilities, ranges, sensors and instrumentation resources. This infrastructure allows the element engineers to successfully model and simulate test results into projections of future system performance. The GMD Combined Test Force, under a single unified organization, integrates developmental and operational test planning, shares test resources, collects and assesses test data, collectively resolves test issues, and minimizes the duplication of test resources and the time required to execute required testing.

FY 2004 Accomplishments:

- Supported SSCO assessments for Shemya (Cobra Dane), Boulder, Buckley, Vandenberg Air Force Base (VAFB), ESI (Aegis Weapon System Radar), Beale UEWR, Fort Greely interceptor site, and Test Bed IDT capability.
- Conducted Test Bed Integrated Ground Test.
- Supported systems check-outs (SCO) and test readiness reviews.
- Completed acquisition of Mission Control Centers (flight and ground).

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

FY 2005 Planned Accomplishments:

- Completes Systems Test Readiness Review documentation.

	FY 2004	FY 2005	FY 2006	FY 2007
RDT&E Test Bed Construction	38,135	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

This GMD RDT&E Construction request is further justified in the accompanying DD-1391 Exhibits, RDT&E Construction Data. Missile Defense System Test Bed Facilities, Phase III (Project Number MDA-504) and Missile Defense System Test Bed - Extended Test Range Facilities Phase III (Project Number DMA-506). Project Number MDA 506 was initially authorized in FY 2002 as the Missile Defense System Test Bed - Kodiak Facilities. The BMDS test range program has evolved to include other locations and this project title has been changed to Missile Defense System Test Bed - Extended Test Range Facilities to reflect this development. The 1391s have been updated to reflect the latest construction costs. RDT&E funding initially allocated to planning and design efforts have been redistributed to the construction efforts.

FY 2004 Accomplishments:

- Completed equipment installation for missile field, IDT, and DSCS at Fort Greely.
- Completed construction on site access and interior site roads and drainage system.
- Completed construction on facilities (IDT, COBRA DANE, DSCS, and Test Support Facilities) at Eareckson Air Station (Shemya).

	FY 2004	FY 2005	FY 2006	FY 2007
Community Impacts	6,585	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- Completed community impact mitigation efforts including education programs, and social service grants.

	FY 2004	FY 2005	FY 2006	FY 2007
Sea-Based X-Band Radar (SBX)	370,014	168,465	0	0
RDT&E Articles (Quantity)	0	2	0	0

The SBX development was initiated in FY 2002. This acquisition is necessary to ensure that a XBR is ready to be integrated into the Ballistic Missile Defense System Test Bed in the fourth quarter of FY 2005. The SBX provides high-resolution tracking and discrimination data to the GMD fire control, thereby significantly enhancing BMDS performance. The Sea-Based X-Band Radar (SBX) is a Midcourse Defense sensor that will support the IDC and Integrated Flight Tests and will provide the capability of exercising all GMD sensor functions (sensor task plan, acquisition, track, discrimination, in-flight target update, target object map and kill assessment). The SBX will include an IFICS Data Terminal and GCN. The SBX will be a relocatable, phased-array (65% populated)

radar. The ability of the SBX to be relocated enables full use of extended test range capabilities for all land and air target launches, provides more realistic siting, and facilitates operationally realistic testing. The SBX Payloads (XBR, IDT, GCN) will be mounted on a modified, sea-going, semi-submersible platform similar to the oil drilling platforms currently in use worldwide.

FY 2004 Accomplishments:

- Completed fabrication of main radar structure.
- Completed installation of radar structure.
- Completed acquisition and initiated installation of radar electronic components.
- Completed fabrication of operations and support structures and facilities for platform.
- Continued acquisition of operations and support equipment for platform.
- Initiated installation of radar electronic components.

FY 2005 Planned Accomplishments:

RDT&E Test Articles: Acquisition of one (1) Sea-Based X-Band Radar (SBX) was initiated in FY 2002 for delivery in FY 2005. Acquisition of one (1) IFICS Data Terminal (IDT), fixed to the SBX platform, was initiated in FY 2002 for delivery in FY 2005.

- Completes installation of radar electronic components.
- Completes installation of IDT and GCN components.
- Completes acquisition and installation of operations and support equipment for platform.
- Completes integration and checkout of Sea-based X-band Radar.

	FY 2004	FY 2005	FY 2006	FY 2007
Site Activation	30,509	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

This effort provides a broad range of site design and layout, facility requirements, and environmental management activities. Per congressional direction, additional funding has been provided for physical security upgrades, network defense, information assurance, and organizational security at Fort Greely.

FY 2004 Accomplishments:

- Completed development and verification of site layout and facility requirements definition for the IDC (including Test Bed) infrastructure.
- Continued Environmental, Safety and Health (ESH) documentation and compliance, NEPA Analyses.
- Completed facility acceptance and equipment installation coordination.
- Initiated and completed security upgrades at Fort Greely.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

	FY 2004	FY 2005	FY 2006	FY 2007
Beale Early Warning Radar Upgrade	30,988	19,597	0	0
RDT&E Articles (Quantity)	1	0	0	0

The Beale Early Warning Radar (EWR) is an existing large, fixed, phased-array surveillance radar used to detect, track, and count individual targets early in their trajectory. The planned Beale upgrades provide the capability of not only detecting, but also providing precise tracking early enough to significantly expand the battlespace for the ground-based interceptors. The Beale upgrades include both hardware and software enhancements to improve overall performance, execute BMDS functionally and, connect to the BMDS.

FY 2004 Accomplishments:

RDT&E Test Articles: Acquisition of various upgrades to the Beale EWR was initiated in FY 2002 for delivery in FY 2004.

- Continued Flight and Ground Test support.
- Continued development and fielding of UEWR Software Builds.
- Completed Beale Integration and Test.
- Completed Beale Sub-system Checkout.
- Completed delivery of Beale Upgrade initial capability.
- Initiated ITWAA integration and certification.

FY 2005 Planned Accomplishments:

- Continues Flight and Ground Test support.
- Continues development and fielding of UEWR Software Builds.
- Completes ITWAA integration and certification

	FY 2004	FY 2005	FY 2006	FY 2007
Initial Defensive Capability (Ground-Based Interceptors (GBI))	340,663	454,416	0	0
RDT&E Articles (Quantity)	9	40	0	0

The Ground-Based Interceptor consists of an Exoatmospheric Kill Vehicle (EKV) and a Booster Vehicle. These Interceptors represent an enhancement to the basic Block 2004 of five (5) Ground Based Interceptor (GBI) Test Bed capability by adding: Eleven (11) GBIs at Fort Greely and up to four (4) GBIs at Vandenberg AFB (VAFB). This effort will provide the United States with a fielded Initial Defensive Capability (IDC) against ballistic missile threats. Note: Two (2) operational GBI's will be used for testing purposes.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

FY 2004 Accomplishments:

RDT&E Articles: Acquisition of 5 EKVs is initiated in FY 2004 for delivery in FY 2004. Refurbishment of 2 silos with 2 sets of command launch equipment at VAFB was initiated in FY 2002 for delivery in FY 2004.

- Acquired and installed five EKVs (4 EKVs for VAFB and 1 for Fort Greely; boosters previously acquired).
- Initiated acquisition of up to ten (10) EKVs for Fort Greely.
- Initiated acquisition of up to ten (10) Boosters for Fort Greely.
- Initiated acquisition of additional common silos for Fort Greely.
- Completed refurbishment of two (2) silos at VAFB.

FY 2005 Planned Accomplishments:

RDT&E Articles: Acquisition of up to 10 EKVs and up to 10 Boosters is initiated in FY 2004 for delivery in FY 2005. Acquisition of 10 silos and 10 sets of command launch equipment was initiated in FY 2004 for delivery in FY 2005. Completes acquisition and installation of up to 10 Boosters for Fort Greely.

- Completes acquisition and installation of up to 10 EKVs for Fort Greely.
- Completes acquisition and installation of common silos for Fort Greely.
-

	FY 2004	FY 2005	FY 2006	FY 2007
Initial Defensive Capability (UEWR & IDT)	65,286	42,216	0	0
RDT&E Articles (Quantity)	0	1	0	0

The Fylingdales UEWR provides GMD fire control access and increased early warning capability for potential threat objects launched from north and east of CONUS. Processor upgrades, along with the associated GMD Communications Network (GCN) connectivity, are planned for full implementation of the Fylingdales UEWR by FY 2005. The IDT provides the capability for midcourse communications with eastbound interceptors from existing Test Bed assets. The IDT shall be located in accordance with a siting analysis to provide favorable communications with launched interceptors. The NE Tier IDT is deferred from FY05 to FY08 to fund critical IDC GBI requirements.

FY 2004 Accomplishments:

- Initiated acquisition of UEWR hardware.
- Initiated installation of UEWR hardware.
- Began installation of UEWR software.
- Initiated IT/WAA integration and certification for the UEWR.

FY 2005 Planned Accomplishments:

- Completes acquisition of UEWR hardware.
- Completes installation of UEWR hardware.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

- Completes installation of UEWR software.
- Completes Integrated Tactical Warning and Attack Assessment and certification for the UEWR.
- Initiates acquisition of IDT.

	FY 2004	FY 2005	FY 2006	FY 2007
Initial Defensive Capability (RDT&E Construction)	116,437	134,597	0	0
RDT&E Articles (Quantity)	0	0	0	0

This GMD RDT&E Construction request is further justified in the accompanying DD-1391 Exhibits, RDT&E Construction Data. The 1391s have been updated to reflect the latest construction costs for the Initial Defensive Capability.

FY 2004 Accomplishments:

- Initiated construction of 10 common silos and supporting facilities at Fort Greely.
- Initiated and completed site facility designs for IDT [NE Tier, CONUS] and UEWR [Fylingdales, UK].
- Initiated facilities construction for UEWR [Fylingdales, UK].

FY 2005 Planned Accomplishments:

- Completes construction of 10 common silos and supporting facilities at Fort Greely.
- Completes facilities construction for UEWR [Fylingdales, UK].
- Initiates facilities construction for IDT [NE Tier, CONUS]

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

D. 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 and spiral upgrades. The Department has structured 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 strategy is to build the initial GMD parts of the BMDS NLT DEC 2004, while continuing RDT&E work and spiral upgrades such that some number of components of GMD will remain part of the BMDS Test Bed even after being fielded as part of the initial capability. 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 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) 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 (2) increasing the fidelity of the project simulations.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Ground-Based Interceptor (GBI)										
Ground-Based Interceptor (GBI)	SS/CPAF	Boeing/ AL/AK/AZ/CA/ CO/TX/VA	219,202	10,273	1/2Q	0	N/A	0	N/A	229,475
Cobra Dane Upgrade										
Cobra Dane Upgrade	SS/CPAF	Boeing/ AL/AK/CA	34,812	0	N/A	0	N/A	0	N/A	34,812
GMD Fire Control & Communications										
GMD Battle Management (Fire Control) & Comms	SS/CPAF	Boeing/ AL/AK/AZ/CA/ CO/TX/VA	45,763	7,239	1/2Q	0	N/A	0	N/A	53,002
Element Engineering and Integration										
Element Engr & Integration	SS/CPAF	Boeing/ AL/AK/AZ/CA/ CO/TX/VA	29,786	10,624	1/2Q	0	N/A	0	N/A	40,410
Element Test & Evaluation (T&E)										
Element T&E	SS/CPAF	Boeing/ AL/AK/AZ/CA/ CO/TX/VA	14,636	3,078	1/2Q	0	N/A	0	N/A	17,714
Sea-Based X-Band Radar (SBX)										
Sea-Based X-Band Radar (SBX)	SS/CPAF	Boeing/ AL/AK/TX	370,014	168,465	1/2Q	0	N/A	0	N/A	538,479
Beale Early Warning Radar Upgrade										
Beale UEWR	SS/CPAF	Boeing/ AL/CA	30,988	19,597	1/2Q	0	N/A	0	N/A	50,585

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
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Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Initial Defensive Capability (Ground-Based Interceptors (GBI))										
IDC (GBI)	SS/CPAF	Boeing/ AL/AK/AZ/CA/ CO/TX/VA	340,663	454,416	1/2Q	0	N/A	0	N/A	795,079
Initial Defensive Capability (UEWR & IDT)										
IDC (UEWR & IDT)	SS/CPAF	Boeing/ AL/AK/CA	65,286	42,216	1/2Q	0	N/A	0	N/A	107,502
Subtotal Product Development			1,151,150	715,908		0		0		1,867,058

Remarks

The Prime Contractor has the responsibility to balance resources across the GMD program and allocate funding according to program progress. This may require the Prime Contractor to reallocate funding, which would change the estimates provided in this R-3 document.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
RDT&E Test Bed Construction										
Construction	MIPR	COE/ AK	38,135	0	N/A	0	N/A	0	N/A	38,135
Community Impacts										
Community Impacts	C/CPAF	Various/ AK	6,585	0	N/A	0	N/A	0	N/A	6,585
Site Activation										
Site Activation	SS/CPFF	Boeing/ AL/AK/AZ/CA/ CO/TX/VA	30,509	0	N/A	0	N/A	0	N/A	30,509
Initial Defensive Capability (RDT&E Construction)										
Construction	MIPR	COE/AK/CA	116,437	134,597	1/2Q	0	N/A	0	N/A	251,034
Subtotal Support Costs			191,666	134,597		0		0		326,263

Remarks

The Prime Contractor has the responsibility to balance resources across the GMD program and allocate funding according to program progress. This may require the Prime Contractor to reallocate funding, which would change the estimates provided in this R-3 document.

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation										

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
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IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										
Remarks										
Project Total Cost			1,342,816	850,505		0		0		2,193,321

Remarks

The Prime Contractor has the responsibility to balance resources across the GMD program and allocate funding according to program progress. This may require the Prime Contractor to reallocate funding, which would change the estimates provided in this R-3 document.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
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COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0808 Ground-Based Midcourse Defense (GMD) Block 2004/2006 Development	1,587,103	2,468,118	2,224,349	2,232,055	330,912	233,703	0	0
RDT&E Articles Qty	16	10	46	21	24	0	0	0

A. Mission Description and Budget Item Justification

The Ground-Based Midcourse (GMD) segment of the BMDS is a key component of the Initial Defensive Capability (IDC) and all future BMDS Blocks being fielded by MDA. It consists of ground-based interceptors, sensors, and fire control systems fielded in multiple locations. The GMD employs hit-to kill technologies to intercept ballistic missiles in the midcourse phase of flight to defend the homeland, deployed forces, friends, and allies. The elements being developed and fielded for the Midcourse segment will comprise most of the critical components in meeting the MDA goals in the near-term.

Project 0808 provides the development for the GMD hardware and software components for the BMDS. This development consists of a series of block development efforts.

GMD system capability is measured by Engagement Sequence Groups (ESG) which define the sequence of events used to enable the weapon to engage a target. The ESGs provide the structure for measuring the level of performance and integration maturity of the GMD system within the BMDS. Engagement sequence identifies the sensors that support four functions (acquire/cue, commit, update, and discriminate) required to launch the GMD GBI against a target. Consistent with the BMDS block development strategy, additional ESGs are incorporated into blocks as sensor systems become available and after integrated testing and checkout is accomplished in the BMDS Test Bed. Block 2004 includes seven BMDS ESGs (Engage on AEGIS, Launch on AEGIS, Engage on Cobra Dane, Engage on UEWRs (Beale and Fylingdales), Engage on Sea-Based X-Band radar, and Launch on Forward-Based X-Band radar (FBX)). Block 2006 incorporates at least three additional BMDS ESGs (Engage on UEWR (Thule), Launch on DSP/SBIRS, and Engage on Forward-Based X-Band radar (FBX)). Block 2008 incorporates additional BMDS ESGs (Launch/Engage on EO/IR and Launch/Engage on THAAD). Block 2010 will add increased capability for GMD BMDS ESGs through incorporation of advanced sensor discrimination, improved hit-to-kill and more flexible fire control strategies within GMD fire control and C2BMC. ESGs are embedded into GMD Integrated Test Program. Possible measures of effectiveness include: defended area, launch area denied, probability of engagement success, battlespace, track times, quality of engagement sequence, and depth of fire. Robustness and capability of the BMDS will be enhanced as the number of operationally available ESGs increases. In addition, continuing development activities including GBI surveillance testing; EKV and GMD fire control upgrades; and improved GBIs enable improvements to all ESGs and increase warfighter confidence.

The capability blocks of the GMD portion of the BMDS are defined as follows:

Block 2004 consists of the early development of the initial GMD hardware and software components of the BMDS IDC and Test Bed. This includes the development of the ground-based interceptor, specifically the booster and EKV; X-Band radar technologies, including the GBR-P; fire control and communications technologies, including the In-Flight Interceptor Communications System (IFICS) Data Terminals (IDTs); test range resources; and future fielding planning. Block 2004 included the first 20 interceptors of fielded capability.

Block 2006 (contained in Project 0808) consists of the continuing development and fielding of capabilities to detect, track, intercept, and defeat ballistic missile threats. Block 2006 includes the next increment of fielded capability with additional interceptors (up to 10), UEWRs, and IDTs. Block 2006 also includes continuing development and evolution of the wide range of software supporting the IDC and assessment, test, and evaluation of alternative GBI basing options, to include a potential European missile site.

Block 2008 (Project 0908) development efforts are currently focused on sustaining engineering and spiral upgrades to the components of the GMD segment of the BMDS and integrated flight test of GBI components. This development effort will mature key technologies in logical stages to provide 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 ``Hit-to-Kill`` technologies. Block 2008 also includes the next increment of fielded capability with additional interceptors (up to 10), and an upgraded IUEWR.

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Block 2010 (Project 0008) further supports the continuing development and testing of new and evolving technologies. In addition, GMD will expand the BMDS capability by beginning the planning for a third missile site starting in FY07 to be fielded in 2010/2011. Block 2010 also includes the next increment of fielded capability with additional interceptors (up to 10), and upgraded IUEWR.

The GMD Block 2004/ 2006 development program provides an integrated development and test program of more capable interceptors (both boost and kill vehicles), targets, sensors, battle management technologies, and GMD Fire Control and Communications systems and infrastructure. Specifically, the Project 0808 provides the following:

- 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 software upgrades to the Early Warning Radars at Beale and Fylingdales, and the Cobra Dane radar at Shemya. The program continues planning for potential upgrades to other Early Warning Radar (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 to support the SBX. The Ground Based Radar Prototype (GBR-P) located at the Ronald Reagan Test Site (RTS), at Kwajalein, is being used as part of the Integrated Flight Test program, and serves as a demonstration platform for these evolving radar technologies.
- The GMD Fire Control and Communications component is an integrated communications network of nodes, to enable the GMD element to function as part of the BMDS. This includes:
  - Various communications links (e.g., CONUS ring, Alaska leased lines and Satellite Communications (SATCOM) to Shemya, Fort Greely, and In-Flight Interceptor Communications System (IFICS) Data Terminals (IDTs).
  - GMD Fire Control and Communications Nodes [Fort Greely and Joint National Integration Center (JNIC) with remote operator workstations at Cheyenne Mountain Operations Center (CMOC)]
  - In-Flight Interceptor Communications System Data Terminals (IDTs) at various locations.
  - These FC&C development initiatives continue on these technologies and components meeting future block capability requirements. This effort will be developed as part of the BMDS overarching BMC/C2 architecture.
- One of the most significant activities supported by this project is the component and systems level testing. The integrated flight and ground tests; the component level developmental testing; modeling and simulation; and the Verification, Validation, and Accreditation testing are critical to the successful fielding of all IDC components. The GMD test program is designed to demonstrate a broad range of GMD component development efforts. These incremental capabilities include multiple launches against multiple threat targets as the block capabilities mature. These components under test include boosters, EKVs, launch infrastructure, sensors, and interfaces with other BMDS elements. Additionally, the test program will incorporate Aegis Weapon System (AWS) radars to support GMD integrated flight test program. The test regimen will significantly expand to include operational interceptors both for ground and flight testing. These will subsequently be replaced with new interceptors from the ongoing production line to ensure the most technically capable GBI inventory while ensuring backward compatibility to the maximum extent possible. This rotatable pool of GBI assets provides GMD the capability to maintain youngest average age for interceptors on alert. GMD will continuously evaluate the capabilities of available interceptors through this inventory surveillance program to be initiated in FY06 to ensure that the newest, most technologically capable missiles are on Alert.

Older GBIs will be used for the Integrated Flight Test Program (up to 3 IFTs per year) to verify/validate maturing component capability improvements.

Software is another key area of development supporting the BMDS. Software development supports the Upgraded Early Warning radars, the X-Band radars, the IDTs, EKV on-board processing and interfaces, the GBI systems interfaces, system-wide communications interfaces and nodes, and fire control. This software must support not only the operational BMDS but also the systems-wide testing during ground and flight tests.

Planning continues to provide a capability to respond to additional future fielding orders 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.

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B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Ground Based Interceptor (GBI)	483,267	621,577	359,900	515,274
RDT&E Articles (Quantity)	8	4	8	6

The GBI development program funds the development of booster and EKV technologies. It also provides developmental assets for flight-testing. GMD has successfully demonstrated a hit-to-kill capability in five (5) separate flight tests.

FY 2004 Accomplishments:

RDT&E Test Articles: Acquisition of 2 GBIs (includes both EKVs and boost vehicles) was initiated in FY 2002 for delivery in FY 2004. Acquisition of two (2) refurbished silos and two (2) command launch equipment at VAFB.

- Completed refurbishment of 2 silos and acquisition of command launch equipment (CLE) at VAFB for flight test and IDC fielding.
- Continued interceptor integration, ground/system tests, and Integrated Flight Tests.
- Continued modeling and simulation development.
- Continued common silo and common CLE development.
- Continued development of EKV technologies to improve system discrimination, performance, and producibility in the areas of on-board sensors and processors, software/algorithms, vehicle maneuvering, and C3 systems.
- Initiated acquisition of 4 GBIs (EKV and booster) for delivery in FY06.
- Completed acquisition of 2 GBIs (EKV and booster) initiated in FY02 for delivery in FY04.
- Continued acquisition of 2 GBIs (EKV and booster) initiated in FY03 for delivery in FY05.

FY 2005 Planned Accomplishments:

RDT&E Test Articles: Acquisition of 2 GBI (includes both EKV and boost vehicle) was initiated in FY 2003 for delivery in FY 2005. The FY05 column reflects an increase in funding as a result of a congressional adjustment from the FY05 PB submission. This funding is being used to continue the booster recovery plan as a result of the mixer explosion at the Pratt and Whitney Chemical Plant and for other GMD enhancements.

- Initiates acquisition of 3 GBIs (includes both EKV and boost vehicle)
- Continues Silo/GBI/launch systems ground testing, system level simulation, and Verification, Validation, and Accreditation activities.
- Continues interceptor, ground/system tests, and Integrated Flight Tests.
- Continues modeling and simulation development.
- Completes common silo and common CLE development.
- Completes acquisition of 2 GBIs (EKV and boost vehicle) initiated in FY03 for delivery in FY05.
- Continues acquisition of 4 GBIs (EKV and boost vehicle) initiated in FY04 for delivery in FY06.

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FY 2006 Planned Program:

RDT&E Test Articles: Acquisition of 4 GBIs (includes both EKV and boost vehicle) was initiated in FY 2004 for delivery in FY 2006.

- Initiates acquisition of 4 GBIs (includes both EKV and boost vehicle) for delivery in FY08.
- Continues Silo/GBI/launch systems ground testing, system level simulation, and Verification, Validation, and Accreditation activities.
- Continues interceptor, ground/system tests, and Integrated Flight Tests.
- Continues modeling and simulation development.
- Continues acquisition of 3 GBIs (includes both EKV and boost vehicle) initiated in FY05.
- Completes acquisition of 4 GBIs (includes both EKV and boost vehicle) initiated in FY04.

FY 2007 Planned Program:

RDT&E Test Articles: Acquisition of 3 GBIs (includes both EKV and boost vehicle) was initiated in FY 2005 for delivery in FY 2007.

- Initiates acquisition of 5 GBIs (includes both EKV and boost vehicle) for delivery in FY 2009.
- Continues Silo/GBI/launch systems ground testing, system level simulation, and Verification, Validation, and Accreditation activities.
- Continues interceptor, ground/system tests, and Integrated Flight Tests.
- Continues modeling and simulation development.
- Completes acquisition of 3 GBIs (includes both EKV and boost vehicle) initiated in FY05.
- Continues acquisition of 4 GBIs (EKV and boost vehicle) initiated in FY06.

	FY 2004	FY 2005	FY 2006	FY 2007
X Band Radar Technology Development	70,988	79,762	80,129	72,321
RDT&E Articles (Quantity)	0	1	0	0

X-Band radar technologies provide high-resolution tracking and discrimination data to the GMD fire control and subsequently the EKV, by way of the in-flight target update and target object map, thereby significantly improving the tracking and discrimination capabilities of the system. This effort develops highly sophisticated software algorithms to enhance target acquisition and discrimination, and material and electronic component enhancements to improve power output and sensitivity. This technology forms the basis for the SBX.

FY 2004 Accomplishments:

- Continued to develop and field XBR Software Builds.
- Continued flight and ground test support.
- Continued operation and maintenance of GBR-P in support of the BMDS Flight Test Program and targets of opportunity.
- Continued the planning, assessment and evaluation of future X- Band technologies, including technology insertion (Project Hercules).

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FY 2005 Planned Accomplishments:

RDT&E Test Articles: Acquisition of XBR software build initiated in FY 2003 and delivered in FY 2005

- Continues the development XBR Software.
- Continues flight and ground test support.
- Supports a Radar Certification Flight (RCF).
- Continues operation and maintenance of GBR-P in support of the BMDS Flight Test Program and targets of opportunity.
- Continues the planning, assessment and evaluation of future X- Band technologies, including technology insertion (Project Hercules).
- Initiates Primary Support Base development for future fielding options for the Sea-Based X-Band Radar.

FY 2006 Planned Program:

- Continues the development of XBR software.
- Continues flight and ground test support.
- Supports a Radar Certification Flight (RCF).
- Continues operation and maintenance of GBR-P.
- Continues the planning, assessment and evaluation of future X- Band technologies, including technology insertion (Project Hercules).
- Completes Primary Support Base development for future fielding options for the Sea-Based X-Band Radar.

FY 2007 Planned Program:

- Completes development of XBR software.
- Continues flight and ground test support.
- Continues operation and maintenance of GBR-P.
- Continues the planning, assessment and evaluation of future X- Band technologies, including technology insertion (Project Hercules).

	FY 2004	FY 2005	FY 2006	FY 2007
Upgraded Early Warning Radar (UEWR) Development	35,776	73,354	55,338	35,071
RDT&E Articles (Quantity)	3	1	0	0

Upgraded Early Warning Radars (UEWRs) are large, fixed, phased-array surveillance radars used to detect, track, and count individual targets early in their trajectory. UEWRs are also effective in cueing the higher resolution X-Band radars to the location and trajectory of incoming targets. The planned upgrades provide precise tracking early enough to significantly expand the battlespace for the ground-based interceptors. This program will provide for the development of enhanced EWR software.

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FY 2004 Accomplishments:

RDT&E Test Articles: Acquisition of two (2) UEWR software builds initiated in FY 2003 and delivered in FY 2004. Acquisition of Cobra Dane software build initiated in FY 2003 and delivered in FY 2004

- Continued flight and ground test support.
- Continued planning for potential future UEWR sites.

FY 2005 Planned Accomplishments:

RDT&E Test Articles: Acquisition of one (1) UEWR software build initiated in FY 2004 and delivered in FY 2005

- Continues flight and ground test support.
- Continues planning for potential future UEWR sites.
- Supports a radar certification flight.

FY 2006 Planned Program:

- Continues flight and ground test support.
- Continues planning for potential future UEWR sites.
- Supports a radar certification flight.

FY 2007 Planned Program:

- Continues flight and ground test support.
- Continues planning for potential future UEWR sites.

	FY 2004	FY 2005	FY 2006	FY 2007
Element Engineering & Integration	175,969	181,407	155,126	154,747
RDT&E Articles (Quantity)	0	0	0	0

GMD Element Engineering provides engineering and analysis support for building and integrating the functional components of the GMD segment of the BMDS. Defines element-level test requirements and objectives and develops element-level assessments and capability-based requirements. Provides engineering, integration, and operations planning supporting the BMDS. Continues the integration of component/element systems and sustains the planning effort for future fielding options. Continues to complement the BMDS systems engineering capability by providing detailed insight and analysis into component technical and design-specific issues. Develops and certifies a simultaneous test and operations capability to ensure no impact to operations in a safe manner.

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FY 2004 Accomplishments:

- Completed Block 2004/2006 Integration Phase 4 (IP-4) Integrated Technical Review (ITR).
- Completed Block 2004/2006 Integration Phase4 (IP-4) Integrated Design Review (IDR).
- Continued software management and specialty engineering.
- Continued software verification and validation.
- Continued modeling and simulation development.
- Continued system analyses, integration, and verification.
- Supported integrated ground tests and specialty testing.
- Conducted pre and post-flight test analyses.

FY 2005 Planned Accomplishments:

- Completes Block 2004 Integration Phase 3 (IP-3) Integrated Assessment Review (IAR).
- Completes Block 2006 Integration Phase 5 (IP-5) Integrated Design Review (IDR).
- Continues software management and specialty engineering.
- Continues software verification and validation.
- Continues modeling and simulation development.
- Continues system analyses, integration, and verification.
- Supports integrated ground tests and specialty testing.
- Conducts pre and post-flight test analyses.
- Supports integration and testing of launch on Forward-Based Radar ESG.
- Initiates simultaneous test and operations efforts.

FY 2006 Planned Program:

- Completes Block 2006 Integration Phase 5 (IP-5) Integrated Technical Review (ITR).
- Completes Block 2004/2006 Integration Phase 4 (IP-4) Integrated Assessment Review (IAR).
- Completes Block 2006/2008 Integration Phase 6 (IP-6) Integrated Design Review (IDR).
- Continues software management and specialty engineering.
- Continues software verification and validation.
- Continues modeling and simulation development.
- Continues system analyses, integration, and verification.
- Supports integrated ground tests and specialty testing.
- Conducts pre- and post-flight test analyses.
- Supports the integration and testing of engage on Forward-Based Radar ESG.
- Continues simultaneous test and operations efforts.

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FY 2007 Planned Program:

- Completes Block 2006 Integration Phase 5 (IP-5) Integrated Assessment Review (IAR).
- Completes Block 2006/2008 Integration Phase 6 (IP-6) Integrated Technical Review (ITR).
- Continues software management and specialty engineering.
- Continues software verification and validation.
- Continues modeling and simulation development.
- Continues system analyses, integration, and verification.
- Supports integrated ground tests and specialty testing.
- Conducts pre- and post-flight test analyses.
- Completes the integration and testing of engage on Forward-Based Radar ESG.
- Continues simultaneous test and operations efforts.

	FY 2004	FY 2005	FY 2006	FY 2007
GMD Fire Control & Communications	217,668	218,879	160,062	148,283
RDT&E Articles (Quantity)	3	1	2	2

The GMD Fire Control and Communications (GFC/C) enables control and operation of the GMD Element as part of the BMDS. The Fire Control sub-component consists of the (1) GMD Fire Control (GFC), Test Exerciser (Tex), and External Systems Interface (ESI). The communications sub-component consists of (1) GMD Communications Network (GCN) and (2) the In-Flight Interceptor Communications System (IFICS).

FY 2004 Accomplishments:

RDT&E Test Articles: Acquisition of GFC/C software build initiated in FY 2003 and delivered in FY 2004. Acquisition of Aegis ESI software build initiated in FY 2003 and delivered in FY 2004. Acquisition of Command Launch Equipment software build initiated in FY 2003 and delivered in FY 2004.

- Continued flight and ground test support.
- Continued development and installation of GFC and ESI software builds.
- Continued development and installation of IFICS software builds.
- Initiated development and installation of Test Exerciser software builds.
- Continued development and installation of GMD software builds.
- Continued the planning, assessment and evaluation of future GFC/C software and technologies enhancements.

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FY 2005 Planned Accomplishments:

RDT&E Test Articles: Acquisition of GFC/C software build initiated in FY 2004 and delivered in FY 2005.

- Continues flight and ground test support.
- Continues development and installation of GFC and IFICS software builds.
- Completes development and installation of Test Exerciser software builds.
- Continues development and installation of GMD software builds in support of GMD capability enhancements.
- Continues the planning, assessment and evaluation of future GFC/C software and technologies enhancements.
- Continues software development upgrades.

FY 2006 Planned Program:

RDT&E Test Articles: Acquisition of External Systems Interface (ESI) software build initiated in FY 2004 and delivered in FY 2006. Acquisition of Command Launch Equipment software build was initiated in FY 2004 and delivered in FY 2006.

- Continues flight and ground test support.
- Continues the planning, assessment and evaluation of future GFC/C software and technologies enhancements.

FY 2007 Planned Program:

RDT&E Test Articles: Acquisition of GFC/C software build initiated in FY 2005 and delivered in FY 2007. Acquisition of External Systems Interface (ESI) software build initiated in FY 2006 and delivered in FY 2007

- Continues flight and ground test support.
- Continues the planning, assessment and evaluation of future GFC/C software and technologies enhancements.

	FY 2004	FY 2005	FY 2006	FY 2007
Element Test and Evaluation	200,517	198,813	305,054	312,333
RDT&E Articles (Quantity)	2	3	4	3

GMD Test and Evaluation utilizes a comprehensive infrastructure of ground-test facilities, ranges, sensors and instrumentation resources providing critical risk reduction and measurement of system performance for all GMD element components. This infrastructure allows the element engineers to successfully model and simulate test results into projections of future system performance. The GMD Combined Test Force, under a single unified organization, integrates developmental and operational test planning, shares test resources, collects and assesses test data, collectively resolves test issues, minimizes the duplication of test resources and the time required to execute required testing, and supports BMDS level test and evaluation.

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FY 2004 Accomplishments:

RDT&E Test Articles: Acquisition of 2 targets initiated in FY 2002 for delivery in FY 2004.

- Continued operation and maintenance of System Test Lab, Prime Contractor Integration Laboratory (PCIL), and Integrated Systems Test Center 2 (ISTC-2).
- Continued planning activities for implementing ISTC-1.
- Continued ground and flight test planning, design, and scheduling.
- Performed pre- and post-test analyses.
- Performed analyses to define target requirements.
- Established Element Test Objectives.

FY 2005 Planned Accomplishments:

RDT&E Test Articles: Acquisition of 3 targets initiated in FY 2003 for delivery in FY 2005.

- Continues operation and maintenance of System Test Lab, PCIL, and ISTC-2.
- Completes installation and implementation of ISTC-1.
- Continues ground and flight test planning, design, and scheduling.
- Conducts Integrated Ground Test (IGT) (development).
- Conducts Distributed Ground Test (DGT).
- Conducts Integrated Flight Tests.
- Performs pre- and post-test analyses.
- Performs analyses to define target requirements.
- Establishes Element Test Objectives.

FY 2006 Planned Program:

RDT&E Test Articles: Acquisition of 4 targets initiated in FY 2004 for delivery in FY 2006.

- Continues operation and maintenance of System Test Lab, PCIL, and ISTC-2.
- Continues ground and flight test planning, design, and scheduling.
- Conducts Integrated Ground Test (IGT) (development).
- Conducts Distributed Ground Test (DGT).
- Conducts Integrated Flight Tests.
- Performs pre- and post-test analyses.
- Performs analyses to define target requirements.
- Establishes Element Test Objectives.

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FY 2007 Planned Program:

RDT&E Test Articles: Acquisition of 3 targets initiated in FY 2005 for delivery in FY 2007.

- Continues operation and maintenance of System Test Lab, PCIL, and ISTC-2.
- Continues ground and flight test planning, design, and scheduling.
- Conducts Integrated Ground Test (IGT) (development).
- Conducts Distributed Ground Test (DGT).
- Conducts Integrated Flight Tests.
- Performs pre- and post-test analyses.
- Performs analyses to define target requirements.
- Establishes Element Test Objectives.

	FY 2004	FY 2005	FY 2006	FY 2007
Site Activation	36,908	36,459	31,672	31,286
RDT&E Articles (Quantity)	0	0	0	0

This effort provides a broad range of site design and layout, facility requirements, and environmental management activities.

FY 2004 Accomplishments:

- Initiated Planning and Design of an additional facility at the Von Braun Complex located at the Redstone Arsenal to consolidate MDA personnel and activities currently located in a number of dispersed locations. Construction was planned to begin in FY 2006. Congressional add in FY 2004 has accelerated start of construction to FY 2004.
- Continued Block 2004 IDO/ Test Bed activation.
- Updated IDO/ Test Bed site activation plans.
- Continued siting, NEPA, and ESH analysis for Block 2004 IDO/ Test Bed.
- Completed siting and Joint Spectrum Center Electromagnetic Interference analysis for SBX.

FY 2005 Planned Accomplishments:

- Continues IDO/ Test Bed support.
- Updates IDO/ Test Bed site activation plans.
- Continues siting, NEPA, and ESH analysis for Block 2004 IDO/ Test Bed.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

FY 2006 Planned Program:

- Continues siting, NEPA, and ESH analysis for Block 2006 and future activities.
- Initiates construction activities for follow-on Test-Bed upgrade programs.
- Updates IDO/Test Bed site activation plans.

FY 2007 Planned Program:

- Continues siting, NEPA, and ESH analysis for Block 2008 and future activities.
- Initiates construction activities for follow-on Test-Bed upgrade programs.
- Updates IDO/Test Bed site activation plans.

	FY 2004	FY 2005	FY 2006	FY 2007
Program Planning and Management	131,106	131,007	110,252	107,020
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- Provided government program office staff and infrastructure for the management of the GMD Program.
- Provided technical and business management expertise to support GMD Joint Program Office (JPO) tasks and activities, financial management, including cost and schedule performance assessments, configuration management, and integration planning activities.
- Provided requirements clarification and verification of H/W and S/W development including management of IV&V activities, test and evaluation planning and execution.
- Continued program management, subcontract management, quality assurance, and technical and testing oversight.

FY 2005 Planned Accomplishments:

- Provides government program office staff and infrastructure for the management of the GMD Program.
- Provides technical and business management expertise to support GMD Joint Program Office (JPO) tasks and activities, financial management, including cost and schedule performance assessments, configuration management, and integration planning activities.
- Provides requirements clarification and verification of H/W and S/W development including management of IV&V activities, test and evaluation planning and execution.
- Continues program management, subcontract management, quality assurance, and technical and testing oversight.

FY 2006 Planned Program:

- Provides government program office staff and infrastructure for the management of the GMD Program.
- Provides technical and business management expertise to support GMD Joint Program Office (JPO) tasks and activities, financial management, including cost and schedule performance assessments, configuration management, and integration planning activities.
- Provides requirements clarification and verification of H/W and S/W development including management of IV&V activities, test and evaluation planning and execution.

- Continues program management, subcontract management, quality assurance, and technical and testing oversight.

FY 2007 Planned Program:

- Provides government program office staff and infrastructure for the management of the GMD Program.
- Provides technical and business management expertise to support GMD Joint Program Office (JPO) tasks and activities, financial management, including cost and schedule performance assessments, configuration management, and integration planning activities.
- Provides requirements clarification and verification of H/W and S/W development including management of IV&V activities, test and evaluation planning and execution.
- Continues program management, subcontract management, quality assurance, and technical and testing oversight.

	FY 2004	FY 2005	FY 2006	FY 2007
Logistics Planning, Production and Protection	234,904	259,110	135,076	127,506
RDT&E Articles (Quantity)	0	0	0	0

GFX represents the materiel and services provided to the prime contractor in support of the GMD development and test efforts. It includes Government Furnished Equipment (GFE), Information (GFI), Facilities (GFF), and Services (GFS) (including communication leases).

FY 2004 Accomplishments:

- Continued to coordinate, procure, and provide GFX (over 700 line items) to the prime contractor to support IDC/ Test Bed activation and GMD test program.
- Continued to provide management efforts to activate a logistics support system to include IDC/ Test Bed site support activation and validation, logistical support requirements, and IDC/ Test Bed readiness reviews.
- Continued to provide comprehensive on-site logistics support to the Site Activation Command (SAC) Alaska and other IDC/ Test Bed sites as required.
- Conducted quality assurance planning and implementation.
- Continued to provide functional support for production, quality, configuration and change management.
- Conducted sustainment, fielding, siting, and facility planning.
- Continued to provide program protection to the Test Bed including physical security.
- Conducted reliability and maintainability analyses.

FY 2005 Planned Accomplishments:

- Continues to coordinate, procure, and provide GFX (over 700 line items) to the prime contractor to support Test Bed activation and GMD test program.
- Continues to provide management efforts to activate a logistics support system to include IDO/ Test Bed site support activations and validation, logistical support requirements, and IDO/ Test Bed readiness reviews.
- Continues to provide comprehensive on-site logistics support to the Site Activation Command (SAC) Alaska and other IDO/ Test Bed sites as required.
- Continues to provide functional support for production, quality, configuration and change management.
- Conducts sustainment, fielding, siting, and facility planning.
- Continues to provide program protection including physical security.

- Conducts reliability and maintainability analyses.

FY 2006 Planned Program:

- Continues to coordinate, procure, and provide GFX (over 700 line items) to the prime contractor to support Test Bed activation and GMD test program.
- Continues to provide comprehensive on-site logistics support to the Site Activation Command (SAC) Alaska and other IDO/ Test Bed sites as required.
- Continues to provide functional support for production, quality, configuration and change management.
- Conducts fielding, siting, and facility planning.
- Continues to provide program protection including physical security.
- Conducts reliability and maintainability analyses.

FY 2007 Planned Program:

- Continues to coordinate, procure, and provide GFX (over 700 line items) to the prime contractor to support Test Bed activation and GMD test program.
- Continues to provide comprehensive on-site logistics support to the Site Activation Command (SAC) Alaska and other IDO/ Test Bed sites as required.
- Continues to provide functional support for production, quality, configuration and change management.
- Conducts fielding, siting, and facility planning.
- Continues to provide program protection including physical security.
- Conducts reliability and maintainability analyses.

	FY 2004	FY 2005	FY 2006	FY 2007
Sustainment Development Program Phase II (SDP II)	0	104,750	279,046	375,123
RDT&E Articles (Quantity)	0	0	0	0

This effort provides for Logistics Support for the GMD Initial Defensive Operations. SDPII will provide a level-of-service consistent with established Engagement Sequence Groups (ESG). SDPII will meet LDO support requirements by providing a flexible and robust support capability that emphasizes support of ESG assets.

FY 2005 Planned Accomplishments:

- Establishes contract for developing and gathering equipment logistics data.
- Completes logistics infrastructure and support concept.
- Initiates SDPII program for logistics support and maintenance of IDO.
- Initiates minimal initial spare acquisitions.

FY 2006 Planned Program:

- Continues SDPII for logistics support and maintenance of IDO.
- Continues logistic infrastructure and support.

- Initiates SBX logistics support.
- Continues minimal initial spare acquisitions.

FY 2007 Planned Program:

- Continues SDPII for logistics support and maintenance of IDO.
- Continues logistic infrastructure and support plan.
- Continues with SBX logistics support.
- Continues minimal initial spare acquisitions.

	FY 2004	FY 2005	FY 2006	FY 2007
Missile Defense Plan II (GBI)	0	500,348	483,494	208,591
RDT&E Articles (Quantity)	0	0	32	8

The Ground-Based Interceptor consists of an Exoatmospheric Kill Vehicle (EKV) and a Booster Vehicle. These Interceptors will enhance the BMDS capability against long and intermediate range ballistic missile attacks by adding ten (10) interceptors.

FY 2005 Planned Accomplishments:

- Initiates acquisition of at least two (2) additional EKVs for Fort Greely.
- Initiates acquisition of at least two (2) additional boosters for Fort Greely.
- Initiates acquisition of fourteen (14) additional common silos for Fort Greely.
- Initiates acquisition of fourteen (14) sets of command launch equipment for Fort Greely.

FY 2006 Planned Program:

RDT&E Test Articles: Acquisition of at least two (2) EKVs and at least two (2) boosters; fourteen (14) common silos and fourteen (14) sets of associated command launch support equipment was initiated in FY 2005 for delivery in FY 2006.

- Completes acquisition of at least two (2) EKVs for Fort Greely.
- Completes acquisition of at least two (2) boosters for Fort Greely.
- Completes acquisition of fourteen (14) common silos for Fort Greely.
- Completes acquisition of fourteen (14) sets of command launch equipment for Fort Greely.
- Initiates acquisition of at least four (4) additional EKVs for Fort Greely.
- Initiates acquisition of at least four (4) additional boosters for Fort Greely.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

FY 2007 Planned Program:

RDT&E Test Articles: Acquisition of at least four (4) EKVs and at least four (4) boosters for Fort Greely was initiated in FY 2006 for delivery in FY 2007.

- Completes acquisition of at least four (4) EKVs for Fort Greely.
- Completes acquisition of at least four (4) boosters for Fort Greely.
- Initiates acquisition of at least four (4) additional EKVs for Fort Greely for delivery in FY 2008.
- Initiates acquisition of at least four (4) additional boosters for Fort Greely for delivery in FY 2008.

	FY 2004	FY 2005	FY 2006	FY 2007
Missile Defense Plan II (IUEWR and IDT)	0	22,385	38,000	59,000
RDT&E Articles (Quantity)	0	0	0	2

The Thule IUEWR will provide increased early warning capability for potential threat objects launched from north and east of CONUS as well as providing a backup capability to the Fylingdales UEWR. The processor (hardware and software) upgrades the GMD fire control access along with the associated GMD Communications Network (GCN) connectivity. They are planned for full implementation at Thule by FY 2007. An additional IDT will be acquired to provide the capability to communicate with multiple interceptors from existing launch sites as well as planned launch sites. The IDT will be located at Fort Greely; acquisition will begin in FY 2005.

FY 2005 Planned Accomplishments:

- Initiates acquisition of long lead IUEWR hardware items.
- Initiates planning / design / environmental process for IUEWR HW/SW installation.
- Initiates acquisition of an IDT at Fort Greely.

FY 2006 Planned Program:

- Continues acquisition of long lead IUEWR hardware items.
- Continues planning / design / environmental process for IUEWR HW/SW installation.
- Continues acquisition of an IDT at Fort Greely.

FY 2007 Planned Program:

RDT&E Test Articles: Acquisition of hardware for one (1) IUEWR was initiated in FY 2005 for delivery in FY 2007. Acquisition of one (1) IDT was initiated in FY 2005 for delivery in FY 2007.

- Completes acquisition of IUEWR hardware items.
- Completes planning / design / environmental process for IUEWR HW/SW installation.
- Completes acquisition of an IDT at Fort Greely.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

	FY 2004	FY 2005	FY 2006	FY 2007
Missile Defense Plan II (RDT&E Construction)	0	40,267	31,200	85,500
RDT&E Articles (Quantity)	0	0	0	0

This GMD RDT&E Construction request is further justified in the accompanying DD-1391 Exhibits, RDT&E Construction Data.

FY 2005 Planned Accomplishments:

- Initiates construction of 10 additional common silos and supporting facilities at Fort Greely.
- Initiates construction of an IDT at Fort Greely.
- Initiates and completes site facility designs for the Thule IUEWR.

FY 2006 Planned Program:

- Completes construction of 10 additional common silos and supporting facilities at Fort Greely.
- Continues construction of an IDT at Fort Greely.
- Initiates construction of Thule IUEWR.

FY 2007 Planned Program:

- Completes construction of an IDT at Fort Greely.
- Completes construction for Thule IUEWR.

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973

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	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

D. 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 and spiral upgrades. The Department has structured 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 strategy is to build the initial GMD parts of the BMDS NLT DEC 2004, while continuing RDT&E work and spiral upgrades such that some number of components of GMD will remain part of the BMDS Test Bed even after being fielded as part of the initial capability. 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 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) 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 (2) increasing the fidelity of the project simulations.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Ground Based Interceptor (GBI)										
Ground Based Interceptor (GBI)	SS/CPAF	Boeing/ AL/AK/AZ/CA/ CO/TX/VA	456,985	596,622	1/2Q	340,521	1/2Q	496,089	1/2Q	1,890,217
X Band Radar Technology Development										
X Band Radar Technology Development	SS/CPAF	Boeing/ AL/AK/AZ/CA/ CO/TX/VA	69,723	66,262	1/2Q	67,592	1/2Q	59,909	1/2Q	263,486
Upgraded Early Warning Radar (UEWR) Development										
Upgraded Early Warning Radar (UEWR) Development	SS/CPAF	Boeing/ AL/AK/AZ/CA/ CO/TX/VA	8,223	57,774	1/2Q	40,231	1/2Q	20,115	1/2Q	126,343
Element Engineering & Integration										
Systems Engineering & Integration	SS/CPAF	Boeing/ AL/AK/AZ/CA/ CO/TX/VA	137,083	139,786	1/2Q	102,166	1/2Q	26,007	1/2Q	405,042
Concurrent Test & Ops			0	20,000	1/2Q	21,000	1/2Q	73,000	1/2Q	114,000
FDR Japan - Bundle			0	0	N/A	10,000	1/2Q	6,000	1/2Q	16,000
BMDS Integration			0	0	N/A	0	N/A	28,000	1/2Q	28,000
GMD Fire Control & Communications										
Fire Control & Communications	SS/CPAF	Boeing/ AL/AK/AZ/CA/ CO/TX/VA	200,460	206,074	1/2Q	147,641	1/2Q	135,986	1/2Q	690,161

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

Date
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APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

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Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Element Test and Evaluation										
	SS/CPAF	Boeing/ AL/AK/AZ/CA/ CO/TX/VA	49,296	55,126	1/2Q	161,413	1/2Q	159,161	1/2Q	424,996
Logistics Planning, Production and Protection										
Logistics Planning, Production and Protection	SS/CPAF	Boeing/ AL/AK/AZ/CA/ CO/TX/VA	160,500	149,603	1/2Q	27,729	1/2Q	21,513	1/2Q	359,345
Missile Defense Plan II (GBI)										
GBI`s	SS/CPAF	Boeing/ AL/AK/AZ/CA/ CO/TX/VA	0	233,615	1/2Q	318,694	1/2Q	93,000	1/2Q	645,309
Expansion	SS/CPAF	Boeing/ AL/AK/AZ/CA/ CO/TX/VA	0	266,733	1/2Q	154,800	1/2Q	115,591	1/2Q	537,124
European Site Planning	SS/CPAF	Boeing/ AL	0	0	N/A	10,000	1/2Q	0	N/A	10,000
Missile Defense Plan II (IUEWR and IDT)										
UEWR & IDT	SS/CPAF	Boeing/ AL/AK/AZ/CA/ CO/TX/VA	0	22,385	1/2Q	38,000	1/2Q	59,000	1/2Q	119,385
Subtotal Product Development			1,082,270	1,813,980		1,439,787		1,293,371		5,629,408

Remarks

The Prime Contractor has the responsibility to balance resources across the GMD program and allocate funding according to program progress. This may require the Prime Contractor to reallocate funding, which would change the estimates provided in this R-3 document.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
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II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Ground Based Interceptor (GBI)										
	SS/FP	DCD/ AL	1,192	1,192	1/2Q	231	1/2Q	245	1/2Q	2,860
	SS/FP	BAE/ AL	7,894	7,894	1/2Q	6,715	1/2Q	6,525	1/2Q	29,028
	SS/FP	TSI/ AL	7,449	6,136	1/2Q	4,885	1/2Q	4,685	1/2Q	23,155
	C/CPAF	Sparta/ AL	1,394	1,394	1/2Q	0	N/A	0	N/A	2,788
	MIPR	AMCOM/ AL	354	354	1/2Q	1,684	1/2Q	1,875	1/2Q	4,267
	MIPR	USASMDC/ AL	391	391	1/2Q	482	1/2Q	500	1/2Q	1,764
	MIPR	GSA/ AL	231	231	1/2Q	662	1/2Q	700	1/2Q	1,824
	MIPR	Mitre/ DC	291	291	1/2Q	0	N/A	0	N/A	582
	MIPR	Picatinny/ NJ	100	125	1/2Q	43	1/2Q	45	1/2Q	313
	MIPR	Crane/ IN	174	149	1/2Q	32	1/2Q	34	1/2Q	389
	SS/FP	CSC/ AL	6,798	6,798	1/2Q	4,645	1/2Q	4,576	1/2Q	22,817
X Band Radar Technology Development										
	C/FP	BAE/ AL	1,095	10,595	1/2Q	10,059	1/2Q	6,687	1/2Q	28,436

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Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
	MIPR	AMCOM/ AL	850	1,210	1/2Q	913	1/2Q	850	1/2Q	3,823
	MIPR	MIT/LL/ MA	600	700	1/2Q	600	1/2Q	575	1/2Q	2,475
	C/CPAF	GA Tech/ GA	565	565	1/2Q	565	1/2Q	550	1/2Q	2,245
	C/CPFF	Xontech/ AL	162	430	1/2Q	400	1/2Q	3,750	1/2Q	4,742
Upgraded Early Warning Radar (UEWR) Development										
	SS/CPAF	Ga. Tech/ GA	1,220	1,220	1/2Q	1,720	1/2Q	1,569	1/2Q	5,729
	C/CPFF	Xontech/ AL	780	780	1/2Q	880	1/2Q	880	1/2Q	3,320
	C/FP	Mevatec/ AL	12,120	11,960	1/2Q	10,487	1/2Q	10,487	1/2Q	45,054
	MIPR	AMCOM/ AL	1,631	1,620	1/2Q	2,020	1/2Q	2,020	1/2Q	7,291
Element Engineering & Integration										
	MIPR	SMDC/ AL	1,040	1,271	1/2Q	1,285	1/2Q	1,272	1/2Q	4,868
	MIPR	NSWC/ VA	3,861	4,549	1/2Q	4,598	1/2Q	4,552	1/2Q	17,560
	MIPR	DTRA/ Ft Belvior, VA	540	740	1/2Q	749	1/2Q	741	1/2Q	2,770
	MIPR	NAIC/ Wright Patterson, AFB	810	834	1/2Q	843	1/2Q	835	1/2Q	3,322

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Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
	MIPR	SBIRS SPO/ LA AFB, CA	2,975	515	1/2Q	0	N/A	0	N/A	3,490
	MIPR	GMD/ AL	1,857	2,163	1/2Q	2,186	1/2Q	2,164	1/2Q	8,370
	MIPR	GME Engineering Analysis/ AL	1,668	2,100	1/2Q	2,123	1/2Q	2,102	1/2Q	7,993
	MIPR	John Hopkins/ MD	1,000	500	1/2Q	505	1/2Q	500	1/2Q	2,505
	MIPR	MIT Lincoln Labs/ MA	3,665	3,765	1/2Q	3,806	1/2Q	3,767	1/2Q	15,003
	MIPR	Photon Labs/ VA	700	834	1/2Q	843	1/2Q	835	1/2Q	3,212
	SS/CPAF	IDA/ VA	90	0	1/2Q	0	N/A	0	N/A	90
	C/CPAF	Various/ AL	310	300	1/2Q	928	1/2Q	919	1/2Q	2,457
	MIPR	JNIC/ CO	3,749	3,741	1/2Q	3,782	1/2Q	3,744	1/2Q	15,016
	MIPR	ARES/ CA	300	309	1/2Q	312	1/2Q	309	1/2Q	1,230
GMD Fire Control & Communications										
	MIPR	NSWC/ Dahlgren, VA	3,619	3,185	1/2Q	3,185	1/2Q	3,061	1/2Q	13,050
	FFRDC	MITRE/ HSV, AL	1,147	1,307	1/2Q	1,307	1/2Q	1,307	1/2Q	5,068
	C/FP	TSI/ HSV, AL	0	1,263	1/2Q	1,250	1/2Q	1,250	1/2Q	3,763

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
	C/CPAF	SPARTA/ HSV, AL	3,053	3,566	1/2Q	3,540	1/2Q	3,540	1/2Q	13,699
	C/FP	BAE Systems/ HSV, AL	201	200	1/2Q	180	1/2Q	180	1/2Q	761
	C/FP	Gray Sys/ HSV, AL	707	950	1/2Q	850	1/2Q	850	1/2Q	3,357
	C/CPAF	CSC/ Arlington, VA	1,760	1,350	1/2Q	1,350	1/2Q	1,350	1/2Q	5,810
	C/CPAF	Northup/ COS, CO	0	759	1/2Q	759	1/2Q	759	1/2Q	2,277
	MIPR	Various	0	225	1/2Q	0	N/A	0	N/A	225
Site Activation										
	C/CPFF	CSC/ AL	4,000	2,350	2Q	4,000	1/2Q	4,000	1/2Q	14,350
	MIPR	OGA/ Various	2,226	3,104	1/2Q	2,176	1/2Q	2,176	1/2Q	9,682
	MIPR	USACE/ AL	3,472	3,661	1/2Q	2,199	1/2Q	1,892	1/2Q	11,224
	C/CPFF	CSC/ AL	3,105	2,966	1/2Q	2,105	1/2Q	2,105	1/2Q	10,281
	C/CPFF	L3 Communications/ AL	1,339	1,339	1/2Q	1,339	1/2Q	1,339	1/2Q	5,356
	C/CPFF	TSI/ AL	864	864	1/2Q	864	1/2Q	864	1/2Q	3,456
	C/CPFF	CSC/ AL	8,629	7,086	1/2Q	6,629	1/2Q	6,629	1/2Q	28,973
	C/CPFF	CSC/ AL	1,975	1,947	1/2Q	1,975	1/2Q	1,975	1/2Q	7,872

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603882C Ballistic Missile Defense Midcourse Defense Segment

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
	C/CPFF	L3 Communications/ AL	2,200	2,200	1/2Q	2,200	1/2Q	2,200	1/2Q	8,800
	MIPR	OGA/ Various	2,077	3,524	1/2Q	1,077	2Q	1,077	1/2Q	7,755
	MIPR	USARAK/ AK	3,952	2,354	1Q	4,350	1/2Q	4,271	1/2Q	14,927
	C/CPFF	BAE/ AL	3,952	4,615	1/2Q	2,309	1/2Q	2,309	1/2Q	13,185
	C/CPFF	BAE/ AL	449	449	1/2Q	449	1/2Q	449	1/2Q	1,796
Program Planning and Management										
SPT DC	C/CPAF	CSC/ VA	93,254	90,254	1/2Q	79,381	1/2Q	77,054	1/2Q	339,943
SPT HSV	C/CPAF	CSC/ AL	25,977	25,406	1/2Q	30,871	1/2Q	29,966	1/2Q	112,220
TRADOC System Manager	MIPR	SMDC/ AL	15,046	15,347	1/2Q	0	N/A	0	N/A	30,393
Logistics Planning, Production and Protection										
Logistics	C/CPFF	L3 Communications/ AL	3,610	3,781	1/2Q	3,781	1/2Q	3,781	1/2Q	14,953
	C/CPFF	BAE Systems/ AL	631	631	1/2Q	631	1/2Q	631	1/2Q	2,524
	C/CPFF	CSC/ AL	942	942	1/2Q	942	1/2Q	942	1/2Q	3,768
	C/CPFF	TSI/ AL	1,311	1,311	1/2Q	1,311	1/2Q	1,311	1/2Q	5,244

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
	C/CPFF	SPARTA/ AL	460	460	1/2Q	460	1/2Q	460	1/2Q	1,840
	C/CPFF	CIRRUS/ AL	499	499	1/2Q	499	1/2Q	499	1/2Q	1,996
	MIPR	MMC/ AL	261	261	1/2Q	261	1/2Q	261	1/2Q	1,044
	MIPR	ARL/ MD	452	452	1/2Q	400	1/2Q	375	1/2Q	1,679
	MIPR	Brooks AFB/ TX	148	148	1/2Q	100	1/2Q	59	1/2Q	455
	MIPR	NSWC/ FL	213	213	2Q	34	1/2Q	34	1/2Q	494
GFX	MIPR	SPAWAR/ CA	850	850	1/2Q	895	1/2Q	940	1/2Q	3,535
	MIPR	AMCOM/ AL	1,052	1,050	1/2Q	1,103	1/2Q	1,159	1/2Q	4,364
	MIPR	DISA/ VA	32,342	29,580	1/3Q	27,122	1/2Q	28,378	1/2Q	117,422
	MIPR	JSC/ MD	250	250	1/2Q	250	1/2Q	150	1/2Q	900
	MIPR	JNIC/ CO	3,237	1,802	1/2Q	1,865	1/2Q	1,969	1/2Q	8,873
	C/CPAF	Boeing/ AL	1,331	1,134	1/2Q	650	1/2Q	670	1/2Q	3,785
	MIPR	Hill AFB/ UT	130	130	1/2Q	130	1/2Q	130	1/2Q	520
	MIPR	AMCOM/ AL	700	650	1/4Q	650	1/2Q	650	1/2Q	2,650
	MIPR	NSA/ MD	2,021	750	1/2Q	500	1/2Q	300	1/2Q	3,571

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603882C Ballistic Missile Defense Midcourse Defense Segment

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
	MIPR	NIST/ OH	1,980	1,390	2/4Q	1,370	1/2Q	1,300	1/2Q	6,040
	MIPR	L3 Communications/ AL	3,790	4,275	1/2Q	4,275	1/2Q	4,275	1/2Q	16,615
	MIPR	SMDC/ AL	8,000	13,945	1/2Q	13,945	1/2Q	13,945	1/2Q	49,835
	MIPR	611th / AK	9,496	9,000	1/2Q	9,000	1/2Q	9,000	1/2Q	36,496
	MIPR	SMDC/ AL	3,074	2,500	1/2Q	4,000	1/2Q	2,500	1/2Q	12,074
	MIPR	VAFB/ CA	1,856	3,000	1/2Q	3,000	1/2Q	3,000	1/2Q	10,856
	MIPR	CCPs/ Various	0	1,500	1/2Q	1,500	1/2Q	1,880	1/2Q	4,880
	MIPR	Various/ Various	231	290	1/2Q	290	1/2Q	290	1/2Q	1,101
	MIPR	Ft Drum/ NY	0	0	N/A	2,500	1/2Q	1,500	1/2Q	4,000
Production	SS/CPFF	TSI/ AL	112	125	1/2Q	125	1/2Q	125	1/2Q	487
	SS/CPFF	BAE Systems/ AL	4,050	3,678	1/2Q	3,019	1/2Q	2,962	1/2Q	13,709
	SS/CPFF	COLSA/ AL	605	625	1/2Q	625	1/2Q	625	1/2Q	2,480
	SS/CPFF	CSC/ AL	285	295	1/2Q	295	1/2Q	295	1/2Q	1,170
	MIPR	AMREDC/ AL	1,575	1,635	1/2Q	1,635	1/2Q	1,635	1/2Q	6,480

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Protection	SS/CPFF	TAMSCO/ AK	8,122	996	1/2Q	1,026	1/2Q	1,057	1/2Q	11,201
	SS/CPAF	Boeing/ AL	0	1,535	1/2Q	0	N/A	0	N/A	1,535
	SS/CPFF	SDC/ AL	790	1,500	1/2Q	1,545	1/2Q	1,591	1/2Q	5,426
	SS/CPFF	US Marshall Service/ TX	0	404	1/2Q	0	N/A	0	N/A	404
	SS/CPFF	C&A/ AL	7,197	3,477	1/2Q	5,104	1/2Q	4,950	1/2Q	20,728
Information Technology	SS/CPFF	SAIC/ AL	6,184	6,121	1/2Q	5,938	1/2Q	5,879	1/2Q	24,122
	SS/CPFF	BAE System/ AL	1,420	1,406	1/2Q	1,363	1/2Q	1,350	1/2Q	5,539
	MIPR	Various/ Various	2,706	2,679	1/2Q	2,598	1/2Q	2,572	1/2Q	10,555
	MIPR	Various/ Various	4,280	4,237	1/2Q	2,610	1/2Q	2,563	1/2Q	13,690
Sustainment Development Program Phase II (SDP II)										
	SS/CPAF	Boeing/ AL/AK/CA	0	104,750	1/2Q	279,046	1/2Q	375,123	1/2Q	758,919
Missile Defense Plan II (RDT&E Construction)										
Facilities Construction	MIPR	COE/ AK	0	40,267	1Q	31,200	1/2Q	85,500	1/2Q	156,967
Subtotal Support Costs			367,053	510,451		640,921		785,512		2,303,937

Remarks
The Prime Contractor has the responsibility to balance resources across the GMD program and allocate funding according to program progress. This may require the Prime Contractor to reallocate funding, which would change the estimates provided in this R-3 document.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date February 2005
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Element Test and Evaluation										
Combined Test Force (CTF)	MIPR	SMDC/ AL	5,877	5,995	1/2Q	0	N/A	0	N/A	11,872
	MIPR	OTAs/ Various	6,700	6,834	1/2Q	0	N/A	0	N/A	13,534
	MIPR	VAFB/ CA	460	428	1/2Q	437	1/2Q	447	1/2Q	1,772
	MIPR	SNL/ NM	100	250	1/2Q	343	1/2Q	350	1/2Q	1,043
	MIPR	NAVSEA/ MD	343	323	1/2Q	395	1/2Q	375	1/2Q	1,436
	MIPR	SMDC/ AL	425	400	1/2Q	442	1/2Q	450	1/2Q	1,717
	MIPR	Kirtland, AFB/ NM	285	400	1/2Q	320	1/2Q	340	1/2Q	1,345
	MIPR	VAFB/ CA	597	450	1/2Q	520	1/2Q	546	1/2Q	2,113
	MIPR	RTS/ Kwajalein	170	200	1/2Q	0	N/A	0	N/A	370
	MIPR	RTS/ Kwajalein	2,426	2,426	1/2Q	0	N/A	0	N/A	4,852
	C/CPFF	COLSA/ AL	4,717	6,099	1/2Q	6,849	1/2Q	6,099	1/2Q	23,764
	C/CPFF	COLSA/ AL	1,446	1,730	1/2Q	2,730	1/2Q	1,730	1/2Q	7,636
	C/CPFF	ELMCO/ AL	557	990	1/2Q	990	1/2Q	990	1/2Q	3,527
	C/CPFF	IEC/ CA	3,122	2,822	1/2Q	3,822	1/2Q	2,822	1/2Q	12,588

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
	C/CPFF	BAE Systems/ AL	1,471	1,580	1/2Q	2,130	1/2Q	3,580	1/2Q	8,761
	C/CPFF	BAE Systems/ AL	1,536	1,700	1/2Q	1,700	1/2Q	2,560	1/2Q	7,496
	C/CPFF	COLSA/ AL	1,711	3,350	1/2Q	813	1/2Q	813	1/2Q	6,687
	C/CPFF	COLSA/ AL	3,736	4,015	1/2Q	4,915	1/2Q	5,015	1/2Q	17,681
	C/CPFF	COLSA/ AL	432	432	1/2Q	432	1/2Q	500	1/2Q	1,796
	C/CPFF	AMTEC/ AL	865	1,494	1/2Q	1,744	1/2Q	3,010	1/2Q	7,113
	C/CPFF	CAS/ AL	772	1,300	1/2Q	1,550	1/2Q	2,095	1/2Q	5,717
	C/CPFF	CSC/ AL	208	238	1/2Q	238	1/2Q	288	1/2Q	972
	C/CPFF	IEC/ CA	0	220	1/2Q	0	N/A	0	N/A	220
	C/TM	AMTEC/ AL	0	500	1/2Q	723	1Q	823	1/2Q	2,046
	MIPR	AMCOM/ AL	1,400	1,500	1/2Q	2,250	1/2Q	4,345	1/2Q	9,495
	C/CPFF	L3 Communications/ AL	3,856	3,637	1/2Q	5,387	1/2Q	5,387	1/2Q	18,267
	MIPR	AMCOM/ AL	768	1,012	1/2Q	0	N/A	2,012	1/2Q	3,792
	C/CPFF	BAE Systems/ AL	3,019	5,267	1/2Q	6,100	1/2Q	4,208	1/2Q	18,594

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
	MIPR	Various/ AL	4,908	95	1/2Q	61	1/2Q	76	1/2Q	5,140
Targets	MIPR	MDA/ AL	15,479	88,000	1/2Q	98,750	1/2Q	104,311	1/2Q	306,540
Subtotal Test and Evaluation			67,386	143,687		143,641		153,172		507,886

Remarks

The Prime Contractor has the responsibility to balance resources across the GMD program and allocate funding according to program progress. This may require the Prime Contractor to reallocate funding, which would change the estimates provided in this R-3 document.

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										

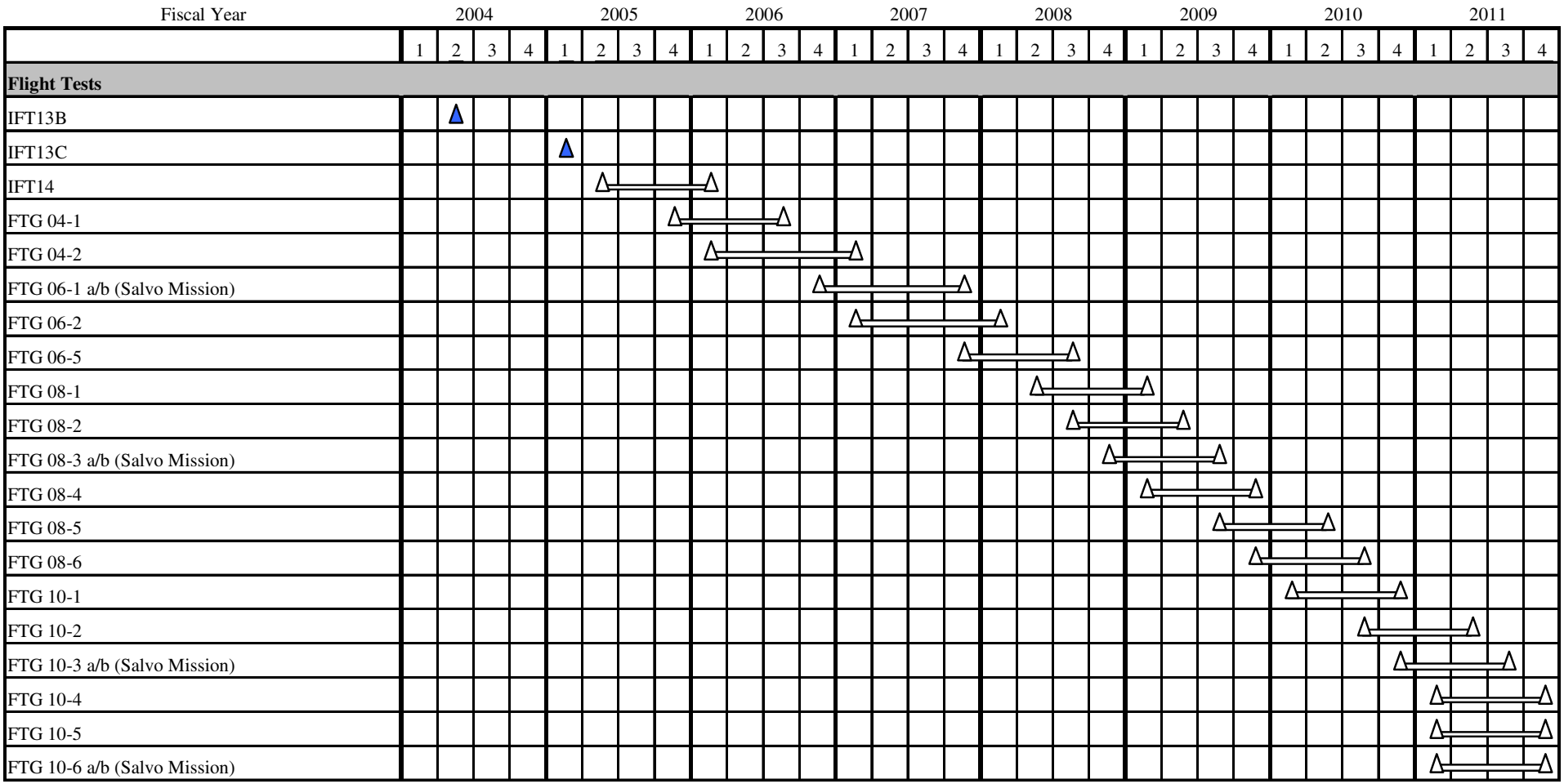
Remarks

Project Total Cost			1,516,709	2,468,118		2,224,349		2,232,055		8,441,231

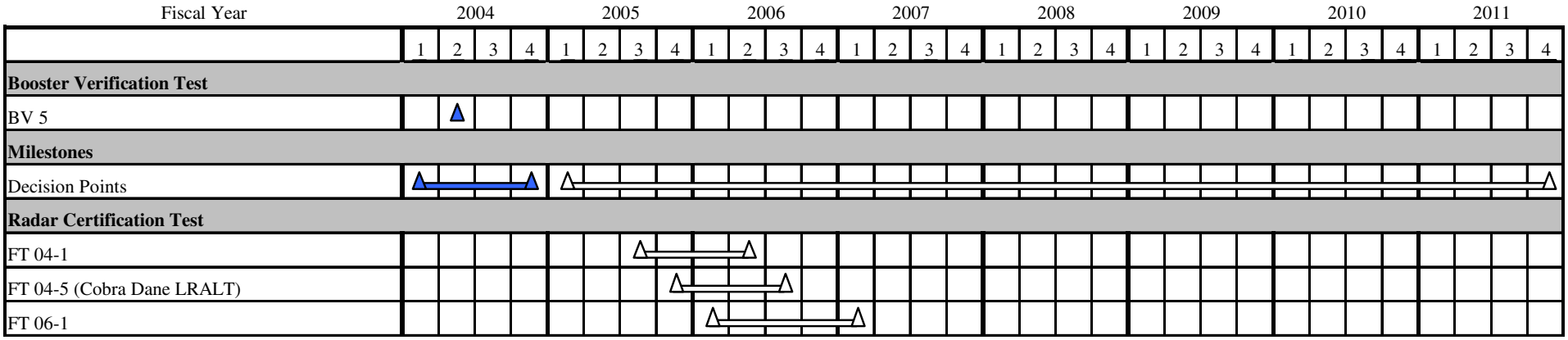
Remarks

The Prime Contractor has the responsibility to balance resources across the GMD program and allocate funding according to program progress. This may require the Prime Contractor to reallocate funding, which would change the estimates provided in this R-3 document.

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**



Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**



Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Flight Tests								
IFT13B	2Q							
IFT13C		1Q						
IFT14		2Q-4Q	1Q					
FTG 04-1		4Q	1Q-3Q					
FTG 04-2			1Q-4Q	1Q				
FTG 06-1 a/b (Salvo Mission)			4Q	1Q-4Q				
FTG 06-2				1Q-4Q	1Q			
FTG 06-5				4Q	1Q-3Q			
FTG 08-1					2Q-4Q	1Q		
FTG 08-2					3Q-4Q	1Q-2Q		
FTG 08-3 a/b (Salvo Mission)					4Q	1Q-3Q		
FTG 08-4						1Q-4Q		
FTG 08-5						3Q-4Q	1Q-2Q	
FTG 08-6						4Q	1Q-3Q	
FTG 10-1							1Q-4Q	
FTG 10-2							3Q-4Q	1Q-2Q
FTG 10-3 a/b (Salvo Mission)							4Q	1Q-3Q
FTG 10-4								1Q-4Q
FTG 10-5								1Q-4Q
FTG 10-6 a/b (Salvo Mission)								1Q-4Q
Booster Verification Test								
BV 5	2Q							
Milestones								
Decision Points	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Radar Certification Test								
FT 04-1		3Q-4Q	1Q-2Q					
FT 04-5 (Cobra Dane LRALT)		4Q	1Q-3Q					
FT 06-1			1Q-4Q	1Q				

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0908 Ground-Based Midcourse Defense (GMD) Block 2008 Development	0	0	73,682	281,000	1,425,476	1,176,220	338,466	213,500
RDT&E Articles Qty	0	0	0	0	38	19	0	0

A. Mission Description and Budget Item Justification

The Ground-Based Midcourse (GMD) segment of the BMDS is a key component of the Initial Defensive Capability (IDC) and all future BMDS Blocks being fielded by MDA. It consists of ground-based interceptors, sensors, and fire control systems fielded in multiple locations. The GMD employs hit-to kill technologies to intercept ballistic missiles in the midcourse phase of flight to defend the homeland, deployed forces, friends, and allies. The elements being developed and fielded of the Midcourse segment will comprise most of the critical components in meeting the MDA goals in the near-term.

GMD system capability is measured by Engagement Sequence Groups (ESG) which define the sequence of events used to enable the weapon to engage a target. The ESGs provide the structure for measuring the level of performance and integration maturity of the GMD system within the BMDS. Engagement sequence identifies the sensors that support four functions (acquire/cue, commit, update, and discriminate) required to launch the GMD GBI against a target. Consistent with the BMDS block development strategy, additional ESGs are incorporated into blocks as sensor systems become available and after integrated testing and checkout is accomplished in the BMDS Test Bed. Block 2004 includes seven BMDS ESGs (Engage on AEGIS, Launch on AEGIS, Engage on Cobra Dane, Engage on UEWRs (Beale and Fylingdales), Engage on Sea-Based X-Band radar, and Launch on Forward-Based X-Band radar. Block 2006 incorporates at least three additional BMDS ESGs (Engage on UEWR (Thule), Launch on DSP/SBIRS, and Engage on Forward-Based X-Band radar (FBX)). Block 2008 incorporates additional BMDS ESGs (Launch/Engage on EO/IR and Launch/Engage on THAAD). Block 2010 will add increased capability for existing BMDS ESGs through incorporation of advanced sensor discrimination, improved hit-to-kill, and more flexible fire control strategies within BMD fire control and C2BMC. ESGs are embedded into GMD Integrated Test Program. Possible measures of effectiveness include: defended area, launch area denied, probability of engagement success, battlespace, track times, quality of engagement sequence, and depth of fire. Robustness and capability of the BMDS will be enhanced as the number of operationally available ESGs increases. In addition, continuing development activities including GBI surveillance testing; EKV and GMD fire control upgrades; and improved GBIs enable improvements to all ESGs and increase warfighter confidence.

The Block 2004 and 2006 (Projects 0708 and 0808) will develop and field the IDC and the first upgrades of the BMDS. GMD will build and field the initial infrastructure (both IDC and Test Bed), deploy the initial increment of interceptors (up to 30), and provide for initial sustainment infrastructure for the IDC.

Block 2008 includes the next increment of fielded capability with additional interceptors (up to 10), and an upgraded IUEWR. It also supports the continuing development and testing of new and evolving BMDS technologies. This consists of sustaining engineering and spiral upgrades to the GMD components of the Block 2004/06 BMDS operational alert and Test Bed. These efforts will include Preplanned Product Improvements (P3I) to GMD components and integration of emerging MDA technologies, including enhanced EKV and SBX capabilities, additional GFC capabilities, countermeasures mitigation, multi-sensor fusion, and other midcourse interceptors. This development effort will mature key technologies in logical stages to allow for an enhanced BMDS operational capability and 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 effort includes improved integration of SBX and FBX radars, including enhanced discrimination, fire control and data fusion software within GFC, to fully utilize this expanded sensor network. This development effort also provides hardware, planning, mission support and execution of the GMD test program.

Block 2010 further supports the continuing development and testing of new and evolving BMDS technologies. In addition, GMD will expand the BMDS capability by beginning the planning for a third missile site starting in FY07 to be fielded in 2010/2011. Block 2010 also includes the next increment of fielded capability with additional interceptors (up to 10), and upgraded IUEWR.

The flow down of BMDS capability specifications resulting from Systems Engineering efforts in Command and Control, Battle Management, and Communications (C2BMC) and Systems Engineering & Integration will guide the integration of Targets and Countermeasures, Test and Evaluation, and Program Operations Support into the BMD System, the BMDS C2BMC architecture, and the BMD Test Bed.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Missile Defense Plan II - Follow-On (GBI)	0	0	70,682	245,000
RDT&E Articles (Quantity)	0	0	0	0

The Ground-Based Interceptors consists of an Exoatmospheric (EKV) and a booster vehicle. These interceptors will enhance the BMDS capability against long and intermediate range ballistic missile attacks by adding additional interceptors.

FY 2006 Planned Program:

- Initiates acquisition of ten (10) common silos at Fort Greely.
- Initiates acquisition of ten (10) sets of command launch equipment.
- Initiates acquisition of up to five (5) EKVs.
- Initiates acquisition of up to five (5) boosters.

FY 2007 Planned Program:

- Continues acquisition of ten (10) common silos at Fort Greely.
- Continues acquisition of ten (10) sets of command launch equipment.
- Continues acquisition of up to five (5) EKVs.
- Continues acquisition of up to five (5) boosters.
- Initiates acquisition of up to five (5) EKVs.
- Initiates acquisition of up to five (5) boosters.
-

	FY 2004	FY 2005	FY 2006	FY 2007
Missile Defense Plan II - Follow-On (IUEWR)	0	0	0	7,000
RDT&E Articles (Quantity)	0	0	0	0

The Otis IUEWR will provide increased early warning capability for potential threat objects launched from north and east of CONUS. The processor (hardware and software) upgrades the GMD fire control and communications access. Upgrades are planned for completion by FY 2009.

FY 2007 Planned Program:

- Initiates acquisition of long lead IUEWR hardware items.
- Initiates planning / design / environmental process for HW/SW installation.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

	FY 2004	FY 2005	FY 2006	FY 2007
Missile Defense Plan II - Follow-On (RDT&E Construction)	0	0	3,000	29,000
RDT&E Articles (Quantity)	0	0	0	0

This GMD RDT&E Construction request is further justified in the accompanying DD-1391 Exhibit, RDT&E Construction Data.

FY 2006 Planned Program:

- Initiates construction of 10 additional silos at Fort Greely.
- Initiates site facility designs for the Otis I-UEWR.

FY 2007 Planned Program:

- Continues construction of 10 additional silos at Fort Greely.
- Continues construction for the Otis I-UEWR.

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
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PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
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PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

D. 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 and spiral upgrades. The Department has structured 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 strategy is to build the initial GMD parts of the BMDS NLT DEC 2004, while continuing RDT&E work and spiral upgrades such that some number of components of GMD will remain part of the BMDS Test Bed even after being fielded as part of the initial capability. 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 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) 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 (2) increasing the fidelity of the project simulations.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Missile Defense Plan II - Follow-On (GBI)										
GBIs	SS/CPAF	Boeing/ AL/AK/AZ/CA/ CO/TX/VA	0	0	N/A	50,000	1/2Q	154,000	1/2Q	204,000
Expansion	SS/CPAF	Boeing/ AL/AK/AZ/CA/ CO/TX/VA	0	0	N/A	20,682	1/2Q	91,000	1/2Q	111,682
Missile Defense Plan II - Follow-On (IUEWR)										
	SS/CPAF	Boeing/ AL/AZ/CA	0	0	N/A	0	N/A	7,000	1/2Q	7,000
Subtotal Product Development			0	0		70,682		252,000		322,682

Remarks

The Prime Contract is not definitized for the restructured Ground-based Midcourse Defense capability-based acquisition strategy, therefore the funding breakouts shown above are estimates. When definitized, the Prime Contractor has the responsibility to balance resources across the GMD program and allocate funding according to program progress. This may require the Prime Contractor to reallocate funding, which would change the estimates provided in this R-3 document.

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Missile Defense Plan II - Follow-On (RDT&E Construction)										
	MIPR	USACOE/ AK	0	0	N/A	3,000	N/A	29,000	1/2Q	32,000
Subtotal Support Costs			0	0		3,000		29,000		32,000

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

Remarks
The Prime Contract is not definitized for the restructured Ground-based Midcourse Defense capability-based acquisition strategy, therefore the funding breakouts shown above are estimates. When definitized, the Prime Contractor has the responsibility to balance resources across the GMD program and allocate funding according to program progress. This may require the Prime Contractor to reallocate funding, which would change the estimates provided in this R-3 document.

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation										

Remarks

IV. Management Services Cost ($ in Thousands)

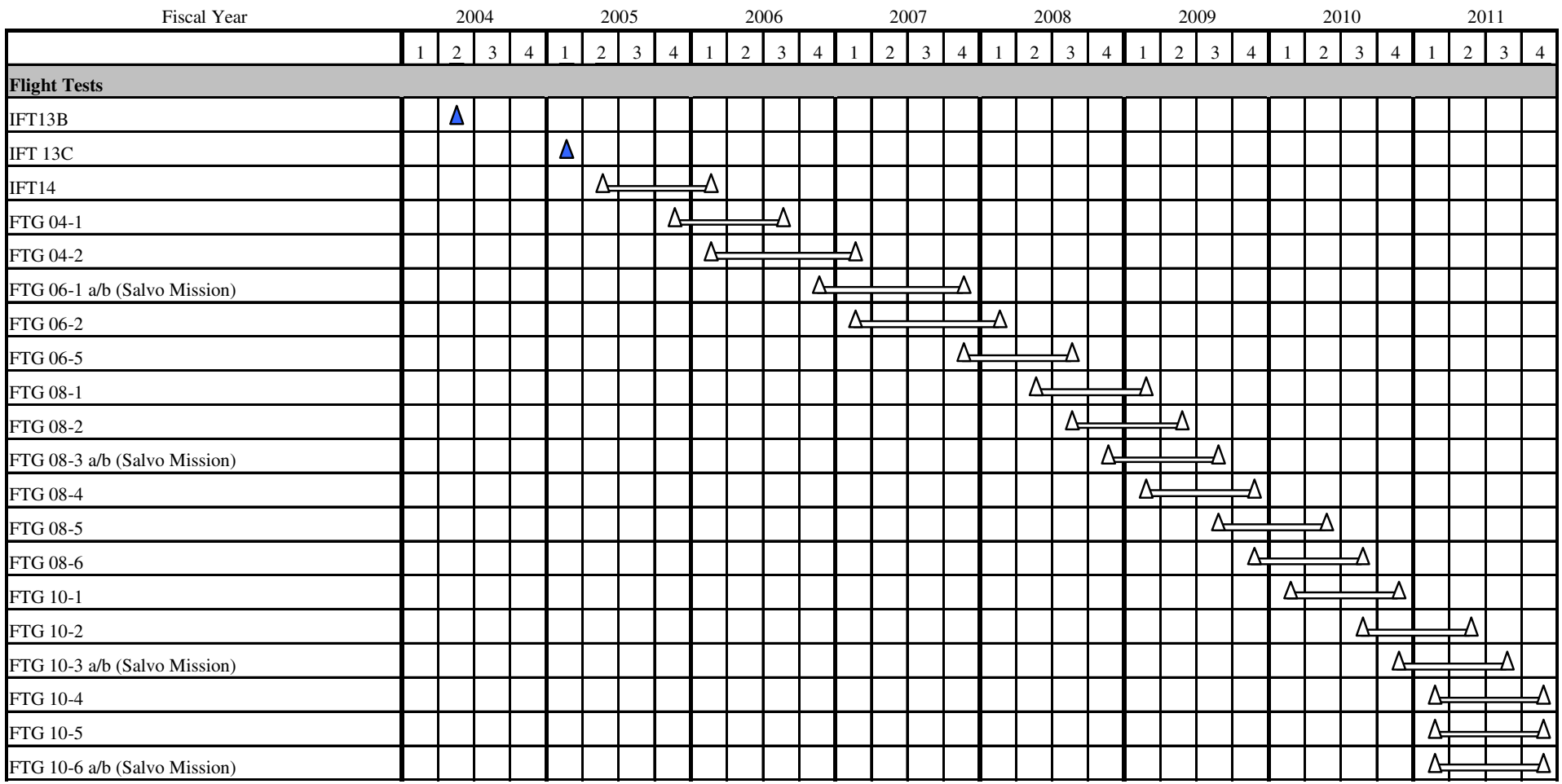
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

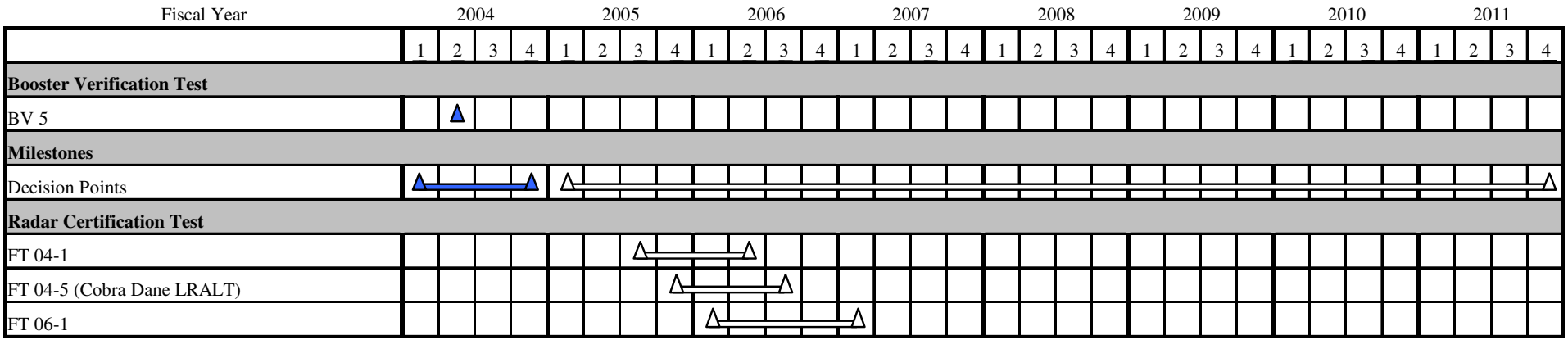
Project Total Cost			0	0		73,682		281,000		354,682

Remarks
The Prime Contract is not definitized for the restructured Ground-based Midcourse Defense capability-based acquisition strategy, therefore the funding breakouts shown above are estimates. When definitized, the Prime Contractor has the responsibility to balance resources across the GMD program and allocate funding according to program progress. This may require the Prime Contractor to reallocate funding, which would change the estimates provided in this R-3 document.

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**



Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**



Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Flight Tests								
IFT13B	2Q							
IFT 13C		1Q						
IFT14		2Q-4Q	1Q					
FTG 04-1		4Q	1Q-3Q					
FTG 04-2			1Q-4Q	1Q				
FTG 06-1 a/b (Salvo Mission)			4Q	1Q-4Q				
FTG 06-2				1Q-4Q	1Q			
FTG 06-5				4Q	1Q-3Q			
FTG 08-1					2Q-4Q	1Q		
FTG 08-2					3Q-4Q	1Q-2Q		
FTG 08-3 a/b (Salvo Mission)					4Q	1Q-3Q		
FTG 08-4						1Q-4Q		
FTG 08-5						3Q-4Q	1Q-2Q	
FTG 08-6						4Q	1Q-3Q	
FTG 10-1							1Q-4Q	
FTG 10-2							3Q-4Q	1Q-2Q
FTG 10-3 a/b (Salvo Mission)							4Q	1Q-3Q
FTG 10-4								1Q-4Q
FTG 10-5								1Q-4Q
FTG 10-6 a/b (Salvo Mission)								1Q-4Q
Booster Verification Test								
BV 5	2Q							
Milestones								
Decision Points	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Radar Certification Test								
FT 04-1		3Q-4Q	1Q-2Q					
FT 04-5 (Cobra Dane LRALT)		4Q	1Q-3Q					
FT 06-1			1Q-4Q	1Q				

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0008 Ground-Based Midcourse Defense (GMD) Block 2010	0	0	0	188,885	717,000	654,831	1,557,354	1,349,209
RDT&E Articles Qty	0	0	0	0	0	10	38	9

A. Mission Description and Budget Item Justification

The mission of the Missile Defense Agency (MDA) is to develop an integrated layered Ballistic Missile Defense System (BMDS) to defend the United States, its deployed forces, friends and allies from ballistic missiles of all ranges and in all phases of flight. In late 2004 the United States fielded a limited capability to defeat a ballistic missile threat. Continuing through the Future Years Defense Plan (FYDP), the breadth and depth of this initial capability will be expanded by adding and networking forward-deployed sensors, interceptors at sea and on land, and layers of increasingly capable weapons and sensors. Today's MDA activities are focused on six objectives: 1) complete development, fielding, and transition to alert of Block 2004; 2) provide warfighter support and sustainment for BMDS; 3) develop a totally integrated BMDS for Block 2006 and beyond; 4) improve the BMD system through incremental improvements and Block upgrades over time; 5) conduct an increasingly robust integrated test program concurrent with operations; and 6) build an international foundation for missile defense.

The Ground-Based Midcourse (GMD) segment of the BMDS is a key component of the Initial Defensive Capability (IDC) and all future BMDS Blocks being fielded by MDA. It consists of ground-based interceptors, sensors, and fire control systems fielded in multiple locations. The GMD employs hit-to kill technologies to intercept ballistic missiles in the midcourse phase of flight to defend the homeland, deployed forces, friends, and allies. The elements being developed and fielded of the Midcourse segment will comprise most of the critical components in meeting the MDA goals in the near-term.

GMD system capability is measured by Engagement Sequence Groups (ESG) which define the sequence of events used to enable the weapon to engage a target. The ESGs provide the structure for measuring the level of performance and integration maturity of the GMD system within the BMDS. Engagement sequence identifies the sensors that support four functions (acquire/cue, commit, update, and discriminate) required to launch the GMD GBI against a target. Consistent with the BMDS block development strategy, additional ESGs are incorporated into blocks as sensor systems become available and after integrated testing and checkout is accomplished in the BMDS Test Bed. Block 2004 includes seven BMDS ESGs (Engage on AEGIS, Launch on AEGIS, Engage on Cobra Dane, Engage on UEWRs (Beale and Fylingdales), Engage on Sea-Based X-Band radar, and Launch on Forward-Based X-Band radar (FBX)). Block 2006 incorporates at least three additional BMDS ESGs (Engage on UEWR (Thule), Launch on DSP/SBIRS, and Engage on Forward-Based X-Band radar (FBX)). Block 2008 incorporates additional BMDS ESGs (Launch/Engage on EO/IR and Launch/Engage on THAAD). Block 2010 will add increased capability for existing BMDS ESGs through incorporation of advanced sensor discrimination, improved hit-to-kill, and more flexible fire control strategies within GMD fire control and C2BMC. ESGs are embedded into GMD Integrated Test Program. Possible measures of effectiveness include: defended area, launch area denied, probability of engagement success, battlespace, track times, quality of engagement sequence, and depth of fire. Robustness and capability of the BMDS will be enhanced as the number of operationally available ESGs increases. In addition, continuing development activities including GBI surveillance testing; EKV and GMD fire control upgrades; and improved GBIs enable improvements to all ESGs and increase warfighter confidence.

The Block 2004 and 2006 (Projects 0708 and 0808) will develop and field the IDC and the first upgrades of the BMDS. GMD will build and field the initial infrastructure (both IDC and Test Bed), deploy the initial increment of interceptors (up to 20) and the next increment of interceptors (up to 10), and provide for initial sustainment infrastructure for the IDC.

Block 2008 supports the continuing development and testing of new and evolving BMDS technologies, and the next increment of additional interceptors (up to 10). This consists of sustaining engineering and spiral upgrades to the GMD components of the Block 2004/06 BMDS operational alert and Test Bed. These efforts will include Preplanned Product Improvements (P3I) to GMD components and integration of emerging MDA technologies, including enhanced EKV and SBX capabilities, additional GFC capabilities, countermeasures mitigation, multi-sensor fusion, and other midcourse interceptors. This development effort will mature key technologies in logical stages to allow for an enhanced BMDS operational capability and 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 effort includes improved integration of SBX and FBX radars, including enhanced discrimination, fire control and data fusion software within GFC, to fully utilize this expanded sensor network. This development effort also provides hardware, planning, mission support and execution of the GMD test program.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

Block 2010 further supports the continuing development and testing of new and evolving BMDS technologies. In addition, GMD will begin to expand the BMDS capability by beginning the planning for a third missile site. Block 2010 also includes the next increment of fielded capability with additional interceptors (up to 10), for either the Third Site or aging inventory at Fort Greely, AK, and upgraded IUEWR.

The flow down of BMDS capability specifications resulting from system engineering efforts in Command and Control, Battle Management, and Communications (C2BMC) and Systems Engineering & Integration will guide the integration of Targets and Countermeasures, Test and Evaluation, and Program Operations Support into the BMD System, the BMDS C2BMC architecture, and the BMD Test Bed.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
GBI Capability & Third Site	0	0	0	188,885
RDT&E Articles (Quantity)	0	0	0	0

FY 2007 Planned Program:

- Initiates acquisition of up to 5 EKVs.
- Initiates acquisition of up to 5 boosters.
- Initiates geo-technical site survey location studies for a possible third interceptor launch site.
- Initiates planning for third site launch complex.
- Conduct environmental, safety and health management analyses/documentation and compliance.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

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	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
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APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

D. 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 and spiral upgrades. The Department has structured 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 strategy is to build the initial GMD parts of the BMDS NLT DEC 2004, while continuing RDT&E work and spiral upgrades such that some number of components of GMD will remain part of the BMDS Test Bed even after being fielded as part of the initial capability. 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 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) 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 (2) increasing the fidelity of the project simulations.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
GBI Capability & Third Site										
Third Site	C/CPAF	Boeing/ AL/AK/AZ/CA/ CO/TX/VA	0	0	N/A	0	N/A	146,750	1/2Q	146,750
GBI`s	C/CPAF	Boeing/ AL/AK/AZ/CA/ CO/TX/VA	0	0	N/A	0	N/A	42,135	1/2Q	42,135
Subtotal Product Development			0	0		0		188,885		188,885

Remarks

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Support Costs			0	0		0		0		0

Remarks

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation										

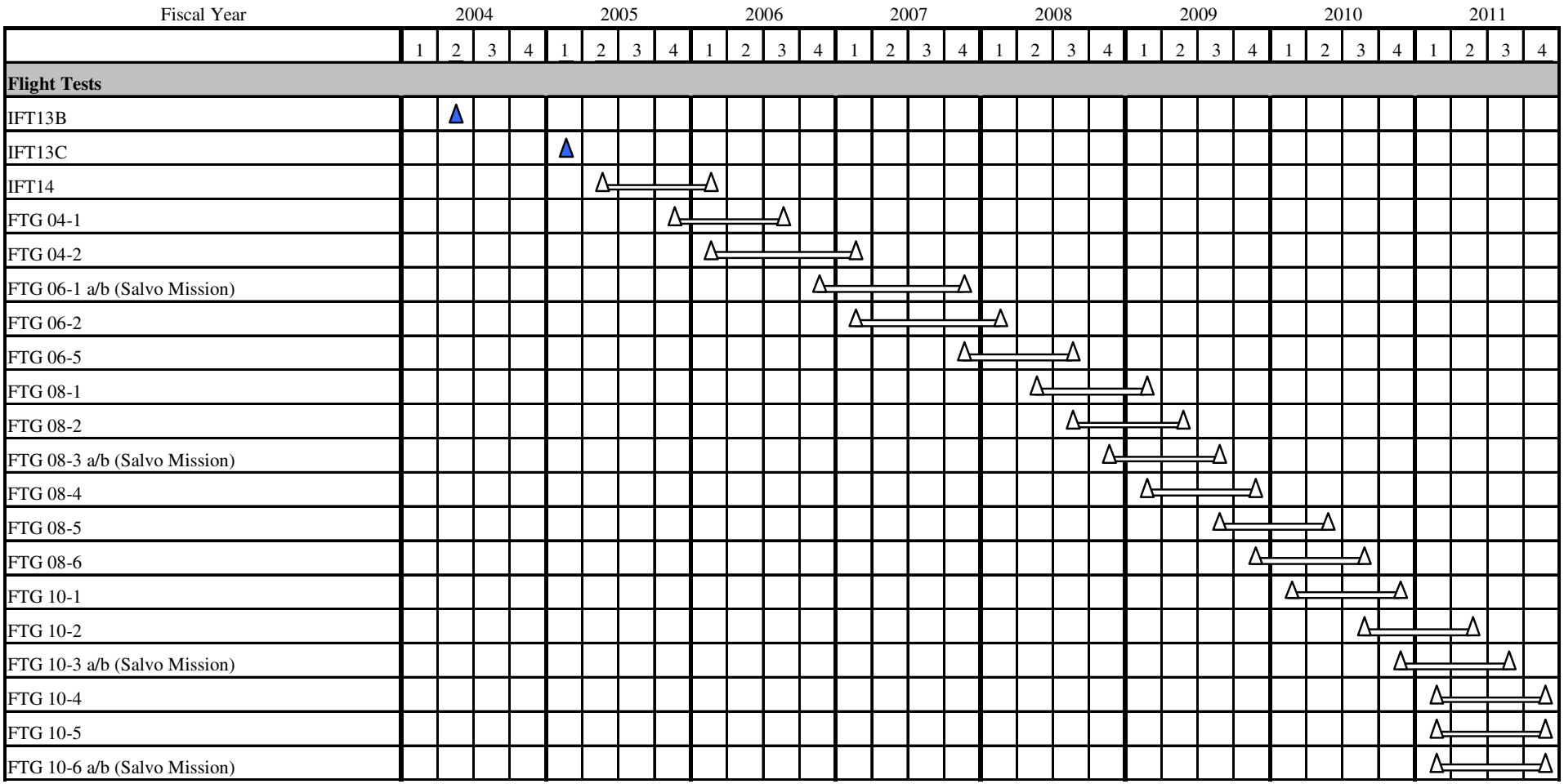
Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

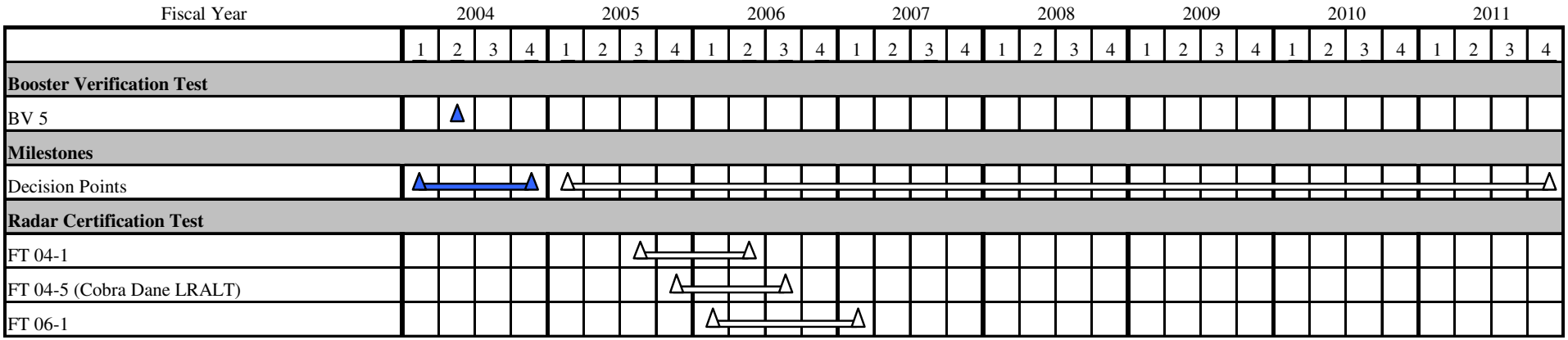
IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										
Remarks										
Project Total Cost			0	0		0		188,885		188,885
Remarks										

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**



Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**



Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Flight Tests								
IFT13B	2Q							
IFT13C		1Q						
IFT14		2Q-4Q	1Q					
FTG 04-1		4Q	1Q-3Q					
FTG 04-2			1Q-4Q	1Q				
FTG 06-1 a/b (Salvo Mission)			4Q	1Q-4Q				
FTG 06-2				1Q-4Q	1Q			
FTG 06-5				4Q	1Q-3Q			
FTG 08-1					2Q-4Q	1Q		
FTG 08-2					3Q-4Q	1Q-2Q		
FTG 08-3 a/b (Salvo Mission)					4Q	1Q-3Q		
FTG 08-4						1Q-4Q		
FTG 08-5						3Q-4Q	1Q-2Q	
FTG 08-6						4Q	1Q-3Q	
FTG 10-1							1Q-4Q	
FTG 10-2							3Q-4Q	1Q-2Q
FTG 10-3 a/b (Salvo Mission)							4Q	1Q-3Q
FTG 10-4								1Q-4Q
FTG 10-5								1Q-4Q
FTG 10-6 a/b (Salvo Mission)								1Q-4Q
Booster Verification Test								
BV 5	2Q							
Milestones								
Decision Points	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Radar Certification Test								
FT 04-1		3Q-4Q	1Q-2Q					
FT 04-5 (Cobra Dane LRALT)		4Q	1Q-3Q					
FT 06-1			1Q-4Q	1Q				

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0709 AEGIS Ballistic Missile Defense Block 2004	605,993	942,975	101,177	15,000	0	0	0	0
RDT&E Articles Qty	6	25	5	0	0	0	0	0

Note:
The following guidelines were used in counting the Aegis BMD RDT&E Articles:

- Missiles, targets, and ship modifications are shown in this budget exhibit in their fiscal year of delivery.
- Aegis BMD computer program deliveries are shown as a single unit delivery in the fiscal year the Engineering Assessment (EA) is conducted.
- SM-3 deployment missiles and shipsets are considered to be Block 04 if they deliver in CY04 or CY05.

Block 2004 funding is split between Research & Development and Deployment as follows:

Research & Development:

- FY04 $521.6M
- FY05 $709.4M
- FY06 $91.2M
- FY07 $0.0M

Deployment:

- FY04 $84.4M
- FY05 $233.6M
- FY06 $0.0M
- FY07 $0.0M

Operations & Support:

- FY04 $0.0M
- FY05 $0.0M
- FY06 $10.0M
- FY07 $15.0M

A. Mission Description and Budget Item Justification

The Aegis BMD mission is to deliver an enduring, operationally effective and supportable Ballistic Missile Defense Capability in Aegis cruisers and destroyers, in defense of the U.S., our deployed forces, allies and friends; to increase the effectiveness of the greater Ballistic Missile Defense System (BMDS) by creating synergy with other BMDS elements; and to incrementally increase this capability by delivering evolutionary spiral improvements as part of BMDS block upgrades.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

The Aegis BMD program is the sea-based element of the Ballistic Missile Defense System. Aegis BMD supports the BMDS mission of intercepting ballistic missiles in all regions, in all phases, and of all ranges, as follows:

- In all regions in locations within range of international waters by providing surveillance, tracking, and engagement capabilities. Japan, and possibly other countries, will deploy Aegis BMD.
- In all phases of ballistic missile flight: boost, midcourse, and terminal.
- Against all ranges:
  - Against long range ballistic missiles by providing surveillance and tracking support as part of the Block 04 Initial Defensive Operations (IDO).
  - Against short and medium range ballistic missiles by providing engagement support as part of Block 04.
  - Against intermediate range ballistic missiles by providing engagement support as part of Block 2006 and Block 2008.

Aegis BMD supports IDO 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 autonomous data and upon data received via the Tactical Digital Information Link Joint (TADIL-J) network. Through development and fielding of the Aegis BMD Signal Processor and upgrades to the SM-3 Block IA missile in Block 06/08, Aegis BMD will significantly improve discrimination capability and performance against more diverse and longer range threats.

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 cueing 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). In addition, Aegis BMD will be able to launch or engage with its SM-3 based on target data provided by external sensors.

The Aegis BMD Block 2004 program will:

- Defeat unitary and separating targets (SRBMs and MRBMs) with Aegis BMD configured cruisers and destroyers using STANDARD Missile -3 (SM-3 Blk I/IA) guided missiles.
- Provide Inter-Continental Ballistic Missile (ICBM) surveillance and track data through the BMDS to the GMD element to cue and initiate GMD fire control Weapons Task Plans.
- Expand the engagement battle space by using remote sensor data delivered via the TADIL-J network.
- Supply Aegis BMD operational data to the BMDS C2BMC Element to support Combatant Commander situational awareness.
- Provide a system that can be used operationally or as a testbed.

The Aegis BMD Block 2004 program develops three incremental capabilities:

- LRS&T (BMD 3.0E computer program) support as part of IDO;
- A preliminary engagement capability (BMD 3.0 with SM-3 Blk I) for test bed operations and for emergency use, if required; and
- A BMD capability that combines the engagement capability with the LRS&T capability integrated with the Navy's multi mission Aegis Combat System (BMD 3.1 with SM-3 Blk I/IA). The final Block 2004 is fully compliant with the Element Capability Specification.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Weapon System Engineering	555,149	819,193	91,177	0
RDT&E Articles (Quantity)	4	18	5	0

FY 2004 Accomplishments:

RDT&E Articles: SM-3 Guided Missiles (1), Aegis destroyers configured with BMD 3.0E (2), BMD 3.0E Computer Program (1)

Aegis Weapon System (AWS)

For Initial Defensive Operations (IDO) Long Range Surveillance and Track(LRS&T) Capability:

- Completed definition and verification of C2BMC requirements and objectives including BMDS interface control specifications for Aegis BMD to GMD engagement sequence group.
- Completed surveillance and tracking (SURV 1.2) testbed capability for initial BMDS test and data collection as a risk reduction to IDO.
  - Configured selected Aegis BMD destroyers with Surveillance and Tracking test configuration (SURV 1.2) for integrated flight tests and training.
  - Collected surveillance and tracking data, evaluated algorithms, and verified BMDS communications paths in IGT2 and PACEX II tests.
  - Conducted a live tracking event in a multiple warfare operational environment and exercised the Aegis BMD Weapon System role in supporting a BMDS Engagement Sequence in PACEX III.
- Delivered Long Range Surveillance & Tracking capability in support of BMDS IDO configuration.
  - Completed Common Data Link Management System (CDLMS) V3.3 development required to incorporate BMD data link functionality.
  - Integrated CDLMS V3.3 with BMD 3.0E to support Aegis BMD IDO Command and Control (C2) architecture.
  - Completed algorithm development and design coding of the BMD 3.0E computer program.
  - Completed Joint Tactical Terminal (JTT) integration with BMD 3.0E which provides the data path for space cues to Aegis BMD.
  - Completed Engineering Assessment (to formally characterize the performance of BMD 3.0E as the basis for government acceptance) and computer program authorization for BMD 3.0E.
  - Obtained concurrence for fielding and deployment of BMD 3.0E at the System Software Safety Technical Review Panel and Weapon System Explosive Safety Review Board reviews.
  - Installed BMD 3.0E on two operational Aegis destroyers, meeting the intent of National Security Presidential Directive (NSPD) 23.
  - Completed initial training, logistics and operational concept support necessary to support the IDO mission.
- Incorporated BMD 3.0E into the BMDS IDO configuration.
  - Provided tactical messages to assess BMDS performance during IGT-2 with BMD 3.0E functionality (high fidelity simulation) and IGT-4 with BMD 3.0E computer program.
  - Characterized and verified Aegis BMD interfaces and interoperability to BMDS during Missile Defense Integration Exercise (MDIE) 04A (SURV 1.2) and MDIE 04B (BMD3.0E).
  - Demonstrated Aegis BMD's role in a midcourse engagement sequence using BMD 3.0E during PACEX IV.

For emergency engagement capability:

- Completed Aegis LEAP Intercept (ALI) testbed for initial Aegis BMD engagement capability.
  - Configured Aegis cruiser for participation in FM-6.
- Neared completion of the Aegis BMD 3.0 computer program in preparation for a December 2004 Engineering Assessment.
- Conducted engineering test and evaluation and multi-element integration testing and verification of the BMD 3.0 computer program.
- Conducted BMD 3.0 Test Procedures Review (TPR) prior to commencing Combat Systems Engineering Development Site (CSEDS) testing.
- Began testing BMD 3.0 at CSEDS, integrating the computer program with a live radar.
- Completed BMD 3.0 ship installation designs.
- Initiated BMD 3.0 installation on one Aegis cruiser in support of FTM 04-1 (FM 7).

For Block 2004:

- Approved the BMD 3.1 system design at the successfully completed System Design Disclosure (SDD).
- Began computer program development of the BMD 3.1.
- Upgraded high fidelity simulation tools to BMD 3.1 functionality and performed system analysis to improve BMD 3.1 and BMDS capability.
- Developed plan for integration of CDLMS V3.4 into BMD 3.1 to accomplish multiple satellite paths (UHF, SHF, and EHF) for improved BMDS interoperability.
- Initiated BMD 3.1 ship installation design activities.
- Completed Joint Tactical Terminal ship installation plan for Block 04 cruisers.
- Assessed open multi-mission computer program issues and defined scope of effort for BMD 3.1 to enhance operational performance.
- To incorporate Short Range Ballistic Missile functions into BMD 3.1:
  - Implemented low exo-atmospheric intercept guidance control changes by developing ship system algorithms and software coding changes.
  - Modified models and simulation tools to support the Weapon System and SM-3 missile changes for the low exo-atmospheric intercept capability.
  - Modified SM-3 Third Stage Guidance Control and Rocket Motor pulse management algorithms to support the low exo-atmospheric intercept.

Vertical Launching System (VLS):

For emergency engagement capability:

- Addressed plans for the canister forward cover to support SM-3 Block I missiles at the Mk 41 VLS Phase I In-Process Review
- Completed Formal Qualification Testing of Mk 41 VLS computer program, Vertical Launching System/Global Positioning System Integration (VGI), and test equipment.
- Conducted Mk 41 VLS Phase I Critical Design Review for approval of VGI design, Mk 41 VLS software, and test requirements.
- Refurbished and procured Mk 21 Mod 2 canisters for SM-3 Blk I missiles.

For Block 2004:

- Addressed pressure and thermal requirements on the Mk 41 VLS and Mk 21 Mod 2 canister to support the deployment of the SM-3 guided missile.
- Demonstrated that the Mk 41 VLS upgrades support BMD 3.1 and the SM-3 missile at the Mk 41 VLS Phase II System Requirements Review.
- Approved proceeding to detailed design of the Mk 41 VLS Phase II at the Preliminary Design Review.

- Completed the engineering development for implementation of Selective Availability Anti-Spoofing Module (SAASM)/crypto key capability for the Vertical Launching System/Global Positioning System Integration (VGI) to support SM-3 requirements.
- Proceeding with VGI upgrades for SAASM/crypto and engineering development of VLS Phase 2 capability for ``any missile, any cell`` multi-mission capability.
- Identified circuit card assembly part obsolescence issues and developed mitigation plan.
- Initiated VLS/NAVSSI interface requirements in support of missile initialization requirements.

Missile:

For emergency engagement capability:

- Conducted ``permit-to-ship`` configuration review to qualify the SM-3 round to meet FM-6 test objectives.
- Demonstrated ability of SM-3 to intercept a ballistic missile with the Kinetic Warhead (KW) performing aimpoint shift during FM-6.
- Completed SM-3/VLS initial VGI integration testing to ensure interface integrity.
- Completed SM-3 Blk I Electromagnetic Interference (EMI) compliance testing for shipboard compatibility.
- Completed SM-3 Blk I In-Process Review (IPR) to review fabrication and assembly status.
- Continued Virtual Operational Missile (VOM) integration at CSEDS to verify missile-to-weapon system interfaces and integrity.
- Completed Hazard of Electronic Radiation on Ordnance (HERO) analysis for SM-3 Blk I configuration.
- Completed Hazard Assessment and Safety tests for SM-3 Blk I configuration (40 foot drop test, slow cook off, transportation, shipboard vibration, and temperature/humidity tests).
- Delivered all sections of five SM-3 Block I missiles to White Sands Missile Range (WSMR) for all-up-round assembly.
- Began fabrication of sections for an additional six SM-3 Blk I missiles
- Completed 80% of initial non-recurring engineering preparation for rate manufacturing of SM-3 components in Tucson AZ, Elkton MD, Canoga Park CA, Tempe AZ, and Camden AR.
- Completed first phase of missile assembly training for Camden Arkansas personnel.
- Initiated support of flight mission analysis (FTM 04-1) in preparation of Mission Control Panel concurrence
  - Completed pre-flight 6 degree of freedom and Monte Carlo performance analysis for FTM 04-1.

For Block 2004:

- Gained approval to continue with detailed design and ground tests of the pulse capable Solid Divert Attitude Control System (SDACS) at the completed SDACS Blk IA Preliminary Design Review (PDR).
- Initiated SM-3 hardware/software integration testing for Block 2004 capability.
- Completed SM-3 Blk IA performance assessment to support requirement compliance of the design.
- Supported the SM-2 Value Engineering Change Proposal (VECP) flight test analysis to incorporate VECPs into the SM-3 Blk IA to extend the SM-3 Blk IA the service life requirements.
- Completed the SM-3 Blk IA System Requirements Review (SRR) that delineated requirements flow from SM-3 ``All-Up-Round`` level to component level.
- Established a Joint Service Insensitive Munitions (IM) technical panel review approval process to obtain IM approval from the Joint Requirements Oversight Council (JROC).
- Completed the nosecone rain erosion test at Holloman AFB to ensure the nosecone meets system requirements.
- Completed most component level Critical Design Reviews (CDR) for the SM-3 Blk IA configuration to support the ``All-Up-Round`` CDR.
- Continued SM-3 ``All-Up-Round`` obsolete material replacement development effort.
- Completed End To End Distributed Development System (ETEDDS) link to Aegis Weapon System (at CSEDS) to verify interfaces and performance.
- Continued Third Stage Rocket Motor (TSRM) obsolete material replacement development and verification tests.
- Completed All-Up-Round design and construction modifications for extended shelf life.

- Initiated test equipment modifications and facility upgrades to expand missile delivery throughput.
- Procured long lead material for initial twelve Blk IA missiles with delivery beginning in FY06.

FY 2005 Planned Accomplishments:

RDT&E Articles: SM-3 Block 1 Missiles (8), BMD 3.0 Computer Program (1), Aegis BMD Cruiser (2), Surveillance and Tracking Aegis Destroyers (7)
Aegis BMD Weapon System:

For Initial Defensive Operations(IDO)(LRS&T Capability):

- Install BMD 3.0E LRS&T capability on seven (7) additional Aegis destroyers.
- Continue crew training in support of installations.
- Monitor the operational performance of the BMD 3.0E computer program.
  - Identify, prioritize, and develop plans to incorporate changes in final Block 04 delivery.
  - Respond to Fleet issues
- Participate in Aegis BMD and other BMDS test events to collect and analyze ballistic missile tracking data.
- Update C2BMC interface control specifications requirements with other elements of the BMDS.

For emergency engagement capability:

- Complete and deliver the emergency engagement capability, BMD 3.0.
  - Complete testing BMD 3.0 at the Combat Systems Engineering Development Site (CSEDS).
  - Obtain concurrence for fielding and deployment of BMD 3.0 at the System Software Safety Technical Review Panel and Weapon System Explosive Safety Review Board reviews.
  - Conduct BMD 3.0 Engineering Assessment to formally characterize the performance of BMD 3.0 as the basis for government acceptance.
  - Complete authorization of BMD 3.0 computer program.
  - Complete BMD 3.0 installations on two (2) cruisers for testbed and potential deployment.
- Conduct waterfront integration testing.
- Achieved Integrated Logistic Support (ILS) Certification for BMD 3.0.
- Conduct crew training for operation and maintenance of BMD 3.0.
- Characterize operational performance of BMD 3.0 in an At-Sea Demonstration.

For Block 2004:

- Collect data on separating targets, develop algorithm modifications, and test of the BMD 3.1 computer program in advance of an FY06 Engineering Assessment.
- Begin multi-element integration and testing of BMD 3.1.
- Begin CSEDS testing of BMD 3.1 and prepare for the Engineering Assessment.
- Improve C2BMC interface control specifications requirements with other BMDS elements.
- Complete trade study of a tactical missile-to-ship telemetry receiving system to support real time Kill Assessment.
- Complete risk reduction for integration of CDLMS 3.4 into BMD 3.1 to accomplish multiple satellite data paths (UHF, SHF, and EHF) for improved BMDS interoperability.
- Completed BMD 3.1 ship installation design effort.

- Complete modifications to engagement models and simulations to account for the low exo-atmospheric intercept firing test.
- Achieved Integrated Logistic Support (ILS) certification for BMD 3.1.

Vertical Launching System (VLS):

For emergency engagement capability:

- Conduct Mk 41 VLS Phase I system ground tests.
- Install the Mk 41 VLS Phase I modifications to support flight missions.
- Procure Mk 21 Mod 2 VLS canisters for SM-3 Blk I missiles.

For Block 2004:

- Conduct Mk 41 VLS Phase II Critical Design Review (BMD 3.1).
- Complete development of a multi-mission Mk 41 VLS capability as part of BMD 3.1.
- Conduct ground tests of Aegis BMD multi-mission Mk 41 VLS capability.
- Continue circuit card assembly re-design for parts obsolescence.
- Complete Mk 41 VLS Ordnance Alteration Kits.
- Procure Mk 21 Mod 2 VLS canisters for SM-3 Blk IA missiles.
- Complete VLS/NAVSSI Interface design effort

Missile:

For emergency engagement capability:

- Participate in Flight missions with SM-3 Blk I missiles.
  - Complete Pre-Flight analysis to verify scenarios and performance assessment.
  - Prepare and complete missile delivery package for the Mission Control Panel reviews.
  - Perform Post-Flight analysis to validate high fidelity simulations.
  - Conduct post test analysis to support Mission Data Reviews (MDRs).
  - Perform analysis and required update changes to SM-3 Blk I Hardware/Software (HW/SW) based on FTM results.
- Perform analysis to support Block 2004 capability assessments required to support BMDS level capability reviews.
- Validate interface compliance for missile pre-launch and in-flight support by completing weapon systems integration testing at CSEDS
- Deliver the five SM-3 Blk I Initial Deployment Rounds.
- Complete assembly and deliver three additional SM-3 Blk I missiles initiated in FY 2004. The remaining three Blk I missiles will be delivered in FY 2006

For Block 2004:

- Complete 90% of SM-3 Blk IA HW/SW integration testing to validate requirement for electrical and mechanical interfaces.
- Conduct SM-3 Blk IA Hazard Assessment and Safety compliance tests. (bullet impact and fragment impact)
- Complete SM-3 Blk IA HERO Test.
- Complete SM-3 Value Engineering Change Proposal (VECP) implementation efforts to ensure service life requirement compliance.
- Conduct SM-3 Blk IA design verification tests (i.e., Live Battery, Battery Qualification, EMI etc) to ensure design requirement compliance and margin assessment.
- Complete Third Stage Rocket Motor obsolete material replacement design verification tests.
- Complete SDACS pulse capability engineering, design verification and qualification (environment and safety) tests.
- Gain approval to proceed with the SM-3 Blk IA hardware/software development by completing the Critical Design Review (CDR).
- Continue to monitor ``All-Up-Round`` obsolete material replacement effort.
- Complete initial non-recurring engineering preparation for rate manufacturing of SM-3 components in Tucson AZ, Elkton MD, Canoga Park CA, Tempe AZ, and Camden AR.
- Begin fabrication of sections for first 12 SM-3 Blk IA missiles.
- Procure Long Lead Material (LLM) for additional SM-3 Blk IA Missiles.

FY 2006 Planned Program:

RDT&E articles: Aegis DDGs configured with BMD 3.0E (1), Aegis BMD 3.1 CG (1), SM-3 Blk I missiles (2), SM-3 Blk IA missile (1).

Aegis BMD Weapon System:

For LRS&T:

- Install BMD 3.0E (LRS&T) on one (1) Aegis Destroyer
- Monitor the operational performance of the BMD 3.0E LRS&T Aegis destroyers.
- Participate in Aegis BMD flight missions and other BMDS test events.

For emergency engagement capability:

- Install BMD 3.1 on one (1) Aegis Cruiser
- Provide BMD 3.0 support on operational Aegis cruisers for testbed operations and emergency deployment.

For Block 2004:

- Complete development of BMD 3.1 Weapon System.
  - Complete integration of CDLMS V3.4 into BMD 3.1 to accomplish multiple satellite data paths (UHF, SHF, and EHF) for improved BMDS interoperability.
  - Complete multi-element integration and testing of BMD 3.1.
  - Formally characterize the performance of BMD 3.1, as the basis for government acceptance, by conducting the BMD 3.1 Engineering Assessment. (Actual delivery occurs in CY06, and is captured under Block 2006, Project 0809).

- Gain approval for fielding BMD 3.1 at the SSSTRP and WSESRB reviews.
- Conduct waterfront integration testing of BMD 3.1.
- Conduct At-Sea Demonstration of BMD 3.1 to characterize operational performance.
- Participate in Flight Mission to demonstrate the low exo-atmospheric intercept capability.
- Participate in other Aegis BMD flight missions and other BMDS test events.
- Continue to participate in the improvement of C2BMC interface control specifications requirements with other BMDS elements.
- Achieve Integrated Logistic Support (ILS) support for BMD 3.1 Aegis Destroyers
- Install engineering load of the BMD 3.1 computer program on an Aegis cruiser to support a missile firing as part of the certification of BMD 3.1

Vertical Launching System:

Emergency engagement capability:

- Provide BMD 3.0 support on operational Aegis cruisers for testbed operations and emergency deployment.
- Support Mk 41 VLS Phase I software and hardware during the transition to Mk 41 VLS Phase II implementation.

Block 2004:

- Test the Mk 41 VLS Phase II system in ground tests.
- Field the Mk 41 VLS Phase II to support SM-3 Blk IA missile deployments and implement the ``any missile, any cell`` multi-mission capability.

Missile:

For Block 2004:

- Participate in FTM 06-1 (FM-10) and FTM 06-3 (FM-11)
  - Complete Pre-Flight analysis to verify scenarios and performance assessment.
  - Prepare and complete missile delivery package for the Mission Control Panel reviews.
  - Perform Post-Flight analysis to validate high fidelity simulations.
  - Conduct post test analysis to support Mission Data Reviews (MDRs)
  - Perform analysis and required update changes to SM-3 Blk I Hardware/Software (HW/SW) based on FTM results.
- Complete SM-3 Blk IA Hazard Assessment and Safety compliance tests.
- Complete SM-3 Blk IA design verification tests (i.e., Live Battery, Battery Qualification, EMI etc) to ensure design requirement compliance and margin assessment.
- Complete test equipment modifications and facility upgrades to expand missile delivery throughput.
- Monitor All Up Round obsolete material replacement effort.
- Complete assembly and delivery of two (2) SM-3 Blk I missiles and the first SM-3 Blk IA missile

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

FY 2007 Planned Program:

Aegis BMD Weapon System:

For Block 2004:

- Participate in Aegis BMD flight missions and other BMDS test events.
- Monitor the operational performance of BMD 3.1 Weapon System, if necessary.
- Respond to Fleet issues.

	FY 2004	FY 2005	FY 2006	FY 2007
Test & Evaluation	50,844	123,782	0	0
RDT&E Articles (Quantity)	2	7	0	0

FY 2004 Accomplishments:

RDT&E Articles: Targets/Aegis Readiness Assessment Vehicles (ARAVs) (2)

- Acquired one Group A (SRBM) target for FM-6.
- Conducted FM-6 flight test. Evaluated Aegis BMD support of BMDS engagement capabilities:
  - AWS capability against a Group A target using an SM-3 Block 0 missile.
  - LRS&T support to the BMDS from Aegis cruisers and destroyers.
- Conducted PACEX II to verify TADIL J connectivity between an Aegis destroyer and BMDS. Exercised operational aspects of LRS&T mission using high fidelity LRBM targets and actual fleet forces.
- Procured an ARAV for PACEX III.
- Participated in PACEX III flight mission using an Aegis destroyer with SURV 1.2 to detect and track Ballistic Missiles (simulated), pass Launch Point data via TADIL J, and provide Ballistic Missile Tracks/Status to BMDS and other tactical data link participants.
- Conducted Glory Trip 185.
  - Proved the capability to search and track a long-range multi-stage target;
  - Transmitted track data to BMDS and the Missile Defense Communication and Operations Node (MIDCON) using the LINK 16 tactical data communications network to support the generation of a fire control solution by the GMD fire control system.
- Conducted PACEX IV.
  - Tested the BMDS midcourse engagement sequence functionality using BMD 3.0E.
  - Demonstrated the IDO Aegis destroyer could pass simulated space tracks to other BMDS elements.
- Conducted Missile Defense Integration Exercises (MDIEs) to characterize and verify BMDS interfaces and interoperability with the SURV 1.2 computer program (in MDIE 04A) and BMD 3.0E (in MDIE 04B).
- Initiated acquisition of targets for future flight test operations.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

- FY 2005 Planned Accomplishments:

RDT&E Articles: Targets/ARAVs (7)

- Acquire 1 Group A (SRBM) target for FTM 04-1(FM-7), 1 Group B (MRBM) target for FTM 04-2 (FM-8), 1 Group B target for FTM 04-3 (FM-9), and 4 ARAVs for the At-Sea Demonstration 3.0 test event.
- Conduct STELLAR DRAGON campaign consisting of FTM 04-1, and At-Sea Demonstration 3.0:
  - Participate in an ARAV Group A simulated engagement to verify BMD 3.0 ability to track.
  - Conduct FTM 04-1 (FM-7) flight test to verify BMD 3.0 emergency engagement capability with an intercept of a Group A target using an SM-3 Blk I missile.
  - Participate in At-Sea Demonstration 3.0 flight mission using an Aegis destroyer (BMD 3.0E) and Aegis cruiser (BMD 3.0) in a Multi-Warfare Environment. The mission will simulate multiple Group A engagements and a Group B engagement concurrent with exercising Aegis Combat System capabilities in other warfare areas.
- Conduct FTM 04-2 (FM-8) and FTM 04-3 (FM-9) flight tests to verify BMD 3.0 intercept of a Group B target.
- Conduct IFT-13C flight mission, using an Aegis destroyer to provide target-tracking data to other BMDS elements.
- Conduct planning for IFT-14 flight mission, using an Aegis destroyer to provide target-tracking data to other BMDS elements and the SM-3 Kinetic Warhead IR Seeker Captive Carry Test Bed in support of BMDS integration.
- Participate in FTG 04-4a/b (IFT-17/18) flight test, using an Aegis destroyer and/or Aegis cruiser to exercise the system for an IDO threat.
- Conduct Glory Trip 188 LRS&T test event. Will verify the AWS capability to search, detect, and track a long-range multi-stage target; and transmit data using satellite Link 16 to BMDS.

	FY 2004	FY 2005	FY 2006	FY 2007
Operations & Support	0	0	10,000	15,000
RDT&E Articles (Quantity)	0	0	0	0

FY 2006 Planned Program:

- Provide In-Service Engineering support to Aegis BMD elements: including the Aegis Weapon System, SM-3, 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) for the Aegis BMD elements: including the Aegis Weapon System, SM-3, and Vertical Launching System.

FY 2007 Planned Program:

- Provide In-Service Engineering support to Aegis BMD elements: including the Aegis Weapon System, SM-3, 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) for the Aegis BMD elements: including the Aegis Weapon System, SM-3, and Vertical Launching System.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

D. Acquisition Strategy

The Aegis BMD element will follow the MDA's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks. The Department has implemented a missile defense acquisition strategy using a multi-path approach to assure that the most effective missile defense is available at the earliest possible time. The Aegis BMD element acquisition approach supports evolutionary development, continuously building upon demonstrated capabilities to advance the BMDS capabilities. After considering all the technical and management aspects of the program and to meet the requirements presented by the 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 Aegis Weapon System, respectively.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Weapon System Engineering										
AWS	SS/CPIF	Lockheed Martin/ NJ	133,700	190,985	2Q	63,410	1Q	0	N/A	388,095
AWS	FFRDC	MIT/LL/ MA	2,475	2,850	2Q	0	N/A	0	N/A	5,325
AWS	SS/CPFF	JHU/APL/ MD	1,825	5,775	1Q	0	N/A	0	N/A	7,600
AWS	MIPR	NSWC/DD/ VA	11,515	17,321	1Q	4,309	1Q	0	N/A	33,145
AWS	MIPR	MITRE/ VA	550	850	1Q	0	N/A	0	N/A	1,400
AWS	MIPR	NSWC/PHD/ CA	4,855	8,969	1Q	1,380	1Q	0	N/A	15,204
AWS		MDA	1,747	11,839	1Q	2,070	1Q	0	N/A	15,656
AWS	Various	VARIOUS	6,313	12,703	1Q	0	N/A	0	N/A	19,016
MISSILE	SS/CPIF	RAYTHEON/ AZ	286,512	418,125	2Q	17,917	1Q	0	N/A	722,554
MISSILE	SS/CPIF	JHU/APL/ MD	9,905	11,788	2Q	303	2Q	0	N/A	21,996
MISSILE	FFRDC	MIT/LL/ MA	1,000	650	1Q	0	N/A	0	N/A	1,650
MISSILE	MIPR	NSWC/DD/ VA	5,942	10,725	1Q	380	1Q	0	N/A	17,047
MISSILE	MIPR	NSWC/PHD/ CA	5,650	4,015	1Q	217	1Q	0	N/A	9,882
MISSILE	MIPR	WSMR/ NM	0	1,642	1Q	306	1Q	0	N/A	1,948

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
MISSILE	MIPR	NSWC/CD/ CA	2,550	1,618	2Q	0	N/A	0	N/A	4,168
MISSILE	MIPR	NSWC/IH/ MD	1,463	1,550	2Q	0	N/A	0	N/A	3,013
MISSILE	MIPR	NAWC/CL/ CA	855	900	1Q	0	N/A	0	N/A	1,755
MISSILE		MDA/ VA	1,559	23,117	1Q	577	1Q	0	N/A	25,253
MISSILE	Various	VARIOUS/ VARIOUS	4,073	2,207	1Q	308	1Q	0	N/A	6,588
Subtotal Product Development			482,489	727,629		91,177		0		1,301,295

Remarks

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Weapon System Engineering										
	SS/CPFF	JHU/APL/ MD	6,634	1,268	2Q	0	N/A	0	N/A	7,902
	SS/CPAF	Lockheed Martin/ NJ	3,000	7,500	2Q	0	N/A	0	N/A	10,500
	MIPR	NSWC/DD/ VA	4,249	7,075	1Q	0	N/A	0	N/A	11,324
	MIPR	NSWC/PHD/ CA	2,707	4,100	1Q	0	N/A	0	N/A	6,807
	MIPR	SPAWAR/ CA	3,484	1,250	1Q	0	N/A	0	N/A	4,734

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603882C Ballistic Missile Defense Midcourse Defense Segment

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
		MDA	811	1,678	1Q	0	N/A	0	N/A	2,489
	MIPR	NAVSEA/ DC	0	3,700	1Q	0	N/A	0	N/A	3,700
	MIPR	SupShip Pascagoula/ MS	525	4,110	1Q	0	N/A	0	N/A	4,635
	MIPR	SupShip Bath/ ME	265	1,700	1Q	0	N/A	0	N/A	1,965
	MIPR	VARIOUS/SSES Philadelphia/ VARIOUS	0	220	1Q	0	N/A	0	N/A	220
Operations & Support										
AWS	MIPR	NSWC/DD/ VA	0	0	N/A	2,500	1Q	3,750	1Q	6,250
AWS	MIPR	NSWC/PHD/ CA	0	0	N/A	2,500	1Q	3,750	1Q	6,250
Missile	MIPR	NSWC/DD/ VA	0	0	N/A	2,500	1Q	3,750	1Q	6,250
Missile	MIPR	NSWC/PHD/ CA	0	0	N/A	2,500	1Q	3,750	1Q	6,250
Subtotal Support Costs			21,675	32,601		10,000		15,000		79,276

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Test & Evaluation										
	MIPR	PMRF/ HI	2,060	9,942	1Q	0	N/A	0	N/A	12,002
	C/CPFF	HTS/ CA	1,750	1,540	2Q	0	N/A	0	N/A	3,290
	SS/CPAF	Xontech/ CA	122	2,000	2Q	0	N/A	0	N/A	2,122
	MIPR	NSWC/PHD/ CA	3,479	8,077	1Q	0	N/A	0	N/A	11,556
	MIPR	NAWC/PM/ CA	1,372	6,775	1Q	0	N/A	0	N/A	8,147
	MIPR	NSWC/Corona/ CA	1,034	3,550	1Q	0	N/A	0	N/A	4,584
	MIPR	NSWC/DD/ VA	6,141	14,165	1Q	0	N/A	0	N/A	20,306
	MIPR	CINPACFLT/ HI	0	2,650	1Q	0	N/A	0	N/A	2,650
	SS/CPFF	JHU/APL/ MD	7,315	12,767	2Q	0	N/A	0	N/A	20,082
	MIPR	SMDC/ AL	260	4,410	1Q	0	N/A	0	N/A	4,670
	MIPR	SPAWAR/ CA	1,113	6,004	1Q	0	N/A	0	N/A	7,117
	MIPR	DOI/ DC	0	1,210	1Q	0	N/A	0	N/A	1,210
	MIPR	MDAO	17,300	32,000	1Q	0	N/A	0	N/A	49,300
	Various	VARIOUS/ VARIOUS	1,668	6,945	1Q	0	N/A	0	N/A	8,613

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
	MIPR	WSMR/ CA	5,685	5,350	1Q	0	N/A	0	N/A	11,035
		MDA	0	6,397	1Q	0	N/A	0	N/A	6,397
Subtotal Test and Evaluation			49,299	123,782		0		0		173,081

Remarks

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Weapon System Engineering										
		NAVSEA/ DC	13,000	13,435	1Q	0	N/A	0	N/A	26,435
	SS/CPFF	JHU/APl/ MD	1,569	1,265	2Q	0	N/A	0	N/A	2,834
	MIPR	NSWC/DD/ VA	1,065	1,333	1Q	0	N/A	0	N/A	2,398
	C/CPFF	Anteon/ VA	22,100	24,649	1Q	0	N/A	0	N/A	46,749
	SS/CPFF	Paradigm/ VA	2,425	1,750	1Q	0	N/A	0	N/A	4,175
	SS/CPAF	Lockheed Martin/ NJ	700	1,000	1Q	0	N/A	0	N/A	1,700
	SS/CPAF	Raytheon/ AZ	1,000	1,000	2Q	0	N/A	0	N/A	2,000
		MDA	5,101	9,821	1Q	0	N/A	0	N/A	14,922
	Various	Various/ Various	5,570	2,947	1Q	0	N/A	0	N/A	8,517

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603882C Ballistic Missile Defense Midcourse Defense Segment

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
		MDA (Salaries)	0	1,763	1Q	0	N/A	0	N/A	1,763
Subtotal Management Services			52,530	58,963		0		0		111,493
Remarks										
Project Total Cost			605,993	942,975		101,177		15,000		1,665,145
Remarks										

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603882C Ballistic Missile Defense Midcourse Defense Segment

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Testing Milestones																																
Pacific Explorer III				▲																												
At-Sea Demo 3.0 (Concurrent with FM-7)						△																										
At-Sea Demo 3.1											△																					
SM-3 Blk I Hazard Assessment and Safety Test			▲																													
SM-3 Blk I HERO Test				▲																												
SM-3 Blk IA HERO Test								△																								
PACEX IV				▲																												
Third Stage Rocket Motor DVT-2			▲																													
Third Stage Rocket Motor DVT-3						△																										
MDIE 04b				▲																												
Manufacturing Processes and Advanced Materials																																
Aegis BMD FM 6 configuration	▲																															
Block 04 Computer Program 3.0E				▲																												
Block 04 Computer Program 3.0						△																										
Aegis BMD FTM 04-1 configuration						△																										
Flight Tests																																
FM-6	▲																															
FTM 04-1 (FM-7)						△																										
FTM 04-2 (FM-8)							△																									
FTM 04-3 (FM-9)								△																								

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Integrated Flight Test																																
IFT 13C					▲																											
IFT 14					△	△																										
FT-04-1					△	△	△	△																								
Development Milestones																																
Block 04 Critical Design Review Report	▲																															
VLS 3.0 Critical Design Review		▲																														
VLS 3.1 Preliminary Design Review			▲																													
VLS 3.1 Critical Design Review					▲																											
BMD 3.0E Engineering Assessment				▲																												
BMD 3.0 M&S Performance Assessment						△																										
BMD 3.0 Engineering Assessment					▲																											
BMD 3.1 System Design Disclosure		▲																														
BMD 3.1 Engineering Assessment										△																						
SM-3 Blk IA SDACS Preliminary Design Review			▲																													
SM-3 Block IA Critical Design Review					▲																											
Fielding Deliveries/Ships																																
Engagement Cruisers (3.0)					△	△	△	△	△	△																						
Long Range Surveillance & Tracking DDGs (3.0E)				▲	▲	△	△	△																								
Fielding Deliveries/Missiles																																
Block I Missiles							△	△	△																							
Accelerated Block I Missiles					▲																											
Block 1A Missiles									△																							

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Testing Milestones								
Pacific Explorer III	4Q							
At-Sea Demo 3.0 (Concurrent with FM-7)		2Q						
At-Sea Demo 3.1			3Q					
SM-3 Blk I Hazard Assessment and Safety Test	3Q							
SM-3 Blk I HERO Test	4Q							
SM-3 Blk IA HERO Test		4Q						
PACEX IV	4Q							
Third Stage Rocket Motor DVT-2	3Q							
Third Stage Rocket Motor DVT-3		2Q						
MDIE 04b	4Q							
Manufacturing Processes and Advanced Materials								
Aegis BMD FM 6 configuration	1Q							
Block 04 Computer Program 3.0E	4Q							
Block 04 Computer Program 3.0		2Q						
Aegis BMD FTM 04-1 configuration		2Q						
Flight Tests								
FM-6	1Q							
FTM 04-1 (FM-7)		2Q						
FTM 04-2 (FM-8)		3Q						
FTM 04-3 (FM-9)		4Q						
Integrated Flight Test								
IFT 13C		1Q						
IFT 14		1Q-2Q						
FT-04-1		1Q-4Q						
Development Milestones								
Block 04 Critical Design Review Report	1Q							
VLS 3.0 Critical Design Review	2Q							
VLS 3.1 Preliminary Design Review	3Q							
VLS 3.1 Critical Design Review		1Q						
BMD 3.0E Engineering Assessment	4Q							
BMD 3.0 M&S Performance Assessment		2Q						

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
BMD 3.0 Engineering Assessment		1Q						
BMD 3.1 System Design Disclosure	2Q							
BMD 3.1 Engineering Assessment			2Q					
SM-3 Blk IA SDACS Preliminary Design Review	3Q							
SM-3 Block IA Critical Design Review		1Q						
Fielding Deliveries/Ships								
Engagement Cruisers (3.0)		1Q-4Q	1Q-2Q					
Long Range Surveillance & Tracking DDGs (3.0E)	4Q	1Q-4Q						
Fielding Deliveries/Missiles								
Block I Missiles		3Q-4Q	1Q					
Accelerated Block I Missiles		1Q						
Block 1A Missiles			1Q					

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0809 AEGIS Ballistic Missile Defense Block 2006	24,418	121,494	574,766	546,817	69,000	15,000	0	0
RDT&E Articles Qty	0	0	25	27	8	0	0	0

Note:
The following guidelines were used in counting the Aegis BMD RDT&E Articles:

- Missiles, targets, and ship modifications are shown in this budget exhibit in their fiscal year of delivery.
- Aegis BMD computer program deliveries are shown as a single unit delivery in the fiscal year the Engineering Assessment (EA) is conducted. .
- SM-3 missiles and shipsets are considered to be Block 2006 if they deliver in CY06 or CY07.

Block 2006 funding is split between Research & Development and Deployment as follows:

Research & Development:

- FY04 $24.4M
- FY05 $83.5M
- FY06 $439.8M
- FY07 $484.8M
- FY08 $54.0M
- FY09 $0.0M

Deployment:

- FY04 $0.0M
- FY05 $38.0M
- FY06 $135.0M
- FY07 $62.0M
- FY08 $0.0M
- FY09 $0.0M

Operations & Support:

- FY04 $0.0M
- FY05 $0.0M
- FY06 $0.0M
- FY07 $0.0M
- FY08 $15.0M
- FY09 $15.0M

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

A. Mission Description and Budget Item Justification

The Aegis BMD mission is to deliver an enduring, operationally effective and supportable Ballistic Missile Defense Capability in Aegis cruisers and destroyers, in defense of the U.S., our deployed forces, allies and friends; to increase the effectiveness of the greater Ballistic Missile Defense System (BMDS) by creating synergy with other BMDS elements; and to incrementally increase this capability by delivering evolutionary spiral improvements as part of BMDS block upgrades.

The Aegis BMD program is the sea-based element of the Ballistic Missile Defense System. Aegis BMD supports the BMDS mission of intercepting ballistic missiles in all regions, in all phases, and of all ranges, as follows:

- In all regions in locations within range of international waters by providing surveillance, tracking, and engagement capabilities. Japan, and possibly other countries, will deploy Aegis BMD.
- In all phases of ballistic missile flight: boost, midcourse, and terminal.
- Against all ranges:
  - Against long range ballistic missiles by providing surveillance and tracking support as part of the Block 2004 Initial Defensive Operations (IDO).
  - Against short and medium range ballistic missiles by providing engagement support as part of Block 2004.
  - Against intermediate range ballistic missiles by providing engagement support as part of Block 2006 and Block 2008.

Aegis BMD supports IDO 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 Joint (TADIL-J) network. Through development and fielding of the Aegis BMD Signal Processor and upgrades to the SM-3 Block IA missile in Block 06/08, Aegis BMD will significantly improve discrimination capability and performance against more diverse and longer range threats.

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 cueing 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). In addition, Aegis BMD will be able to launch or engage with its SM-3 based on target data provided by external sensors.

Aegis BMD Block 2006 will continue the evolutionary spiral development of Block 2004 to enhance support of the BMDS missions of intercepting ballistic missiles in all regions, all phases, and all ranges.

AN/SPY-1 radar capability will be enhanced with the development of an Aegis BMD Signal Processor (BSP) that will improve remote tracking capability for BMDS as well as provide enhanced local engage capability against more robust threats.

Missile improvements include introduction of seeker All-Reflective-Optics-Optics (ARO) and a Kinetic Warhead Advanced Signal Processor (ASP) to mitigate diminished manufacturing source issues in SM-3 Blk IA missiles. Additionally, the increase 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.

Block 06 development is focused on enhancing BMDS engagement sequence support. Aegis BMD Block 2006 will:

- Defeat unitary and separating targets: Short Range Ballistic Missiles (SRBM), Medium Range Ballistic Missiles (MRBM), and Intermediate Range Ballistic Missiles (IRBM) with Aegis BMD configured cruisers, destroyers and STANDARD Missile-3 (SM-3) Blk IA) guided missiles.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

- Expand the battle space from the Block 2004 capability by developing the capability to launch an SM-3 missile based on track data received from remote sensors.
- Provide improved Inter-Continental Ballistic Missile (ICBM) surveillance and track data through the BMDS to GMD fire control for radar cueing and development of early fire control solutions. Provide improved ballistic missile target tracking, discrimination, and object classification via the Aegis Weapon System BSP's Engineering Development Model (EDM) high resolution medium frequency band tracker and synthetic wide band surface feature discrimination AN/SPY-1 Radar modifications.
- Support additional engagement scenarios against MRBMs and IRBMs using remote track data from other forward deployed BMDS Elements.
- Within Block 2006, Aegis BMD will install the BMD 3.1 engagement capability on additional Aegis destroyers and procure 40 additional SM-3 Blk IA missiles.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Weapons System Engineering	24,418	119,394	475,920	430,017
RDT&E Articles (Quantity)	0	0	14	24

FY 2004 Accomplishments:

Aegis BMD Weapon System:

- Transitioned the radar High Range Resolution (HRR) wideband signal processing efforts into the real-time Aegis BMD Signal Processor (BSP).
- Completed fabrication and started incremental testing of an Advanced Development Model (ADM) of the AN/SPY-1 BMD Signal Processor (BSP).
- Demonstrated real time enhanced S-Band tracking, discrimination feature extraction, and target designation.
- Commenced definition of Block 06 engagement coordination methods, integration and capabilities including engagement coordination among BMDS elements.
- Supported performance capability assessment engineering.
- Conducted real-time synthetic wideband feature extraction as future system risk reduction activities.
- Conducted Wideband Static Image Display Demonstration.
- Conducted an Engineering Evaluation of the Aegis BSP.

FY 2005 Planned Accomplishments:

Aegis BMD Weapon System:

- Begin improvements to ballistic missile tracking, characterization, discrimination, feature extraction, object classification, and kill assessment as a part of the Aegis BSP work, to include:
  - Real-time feature extraction capability and classification algorithm development
  - Incremental and at-sea testing of the Aegis BSP Advanced Development Model
- Commence development of BMD 6.1.
  - Commence top level requirements flow down for Block 2006 Aegis Combat System design .
  - Commence detailed design for Aegis components: SPY radar system, command and control system, weapons control system, and mission planning system.
- Undertake S-Band Advanced Radar (SBAR) algorithm research and analysis in the areas of digital signal processing, radio frequency processing, systems engineering, and radar control processing.

- Commence Aegis BMD Multi-Asset Planning in support of Joint Defense Planner.
- Begin definition, planning, and initial implementation of Aegis BMD Link certification requirements.

Missile:

- Continue Pre-flight analysis support for Block 06 related Flight Mission Planning Analysis.
- Monitor parts obsolescence replacement material engineering.
- Review data analysis and requirements changes to update, as required, missile changes to pace threat and weapon system changes.
- Initiate IR discrimination risk reduction and algorithm development.
- Conduct Design Verification Tests (DVTs) of All Reflective Optics (AROs) and integrate into the Kinetic Warhead in preparation for FY06 and FY07 flight tests as a risk reduction effort for the particle anomaly observed in previous flight missions.
- Fabricate generation two Advanced Signal Processor (ASP) and conduct computer-in-the-loop and hardware-in-the-loop testing for improved missile discrimination and to mitigate diminished manufacturing source issues.
- Initiate ARO/ASP Kinetic Warhead integration testing to verify Aegis BMD performance against requirements.
- Initiate Block 2006 Element Capability Specifications (ECS) requirements analysis for flow down to missile top-level requirements.
- Initiate Block 2006 capability performance assessment studies for SM-3 Blk IA.
- Review manufacturing practices to lower unit cost of SM-3 Blk IA via improved manufacturing processes/changes.
- Procure long lead material for Blk IA missiles with delivery beginning in FY07.

FY 2006 Planned Program:

RDT&E Articles: BMD 3.1 Computer Program (1), BMD 3.0 Aegis Cruiser (1), BMD 3.1 Aegis Cruiser (1), BMD 3.0E Surveillance and Tracking Aegis Destroyers (2), BMD 3.1 engage Aegis Destroyers (2), SM-3 Block I Missiles (1), SM-3 Block IA Missiles (6)

Aegis BMD Weapon System:

- Install BMD 3.0E on two (2) Aegis Destroyers. (Actual shipsets for all BMD 3.0E destroyers will be completed in FY06. Remaining ship installations are based on projected ship availability).
- Install BMD 3.0 on one (1) Aegis Cruiser
- Formally accept BMD 3.1 computer program following the successful Engineering Assessment conducted as part of Block 2004, Project 0709.
- Initiate installation of BMD 3.1 on Aegis Cruisers and Aegis Destroyers.
- Install BMD 3.1 on one (1) Aegis Cruiser and two (2) Aegis Destroyers.
- Improve ballistic missile tracking, characterization, discrimination, feature extraction, object classification, and kill assessment as a part of the Aegis BSP work, to include:
  - Real-time feature extraction capability and classification algorithm development.
  - Incremental and at-sea testing of the BSP Advanced Development Model.
- Complete all design documentation and system modeling analysis for the Block 2006 Aegis Combat System.
- Continue development of the computer program upgrade BMD 6.1 in order to achieve an FY07 Engineering Assessment.
- Commence Block 2006 Aegis Combat System level integration and test at the land site (CSEDS) test facility.
- Incorporate CDLMS upgrades into BMD 6.1 including:
  - Enhanced Launch on TADIL J design and development to increase the battle space.
  - Aegis BMD Engagement Coordination with other BMDS elements.

- Aegis BMD Multi-Asset (e.g., sensor or weapon) Planning in support of Joint Defense Planner.
- Conduct definition, planning, and initial implementation of Aegis BMD Link certification requirements
- Initiate efforts to review the migration of the Aegis BMD C2BMC architecture into future Global Information Grid (GIG) compliant networks.

Missile:

- Conduct Pre-flight analysis support for Block 2006 related Flight Mission Planning analysis.
- Review data analysis and requirements changes to update, as required, missile changes to pace threat and weapon system changes.
- Continue IR discrimination risk reduction and algorithm development.
- Near completion of All Reflective Optics (ARO) engineering (completion in FY07) for improved missile discrimination capabilities.
- Near completion of Advanced Signal Processor (ASP) design efforts (completion in FY07) for improved missile discrimination and to mitigate diminished manufacturing source issues.
- Complete Block 2006 Element Capability Specifications (ECS) requirements analysis for flow down to missile top-level requirements.
- Complete Block 2006 capability performance assessment studies for SM-3 Blk IA.
- Review manufacturing practices to lower unit cost of SM-3 Blk IA via improved manufacturing processes/changes.
- Complete assembly and deliver the final SM-3 Block I missile.
- Complete assembly and deliver the first six (6) SM-3 Blk IA missiles initiated in FY05. Deliveries continue into succeeding fiscal years.
- Continue component level assembly build-up for succeeding SM-3 Blk IA missiles.
- Procure Long Lead Material for SM-3 Blk IA Missiles with delivery beginning in FY08.
- Continue monitoring parts obsolescence replacement material engineering.

FY 2007 Planned Program:

RDT&E Articles: BMD 3.0E Aegis Surveillance and Tracking destroyers (2), BMD 3.1 Aegis cruiser (1), BMD 3.1 engage Aegis destroyers (5), Aegis BSP Engineering Development Model (1), SM-3 Block IA Missiles (15)

Aegis BMD Weapon System:

- Install BMD 3.0E capability on two (2) Aegis destroyers. (Shipsets for final BMD 3.0E destroyer will be available at this time. Projected installation dates for remaining destroyer is based on ship availability).
- Install BMD 3.1 on one (1) Aegis Cruiser.
- Install BMD 3.1 on five (5) Aegis destroyers.
- Continue improvement to ballistic missile tracking, characterization, discrimination, feature extraction, object classification, and kill assessment as a part of the Aegis BSP work, to include:
  - Real-time feature extraction capability and classification algorithm development.
  - Incremental and at-sea testing of the Advanced Development Model (ADM) Aegis BSP.
  - Fabrication and incremental testing of the Engineering Development Model (EDM) version of the Aegis BSP.
- Complete CDLMS upgrades into BMD 6.1 to incorporate:
  - Enhanced Launch on TADIL J design and development to increase the battle space.
  - Design and development of Aegis BMD Engagement Coordination with other BMDS elements.
  - Aegis BMD Multi-Asset (e.g., sensor or weapon) Planning in support of Joint Defense Planner.
- Complete development of the computer program upgrade BMD 6.1 culminating with an Engineering Assessment (EA) which provides government acceptance of the computer program.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

- Complete real-time feature extraction capability and object classification algorithm development.
- Complete Block 2006 Aegis Combat System level integration and test at land site (CSEDS) before delivery to test ship.
- Complete definition, planning, and initial implementation of Aegis BMD Link certification requirements.

Missile:

- Complete All Reflective Optics (ARO) engineering for improved missile discrimination capabilities.
- Complete Advanced Signal Processor (ASP) design efforts for improved missile discrimination and to mitigate diminished manufacturing source issues.
- Perform Design Verification tests of SM-3 Blk IA with ARO/ASP to validate design and performance.
- Complete IR discrimination risk reduction and algorithm development.
- Initiate ``All-Up-Round`` level electromagnetic interference tests to ensure shipboard compatibility.
- Upgrade Virtual and Inert Operational Missiles to validate interface integrity within missile and across weapon system interfaces.
- Continue assembly and delivery of SM-3 Blk IA missiles.
- Continue monitoring parts obsolescence replacement material engineering.

	FY 2004	FY 2005	FY 2006	FY 2007
Test & Evaluation	0	2,100	98,846	116,800
RDT&E Articles (Quantity)	0	0	11	3

FY 2005 Planned Accomplishments:

Initiate acquisition of targets for FTM 06-1 (FM-10)

- Begin test planning for FTM 06-1 and FTM 06-2 (FM-11)
- Participate in Critical Measurements and Countermeasures (CMCM-1) flight tests with the Aegis BMD Signal Processor Advanced Development Model (ADM).

FY 2006 Planned Program:

RDT&E Articles: targets/ARAVs (11)

- Conduct At-Sea Demonstration 3.1 with BMD 3.1 in a simulated engagement against multiple ARAVs (Group A (SRBM), Group B (MRBM), and Group D (LRBM).
- Conduct FTM 06-1 to verify BMD 3.1 engagement capability with intercept of multiple targets using SM-3 Block I and IA missiles in separate engagements.
- Conduct FTM 06-2 to verify BMD 3.1 engagement capability with intercept of multiple ARAV targets in separate engagements.
- Participate in GMD Integrated Flight Tests.
- Participate in THAAD flight tests.
- Continue to test interoperability with other BMDS elements.

- Initiate acquisition of targets for FTM 06-3 (FM-12) and FTM 06-4 (FM-13).
- Begin test planning for FTM 06-3 and FTM 06-4

FY 2007 Planned Program:

RDT&E Articles: targets/ARAVs (3)

- Conduct FTM 06-3 to verify Aegis BMD 3.1 multiple simultaneous engagement capability with intercept of multiple targets.
- Conduct FTM 06-4 to verify Aegis BMD 3.1 engagement capability with intercept of Group D (LRBM) target using Launch on TADIL J capability.
- Participate in GMD Integrated Flight Tests.
- Continue to test interoperability with other BMDS elements.

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
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	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

D. Acquisition Strategy

The Aegis BMD element will follow the MDA'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 Aegis BMD element acquisition approach supports evolutionary development, continuously building upon demonstrated capabilities to advance the BMDS capabilities. The best approach (competitive or selected source) will be determined after considering all the technical and management aspects of the program.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Weapons System Engineering										
AWS	SS/CPAF	Lockheed Martin/ NJ	13,770	61,950	1Q	105,766	1Q	125,175	1Q	306,661
AWS	FFRDC	MIT/LL/ MA	3,185	1,890	1Q	2,981	1Q	2,564	1Q	10,620
AWS	CPFF	JHU/APL/ MD	0	1,100	1Q	1,304	1Q	1,122	1Q	3,526
AWS	MIPR	NSWC/DD/ VA	2,150	500	1Q	2,395	1Q	2,179	1Q	7,224
AWS	MIPR	MITRE/ VA	365	400	1Q	745	1Q	641	1Q	2,151
AWS	MIPR	NSWC/PHD/ CA	0	0	N/A	295	1Q	0	N/A	295
AWS		MDA	2,000	0	N/A	5,298	1Q	10,318	1Q	17,616
AWS	Various	Various	2,948	0	N/A	1,914	1Q	8,365	1Q	13,227
Missile	SS/CPIF	Raytheon/ AZ	0	0	N/A	214,000	1Q	118,320	1Q	332,320
Missile	SS/CPIF	JHU/APL/ MD	0	0	N/A	6,270	1Q	6,019	1Q	12,289
Missile	FFRDC	MIT/LL/ MA	0	0	N/A	2,640	1Q	2,534	1Q	5,174
Missile	MIPR	NSWC/DD/ VA	0	0	N/A	2,430	1Q	2,903	1Q	5,333
Missile	MIPR	NSWC/PHD/ CA	0	0	N/A	790	1Q	0	N/A	790
Missile	MIPR	WSMR/ NM	0	0	N/A	3,030	1Q	3,485	1Q	6,515

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
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Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Missile	MIPR	NAWC/CL/ CA	0	0	N/A	1,970	1Q	2,851	1Q	4,821
Missile	MIPR	NSWC/IH/ MD	0	0	N/A	1,650	1Q	1,584	1Q	3,234
Missile		MDA	0	0	N/A	18,175	1Q	20,857	1Q	39,032
Missile	Various	Various	0	0	N/A	6,020	1Q	5,583	1Q	11,603
Subtotal Product Development			24,418	65,840		377,673		314,500		782,431

Remarks

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Weapons System Engineering										
	SS/CPFF	JHU/APL/ MD	0	3,191	1Q	6,670	1Q	5,936	1Q	15,797
	SS/CPAF	Lockheed Martin/ NJ	0	1,000	2Q	2,000	2Q	2,300	2Q	5,300
	SS/CPAF	MIT/LL/ MA	0	2,570	1Q	1,334	1Q	1,187	1Q	5,091
	SS/FPI	NSWC/DD/ VA	0	2,862	1Q	5,865	1Q	9,486	1Q	18,213
	SS/MIPR	NSWC/Corona/ CA	0	225	1Q	368	1Q	328	1Q	921
	SS/MIPR	NSWC/PHD/ CA	0	936	1Q	1,595	1Q	1,420	1Q	3,951
	SS/CPAF	RAYTHEON/ AZ	0	39,960	2Q	2,000	2Q	7,900	2Q	49,860

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
	SS/CPFF	SEG/ VA	0	2,095	2Q	5,651	2Q	6,809	2Q	14,555
	SS/CPFF	TSC/ VA	0	365		0	N/A	0	N/A	365
	SS/CPFF	BMPCOE/ MD	0	0	1Q	473	1Q	421	1Q	894
	Various	VARIOUS/ US	0	0	1Q	1,959	1Q	5,617	1Q	7,576
	SS/CPFF	MITRE/ VA	0	350	1Q	1,187	1Q	1,056	1Q	2,593
	MIPR	SPAWAR/ CA	0	0	N/A	3,898	1Q	3,469	1Q	7,367
		MDA	0	0	N/A	2,670	1Q	7,241	1Q	9,911
Subtotal Support Costs			0	53,554		35,670		53,170		142,394

Remarks

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Test & Evaluation										
Test & Eval	MIPR	PMRF/ HI	0	0	N/A	7,450	1Q	6,570	1Q	14,020
Test & Eval	MIPR	SMDC/ AL	0	2,100	2Q	29,565	1Q	64,485	1Q	96,150
Test & Eval	MIPR	NSWC/DD/ VA	0	0	N/A	13,272	1Q	11,810	1Q	25,082
Test & Eval	SS/CPFF	JHU/APL/ MD	0	0	N/A	5,989	1Q	5,265	1Q	11,254

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Test & Eval		MDA	0	0	N/A	15,797	1Q	4,249	1Q	20,046
Test & Eval	MIPR	NSWC/PHD/ CA	0	0	N/A	8,313	1Q	7,347	1Q	15,660
Test & Eval	SS/CPAF	Xontech/ CA	0	0	N/A	1,204	1Q	949	1Q	2,153
Test & Eval	C/CPFF	HTS/ CA	0	0	N/A	2,955	1Q	2,525	1Q	5,480
Test & Eval	MIPR	NAWC/PM/ CA	0	0	N/A	4,651	1Q	4,050	1Q	8,701
Test & Eval	MIPR	AIRPAC/ HI	0	0	N/A	993	1Q	813	1Q	1,806
Test & Eval	MIPR	SPAWAR/ CA	0	0	N/A	1,933	1Q	1,587	1Q	3,520
Test & Eval	Various	Various	0	0	N/A	6,724	1Q	5,275	1Q	11,999
Test & Eval	MIPR	WSMR/ CA	0	0	N/A	0	N/A	1,875	1Q	1,875
Subtotal Test and Evaluation			0	2,100		98,846		116,800		217,746

Remarks

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Weapons System Engineering										
		NAVSEA/ DC	0	0	1Q	13,867	1Q	14,283	1Q	28,150
	SS/CPFF	JHU/APL/ MD	0	0	1Q	2,519	1Q	2,640	1Q	5,159

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603882C Ballistic Missile Defense Midcourse Defense Segment

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
	MIPR	NSWC/DD/ VA	0	0	1Q	1,851	1Q	1,954	1Q	3,805
	C/CPFF	Anteon/ VA	0	0	2Q	26,105	1Q	26,976	1Q	53,081
	C/CPFF	Paradigm/ VA	0	0	1Q	3,984	1Q	3,997	1Q	7,981
	SS/CPAF	Lockheed Martin/ NJ	0	0	2Q	1,336	1Q	1,373	1Q	2,709
	SS/CPAF	Raytheon/ AZ	0	0	2Q	1,542	1Q	1,585	1Q	3,127
		MDA	0	0	1Q	7,705	1Q	6,937	1Q	14,642
	Various	Various/ Various	0	0	1Q	3,668	1Q	2,602	1Q	6,270
Subtotal Management Services			0	0		62,577		62,347		124,924
Remarks										
Project Total Cost			24,418	121,494		574,766		546,817		1,267,495
Remarks										

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile

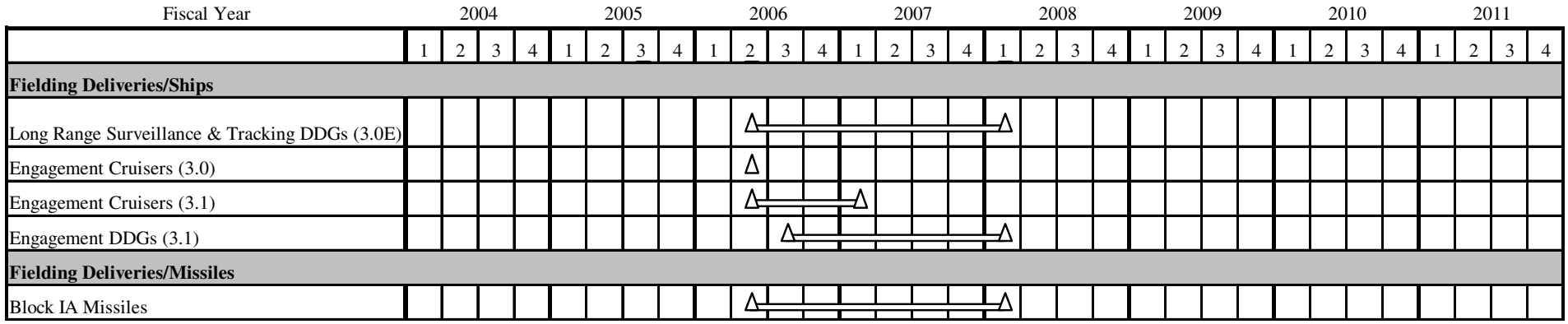
Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603882C Ballistic Missile Defense Midcourse Defense Segment

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Integrated Flight Test																																
FTG 06-1a/b (IFT 20/21)																																
FTG 06-2 (IFT 22)																																
FTG 06-3a/b (IFT 23)																																
FTG 08-1																																
Flight Tests																																
FTM 06-1 (FM-10)																																
FTM 06-2 (FM-11)																																
FTM 06-3 (FM-12)																																
FTM 06-4 (FM-13)																																
Manufacturing Processes and Advanced Materials																																
BMD 3.1 Computer Program																																
BMD 6.1 Computer Program																																
BSP Engineering Development Model # 1																																
Development Milestones																																
Block 2006 System Requirements Review																																
BMD 6.1 System Concept Review																																
BMD 6.1 System Design Disclosure																																
BMD 6.1 Engineering Assessment																																

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**



Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Integrated Flight Test								
FTG 06-1a/b (IFT 20/21)			1Q-4Q					
FTG 06-2 (IFT 22)				1Q-4Q				
FTG 06-3a/b (IFT 23)				1Q-4Q				
FTG 08-1				1Q-4Q				
Flight Tests								
FTM 06-1 (FM-10)			3Q					
FTM 06-2 (FM-11)			4Q					
FTM 06-3 (FM-12)				3Q				
FTM 06-4 (FM-13)				4Q				
Manufacturing Processes and Advanced Materials								
BMD 3.1 Computer Program			2Q					
BMD 6.1 Computer Program					1Q			
BSP Engineering Development Model # 1				4Q				
Development Milestones								
Block 2006 System Requirements Review		2Q						
BMD 6.1 System Concept Review		3Q						
BMD 6.1 System Design Disclosure			2Q					
BMD 6.1 Engineering Assessment					1Q			
Fielding Deliveries/Ships								
Long Range Surveillance & Tracking DDGs (3.0E)			2Q-4Q	1Q-4Q	1Q			
Engagement Cruisers (3.0)			2Q					
Engagement Cruisers (3.1)			2Q-4Q	1Q				
Engagement DDGs (3.1)			3Q-4Q	1Q-4Q	1Q			
Fielding Deliveries/Missiles								
Block IA Missiles			2Q-4Q	1Q-4Q	1Q			

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0909 AEGIS Ballistic Missile Defense Block 2008	0	0	135,158	354,233	636,729	546,069	205,208	44,039
RDT&E Articles Qty	0	0	0	0	31	34	9	0

Note:
Block 2008 funding is split between Research & Development and Deployment as follows:

Research & Development:

- FY06 $10.2M
- FY07 $158.0M
- FY08 $390.6M
- FY09 $437.1M
- FY10 $155.2M
- FY11 $24.0M

Deployment:

- FY06 $125.0M
- FY07 $196.2M
- FY08 $246.1M
- FY09 $109.0M
- FY10 $30.0M
- FY11 $0.0M

Operations & Support

- FY06 $0.0M
- FY07 $0.0M
- FY08 $0.0M
- FY09 $0.0M
- FY10 $20.0M
- FY11 $20.0M

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

A. Mission Description and Budget Item Justification

The Aegis BMD mission is to deliver an enduring, operationally effective and supportable Ballistic Missile Defense Capability in Aegis cruisers and destroyers, in defense of the U.S., our deployed forces, allies and friends; to increase the effectiveness of the greater Ballistic Missile Defense System (BMDS) by creating synergy with other BMDS elements; and to incrementally increase this capability by delivering evolutionary spiral improvements as part of BMDS block upgrades.
The Aegis BMD program is the sea-based element of the Ballistic Missile Defense System. Aegis BMD supports the BMDS mission of intercepting ballistic missiles in all regions, in all phases, and of all ranges, as follows:

- In all regions in locations within range of international waters by providing surveillance, tracking, and engagement capabilities. Japan, and possibly other countries, will deploy Aegis BMD.
- In all phases of ballistic missile flight: boost, midcourse, and terminal.
- Against all ranges:
  - Against long range ballistic missiles by providing surveillance and tracking support as part of the Block 2004 Initial Defensive Operations (IDO).
  - Against short and medium range ballistic missiles by providing engagement support as part of Block 2004.
  - Against intermediate range ballistic missiles by providing engagement support as part of Block 2006 and Block 2008.

Aegis BMD supports IDO 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 Joint (TADIL-J) network. Through development and fielding of the Aegis BMD Signal Processor and upgrades to the SM-3 Block IA missile in Block 06/08, Aegis BMD will significantly improve discrimination capability and performance against more diverse and longer range threats.

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 cueing 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). In addition, Aegis BMD will be able to launch or engage with its SM-3 based on target data provided by external sensors.

Aegis BMD Block 2008 will evolve (through spiral capability driven development) from Block 2006 with the focus of development on fully integrated radar discrimination. Aegis BMD Block 2008 will provide:

- Integration of Block 06 Discrimination Capabilities (e.g. Synthetic Wideband Radar Upgrade, Signal Processing & Feature Extraction Algorithms, Improved CCM).
- 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.
- Analysis for planned upgrades to the SM-3 missile to improve discrimination, divert, and probability of mission success.
- Risk Reduction for integration of the MDA multi-use interceptor to support MDA's performance-based-decisions acquisition strategy.
- Testing of the Aegis BMD Signal Processor and demonstrations of closed-loop synthetic wideband and narrowband discrimination.
- Improvements to the Aegis BMD Signal Processor (BSP) discrimination and feature extraction algorithms to incorporate lessons learned from continued ground and flight testing.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Weapons System Engineering	0	0	135,158	344,233
RDT&E Articles (Quantity)	0	0	0	0

FY 2006 Planned Program:

- Revise BMDS System Specification (SS)
- Perform System level trade-off studies based on the SS.
- Conduct a Preliminary Concept Review to downselect potential system designs
- Procure Long Lead Material for SM-3 Blk IA Missiles with delivery beginning in FY08.
- Commence studies to improve Lethal Object Designation in a clutter environment

FY 2007 Planned Program:

- Review and update the Block 2008 System Specification to the selected system design
- Draft the Block 2008 Element Capability Specification (ECS) based on the approved System Specification
- Conduct System Requirements Review (SRR), based on the approved Element Capability Specification, to present the Block 2008 requirements to the prime contractor
- Conduct the System Concept Review (SCR), based on SRR direction to the prime contractor, to review and gain approval for the contractor's approach to meeting the Block 2008 requirements
- Draft the Block 2008 A-Spec, which defines the Aegis Weapon System design requirements to meet Block 2008 system level requirements.
- Complete work to improve Lethal Object Designation in a clutter environment.
- Procure Long Lead Material for SM-3 Block IA missiles with delivery beginning in FY09
- Conduct critical experiments using Aegis BMD Signal Processor testbed equipment
  - determine/refine the need for further enhancements to be incorporated in Block 2008
  - Begin efforts to incorporate required enhancements
- Conduct critical experiments using the MK-99 Doppler Data Collection System or similar equipment as a risk mitigation for Block 2008 implementation
- Conduct studies on sensor fusion, Engage on Remote capability, and engagement control for a Block 2008 implementation

	FY 2004	FY 2005	FY 2006	FY 2007
Test & Evaluation	0	0	0	10,000
RDT&E Articles (Quantity)	0	0	0	0

FY 2007 Planned Program:

- Begin Procurement of target vehicles for FTM 08-1 and FTM 08-2

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

D. Acquisition Strategy

The Aegis BMD element will follow the MDA's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks. The Department has implemented a missile defense acquisition strategy using a multi-path approach to assure that the most effective missile defense is available at the earliest possible time. The Aegis BMD element acquisition approach supports evolutionary development, continuously building upon demonstrated capabilities to advance the BMDS capabilities. After considering all the technical and management aspects of the program and to meet the requirements presented by the 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 Aegis Weapon System, respectively.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Weapons System Engineering										
AWS	SS/CPAF	Lockheed Martin/ NJ	0	0	N/A	1,179	1Q	89,102	1Q	90,281
Missile	SS/CPIF	Raytheon/ AZ	0	0	N/A	122,000	1Q	211,420	1Q	333,420
Missile	MIPR	NSWC/DD/ VA	0	0	N/A	1,000	1Q	2,850	1Q	3,850
Missile		NSWC/PHD/ CA	0	0	N/A	1,000	1Q	2,550	1Q	3,550
Missile	Various	Various	0	0	N/A	1,000	1Q	2,180	1Q	3,180
Missile		MDA	0	0	N/A	0	N/A	1,000	1Q	1,000
AWS	FFRDC	MIT/LL/ MA	0	0	N/A	0	N/A	1,200	1Q	1,200
AWS	SS/CPFF	JHU/APL/ MD	0	0	N/A	0	N/A	1,300	1Q	1,300
AWS	MIPR	NSWC/DD/ VA	0	0	N/A	0	N/A	2,250	1Q	2,250
AWS	Various	Various	0	0	N/A	0	N/A	1,240	1Q	1,240
Subtotal Product Development			0	0		126,179		315,092		441,271

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Weapons System Engineering										
AWS	SS/CPAF	Lockheed Martin/ NJ	0	0	N/A	3,450	1Q	4,870	1Q	8,320
AWS	SS/CPFF	JHU/APL/ MD	0	0	N/A	1,100	1Q	2,182	1Q	3,282
AWS	FFRDC	MIT/LL/ MA	0	0	N/A	1,250	1Q	2,426	1Q	3,676
AWS	MIPR	NSWC/DD/ VA	0	0	N/A	1,115	1Q	2,273	1Q	3,388
AWS	SS/MIPR	NSWC/PHD/ CA	0	0	N/A	0	1Q	578	1Q	578
AWS	MIPR	NSWC/Corona/ CA	0	0	N/A	785	1Q	879	1Q	1,664
AWS		Various	0	0	N/A	329	1Q	1,850	1Q	2,179
Missile	SS/CPAF	Raytheon/ AZ	0	0	N/A	950	1Q	12,530	1Q	13,480
Missile	MIPR	NSWC/DD/ VA	0	0	N/A	0	N/A	475	1Q	475
Missile	MIPR	NSWC/PHD/ CA	0	0	N/A	0	N/A	350	1Q	350
Missile	SS/CPFF	JHU/APL/ MD	0	0	N/A	0	N/A	375	1Q	375
Missile		Various/ Various	0	0	N/A	0	N/A	353	1Q	353
Subtotal Support Costs			0	0		8,979		29,141		38,120

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Test & Evaluation										
	MIPR	SMDC/ AL	0	0	N/A	0	N/A	10,000	1Q	10,000
Subtotal Test and Evaluation			0	0		0		10,000		10,000

Remarks

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

Project Total Cost			0	0		135,158		354,233		489,391

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603882C Ballistic Missile Defense Midcourse Defense Segment

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Testing Milestones																																
RIMPAC 08																				▲												
Development Milestones																																
BMD 8.1 Development													▲	═	═	═	═	═	═	═	═	═	═	═	▲							
BMD 8.1 Engineering Assessment																									▲							
Block 2008 Critical Design Review																		▲														
Block 2008 Preliminary Design Review															▲																	
Integrated Flight Test																																
FTG 08-1																		▲	═	═	▲											
FTG 08-3a																				▲	═	═	▲									
FTG 08-3b																				▲	═	═	▲									
FTG 10-1																					▲	═	═	▲								
FTG 10-2																					▲	═	═	▲								
FTG 10-3																					▲	═	═	▲								
Flight Tests																																
FTM 08-1																			▲													
FTM 08-3																						▲										
FTM 08-4																								▲								
FTM-08-2																				▲												
Manufacturing Processes and Advanced Materials																																
BSP Engineering Development Model # 2																			▲													

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Fielding Deliveries/Ships																																
LRS&T destroyers																		△														
Engagement DDGs (BMD 3.1)																		△	———	———	———	———	△									
BMD 6.1 destroyers																					△	———	———	———	△							
BMD 6.1 Cruiser																						△										
Fielding Deliveries/Missiles																																
Block 1A Missiles																		△	———	———	———	———	———	△								

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Testing Milestones								
RIMPAC 08					4Q			
Development Milestones								
BMD 8.1 Development				1Q-4Q	1Q-4Q	1Q-4Q	1Q	
BMD 8.1 Engineering Assessment							1Q	
Block 2008 Critical Design Review					2Q			
Block 2008 Preliminary Design Review				3Q				
Integrated Flight Test								
FTG 08-1					2Q-4Q	1Q		
FTG 08-3a					4Q	1Q-3Q		
FTG 08-3b					4Q	1Q-3Q		
FTG 10-1						1Q-4Q		
FTG 10-2						1Q-4Q		
FTG 10-3						1Q-4Q		
Flight Tests								
FTM 08-1					3Q			
FTM 08-3						2Q		
FTM 08-4						4Q		
FTM-08-2					4Q			
Manufacturing Processes and Advanced Materials								
BSP Engineering Development Model # 2					3Q			
Fielding Deliveries/Ships								
LRS&T destroyers					2Q			
Engagement DDGs (BMD 3.1)					2Q-4Q	1Q-3Q		
BMD 6.1 destroyers						1Q-4Q	1Q	
BMD 6.1 Cruiser						2Q,2Q		
Fielding Deliveries/Missiles								
Block 1A Missiles					2Q-4Q	1Q-4Q		

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0009 AEGIS Ballistic Missile Defense Block 2010	0	0	0	0	20,000	185,000	576,260	644,000
RDT&E Articles Qty	0	0	0	0	0	0	31	34

Note:
Block 2010 funding is split between Research & Development and Deployment as follows:

Research & Development:

- FY08 $0.0M
- FY09 $0.0M
- FY10 $308.2M
- FY11 $447.0M

Deployment:

- FY08 $20.0M
- FY09 $185.0M
- FY10 $268.1M
- FY11 $197.0M

A. Mission Description and Budget Item Justification

The Aegis BMD mission is to deliver an enduring, operationally effective and supportable Ballistic Missile Defense Capability in Aegis cruisers and destroyers, in defense of the U.S., our deployed forces, allies and friends; to increase the effectiveness of the greater Ballistic Missile Defense System (BMDS) by creating synergy with other BMDS elements; and to incrementally increase this capability by delivering evolutionary spiral improvements as part of BMDS block upgrades.

The Aegis BMD program is the sea-based element of the Ballistic Missile Defense System. Aegis BMD supports the BMDS mission of intercepting ballistic missiles in all regions, in all phases, and of all ranges, as follows:

- In all regions in locations within range of international waters by providing surveillance, tracking, and engagement capabilities. Japan, and possibly other countries, will deploy Aegis BMD.
- In all phases of ballistic missile flight: boost, midcourse, and terminal.
- Against all ranges:
  - Against long range ballistic missiles by providing surveillance and tracking support as part of the Block 04 Initial Defensive Operations (IDO).
  - Against short and medium range ballistic missiles by providing engagement support as part of Block 04.
  - Against intermediate range ballistic missiles by providing engagement support as part of Block 2006 and Block 2008.

Aegis BMD supports IDO 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 autonomous data and upon data received via the Tactical Digital Information Link Joint (TADIL-J) network. Through

development and fielding of the Aegis BMD Signal Processor and upgrades to the SM-3 Block IA missile in Block 06/08, Aegis BMD will significantly improve discrimination capability and performance against more diverse and longer range threats.

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 cueing 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). In addition, Aegis BMD will be able to launch or engage with its SM-3 based on target data provided by external sensors.

Aegis Ballistic Missile Defense (BMD) Block 2010 will evolve (through spiral capability driven development) from the BMD Block 2008 Aegis Weapon System and its integration with the Navy developed Aegis Open Architecture System:

- Defeats a wide variety of ballistic missiles in the presence of complex counter countermeasures (Short Range Ballistic Missiles (SRBM) , Medium Range Ballistic Missiles (MRBM), Intermediate Range Ballistic Missiles (IRBM), and Intercontinental Ballistic Missiles (ICBMs).
- Incorporate Advanced CCM Improvements - Provides Discrimination Algorithms, Adaptive Processing, C2BMC Upgrades for BMDS Integration.
- Provides for possible integration of the Aegis BMD Weapon System and the Missile Defense Agency (MDA) Common Interceptor.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Funding in this Project is not programmed until FY 2008.	0	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

D. Acquisition Strategy

The Aegis BMD element will follow the MDA's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks. The Department has implemented a missile defense acquisition strategy using a multi-path approach to assure that the most effective missile defense is available at the earliest possible time. The Aegis BMD element acquisition approach supports evolutionary development, continuously building upon demonstrated capabilities to advance the BMDS capabilities. After considering all the technical and management aspects of the program and to meet the requirements presented by the 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 Aegis Weapon System, respectively.

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Flight Tests																																
FTM 10-1																									Δ							
FTM 10-2																											Δ					
FTM 10-3																													Δ			
FTM 10-4																															Δ	
Fielding Deliveries/Ships																																
BMD 6.1 Cruiser																										Δ					Δ	
BMD 6.1 destroyers																										Δ					Δ	
BMD 8.1 Cruisers																													Δ		Δ	
BMD 8.1 Destroyers																													Δ			Δ
Development Milestones																																
Element Capability Spec																							Δ									
Block 2010 PDR																											Δ					
Block 2010 CDR																															Δ	

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Flight Tests								
FTM 10-1							1Q	
FTM 10-2							3Q	
FTM 10-3								1Q
FTM 10-4								3Q
Fielding Deliveries/Ships								
BMD 6.1 Cruiser							2Q-4Q	1Q-3Q
BMD 6.1 destroyers							2Q-4Q	1Q-3Q
BMD 8.1 Cruisers								1Q-3Q
BMD 8.1 Destroyers								1Q-4Q
Development Milestones								
Element Capability Spec						3Q		
Block 2010 PDR							3Q	
Block 2010 CDR								3Q

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0402 Japanese Cooperative Program	51,775	71,283	24,800	52,791	112,500	131,500	129,500	100,000
RDT&E Articles Qty	0	1	1	0	2	2	0	0

A. Mission Description and Budget Item Justification

The Aegis BMD mission is to deliver an enduring, operationally effective and supportable Ballistic Missile Defense Capability in Aegis cruisers and destroyers, in defense of the U.S., our deployed forces, allies and friends; to increase the effectiveness of the greater Ballistic Missile Defense System (BMDS) by creating synergy with other BMDS elements; and to incrementally increase this capability by delivering evolutionary spiral improvements as part of BMDS block upgrades.

The Aegis BMD program is the sea-based element of the Ballistic Missile Defense System. Aegis BMD supports the BMDS mission of intercepting ballistic missiles in all regions, in all phases, and of all ranges, as follows:

- In all regions in locations within range of international waters by providing surveillance, tracking, and engagement capabilities. Japan, and possibly other countries, will deploy Aegis BMD.
- In all phases of ballistic missile flight: boost, midcourse, and terminal.
- Against all ranges:
  - Against long range ballistic missiles by providing surveillance and tracking support as part of the Block 2004 Initial Defensive Operations (IDO).
  - Against short and medium range ballistic missiles by providing engagement support as part of Block 2004.
  - Against intermediate range ballistic missiles by providing engagement support as part of Block 2006 and Block 2008.

Aegis BMD supports IDO 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 autonomous data and upon data received via the Tactical Digital Information Link Joint (TADIL-J) network. Through development and fielding of the Aegis BMD Signal Processor and upgrades to the SM-3 Block IA missile in Block 06/08, Aegis BMD will significantly improve discrimination capability and performance against more diverse and longer range threats.

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 cueing 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). In addition, Aegis BMD will be able to launch or engage with its SM-3 based on target data provided by external sensors.

The U.S./Japan Joint Cooperative Research (JCR) program will continue per the U.S. Department of Defense (DoD)/Japan Defense Agency (JDA) Memorandum of Agreement signed in 1999 to conduct cooperative research in Ballistic Missile Defense. The focus of research is on four components of the SM-3 guided missile: sensor, advanced kinetic warhead, second stage propulsion and lightweight nosecone. In FY 2005 and 2006, the JCR project plans to flight test the lightweight nosecone in Joint Control Test Vehicle-1 and Joint Flight Mission-1.

The government of Japan has expressed an interest in the joint development of a 21” SM-3 missile (SM-3 Blk II). A significant workshare contribution by Japan is anticipated as follow-on to the ongoing U.S./Japan JCR program being conducted from FY03 to FY06. The SM-3 Blk II missile development will build upon established joint research investments by the government of Japan, including 21” components for the SM-3 2nd stage rocket motor. The funding profile assumes a similar level of effort by Japan.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

Aegis BMD will continue the evolutionary development of the SM-3 missile with a U.S./Japan Joint Cooperative Program. The SM-3 Blk II missile development will replace the SM-3 Blk IA 13.5`` rocket motors (2nd , 3rd stages) and warhead. The 2nd and 3rd stages will be redesigned with 21" rocket motors and module components. Trade studies will be conducted to address the redesign of warhead components including optics, seeker, signal processor and Divert & Attitude Control System. Annual continuation reviews will evaluate program progress and Japanese contributions.

The SM-3 Blk II 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.

The Aegis BMD Japanese Cooperative Program will:

- Develop components for the SM-3 Blk II missile and integrate them into an All Up Round (AUR)
  - 21" 2nd stage and rocket motor
  - 21" 3rd stage and rocket motor
  - Improved warhead components based on trade study recommendations
    - All-Reflective Optics (ARO)
    - 2-Color Seeker
    - Advanced Signal Processor (ASP)
    - Improved Divert & Attitude Control System
- Modify the Aegis Weapon System to exploit the capability of the SM-3 Blk II missile and use of threat track data from BMDS sensors.
- Modify the Vertical Launching System (VLS) to accommodate the SM-3 Blk II missile.
  - Includes development of a light weight canister
- Integrate the SM-3 Blk II missile and VLS with Aegis ship systems
- Conduct test and evaluation using ground and flight tests
  - SM-3 Blk II missile
  - Aegis BMD ship systems
  - Aegis BMD weapon systems

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Japan Cooperative Program	51,775	71,283	24,800	52,791
RDT&E Articles (Quantity)	0	1	1	0

FY 2004 Accomplishments:

- Continued development and system engineering support for the four U.S./JCR components.
- Continued procurement of test article and ship modifications for JCTV-1 and JFM-1 Proof of Principle (PoP) flight tests.
- Conducted PoP missile nosecone Critical Design Review (CDR) supporting integration of Japan Defense Agency (JDA) developed lightweight nosecone on SM-3 missiles to be used for JCTV-1 and JFM-1 PoP flight tests.
- Conducted Preliminary Design Review (PDR) for Ship System and Vertical Launching System (VLS) modifications to support JCR JCTV-1 and JFM-1 PoP flight tests.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

- Completed integration of the Japanese Quantum Well Infrared Photodetector (QWIP) seeker onto Widebody Airborne Sensor Platform (WASP).
- Conducted ground testing of JDA's lightweight nosecone, including Design Verification and Engineering Tests (DVTs) for shielding effectiveness, electrostatic discharge, and nosecone push-through and separation tests.
- Continued system engineering support for JDA design and development of second stage propulsion, QWIP seeker, lightweight nosecone and SDACS valve and thruster components.

FY 2005 Planned Accomplishments:

RDT&E Articles: SM-3 Missile (1)

- Continue development and system engineering support for the four U.S./JCR components.
- Conduct Critical Design Review for Ship System and VLS modifications to support JCR JCTV-1 and JFM-1 PoP flight tests.
- Continue procurement of test articles and ship modifications for JCTV-1 and JFM-1.
- Continue ground testing and test planning to support JCTV-1 and JFM-1 PoP flight tests.
- Deliver SM-3 missile for use in JCTV-1 PoP flight test.
- Conduct JCTV-1 PoP flight test.
- Conduct Captive Carry Testing (CCT) with QWIP sensor on WASP.
- Prepare for and initiate hazard assessment and insensitive munitions testing of JDA rocket motors.
- Continue system engineering support for JDA design and development of second stage propulsion, QWIP seeker, lightweight nosecone and SDACS valve and thruster components.

FY 2006 Planned Program:

RDT&E Articles: SM-3 Missile (1)

- Continue ground testing and test planning to support JFM-1 PoP flight test.
- Deliver SM-3 missile for use in JFM-1 PoP flight test.
- Conduct JFM-1 PoP flight test.
- Conduct analysis of JCTV-1 and JFM -1 PoP flight tests.
- Continue development and system engineering support for the four U.S./JCR components.
- Conduct Captive Carry Testing (CCT) with QWIP sensor on WASP.
- Continue hazard assessment and insensitive munitions testing of JDA rocket motors.
- Continue system engineering support for JDA design and development of second stage propulsion, QWIP seeker, lightweight nosecone and SDACS valve and thruster components.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

FY 2007 Planned Program:

- Initiate Aegis Weapon System design studies for the SM-3 Blk II missile effort.
- Initiate Vertical Launching System lightweight canister design studies for SM-3 Blk II missile effort.
- Initiate SM-3 Blk II missile design.
- Support Japan 21" missile development efforts.
- Begin prototype components development.

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

D. Acquisition Strategy

The major near-term focus of activity for the Japan Cooperative Research Project will be preparation for and execution of the JCTV-1 and JFM-1 flight tests. Both tests will be integrated into the larger Aegis BMD test program. Acquisition of hardware, software modifications and required services will occur in conjunction with contractual and tasking efforts for U. S. Navy work and events.

The Japan Cooperative Program for the SM-3 Blk II missile will utilize a performance based approach that ties program decision milestones to the performance of development module prototypes as well as Control Test Vehicle (CTV) and Guidance Test Vehicle (GTV) flight test article performance.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Japan Cooperative Program										
JCR	SS/CPAF	Raytheon/ AZ	31,272	46,210	2Q	7,436	1Q	42,670	1Q	127,588
JCR	SS/CPAF	Lockheed Martin/ NJ	7,253	7,820	1Q	4,000	1Q	1,000	1Q	20,073
JCR		Various	124	154	1Q	0	N/A	0	N/A	278
Subtotal Product Development			38,649	54,184		11,436		43,670		147,939

Remarks

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Japan Cooperative Program										
	SS/CPFF	NSWC/DD/ VA	3,163	1,649	1Q	781	1Q	500	1Q	6,093
	SS/CPFF	NSWC/PHD/ CA	0	895	1Q	155	1Q	165	1Q	1,215
	SS/CPFF	JHU/APL/ MD	3,400	2,093	2Q	1,615	1Q	1,615	1Q	8,723
	Various	Various/ Various	1,244	1,036	1Q	739	1Q	448	1Q	3,467
	SS/MIPR	NAWC/CL/ CA	211	514	1Q	750	1Q	200	1Q	1,675
	SS/MIPR	ANTEON/ VA	1,975	2,322	1Q	2,218	1Q	2,218	1Q	8,733

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
	SS/CPFF	PARADIGM/ VA	313	130	1Q	135	1Q	135	1Q	713
		MDA/ VA	1,200	1,794	1Q	0	N/A	3,090	1Q	6,084
	SS	NAVSEA/ DC	806	725	1Q	750	1Q	750	1Q	3,031
	SS/CPAF	Lockheed Martin/ NJ	0	3,032	1Q	2,994	1Q	0	N/A	6,026
Subtotal Support Costs			12,312	14,190		10,137		9,121		45,760

Remarks

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Japan Cooperative Program										
Test & Evaluation	MIPR	PMRF/ HI	0	190	1/2Q	380	1Q	0	N/A	570
	MIPR	NSWC/PHD/ CA	309	850	1/2Q	978	1Q	0	N/A	2,137
	MIPR	NAWC/PM/ CA	0	610	1/2Q	610	1Q	0	N/A	1,220
	MIPR	NSWC/Corona/ CA	420	315	1/2Q	315	1Q	0	N/A	1,050
	MIPR	NSWC/DD/ VA	25	343	1/2Q	343	1Q	0	N/A	711

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
	SS/CPFF	JHU/APL/ MD	60	200	1/2Q	200	1Q	0	N/A	460
	Various	Various	0	401	1/2Q	401	1Q	0	N/A	802
Subtotal Test and Evaluation			814	2,909		3,227		0		6,950

Remarks

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

Project Total Cost			51,775	71,283		24,800		52,791		200,649

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603882C Ballistic Missile Defense Midcourse Defense Segment

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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																																
21 Inch Critical Design Review																					Δ											
21 Inch Design Concept Review														Δ																		
21 Inch Preliminary Design Review																	Δ															
Ship System and VLS Critical Design Review						Δ																										
Ship System and VLS Preliminary Design Review				▲																												
Flight Tests																																
Control Test Vehicle Flight																										Δ						
Guidance Test Vehicle-1																												Δ				
Guidance Test Vehicle-2																														Δ		
Japan Cooperative Research Project																																
JCTV-1								Δ																								
JFM-1										Δ																						

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603882C Ballistic Missile Defense Midcourse Defense Segment

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Development Milestones								
21 Inch Critical Design Review						1Q		
21 Inch Design Concept Review				2Q				
21 Inch Preliminary Design Review					1Q			
Ship System and VLS Critical Design Review		2Q						
Ship System and VLS Preliminary Design Review	4Q							
Flight Tests								
Control Test Vehicle Flight							2Q	
Guidance Test Vehicle-1							4Q	
Guidance Test Vehicle-2								2Q
Japan Cooperative Research Project								
JCTV-1		4Q						
JFM-1			2Q					

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0515 Multiple Kill Vehicles	0	0	82,000	219,645	272,900	306,500	308,200	113,500
RDT&E Articles Qty	0	0	0	0	0	0	0	0

Note:
This project was previously funded in the BMD Technology Program Element, 0603175C within project 0502 in Engagement Systems.

A. Mission Description and Budget Item Justification

The Multiple Kill Vehicles (MKV) program is the Missile Defense Agency's transformational weapon system development program to deal with the midcourse discrimination problem: target selection amid uncertainty and countermeasures. The MKV system consists of a Carrier Vehicle loaded with a complement of small intercepting kill vehicles, each about the size of a loaf of bread. The exact number of kill vehicles carried is restricted information, but can be substantially greater than 10 when MKV is launched by a Ground-Based Midcourse Interceptor. Work to adapt the MKV payload to smaller, more mobile boosters such as kinetic energy interceptors has also begun. During flight, the Carrier Vehicle acquires and tracks the objects in a midcourse complex, consisting of a warhead, countermeasure objects, and deployment debris, all of which can be spread out over many cubic kilometers. It then assigns kill vehicles to targets of concern, and releases them to fly out to their respective targets. Once within range of their assigned targets, the kill vehicles autonomously acquire, hit, and destroy them using their on-board seekers and divert motors. Advancements in sensors, propulsion, computers, and inertial navigation have enabled such kill vehicles, which are small but lethal, due to the vast kinetic energies involved in midcourse hit-to-kill engagements.

What is clearly transformational about MKV is its ability to destroy large numbers of targets using a single engaging interceptor missile. This reduces the burden on sensors and algorithms, which no longer need to be programmed to select one, best target. This dramatically alters the statistical probability of kill in favor of the defender and provides for early, decisive engagement of an adversary complex. Seeing its potential, the BMD System Engineering process monitored the concept development of MKV in the MDA Advanced Systems organization, and determined it to be ready for system development at this time. While the cost of the development program for MKV is anticipated to be over $1B, the out-year cost comparison of a missile field equipped with MKVs versus the large numbers of single-KV interceptors needed to provide equivalent capability fully justifies the cost of MKV development. The MKV payload is anticipated to be ready for initial fielding in the 2012-2014 time frame. To maximize return on investment, MDA will manage MKV using a flexible, decision-based approach supported by vigorous management reviews. If unanticipated technological obstacles surface the program will be delayed, or if the program is on track and the adversary challenge mounts the program may be accelerated.

MKV is a strong example of spiral development. It utilizes the same sensors, battle management, missile fields and even boosters that precede it.

The program is further documented in project 0502 of Program Element 0603175C.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Multiple Kill Vehicles	0	0	82,000	219,645
RDT&E Articles (Quantity)	0	0	0	0

Note: In FY 2004 and FY 2005, the Multiple Kill Vehicle (MKV) program is funded in Engagement Systems portion of Project 0502 of Program Element 0603175C.

FY 2004 Accomplishments:

- Selected one contractor team to begin Multiple Kill Vehicle (MKV) system development.
- Conducted MKV kill vehicle seeker, divert propulsion, and avionics component breadboard demonstrations.

- Conducted second MKV system design review to ensure kill vehicle and carrier vehicle compatibility.

FY 2005 Planned Accomplishments:

- Conduct critical design review for the MKV hover test vehicle.
- Purchase long lead items for MKV kill vehicle hover test in FY 2006.
- Conduct MKV kill vehicle seeker, divert propulsion, and avionics brassboard demonstrations.
- Conduct MKV weapon control algorithm and software development.

FY 2006 Planned Program:

- Complete kill vehicle seeker/avionics/software hardware-in-the-loop testing.
- Conduct MKV kill vehicle hover test.
- Continue MKV weapon control algorithm and software development.
- Conduct preliminary design review for the MKV demonstration carrier vehicle.
- Conduct MKV Design Readiness Review.

FY 2007 Planned Program:

- Conduct preliminary design review for the integrated MKV payload.
- Conduct critical design review for the MKV flight test vehicle.
- Purchase long lead items to support MKV kill vehicle flight test in FY 2008.
- Conduct critical design review for the MKV demonstration carrier vehicle.
- Characterize state-of-the-art radiation hardened parts for the tactical payload.

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

D. Acquisition Strategy

MKV will follow the MDA's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks. The program will also be controlled through decision-based acquisition. An integrated Design Readiness Review will be conducted at the end of FY06 by the MDA Director to adjust out-year funding levels for the program in future budgets. The MKV system development prime contract was competitively awarded to Lockheed Martin Space Systems Company, Sunnyvale, CA, in FY 2004. The prime contract is an indefinite delivery / indefinite quantity type with a cost plus award fee pricing arrangement for individual task orders. Task Order 1 covers approximately one year of system development effort and culminates in the Hover Test Vehicle Critical Design Review (CDR) in Mid-February 2005. Task Order 2 and subsequent task orders will be issued dependent on the contractor's performance, particularly in achieving specific program milestones, such as the Hover Test Vehicle CDR.

The U. S. Army Space and Missile Defense Command, Huntsville, AL, manages the system development contract on behalf of the Missile Defense Agency as its Executing Agent.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Multiple Kill Vehicles										
MKV System Development	CPAF	LMSSC/ Sunnyvale, CA & Dallas, TX	0	0	1Q	73,371	1Q	183,320	1Q	256,691
Subtotal Product Development			0	0		73,371		183,320		256,691

Remarks

This project was previously funded in the BMD Technology Program Element, 0603175C within project 0502 in Engagement Systems.

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Multiple Kill Vehicles										
Support Contracts	FFP	Sparta/ Arlington, VA	0	0	N/A	200	1Q	0	N/A	200
Support Contracts	FFP	Computer Sciences Corp/ Arlington, VA	0	0	N/A	450	1Q	0	N/A	450
Support Contracts	CPFF	Aero Thermo Technology/ Huntsville, AL	0	0	N/A	600	1Q	0	N/A	600
Support Contracts	CPFF	Gray Research/ Huntsville, AL	0	0	N/A	500	1Q	0	N/A	500
Support Contracts	CPAF	ITT/ Huntsville, AL	0	0	N/A	349	1Q	750	1Q	1,099

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Support Contracts	FFP	Science and Technology Associates/ Arlington, VA	0	0	N/A	1,000	1Q	1,200	1Q	2,200
Support Contracts	CPFF	Various/ Various	0	0	N/A	450	1Q	3,200	1Q	3,650
Subtotal Support Costs			0	0		3,549		5,150		8,699

Remarks

This project was previously funded in the BMD Technology Program Element, 0603175C within project 0502 in Engagement Systems.

Base contract awarded January 2004. Task orders on the contract awarded approximately annually. Task order 2 will be awarded in 2Q of FY05, task order 3's targeted award date is 1Q FY06.

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Multiple Kill Vehicles										
Government Test Support (Range Costs and GFE)	MIPR	Pacific Missile Range & Vandenberg AFB/ HI & CA	0	0	N/A	3,530	1Q	28,470	1Q	32,000
Subtotal Test and Evaluation			0	0		3,530		28,470		32,000

Remarks

This project was previously funded in the BMD Technology Program Element, 0603175C within project 0502 in Engagement Systems.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Multiple Kill Vehicles										
Management Support	Various	TBD/ TBD	0	0	N/A	1,550	1Q	2,705	1Q	4,255
Subtotal Management Services			0	0		1,550		2,705		4,255

Remarks

This project was previously funded in the BMD Technology Program Element, 0603175C within project 0502 in Engagement Systems.

Project Total Cost			0	0		82,000		219,645		301,645

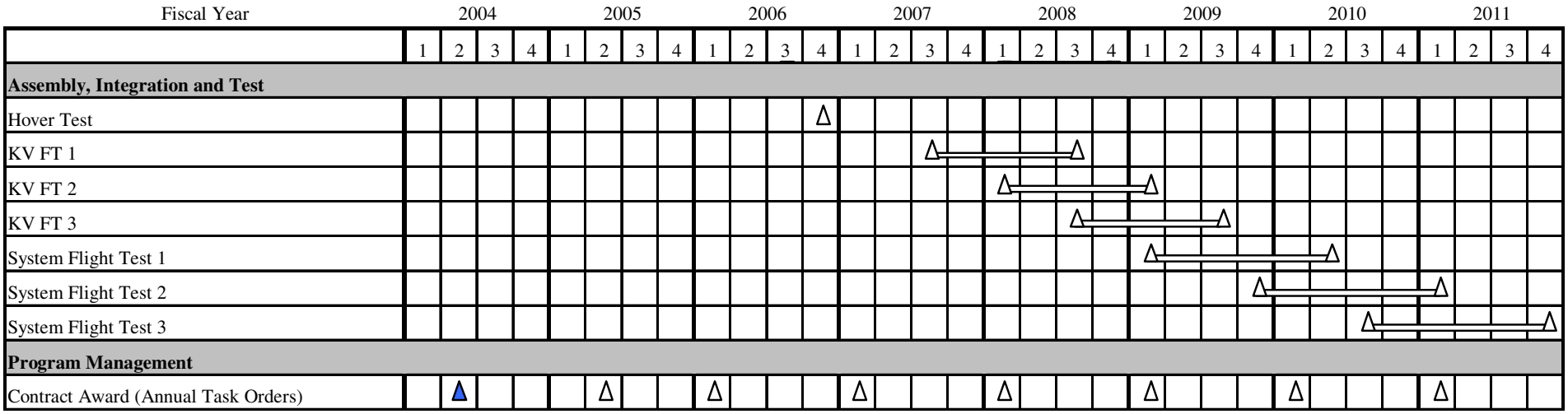
Remarks

This project was previously funded in the BMD Technology Program Element, 0603175C within project 0502 in Engagement Systems.

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
System Engineering																																
Design Readiness Review												Δ								Δ												
Fielding Decision																																Δ
IPR							Δ			Δ																Δ				Δ		
System CDR																						Δ										
System Hardware CDR																			Δ													
System PDR															Δ																	
Kill Vehicle																																
Flight Test Kill Vehicle CDR														Δ																		
Hover Test Kill Vehicle CDR						Δ																										
KV HWIL & Ground Test							Δ	—	—	—	—	—	—	—	Δ																	
Kill Vehicle Flight Test Deliveries																	Δ	—	—	—	—	—	—	—	—	—	—	Δ				
Seeker Software CDR							Δ																									
Carrier Vehicle																																
Carrier Vehicle CDR																Δ																
Carrier Vehicle Flight Test Deliveries																					Δ	—	—	—	—	—	—	Δ				
Carrier Vehicle PDR											Δ																					
HWIL & Ground Test																	Δ	—	—	Δ												

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**



Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603882C Ballistic Missile Defense Midcourse Defense Segment

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
System Engineering								
Design Readiness Review			4Q		4Q			
Fielding Decision								4Q
IPR		3Q	2Q				2Q	2Q
System CDR						2Q		
System Hardware CDR					3Q			
System PDR				3Q				
Kill Vehicle								
Flight Test Kill Vehicle CDR				2Q				
Hover Test Kill Vehicle CDR		2Q						
KV HWIL & Ground Test		3Q-4Q	1Q-4Q	1Q-3Q				
Kill Vehicle Flight Test Deliveries					1Q-4Q	1Q-4Q	1Q-4Q	
Seeker Software CDR		3Q						
Carrier Vehicle								
Carrier Vehicle CDR				4Q				
Carrier Vehicle Flight Test Deliveries						1Q-4Q	1Q-4Q	
Carrier Vehicle PDR			3Q					
HWIL & Ground Test					1Q-4Q			
Assembly, Integration and Test								
Hover Test			4Q					
KV FT 1				3Q-4Q	1Q-3Q			
KV FT 2					1Q-4Q	1Q		
KV FT 3					3Q-4Q	1Q-3Q		
System Flight Test 1						1Q-4Q	1Q-2Q	
System Flight Test 2						4Q	1Q-4Q	1Q
System Flight Test 3							3Q-4Q	1Q-4Q
Program Management								
Contract Award (Annual Task Orders)	2Q	2Q	1Q	1Q	1Q	1Q	1Q	1Q

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0602 Program-Wide Support	85,099	47,084	50,264	55,565	66,331	66,690	68,634	81,634
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

Program-Wide Support provides funding for common support functions across the entire program such as strategic planning, program integration, cost estimating, contracting, financial management to include preparation of financial statements, reimbursement of financial services provided by DFAS, internal review and audit, earned-value management, and program assessment. Includes costs for both government civilians performing these functions as well as support contractors providing government staff augmentation in these areas. Applies to costs at the MDA HQ as well as its Executing Agents in the Services: Army Space and Missile Defense Command, Army PEO Space and Missile Defense, Office of Naval Research, and various Air Force laboratory and acquisition activities. Other costs include physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses at the various MDA Executing Agent locations, which at the MDA HQ are generally funded from the Management Headquarters Program Element (0901598C). Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Civilian Salaries and Support	85,099	47,084	50,264	55,565
RDT&E Articles (Quantity)	0	0	0	0

See Section A: Mission Description and Budget Item Justification

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603882C Ballistic Missile Defense Midcourse Defense Segment**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total PE Cost	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182
0710 Airborne Laser (ABL) Block 2004	463,132	457,900	0	0	0	0	0	0
0810 Airborne Laser (ABL) Block 2006	0	0	464,867	629,761	0	0	0	0
0910 Airborne Laser (ABL) Block 2008	0	0	0	0	601,294	669,120	0	0
0010 Airborne Laser (ABL) Block 2010	0	0	0	0	0	0	791,930	1,163,040
0602 Program-Wide Support	12,779	18,279	18,996	18,967	19,499	21,687	19,500	20,142

A. Mission Description and Budget Item Justification

The Administration and the Congress have committed to deploying a ballistic missile defense system as soon as technologically possible. In response to Presidential direction, MDA fielded an initial defensive capability in 2004 to address known threats. We began with the most mature components - a small number of sensors and interceptors and a fire control system - forming the foundation of an integrated and layered ballistic missile defense system (BMDS). The fielded system is limited, intended to support comprehensive development and testing while providing defense of the United States against attack by a limited number of ballistic missiles. Our objective remains a single integrated layered system with diverse basing options.

We have balanced fielding decisions with a comprehensive development program to deliver the maximum operational capability within the resources provided. The FY 2006 biennial budget submission, to include the FYDP years, emphasizes full integration of BMDS elements and components - that is, making the system work better as a single system - as well as continued development of capabilities that will close performance gaps in our current configuration. This program is balanced and funded to meet a broad spectrum of potential threats - 1) the size of the rogue nation threat; 2) the complexity of the rogue nation threat; 3) aggressive tactics to circumvent our current posture; and 4) the emergence of new threats. The Administration is committed to defending the American people against new threats of the 21st century and has called out deployment of effective missile defenses as an essential element of that effort. There is risk associated with any significant downward adjustments in this budget.

In the course of the past year, MDA has reviewed its overall approach to developing and fielding a BMDS - an integrated, layered defense against threats of all ranges, in all phases of flight. This approach is critical to achieving the highest performance defense and ensuring the defense is not vulnerable to any particular threat.

MDA identifies BMDS capabilities, architectures and element contributions to counter the threat and organizes them by Engagement Sequence Groups (ESGs). These ESGs describe a combination of weapons, sensors and C2BMC capabilities that must work together to detect, track and intercept an enemy missile - the complete kill chain from the time the threat missile is first detected through the intercept of the target. Through ESGs, the MDA Systems Engineer identifies the necessary interfaces required to deliver a usable configuration of the BMDS. ESGs are also useful in helping the operator plan and train for operation of that capability, and they provide a means to track and test future improvements to the system. The Airborne Laser (ABL), integrated with C2BMC, represents a key engagement sequence group (ESG) within the BMDS. The ABL's sensor capability can also be used by other BMDS elements, expanding the overall BMDS ESGs available. In FY05, ABL is a Level 3 ESG, i.e., in the phase of integrating and proving major subsystems and providing confidence in full integration. C2BMC and BMDS-level systems engineering and integration guide ABL's optimum incorporation into the BMD System.

Program Element 0603883C, Boost Defense Segment (BDS), funds the Airborne Laser (ABL) element portions of BMDS' Block 2004, 2006, 2008, and 2010 and other mission area investment activities. The FY 2005 request includes funds for international cooperation. The ABL provides a capability to destroy ballistic missiles in the boost phase of their trajectory, the segment from post launch through propellant burnout after which the missile enters the midcourse phase of ballistic flight. The boost phase typically includes the first 60-300 seconds of flight and concludes at altitudes between 20-450 kilometers. Destroying ballistic missiles in the boost phase means threats can be negated long before they have an opportunity to deploy reentry vehicles, submunitions, or

countermeasures, and debris from successful engagements can be precluded from affecting protected areas and assets. As a result, adding ABL to the BMDS significantly increases the overall defensive capability by reducing the amount of targets faced by successive defenders and addressing certain threats they cannot counter.

The ABL program is designing, building, and testing an air-based laser system to acquire, track, and kill ballistic missiles. ABL integrates three major subsystems (Laser; Beam Control; and Battle Management, Command, Control, Communications, Computers and Intelligence (BMC4I)) into a modified commercial Boeing 747-400 aircraft. ABL also includes ABL-specific ground support equipment. The development of the 1st ABL weapon system test bed will be accomplished by incrementally stepping through all the key knowledge points (increasing degrees of integration and testing of the integrated weapon system denoting significant levels of accumulated understanding) that confirm the ABL's viability. The key knowledge points are:

- Completion of ground testing of a flight worthy, weapon class laser segment suitable for use in an ABL
- Completion of aircraft modifications necessary for High Energy Laser (HEL) segment
- Completion of flight testing of the Beam Control Fire Control (BCFC) segment
- Completion of integration and ground testing of ABL weapon system combining the laser, BCFC, and battle management segments
- Successful demonstration of ABL lethality against a boosting missile (shoot down)
- Flight testing of an ABL weapon system expanded performance envelope

Each point supports decisions to complete subsequent program milestones. In FY07, the program will expand the capability-based evolutionary acquisition strategy by initiating the development of a 2nd ABL weapon system testbed to provide the proof of a robust, supportable, producible capability ultimately needed for an operational ABL force.

Program-Wide Support provides funding for common support functions across the entire program such as strategic planning, program integration, cost estimating, contracting, financial management to include preparation of financial statements, reimbursement of financial services provided by DFAS, internal review and audit, earned-value management, and program assessment. Includes costs for both government civilians performing these functions as well as support contractors providing government staff augmentation in these areas. Applies to costs at the MDA HQ as well as its Executing Agents in the Services: Army Space and Missile Defense Command, Army PEO Space and Missile Defense, Office of Naval Research, and various Air Force laboratory and acquisition activities. Other costs include physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses at the various MDA Executing Agent locations, which at the MDA HQ are generally funded from the Management Headquarters Program Element (0901598C). Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

B. Program Change Summary	FY 2004	FY 2005	FY 2006	FY 2007
Previous President's Budget (FY 2005 PB)	617,270	492,614	555,667	611,736
Current President's Budget (FY 2006 PB)	475,911	476,179	483,863	648,728
Total Adjustments	-141,359	-16,435	-71,804	36,992
Congressional Specific Program Adjustments	0	5,750	0	0
Congressional Undistributed Adjustments	0	-22,185	0	0
Reprogrammings	-51,314	0	0	0
SBIR/STTR Transfer	-90,045	0	0	0
Adjustments to Budget Years	0	0	-71,804	36,992

Select activities and the associated funding originally scheduled in FY 2006 were slipped to FY 2007 and FY 2008 as a result of a reduction to FY2006. The FY 2006 funding reduction was offset across the FYDP by increasing FY 2007 and FY 2008, respectively. Impacted government activities include the BMDS Security Guide Implementation, 1st ABL spares, Mission Assurance Implementation Plan (MAIP), and LFT&E efforts. Infrastructure Improvement and Technology Insertion efforts were also impacted. In addition, an FY 2006 and FY2007 reduction occurred as a result of a Zero Budget Transfer (ZBT). Indirect test range costs at Edwards AFB will no longer be paid from the ABL program element.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0710 Airborne Laser (ABL) Block 2004	463,132	457,900	0	0	0	0	0	0
RDT&E Articles Qty	0	5	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

The ABL Block 2004 effort continues integration and test of the first increment in the evolutionary acquisition of an air-based, boost phase intercept capability using directed energy. This 1st ABL weapon system test bed under development in Block 2004 represents a unique, dedicated, highly mobile weapon element for the overall BMDS.

The ABL Block 2004 effort capitalizes on the technical progress achieved to date in integration and test of the 1st ABL weapon system test bed. The primary focus is accomplishing key near-term knowledge points while maintaining the overall objective of achieving a lethal demonstration at the earliest possible date. To that end, efforts necessary to reduce the risk and uncertainties associated with follow-on steps to shoot down also continue. The Block 04 program additionally provides continued ABL-specific technology maturation, integration and testing for future blocks; provides continued infrastructure sustainment to maintain and improve domestic capability to produce advanced optics and sensors for high-energy laser systems; and provides international cooperation exploration. The ABL initial development contract was established to design, fabricate, integrate, and test a Boeing 747 aircraft with a laser device, as well as Beam Control and Battle Management Systems.

The development of the 1st ABL weapon system test bed will be accomplished by incrementally stepping through all the key knowledge points (increasing degrees of integration and testing of the integrated weapon system denoting significant levels of accumulated understanding) that confirm the ABL's viability. Each point supports program decisions to complete subsequent milestones. The key knowledge points are:

- Completion of ground testing of a flight worthy, weapon class laser segment suitable for use in an ABL
- Completion of aircraft modifications necessary for High Energy Laser (HEL) segment
- Completion of flight testing of the Beam Control Fire Control (BCFC) segment
- Completion of integration and ground testing of ABL weapon system combining the laser, BCFC, and battle management segments
- Successful demonstration of the ABL lethality against a boosting ballistic missile (shoot down)
- Flight testing of an ABL weapon system expanded performance envelope

ABL integrated with C2BMC represents a key engagement sequence group (ESG) within the BMDS. ABL's sensor capability can also be used by other BMDS elements, expanding the overall BMDS ESGs available. In FY05, ABL will be a Level 3 ESG, i.e., in the phase of integrating and proving major subsystems and providing confidence in full integration. C2BMC and BMDS-level systems engineering and integration guide ABL's optimum incorporation into the BMD System.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
1st ABL	378,828	377,200	0	0
RDT&E Articles (Quantity)	0	0	0	0

Continue Block 2004 efforts for developing the 1st ABL weapon system testbed. This includes ground integration and testing of a flight worthy weapons class laser. This also includes efforts to integrate and test the Beam Control Fire Control (BCFC) segment on the aircraft.

FY 2004 Accomplishments:

- Completed ground integration and testing of the BCFC segment
- Completed integration of the six laser modules in the laser System Integration Laboratory (SIL)
- Completed SIL testing through iodine flow major activation in preparation for SIL first light
- Completed majority of integration efforts of the beam control segment into the 1st ABL weapon system aircraft

FY 2005 Planned Accomplishments:

- First flight of the ABL with the Beam Control System
- Complete passive Low Power (LP) system readiness and flight tests
- Complete High Energy Laser (HEL) SIL testing
- First light of the full laser within the laser SIL
- Complete Link-16 implementation, providing for integration into the BMDS
- Conduct Common Cost Methodology Working Group (CCMWG) efforts in support of ABL life cycle cost (LCC) estimates, and affordability modeling. This effort incorporates the use of Block 04 actual costs for estimating a 2nd ABL unit.
- Initiate international cooperation efforts
- Initiate phased implementation of MDA BMDS security compliance
- Complete testing of laser modules in the laser SIL

	FY 2004	FY 2005	FY 2006	FY 2007
Government Activities	72,392	73,900	0	0
RDT&E Articles (Quantity)	0	5	0	0

The Block 2004 government activities include support for the increased operations tempo of the Integrated Test Force (ITF), ground test activities at Edwards AFB, diagnostics for flight tests, boost diagnostics, targets, Atmospheric Decision Aid (ADA) support to ABL flight testing, ITF environmental activities, modeling and simulation efforts for BMDS integration, logistics, contractor personnel support (Analysis and Analytical Services, System Engineering Technical Assistance, Federally Funded Research Development Center), and System Program Office (SPO) administrative operating support.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

FY 2004 Accomplishments:

- Continued successful development and testing of airborne instrumentation target.
- Continued development and application of modeling and simulation tools to support ABL testing and BMDS integration
- Continued lethality analysis of conceptual and threat missiles
- Supported BMDS engineering, test planning, and test execution
- Supported ground test activities at Edwards AFB
- Conducted oversight of auxiliary research efforts
- Purchase of 5 Foreign Military Assets (FMA) targets by Targets and Countermeasures (TC) Program Office
- The Targets and Countermeasures (TC) Program Office supported the procurement and launch of targets for ABL

RDT&E Test Articles: These RDT/E articles are targets that will be used to test the 1st ABL weapon system test bed. The targets will be prepared for generic MDA configuration and placed in hold status until needed for final test configuration.

- No delivery in FY 2004 of Foreign Military Assets (FMA). The delivery of 3 FMAs stated in previous PB submission are delayed until FY 2005.

FY 2005 Planned Accomplishments:

- Complete AF Link-16 testing
- Support ground and flight test operations out of Edwards AFB
- Provide atmospheric decision aid support to ABL flight testing
- Provide diagnostics and targets to support ABL flight testing
- Support MDA Engagement Sequence Group (ESG) management activities
- Continue modeling and simulation activities to support ABL development and incorporation within the BMDS
- Continue program operations for managing the execution of the ABL program

RDT&E Test Articles: These RDT/E articles are targets that will be used to test the 1st ABL weapon system test bed. The targets will be prepared for generic MDA configuration and placed in hold status until needed for final test configuration.

- 5 Foreign Military Assets. The previous PB submission stated 2 FMAs for FY 2005; the total increased to 5 FMAs due to the delay stated above for FY 2004.

	FY 2004	FY 2005	FY 2006	FY 2007
Infrastructure Improvement	7,400	5,200	0	0
RDT&E Articles (Quantity)	0	0	0	0

Conduct investments to enhance the ABL-specific industrial base with the focus on large optics, optical coatings, sensors, and targeted manufacturing shortfalls for 2nd ABL weapon system test bed.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

FY 2004 Accomplishments:

- Continued large optics fabrication and sustainment efforts
- Initiated program to improve Electron Bombarded Charge Couple Device (EBCCD) camera manufacturing yields and processes
- Initiated effort to improve optical coating process and process controls
- Initiated effort to develop oxy fluoride glass for bulkhead windows

FY 2005 Planned Accomplishments:

- Continue improvements in process and process controls for coating large and small optics to increase quality and repeatability
- Continue optics fabrication and sustainment efforts
- Initiate program to develop EBCCD camera replacement prototype
- Continue effort to develop oxy fluoride glass for bulkhead windows

	FY 2004	FY 2005	FY 2006	FY 2007
Technology Insertion	4,512	1,600	0	0
RDT&E Articles (Quantity)	0	0	0	0

Develop promising technologies for incorporation in 2nd ABL weapon system testbed. Efforts will focus on technologies that will improve ABL lethality, reliability, and maintainability to improve ABL's contribution to the BMDS.

FY 2004 Accomplishments:

- Continued efforts to reduce optical jitter and improve beam control performance
- Initiated investigation to improve High Energy Laser (HEL) power, efficiency, and operational regime
- Initiated project to develop cryogenically cooled Ytterbium-doped: Yttrium Aluminum Garnet (Yb:YAG) crystal illuminator laser
- Developed components for pressure recovery system to enable low altitude operations
- Developed and implemented advanced disturbance filtering algorithms and reference sensor to reduce beam control system jitter
- Initiated target typing study
- Initiated study to improve Active Ranging System (ARS) performance
- Identified potential structural components for lightweighting

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

FY 2005 Planned Accomplishments:

- Continue efforts to reduce optical jitter and improve beam control performance
- Continue project to develop cryogenically cooled Yb:YAG illuminator laser
- Continue program to increase High Energy Laser (HEL) power, efficiency, and operational regime

	FY 2004	FY 2005	FY 2006	FY 2007
Weapon System Development	0	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

The line for Weapon System Development is listed here since it appears in the R-3, which provides the historical costs for this item.

	FY 2004	FY 2005	FY 2006	FY 2007
Iron Bird	0	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

The Iron Bird ground test facility has been put on hold within the ABL program. The line for Iron Bird is listed here since it appears in the R-3, which provides the historical costs for this item.

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
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PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419

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PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

D. Acquisition Strategy

The Airborne Laser entered into a program definition and risk reduction (PDRR) contract in November 1996. The initial development contract was awarded to the Boeing/TRW (now Northrop Grumman)/Lockheed Martin team. Since then, there has been steady and significant progress. The program remains structured to demonstrate technical achievements throughout the preliminary design and risk reduction phase, culminating in a lethality demonstration. The current contractual vehicles were implemented to provide better management in the high-risk environment for the technology advanced ABL program, thereby, reducing uncertainties and improving planning. The program structure allows remaining efforts to be grouped and phased to emphasize the focus on incremental achievement of technical milestones and increasing confidence in the technical viability of the airborne laser.
The development of the 1st ABL weapon system test bed will be accomplished by incrementally stepping through all the key knowledge points (integration and test milestones denoting significant levels of accumulated understanding) that confirm the ABL's viability. The key knowledge points are:

- Completion of ground testing of a flight worthy, weapon class laser segment suitable for use in an ABL
- Completion of aircraft modifications necessary for High Energy Laser (HEL) segment
- Completion of flight testing of the Beam Control / Fire Control (BCFC) segment
- Completion of integration and ground testing of ABL weapon system combining the laser, BCFC, and battle management segments
- Successful demonstration of the ABL lethality against a boosting ballistic missile (shoot down)
- Flight testing of an ABL weapon system expanded performance envelope

The Airborne Laser development follows the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition, and use of two-year capability blocks (in the case of ABL; ABL Blocks 2004, 2006, 2008, and 2010). This approach systematically and incrementally adds more capability as technology matures.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
1st ABL										
	C/CPAF	Boeing Defense & Space Group/ Seattle, WA	1,205,701	377,200	1/4Q	0	N/A	0	N/A	1,582,901
Infrastructure Improvement										
Contract	SS/Various	Multiple, i.e. Lockheed Martin/ Multiple, i.e. MD, CA	12,397	5,200	1/4Q	0	N/A	0	N/A	17,597
Technology Insertion										
Contract	SS/Various	Multiple, i.e. Northrop Grumman, Lockheed Martin/ Multiple, i.e. CA	23,805	1,600	1/4Q	0	N/A	0	N/A	25,405
Weapon System Development										
	SS/CPAF	Boeing Defense & Space Group/ Seattle, WA	39,583	0	N/A	0	N/A	0	N/A	39,583
Iron Bird										
Contract	SS/CPAF	Boeing Defense & Space Group/ Seattle, WA	8,505	0	N/A	0	N/A	0	N/A	8,505
Subtotal Product Development			1,289,991	384,000		0		0		1,673,991

Remarks

Prior year totals reflect post transfer of ABL from an Air Force program to an MDA program. Although the R-2A does not include funding for Weapon System Development FY 2004-2006, Weapon System Development is listed in the R-3 to provide the historical costs for this item. Although the R-2A does not include funding for Iron Bird FY 2004-2006, Iron Bird is listed in the R-3 to provide the historical costs for this item. An FY 2005 $4.25M Congressional Add is included for international cooperation for the 1st ABL.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Government Activities										
Technical Support Costs	C/CPAF	Northrop Grumman/ Kirtland AFB/Various	33,074	17,700	1/4Q	0	N/A	0	N/A	50,774
Technical Support Costs	MIPR	Aerospace/ Kirtland AFB	2,803	1,500	1/4Q	0	N/A	0	N/A	4,303
Technical Support Costs	MIPR	Tecolote Research/ Kirtland AFB	4,485	2,400	1/4Q	0	N/A	0	N/A	6,885
Technical Support Costs	MIPR	MITRE/ Kirtland AFB	934	500	1/4Q	0	N/A	0	N/A	1,434
Government and Other Support Costs	C/FP	ABLSPO/ Kirtland AFB, Various	0	300	1/4Q	0	N/A	0	N/A	300
Government and Other Support Costs	MIPR	AFRL/ TX, CA, Various	2,474	540	1/4Q	0	N/A	0	N/A	3,014
Government and Other Support Costs	MIPR	AFRL/ Kirtland AFB	1,145	250	1/4Q	0	N/A	0	N/A	1,395
Government and Other Support Costs	MIPR	UDRI/ OH	1,782	389	1/4Q	0	N/A	0	N/A	2,171
Government and Other Support Costs	MIPR	AFRL/ Kirtland AFB	2,080	454	1/4Q	0	N/A	0	N/A	2,534
Government and Other Support Costs	MIPR	NAVAIR/ CA	641	140	1/4Q	0	N/A	0	N/A	781
Government and Other Support Costs	MIPR	AFRL/ Kirtland AFB	1,145	250	1/4Q	0	N/A	0	N/A	1,395
Government and Other Support Costs	MIPR	AFRL/ Kirtland AFB	2,300	502	1/4Q	0	N/A	0	N/A	2,802

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603883C Ballistic Missile Defense Boost Defense Segment

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Government and Other Support Costs	C/FP	ABL SPO/ Kirtland AFB	916	200	1/4Q	0	N/A	0	N/A	1,116
Government and Other Support Costs	MIPR	AFRL/ Kirtland AFB, MA, Various	2,061	450	1/4Q	0	N/A	0	N/A	2,511
Government and Other Support Costs	Various	ABL SPO/ Kirtland AFB	4,581	1,000	1/4Q	0	N/A	0	N/A	5,581
Government and Other Support Costs	Various	ABL SPO/ Kirtland AFB	5,955	1,300	1/4Q	0	N/A	0	N/A	7,255
Government and Other Support Costs	MIPR	ACC/ VA	2,291	500	1/4Q	0	N/A	0	N/A	2,791
Government and Other Support Costs	Various	ABL SPO/ Kirtland AFB, Various	252	55	1/4Q	0	N/A	0	N/A	307
Government and Other Support Costs	MIPR	ABL SPO/ Kirtland AFB	266	58	1/4Q	0	N/A	0	N/A	324
Government and Other Support Costs	MIPR	ABL SPO/ Kirtland AFB	907	198	1/4Q	0	N/A	0	N/A	1,105
Government and Other Support Costs	Various	ABL SPO/ Kirtland AFB	5,103	1,114	1/4Q	0	N/A	0	N/A	6,217
Government and Other Support Costs	Various	ABL SPO/ Kirtland AFB	1,374	300	1/4Q	0	N/A	0	N/A	1,674
Subtotal Support Costs			76,569	30,100		0		0		106,669

Remarks

Prior year totals reflect post transfer of ABL from an Air Force program to an MDA program.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Government Activities										
Integrated Test Force	MIPR	AFFTC/ Edwards AFB	34,000	24,900	1/4Q	0	N/A	0	N/A	58,900
LFT&E-Lethality Baseline Tests	Various	Various/ Various	23,546	4,300	1/4Q	0	N/A	0	N/A	27,846
Target - Test Instrumentation	MIPR	Various/ Various	39,276	14,600	1/4Q	0	N/A	0	N/A	53,876
Subtotal Test and Evaluation			96,822	43,800		0		0		140,622

Remarks

Prior year totals reflect post transfer of ABL from an Air Force program to an MDA program.

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										
Project Total Cost			1,463,382	457,900		0		0		1,921,282

Remarks

Prior year totals reflect post transfer of ABL from an Air Force program to an MDA program.

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Testing Milestones																																
Initiate integration of BCFC into 1st ABL				▲																												
First Light					▲																											
First Flight with BCFC system					▲																											
Passive LP System Readiness and Flight Tests							△																									
Complete Link-16 testing								△																								
Complete laser module tests in laser SIL								△																								

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Testing Milestones								
Initiate integration of BCFC into 1st ABL	4Q							
First Light		1Q						
First Flight with BCFC system		1Q						
Passive LP System Readiness and Flight Tests		3Q						
Complete Link-16 testing		4Q						
Complete laser module tests in laser SIL		4Q						

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0810 Airborne Laser (ABL) Block 2006	0	0	464,867	629,761	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

ABL's high-payoff boost defense capability is essential for the envisioned BMDS - an integrated, layered defense against threats of all ranges, in all phases of flight. Destroying ballistic missiles in the boost phase means threats can be negated long before they have an opportunity to deploy reentry vehicles, submunitions, or countermeasures, and debris from successful engagements can be precluded from affecting protected areas and assets. As a result, adding ABL to the BMDS significantly increases the overall defensive capability by reducing the amount of targets faced by successive defenders and addressing certain threats they cannot counter. Further increasing the robustness of the BMDS is ABL's sensor capability that can enhance the performance of other elements. Plus, the unique and revolutionary aspect of ABL's mobility and directed energy weapon add up to a weapon system that creates a panoply of additional complexities for those trying to develop or employ missile threats. The ABL Block 2006 effort will continue the program's integration and ground and flight test activities for the 1st ABL weapon system test bed. It will also provide continued ABL specific technology maturation for integration and testing on subsequent blocks along with infrastructure sustainment to maintain and improve domestic capability to produce advanced optics and sensors for high-energy laser systems. Finally, it will reinitiate studies and establish the capabilities baseline for an advanced (robust, supportable, and producible) 2nd ABL weapon system.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
1st ABL	0	0	387,267	492,126
RDT&E Articles (Quantity)	0	0	0	0

Continue program for developing the 1st ABL weapon system test bed, to include start of the integration of the laser into the 1st ABL weapon system testbed, the initiation of ground testing and the purchase of spares for the 1st ABL weapon system test bed.

FY 2006 Planned Program:

- Conduct LP system ground test and flight tests
- Continue phased implementation of MDA-BMDS security compliance
- Begin laser SIL disassembly and parts refurbishment
- Conduct any necessary aircraft structural modifications

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

FY 2007 Planned Program:

- Continue laser SIL disassembly and parts refurbishment
- Initiate integration of the laser into the 1st ABL weapon system
- Conduct any necessary aircraft structural modifications, Beam Control Fire Control (BCFC) upgrades and rework
- Initiate Service Life Extension Program, activities include; aircraft (engine wear and other maintenance), laser (valves and other plumbing, turbo pumps, gas generators, tanks), BCFC (processors/cards, steering mirrors, illuminator diodes), BMC4I (processors/cards, Infrared Search and Track (IRST) components, Active Ranging System (ARS) components)
- Initiate purchase of deployable ground support equipment and 1st ABL spares
- Complete implementation of MDA-BMDS security practices
- Initiate core standards trade studies and Mission Assurance Implementation Plan (MAIP)
- Initiate ground testing of fully integrated weapon system

	FY 2004	FY 2005	FY 2006	FY 2007
2nd ABL	0	0	0	15,800
RDT&E Articles (Quantity)	0	0	0	0

Capture and maintain baseline for 1st ABL weapon system to support definition of an advanced 2nd ABL weapon system test bed through trade studies and data collection and analysis efforts to guide incorporation of lessons learned from laser SIL and BCFC test and integration activities. Conduct trade studies to bound extent of 2nd ABL advancements and establish capabilities baseline.

FY 2007 Planned Program:

- Trade studies to determine 2nd aircraft system performance capabilities
- Initiate design for 2nd ABL weapon system

	FY 2004	FY 2005	FY 2006	FY 2007
Infrastructure Improvement	0	0	5,200	9,800
RDT&E Articles (Quantity)	0	0	0	0

Conduct investments to enhance the ABL specific industrial base with the focus on large optics, optical coatings and targeted manufacturing shortfalls for 2nd ABL weapon system test bed.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

FY 2006 Planned Program:

- Continue optics fabrication and sustainment efforts
- Continue to improve Electron Bombarded Charged Couple Device (EBCCD) camera manufacturing yields and processes
- Continue development of oxy fluoride glass for bulkhead windows
- Continue optical coatings process and chamber control improvements

FY 2007 Planned Program:

- Continue optics fabrication and sustainment efforts
- Continue to improve EBCCD camera manufacturing yields and processes
- Develop EBCCD replacement prototype
- Continue optical coatings process and chamber control improvements
- Develop oxy fluoride bulkhead windows prototype

	FY 2004	FY 2005	FY 2006	FY 2007
Technology Insertion	0	0	1,600	7,400
RDT&E Articles (Quantity)	0	0	0	0

Develop promising technologies for incorporation in 2nd ABL weapon system test bed or future ABL blocks. Efforts will focus on technologies that will improve ABL lethality, reliability, and maintainability to improve ABL's contribution to the BMDS.

FY 2006 Planned Program:

- Continue program to increase high energy laser power, efficiency, and operational regime
- Continue efforts to reduce optical jitter and improve beam control performance
- Increase wavefront control performance via steering mirror enhancements

FY 2007 Planned Program:

- Continue program to increase high energy laser power, efficiency, and operational regime
- Continue efforts to reduce optical jitter and improve beam control performance
- Develop ARS components to improve performance

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

	FY 2004	FY 2005	FY 2006	FY 2007
Government Activities	0	0	70,800	104,635
RDT&E Articles (Quantity)	0	0	0	0

The Block 2006 government activities include support for the increased operations tempo for the Integrated Test Force (ITF), ground test activities at Edwards AFB, diagnostics for flight tests, boost diagnostics, targets, Atmospheric Decision Aid (ADA) support to ABL flight testing, ITF environmental activities, modeling and simulation efforts for BMDS integration, logistics, contractor personnel support (Analysis and Analytical Services, System Engineering Technical Assistance, Federally Funded Research Development Center), and System Program Office (SPO) administrative operating support.

FY 2006 Planned Program:

- Continue program office operations for managing execution of the ABL program
- Continue development and application of modeling and simulation tools to support ABL testing and BMDS integration
- Continue lethality analysis of current and projected threat missiles
- Support BMDS engineering, test planning, and test execution
- Provide diagnostics and targets to support ABL flight testing
- Support ground test activities for increased operations tempo at Edwards AFB

FY 2007 Planned Program:

- Continue program office operations for managing execution of the ABL program
- Continue development and application of modeling and simulation tools to support ABL testing and BMDS integration
- Provide atmospheric decision aid test support to ABL
- Continue lethality analysis of current and projected threat missiles
- Provide diagnostics and targets which will support later ABL flight testing
- Continue ground test activities for increased operations tempo at Edwards AFB

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

D. Acquisition Strategy

The Airborne Laser development follows the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition, and use of two-year capability blocks (in the case of ABL; ABL Blocks 2004, 2006, 2008, and 2010). This approach systematically and incrementally adds more capability as technology matures. In FY07, the program will expand the capability-based evolutionary acquisition strategy by initiating the development of a 2nd ABL weapon system as a step along the way to ultimately producing an operational ABL force. A decision will be made as to whether the ABL Block 2006 program will continue with the existing prime contract, or move to a new contract. The ABL Block 2006 effort will learn from the ABL Block 2004 accomplishments and will continue the program's integration and ground and flight test activities for the 1st ABL weapon system testbed. It will also provide continued ABL specific technology maturation for integration and testing on subsequent blocks along with infrastructure sustainment to maintain and improve domestic capability to produce advanced optics and sensors for high-energy laser systems. Finally, it will reinitiate studies and establish the capabilities baseline for an advanced (robust, supportable, and producible) 2nd ABL weapon system.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
1st ABL										
	C/CPAF	Boeing Defense &Space Group/ Seattle, WA	0	0	N/A	387,267	1/4Q	492,126	1/4Q	879,393
2nd ABL										
	SS/CPAF	Boeing Defense & Space Group/ Seattle, WA	0	0	N/A	0	1/4Q	15,800	1/4Q	15,800
Infrastructure Improvement										
Contract	SS/Various	Multiple, i.e. Lockheed Martin/ Multiple, i.e. MD, CA	0	0	N/A	5,200	1/4Q	9,800	1/4Q	15,000
Technology Insertion										
Contract	SS/Various	Multiple, i.e. Northrop Grumman, Lockheed Martin/ Multiple, i.e. CA	0	0	N/A	1,600	1/4Q	7,400	1/4Q	9,000
Subtotal Product Development			0	0		394,067		525,126		919,193

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Government Activities										
Technical Support Costs	C/CPAF	Northrop Grumman/ Kirtland AFB, Various	0	0	N/A	20,200	1/4Q	25,000	1/4Q	45,200
Technical Support Costs	MIPR	Aerospace/ Kirtland AFB	0	0	N/A	1,650	1/4Q	1,700	1/4Q	3,350
Technical Support Costs	MIPR	Tecolote Research/ Kirtland AFB	0	0	N/A	2,550	1/4Q	2,700	1/4Q	5,250
Technical Support Costs	MIPR	MITRE/ Kirtland AFB	0	0	N/A	700	1/4Q	800	1/4Q	1,500
Government and Other Support Costs	C/FP	ABL SPO/ Kirtland AFB	0	0	N/A	330	1/4Q	347	1/4Q	677
Government and Other Support Costs	MIPR	AFRL / TX, CA, Various	0	0	N/A	594	1/4Q	624	1/4Q	1,218
Government and Other Support Costs	MIPR	AFRL/ Kirtland AFB	0	0	N/A	275	1/4Q	289	1/4Q	564
Government and Other Support Costs	MIPR	UDRI/ OH	0	0	N/A	428	1/4Q	449	1/4Q	877
Government and Other Support Costs	MIPR	AFRL/ Kirtland AFB	0	0	N/A	499	1/4Q	524	1/4Q	1,023
Government and Other Support Costs	MIPR	NAVAIR/ CA	0	0	N/A	154	1/4Q	162	1/4Q	316
Government and Other Support Costs	MIPR	AFRL/ Kirtland AFB	0	0	N/A	275	1/4Q	289	1/4Q	564
Government and Other Support Costs	MIPR	AFRL/ Kirtland AFB	0	0	N/A	552	1/4Q	580	1/4Q	1,132

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603883C Ballistic Missile Defense Boost Defense Segment

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Government and Other Support Costs	C/FP	ABL SPO/ Kirtland AFB	0	0	N/A	220	1/4Q	231	1/4Q	451
Government and Other Support Costs	MIPR	AFRL/ Kirtland AFB, MA, Various	0	0	N/A	495	1/4Q	520	1/4Q	1,015
Government and Other Support Costs	Various	ABL SPO/ Kirtland AFB	0	0	N/A	1,100	1/4Q	1,155	1/4Q	2,255
Government and Other Support Costs	Various	ABL SPO/ Kirtland AFB	0	0	N/A	1,430	1/4Q	1,502	1/4Q	2,932
Government and Other Support Costs	MIPR	ACC/ VA	0	0	N/A	550	1/4Q	578	1/4Q	1,128
Government and Other Support Costs	Various	ABL SPO/ Kirtland AFB, Various	0	0	N/A	61	1/4Q	64	1/4Q	125
Government and Other Support Costs	MIPR	ABL SPO/ Kirtland AFB	0	0	N/A	64	1/4Q	67	1/4Q	131
Government and Other Support Costs	MIPR	ABL SPO/ Kirtland AFB	0	0	N/A	218	1/4Q	229	1/4Q	447
Government and Other Support Costs	Various	ABL SPO/ Kirtland AFB	0	0	N/A	1,455	1/4Q	1,525	1/4Q	2,980
Subtotal Support Costs			0	0		33,800		39,335		73,135

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Government Activities										
Integrated Test Force	MIPR	AFFTC/ Edwards AFB	0	0	N/A	15,200	1/4Q	17,800	1/4Q	33,000
LFT&E-Lethality Baseline Tests	Various	Various/ Various	0	0	N/A	4,300	1/4Q	17,900	1/4Q	22,200
Target-Test Instrumentation	MIPR	Various/ Various	0	0	N/A	17,500	1/4Q	29,600	1/4Q	47,100
Subtotal Test and Evaluation			0	0		37,000		65,300		102,300

Remarks

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										
Project Total Cost			0	0		464,867		629,761		1,094,628

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Program Milestones																																
Begin SIL disassembly and parts refurbishment									Δ																							
Complete A/C preservation, laser provisioning										Δ																						
Complete Low Power System Int. & Test										Δ																						
Laser installation on A/C NET													Δ			Δ																

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Program Milestones								
Begin SIL disassembly and parts refurbishment			1Q					
Complete A/C preservation, laser provisioning			2Q					
Complete Low Power System Int. & Test			2Q					
Laser installation on A/C NET				1Q-4Q				
A/C structural mods/BCFC upgrades NET				1Q-4Q				

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0910 Airborne Laser (ABL) Block 2008	0	0	0	0	601,294	669,120	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

The ABL Block 2008 effort furthers ground and flight testing of the 1st ABL weapon system. The Block 2008 effort continues the ABL-specific technology and infrastructure sustainment efforts, as well as the trades studies and capability baseline efforts for defining the 2nd ABL weapon system. The Block 2008 effort provides for enhancement of BMDS integration and the initiation of ground support. The Block 2008 program also transitions the 2nd ABL effort from trade studies to design activities and initiates the acquisition of the 2nd Boeing 747 airframe (the green aircraft).

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Funding in this Project is not programmed until FY 2008.	0	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

D. Acquisition Strategy

The Airborne Laser development follows the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition, and use of two-year capability blocks (in the case of ABL; ABL Blocks 2004, 2006, 2008, and 2010). This approach systematically and incrementally adds more capability as technology matures. The ABL Block 2008 effort furthers ground and flight testing of the 1st ABL weapon system. The Block 2008 effort continues the ABL-specific technology and infrastructure sustainment efforts, as well as the trades studies and capability baseline efforts for defining the 2nd ABL weapon system. The Block 2008 effort provides for enhancement of BMDS integration and the initiation of ground support. The Block 2008 program also continues trade studies and then transitions emphasis to design to design activities and initiates the acquisition of the 2nd Boeing 747 airframe (the green aircraft).

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Testing Milestones																																
Continue Ground and Flight Tests																																

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Testing Milestones								
Continue Ground and Flight Tests					1Q-4Q	1Q-4Q		

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0010 Airborne Laser (ABL) Block 2010	0	0	0	0	0	0	791,930	1,163,040
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

The Block 2010 effort includes evaluations against a broader spectrum of threats as an integrated part of the overall BMDS, and also provides for enhancement of BMDS integration. The Block 2010 effort moves the focus of ABL activity to the 2nd ABL weapon system test bed. This test bed addresses performance enhancements and life cycle cost considerations that will ensure a robust, supportable and producible capability. The effort will complete the design activities; obtain delivery and start modifications of the green aircraft, and initiate fabrication of weapon components. ABL-specific technology maturation and infrastructure improvement also continues.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Funding in this Project is not programmed until FY 2010.	0	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

D. Acquisition Strategy

The Airborne Laser development follows the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition, and use of two-year capability blocks (in the case of ABL; ABL Blocks 2004, 2006, 2008, and 2010). This approach systematically and incrementally adds more capability as technology matures. The Block 2010 effort includes evaluations against a broader spectrum of threats as an integrated part of the overall BMDS, and also provides for enhancement of BMDS integration. The Block 2010 effort moves the focus of ABL activity to the 2nd ABL weapon system test bed. This test bed addresses performance enhancements and life cycle cost considerations that will ensure a robust, supportable and producible capability. The effort will complete the design activities; obtain delivery and start modifications of the 2nd Boeing 747 airframe (the green aircraft), and initiate fabrication of weapon components. ABL-specific technology maturation and infrastructure improvement also continues.

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Testing Milestones																																
Continued Flight and Ground Tests																																

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Testing Milestones								
Continued Flight and Ground Tests							1Q-4Q	1Q-4Q

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603883C Ballistic Missile Defense Boost Defense Segment**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0602 Program-Wide Support	12,779	18,279	18,996	18,967	19,499	21,687	19,500	20,142
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

Program-Wide Support provides funding for common support functions across the entire program such as strategic planning, program integration, cost estimating, contracting, financial management to include preparation of financial statements, reimbursement of financial services provided by DFAS, internal review and audit, earned-value management, and program assessment. Includes costs for both government civilians performing these functions as well as support contractors providing government staff augmentation in these areas. Applies to costs at the MDA HQ as well as its Executing Agents in the Services: Army Space and Missile Defense Command, Army PEO Space and Missile Defense, Office of Naval Research, and various Air Force laboratory and acquisition activities. Other costs include physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses at the various MDA Executing Agent locations, which at the MDA HQ are generally funded from the Management Headquarters Program Element (0901598C). Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Civilian Salaries and Support	12,779	18,279	18,996	18,967
RDT&E Articles (Quantity)	0	0	0	0

See Section A: Mission Description and Budget Item Justification

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603883C Ballistic Missile Defense Boost Defense Segment

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total PE Cost	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614
0812 Space Tracking and Surveillance System (STSS) Block 2006	262,786	255,839	231,230	208,204	64,467	11,122	7,704	7,070
0912 Space Tracking and Surveillance System (STSS) Block 2008	0	0	0	45,200	29,319	24,092	14,066	13,762
0012 Space Tracking and Surveillance System (STSS) Block 2010	12,100	47,833	0	0	0	0	0	0
R112 Space Tracking and Surveillance System (STSS) Block 2012	0	0	535	167,045	440,000	579,000	737,000	773,000
0403 Russian-American Observation Satellite(s) Program (RAMOS)	27,562	0	0	0	0	0	0	0
0811 Ballistic Missile Defense Radars Block 2004/2006	110,018	260,519	272,243	263,367	60,400	0	0	0
0911 Ballistic Missile Defense Radars Block 2008	0	0	8,100	274,600	564,528	438,426	91,200	25,300
0011 Ballistic Missile Defense Radars Block 2010	0	0	9,400	15,700	19,000	101,000	193,342	174,065
0602 Program-Wide Support	5,348	13,106	8,321	21,595	36,294	32,494	25,896	25,417
Amount Included in PE 0904903D	0	0	0	0	-645,737	-729,253	-855,679	-887,800
Total PE Cost Reflected in R-1	417,814	577,297	529,829	995,711	568,271	456,881	213,529	130,814

Note:
The Space Tracking and Surveillance System (STSS) continues developing a common satellite ground segment and preparing two R&D satellites for launch (STSS Block 2006 -- Project 0812). Beginning in FY 2007 STSS will upgrade the ground segment and data processing algorithms to take advantage of on-orbit experience (STSS Block 2008 -- Project 0912). As an addition from last year, MDA is beginning to plan for a constellation of STSS satellites (STSS Block 2012 -- Project R112).

BMDS sensor improvements for delivery in Block 2008/Block 2010 timeframe will include the procurement of two X-Band Dish radars to augment the Forward Based X-Band Radar-Transportable (FBX-T) radar discrimination performance and the upgrade of an existing Large X-Band Dish radar to add sensor capabilities to the layered sensor concept.

A. Mission Description and Budget Item Justification

The mission of the Missile Defense Agency (MDA) is to develop an integrated layered Ballistic Missile Defense System (BMDS) to defend the United States, its deployed forces, friends and allies from ballistic missiles of all ranges and in all phases of flight. The United States will soon field a limited capability to defeat a ballistic missile threat. Continuing through the Future Years Defense Plan (FYDP), the breadth and depth of this initial capability will be expanded by adding and networking forward-deployed sensors, interceptors at sea and on land, and layers of increasingly capable weapons and sensors. Today's MDA activities are focused on five objectives: 1) complete development, initial fielding, and verification of Block 2004; 2) provide BMDS sustainment and Warfighter (Combatant Commanders) support; 3) develop a totally integrated capability for Block 2006 and beyond based on a strong core research and development program and improving the BMDS incrementally over time to meet future challenges; 4) execute an increasingly complex test program; and 5) establish a robust international foundation for missile defense.

MDA identifies BMDS capabilities, architectures and element contributions to counter the threat and organizes them by Engagement Sequence Groups (ESGs). These ESGs describe a combination of weapons, sensors and C2BMC capabilities that must work together to detect, track and intercept an enemy missile - the complete kill chain from the time the threat missile is first detected through the intercept of the target. Through ESGs, the MDA Systems Engineer identifies the necessary interfaces required to deliver a usable configuration of the BMDS. The engagement sequence group approach enables the REO, working with the responsible test organization (RTO), to develop detailed test plans in collaboration with the developers. ESGs are also useful in helping the operator plan and train for operation of that capability, and they provide a means to track and test future improvements to the system.

Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

The Sensors Program Element (PE) funds the sensor-related element portions of Blocks 2006, 2008, and 2010 and other sensor-related mission area investment activities. Technologies and capabilities developed under the Sensors Program Element include: the Space Tracking and Surveillance System (STSS), Forward Based X-Band Radar-Transportable (FBX-T) Radar, and Electro-Optics/Infrared (EO/IR) Demonstration and additional RF assets for layered sensors. The BMDS spiral development approach allows sensor technologies and capabilities to be incorporated as they mature and evolve into a network of sensors at the BMDS level. Sensor elements in this PE have been developed in coordination with the responsible engineering organization (REO) led by MDA Systems Engineering to help ensure that the elements are focused as a single, integrated system. Sensor data is used to detect, track, and discriminate ballistic missile threats; to control interceptors; and to support kill assessment and re-targeting.

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

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

The STSS project develops and fields a new sensor for the BMDS with the capability to globally track and discriminate ballistic missiles from the boost phase through the midcourse phase up until intercept or reentry. STSS enables new Engagement Sequences and provides coverage of a wider variety of threat trajectories than terrestrial radars can provide. STSS sensors will provide data to close the fire control loop with BMDS interceptors allowing earlier and, if necessary, additional shots. STSS's infrared sensors, when combined with radars, provide robustness against countermeasures.

The STSS project will develop Block 2006 R&D satellites and a common ground station to demonstrate the key functions of the STSS system. In Block 2008 STSS will incrementally upgrade the Block 2006 satellite ground station and software to optimize their use in the BMDS Test Bed. The STSS Block 2006 demonstrations will establish a foundation in actual testing for the design and fabrication of a constellation of satellites. Lessons learned from the Block 2006 and 2008 efforts will feed the early planning for an STSS constellation. Operational STSS satellites will be integrated into the BMDS in the Block 2012 timeframe, providing global 24-hour, 7-day-a-week capability to track all ballistic missiles, and allowing BMDS interceptors to launch and engage on STSS data. STSS tracking data will extend the kinematic range of the BMDS interceptor inventory, and allow shots against targets launched on trajectories without radar coverage.

The BMDS Radars Project will significantly enhance BMDS effectiveness by expanding the battlespace. The project includes the Forward Based X-Band Radar-Transportable (FBX-T) a land based component, but will have potential for a sea based configuration. The FBX-T Radar will provide early detection, tracking, and discrimination of threat missiles, providing data to the BMDS sensor network. The Forward Based Radar project will evaluate advanced algorithms and prototype the interfaces to the BMDS C2BMC using the TPS-X radar. In parallel, the Sensor Program will define improvements or modifications to both MDA and non-MDA owned sensors that have been identified for performance enhancement of the BMDS. The Airborne Infrared Surveillance (AIRS) program will be evaluating the utility of infrared (IR) surveillance capabilities with the specific intent to enhance BMDS engagement sequences.

Current plans call for the initial FBX-T Radar to be available in CY 2005. Contract options for two additional FBX-T radars will be exercised in FY 2005. These additional radars will be integrated into the BMDS as Block 2006 and Block 2008 assets. Evolving radar configurations will use additional algorithms and provide enhanced capabilities to support the BMDS. Beginning in FY 2006 the Forward Based Radar initiative will provide for continued sensor evolution to improve the capabilities for a BMDS configuration(s) for Block 2008 and beyond.

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Due to the lack of progress in the RAMOS Government-to-Government agreement with Russia, and the uncertainty this caused, MDA terminated the RAMOS program. RAMOS termination was accomplished using remaining FY04 funds. MDA received the Russian Government's draft MOU in July 2002. Despite 17 months of discussions, MDA was unable to complete a government-to-government agreement. Without this agreement, which includes the fundamental issue of taxes and liabilities, the RAMOS program could not be executed beyond the design stage. MDA will continue to discuss an overarching MOU to govern defense cooperation with Russia, and is actively exploring alternative, more beneficial missile defense cooperative projects with Russia, that enjoy the support of the Government of the Russian Federation. In accordance with Sec 8049 of the FY05 Department of Defense Appropriations Act, FY04 funds in the amount of $26.5M were rescinded from the RAMOS Program.

Program-Wide Support provides funding for common support functions across the entire program such as strategic planning, program integration, cost estimating, contracting, and financial management to include preparation of financial statements, reimbursement of financial services provided by DFAS, internal review and audit, earned-value management, and program assessment. Includes costs for both government civilians performing these functions as well as support contractors providing government staff augmentation in these areas. Applies to costs at the MDA HQ as well as its Executing Agents in the Services: Army Space and Missile Defense Command, Army PEO Space and Missile Defense, Office of Naval Research, and various Air Force laboratory and acquisition activities. Other costs include physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses at the various MDA Executing Agent locations, which at the MDA HQ are generally funded from the Management Headquarters Program Element (0901598C). Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

B. Program Change Summary	FY 2004	FY 2005	FY 2006	FY 2007
Previous President's Budget (FY 2005 PB)	425,421	591,957	790,265	1,453,679
Current President's Budget (FY 2006 PB)	417,814	577,297	529,829	995,711
Total Adjustments	-7,607	-14,660	-260,436	-457,968
Congressional Specific Program Adjustments	0	13,850	0	0
Congressional Undistributed Adjustments	0	-28,510	0	0
Reprogrammings	-6,831	0	0	0
SBIR/STTR Transfer	-776	0	0	0
Adjustments to Budget Years	0	0	-260,436	-457,968

The FY 2004 Sensor program increase of $10,170,000 was made to accelerate deliver of FBX-T #1, a Block 2006 asset, to Block 2004 in support of the Missile Defense Agency priorities.

The FY 2005 Sensor program increase of $4,418,000 was made for deployment services for FBX-T #1 in preparation for fielding. A Congressional increase of $13,850,000 to the Sensor program was made for Airborne Infrared Surveillance (AIRS) System, Improve Material for Optical Memories, and Ground-Based Studies of Rocket Plume Signatures. The FY 2006 Sensor program increase of $29,629,000 was made for a full year of Operation and Sustainment for FBX-T #1 and delivery and fielding of FBX-T #2. The FY 2007 Sensor program decrease of $34,165,000 was based on the elimination of FBX-T #4.

STSS Block 2010 funds in FY 2006 and 2007 moved to Special Programs Program Element (0603891C).

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0812 Space Tracking and Surveillance System (STSS) Block 2006	262,786	255,839	231,230	208,204	64,467	11,122	7,704	7,070
RDT&E Articles Qty	0	0	1	4	0	0	0	0

A. Mission Description and Budget Item Justification

STSS is the space based sensor element of the BMDS.

Block 2006 STSS is a low risk space based demonstration of key capabilities, adding two space based sensors and associated ground station processing capability to the Block 2006 BMDS Test Bed. The Block 2006 activity provides key knowledge on which to base the design of a future constellation. Block 2006 STSS delivers a ground segment in FY06 and launches two satellites with visible and infrared sensors into low earth orbit in FY07 for testing with other BMDS elements. These two satellites will provide valuable risk reduction for acquisition, tracking, and discrimination functionality including stereo data fusion, cueing radars over the horizon and over-the-horizon fire control. Key demonstrations will be performed showing the ability to close the BMDS interceptor fire control loop with data from the Block 2006 satellites.

To provide STSS with early, appropriate test opportunity, STSS is procuring four dedicated ballistic missile targets for on-orbit testing, two in FY07 and two in FY08. The STSS-centric tests with these targets will also include opportunities for secondary participation from other BMDS Elements. STSS is contracting through NASA for launch services for the two Block 2006 satellites using a single Delta II launch vehicle.

The Block 2006 program will develop and contribute to the testing of Engagement Sequence Groups (ESG) allowing BMDS interceptors to launch and/or engage on STSS sensor data. Testing will include configurations of the BMDS to include surrogate sensors such as the AF Maui Optical Station (AMOS) telescopes and High Altitude Observatory (HALO) II aircraft.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Space	98,048	143,313	123,609	83,277
RDT&E Articles (Quantity)	0	0	0	4

FY 2004 Accomplishments:

- Conducted Delta Critical Design Review (CDR)
- Completed Payload Software Build 2
- Completed Closed Loop Testing of Sensor Payload Software

FY 2005 Planned Accomplishments:

- Initial payment to NASA toward Launch Services for the 2 Block 2006 Satellites
- Complete Payload Software Build 3

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
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- Conduct System Compatibility Tests (Payload and Satellite Bus)
- Deliver Payload 1 to system integration
- Conduct Payload and Satellite Bus integration for Satellite 1

FY 2006 Planned Program:

- Deliver payload 2 to system integration
- Conduct Payload and Satellite Bus integration for satellite 2
- Begin integration of the two Satellites with NASA booster and Orbital Insertion Stage (OIS)

FY 2007 Planned Program:

RDT&E Articles: Two satellites and two ballistic missile targets

- Complete integration of the two satellites with the booster and Orbital Insertion Stage (OIS)
- Launch two STSS satellites into Low Earth Orbit (LEO)
- Conduct Post Launch Analysis
- Conduct initial on-orbit check out
- Procure two ballistic missile targets
- Conduct tests with Resident Space Objects, Ground based and Airborne targets
- Conduct first dedicated flight tests with ballistic missile targets

	FY 2004	FY 2005	FY 2006	FY 2007
Ground	43,068	21,372	10,534	1,118
RDT&E Articles (Quantity)	0	0	1	0

FY 2004 Accomplishments

- Matured Ground System Design
- Initiated Satellite Operation Training Plan

FY 2005 Planned Accomplishments:

- Continue Ground Hardware Integration
- Conduct Initial Crew Training
- Conduct Ground Acceptance Test 1 (tasking, health and status software sufficient to operate a single satellite)

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FY 2006 Planned Program:

RDT&E Article: One STSS Ground Station

- Continue Ground Segment Integration
- Conduct Ground Acceptance Test 2 (satellite to satellite communication functions, ground to satellite data feeds)
- Perform Test Rehearsals

FY 2007 Planned Program:

- Support preparation for satellite launch
- Support the initial satellite check out and testing with Resident Space Objects, Airborne and Ground Based targets, and dedicated ballistic missile targets

	FY 2004	FY 2005	FY 2006	FY 2007
Government	20,604	23,620	27,045	26,648
RDT&E Articles (Quantity)	0	0	0	0

FY04 Accomplishments:

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

FY05 Planned Accomplishments:

- FFRDC Requirements include Aerospace and Mitre Personnel Support
- Program Office Support includes Security Support, TDY, Cost Estimating Support, Management Services, Hardware and Software purchases and maintenance, Computer Network Support, and Supplies
- Conduct BMDS system trades leveraging Block 2006 program office, MDA system engineers and Block 2006 contractor
- Initiate development of a capability based/spiral development acquisition strategy

FY06 Planned Program:

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

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APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

- Complete development of a capability based/spiral development acquisition strategy
- Complete BMDS system trades

FY07 Planned Program:

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

	FY 2004	FY 2005	FY 2006	FY 2007
SE/PM	76,149	61,848	63,567	90,572
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments

- Analyzed Ground Test Data
- Conducted initial System Compatibility Tests

FY 2005 Planned Accomplishments:

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

FY 2006 Planned Program:

- Continue System Compatibility Tests (Ground to Satellite and Satellite to Satellite communication)
- Advanced Algorithm Development
- BMDS Integration
- Begin Launch & On-orbit Flight Test Preparations

FY 2007 Planned Program:

- Complete Launch & On-orbit Flight Test Preparations
- Conduct Launch
- Staff and operate the STSS Ground Segment
- Conduct initial satellite check out and testing with Resident Space Objects, Airborne and Ground based targets and dedicated ballistic missile targets

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	FY 2004	FY 2005	FY 2006	FY 2007
IR Engagement Sequence	11,287	5,686	6,475	6,589
RDT&E Articles (Quantity)	0	0	0	0

(Note: the FY04 budget contained funding for AIRS in this task. Beginning in FY05, AIRS will be funded and managed in project 0811. STSS will continue to participate as a user of AIRS data, and to leverage lessons learned from IR sensor contributions to the BMDS.)

FY 2004 Accomplishments:

- Performed modification to the HALO II aircraft and AIRS sensors
- Collected and Analyzed AIRS data for use in evaluation of relevance BMDS engagement sequences
- Continued to refine data processing algorithms and connectivity to the BMDS

FY 2005 Planned Accomplishments:

- Continue testing and evaluation of IR/Vis sensors' utility in BMDS Engagement sequences using surrogate sensor measurements
- Continue developing connectivity and algorithms toward providing near real time IR and IR-RADAR fused data to the BMDS

FY 2006 Planned Program:

- Continue testing and evaluation of IR/Vis sensors' utility in BMDS Engagement sequences using surrogate sensor measurements
- Continue developing connectivity and algorithms toward providing near real time IR and IR-RADAR fused data to the BMDS

FY 2007 Planned Program:

- Continue work with the BMDS to develop and test engagement sequences that include the STSS satellites.

	FY 2004	FY 2005	FY 2006	FY 2007
C2BMC	13,630	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

These funds were executed by the C2BMC Element to further the BMDS command control, battle management and communication infrastructure. This includes the offline prototyping environment known as the X-Lab into which the STSS Block 2006 ground segment will connect. This connection will enable true end to end BMDS testing with Block 2006 satellite data.

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C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

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D. Acquisition Strategy

STSS follows the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks. The STSS effort is being pursued through a single prime contractor, Northrop Grumman Space Technology (NGST), formerly TRW, with subcontractors playing key roles in systems engineering and sensor payloads. The program develops a ground station and series of R&D satellites aligned to the BMDS capability blocks. A contract for the first R&D spiral, the Block 2006 satellites was awarded in fourth quarter FY 2002. This contract implements MDA's capability-based acquisition strategy by a) using largely existing satellite hardware as a low risk opportunity, b) building upon the lessons learned from previous development efforts and c) establishing a series of planned enhancements to bring added capability to the BMDS.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Space										
Capability Based R&D Contract	SS/CPAF	NGST/ CA	94,176	104,644	1/4Q	76,184	1/4Q	22,535	1/4Q	297,539
Launch Vehicle Integration	Various	Various/ Various	3,872	38,469	1/4Q	32,086	1/4Q	26,244	1/4Q	100,671
Target Acquisition	Various	Various/ Various	0	200	1/4Q	15,339	1/4Q	34,498	1/4Q	50,037
Ground										
Capability Based R&D Contract	SS/CPAF	NGST/ CA	43,068	21,372	1/4Q	9,274	1/4Q	578	1/4Q	74,292
Government Furnished Equipment	Various	Various/ Various	0	0	N/A	1,260	1/4Q	540	1/3Q	1,800
SE/PM										
Capability Based R&D Contract	SS/CPAF	NGST/ CA	72,372	56,202	1/4Q	56,750	1/4Q	83,636	1/4Q	268,960
Advanced Algorithm Development	Various	Various/ Various	3,767	5,646	1/4Q	6,817	1/4Q	6,936	1/4Q	23,166
IR Engagement Sequence										
Airborne Infrared Surveillance (AIRS)	Various	Various/ Various	7,002	0	N/A	0	N/A	0	N/A	7,002
Data Collection and Analysis	Various	Various/ Various	4,295	5,686	1/3Q	6,475	1/3Q	6,589	1/3Q	23,045
C2BMC										
Subtotal Product Development			228,552	232,219		204,185		181,556		846,512

Remarks

- The Capability Based R&D contract was awarded in FY 2002. Prior year and FY 2003 costs were included in Project 5041.
- Funds obligation is incremental throughout the year.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Government										
System Program Office Support	Various	Various/ CA	9,177	9,500	1/4Q	12,400	1/4Q	12,200	1/4Q	43,277
Subtotal Support Costs			9,177	9,500		12,400		12,200		43,277

Remarks

- All system program office support costs have been allocated to Block 2006, through the launch in FY07.
- Prior year and FY 2003 costs were included in Project 5041.

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation										

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Government										
FFRDC	FFRDC	AEROSPACE/ CA	11,427	14,120	1/2Q	14,645	1/2Q	14,448	1/2Q	54,640
Subtotal Management Services			11,427	14,120		14,645		14,448		54,640

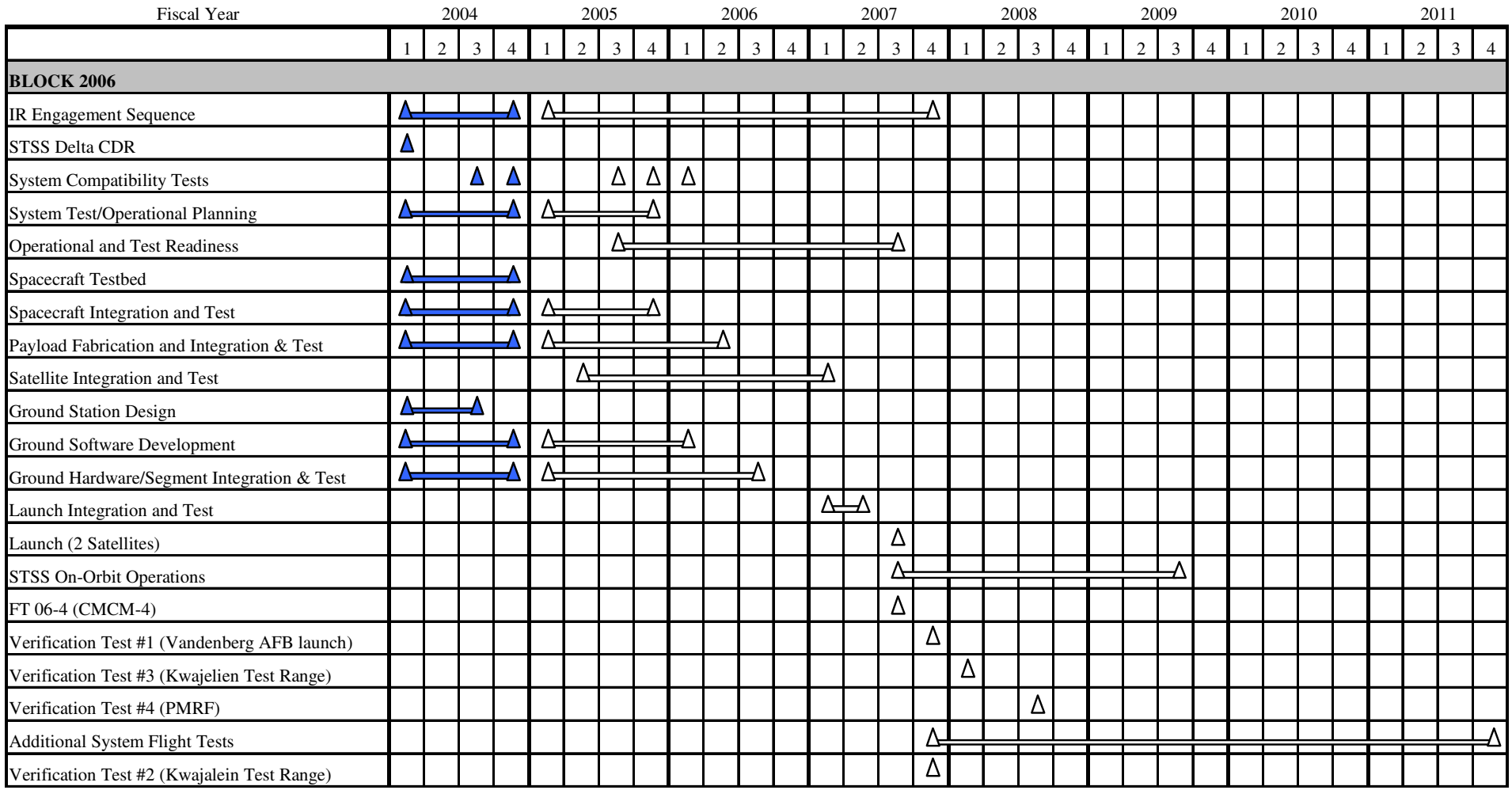
Remarks

- All FFRDC costs have been allocated to Block 2006, through the launch in FY07.
- Prior year and FY 2003 costs were included in Project 5041.

Project Total Cost			249,156	255,839		231,230		208,204		944,429

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**



Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
BLOCK 2006								
IR Engagement Sequence	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q				
STSS Delta CDR	1Q							
System Compatibility Tests	3Q,4Q	3Q,4Q	1Q					
System Test/Operational Planning	1Q-4Q	1Q-4Q						
Operational and Test Readiness		3Q-4Q	1Q-4Q	1Q-3Q				
Spacecraft Testbed	1Q-4Q							
Spacecraft Integration and Test	1Q-4Q	1Q-4Q						
Payload Fabrication and Integration & Test	1Q-4Q	1Q-4Q	1Q-2Q					
Satellite Integration and Test		2Q-4Q	1Q-4Q	1Q				
Ground Station Design	1Q-3Q							
Ground Software Development	1Q-4Q	1Q-4Q	1Q					
Ground Hardware/Segment Integration & Test	1Q-4Q	1Q-4Q	1Q-3Q					
Launch Integration and Test				1Q-2Q				
Launch (2 Satellites)				3Q				
STSS On-Orbit Operations				3Q-4Q	1Q-4Q	1Q-3Q		
FT 06-4 (CMCM-4)				3Q				
GT-196				4Q				
Verification Test #1 (Vandenberg AFB launch)				4Q				
Verification Test #3 (Kwajelien Test Range)					1Q			
Verification Test #4 (PMRF)					3Q			
Additional System Flight Tests				4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Verification Test #2 (Kwajalein Test Range)				4Q				

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0912 Space Tracking and Surveillance System (STSS) Block 2008	0	0	0	45,200	29,319	24,092	14,066	13,762
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

STSS is the space based sensor element of the BMDS.

The STSS Block 2008 project for upgrades to the Block 2006 ground station and software. The Block 2008 upgrade effort will incorporate lessons learned from on-orbit experiments to improve the performance of the system and its utility to the BMDS. These improvements will provide additional data on which to base design and algorithms choices for the Block 2012 Constellation.

STSS will conduct integrated operations with other BMD Elements in concert with the MDA Responsible Test Organization (RTO). Testing will be conducted to verify BMD System level goals and performance.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Ground and Software Upgrades	0	0	0	45,200
RDT&E Articles (Quantity)	0	0	0	0

FY 2007 Planned Program:

- Modify Block 2006 contract to include Ground Segment and software upgrades
- Based on performance of Block 2006 satellites on-orbit, refine acquisition, tracking and data processing software to increase utility of the satellites
- Refine Ground Segment to increase utility of Block 2006 satellites to the BMDS

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

D. Acquisition Strategy

STSS will follow the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development and evolutionary acquisition. The Block 2008 Ground Segment and Software Upgrade effort will be pursued through the Block 2006 prime contractor, Northrop Grumman Space Technology (NGST), with subcontractors playing key roles as needed. A contract for the Block 06 activity was awarded in fourth quarter FY 2002. Options on this contract will be awarded to accomplish the Block 2008 Ground Segment and Software Upgrade activity. Contract modification is expected to take place in the FY 2007 timeframe.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Ground and Software Upgrades										
Capability Based R&D Contract	SS/CPAF	NGST/CA	0	0	N/A	0	N/A	45,200	1Q	45,200
Subtotal Product Development			0	0		0		45,200		45,200

Remarks

As the Ground and Software upgrades activity is a refinement of the Block 06 ground segment, no funding or activity is planned until FY07.

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation										

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										
Remarks										
Project Total Cost			0	0		0		45,200		45,200

Remarks

As the Ground and Software upgrades activity is a refinement of the Block 06 ground segment, no funding or activity is planned until FY07.

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
BLOCK 2008																																
Contract Modification													Δ																			
Ground Station Upgrades														Δ						Δ												

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
BLOCK 2008								
Contract Modification				1Q				
Ground Station Upgrades				2Q-4Q	1Q-4Q			

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0012 Space Tracking and Surveillance System (STSS) Block 2010	12,100	47,833	0	0	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0	0

Note:
Activity for this funding is described elsewhere due to classification.

A. Mission Description and Budget Item Justification

Activity is described elsewhere due to classification.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Future Block Development	12,100	47,833	0	0
RDT&E Articles (Quantity)	0	0	0	0

Activity is described elsewhere due to classification.

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

D. Acquisition Strategy

Activity is described elsewhere due to classification.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Future Block Development										
			0	47,833		0		0		47,833
Subtotal Product Development			0	47,833		0		0		47,833

Remarks

Activity is described elsewhere due to classification.

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation										

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										
Remarks										
Project Total Cost			0	47,833		0		0		47,833

Remarks

Activity is described elsewhere due to classification.

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Block 2010																																
Future Blocks (See Classified Section)																																

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Block 2010								
Future Blocks (See Classified Section)	1Q-4Q	1Q-4Q						

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
R112 Space Tracking and Surveillance System (STSS) Block 2012	0	0	535	167,045	440,000	579,000	737,000	773,000
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

The Block 2012 STSS constellation builds upon the Block 2006 STSS hardware and software integration. Key decision points in developing the constellation are tied to the STSS Block 2006 effort. Most importantly, authority to proceed with the constellation contract will be granted after delivery of the Block 2006 Flight Payloads. Constellation CDR will occur after significant on-orbit demonstrations with the Block 2006 system have been performed and data analyzed. The launch of the first satellite in the constellation is expected to be in early Block 2012. Exact launch schedule will depend on satellite configuration as determined by BMDS system trades to be conducted in FY05, and acquisition strategy to be developed in FY05 and FY06.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Block 2012 Constellation	0	0	535	167,045
RDT&E Articles (Quantity)	0	0	0	0

FY 2006 Planned Program:

- Award Contract

FY 2007 Planned Program:

- Begin Contractor Constellation and Satellite Design Efforts
- Implement a capability based acquisition strategy
- Conduct analysis of Block 2006 performance for application to Block 2012 design effort
- Conduct Satellite System Design Review (SDR)

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

C. Other Program Funding Summary

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PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
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PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

D. Acquisition Strategy

A capability based acquisition strategy for the STSS Constellation activity will be developed in FY05 and early FY06.

The strategy will be consistent with MDA's spiral development and evolutionary acquisition philosophy. Contract award is anticipated in late FY06. Progress on Block 2006 satellites will be key to the development of the STSS Constellation. Block 2006 Flight Payloads will be delivered prior to Block 2012 contract award. Significant Block 2006 on-orbit experience will be in hand before Block 2012 constellation CDR.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Block 2012 Constellation										
STSS Constellation		TBD	0	0	N/A	535	4Q	167,045	1/4Q	167,580
Subtotal Product Development			0	0		535		167,045		167,580

Remarks

Acquisition Strategy is under development -- contract details are TBD.

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation										

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										
Remarks										
Project Total Cost			0	0		535		167,045		167,580

Remarks

Acquisition Strategy for the Constellation is under development -- contract details are TBD.

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
STSS Constellation																																
Acquisition Strategy Development																																
BMDS System Trades																																
Conduct System Design Review																																
Contract Award																																
Satellite Design & Development																																

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
STSS Constellation								
Acquisition Strategy Development		2Q-4Q	1Q-3Q					
BMDS System Trades		2Q-4Q	1Q-3Q					
Conduct System Design Review				4Q				
Contract Award			4Q					
Satellite Design & Development				1Q-3Q				

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0403 Russian-American Observation Satellite(s) Program (RAMOS)	27,562	0	0	0	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

Due to the lack of progress on the RAMOS Government-to-Government agreement with Russia, and the uncertainty this caused, MDA terminated the RAMOS program. RAMOS termination was accomplished using remaining FY04 funds. MDA received the Russian Government's draft MOU in July 2002 and despite 17 months of discussions, MDA was unable to complete a government-to-government agreement. Without this agreement, which includes the fundamental issue of taxes and liabilities, the RAMOS program could not be executed beyond the design stage. MDA will continue to discuss an overarching MOU to govern defense cooperation with Russia, and is actively exploring alternative more beneficial missile defense cooperative projects with Russia, that enjoy the support of the Government of the Russian Federation. In accordance with Sec 8049 of the FY05 Department of Defense Appropriations Act the FY04 funds in the amount of $26.5M was rescinded from the Ramos Program. However, at the time of the rescission, most of the FY04 funding was already expended. Only $8.472M was available for the rescission.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Design and Development	27,154	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 activities:

- Continued detailed design of the satellite sensors, payload support equipment, ground support equipment, and all associated projects to accomplish the space experiments (until termination decision)
- Continued preliminary design of ground facilities (until termination decision)
- Designed and begin fabricating sensor prototypes to be used during interface testing (until termination decision)
- Began writing sensor software (until termination decision)
- Continued development of models and simulations to test the design and concepts(until termination decision)
- Executed a partial termination and began orderly closure of all activities (until FY04 rescission)
- Terminated all activities when most of the FY04 funding was rescinded

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

	FY 2004	FY 2005	FY 2006	FY 2007
RAMOS Solar Arrays	408	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

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

FY 2004 activities:

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

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

D. Acquisition Strategy

This program has been terminated.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Design and Development										
U.S. Hardware Development	SS/CPFF	Utah State Univ/SDL/ Logan, UT	41,267	0	N/A	0	N/A	0	N/A	41,267
R.F. Hardware Development	SS	Rosoboronexport , RF	33,828	0	N/A	0	N/A	0	N/A	33,828
Engineering & Integration Supt	C/CPAF	Ball Aerospace & Tech Corp/ Broomfield, CO	21,561	0	N/A	0	N/A	0	N/A	21,561
RAMOS Solar Arrays										
Design and Development	MIPR	AFRL/Kirtland AFB, NM	6,292	0	N/A	0	N/A	0	N/A	6,292
Subtotal Product Development			102,948	0		0		0		102,948

Remarks

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Design and Development										
Development Support	MIPR	AFRL/ Hansom AFB, MA	1,946	0	N/A	0	N/A	0	N/A	1,946
Subtotal Support Costs			1,946	0		0		0		1,946

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Design and Development										
Security Monitoring Supt	MIPR	DTSA	230	0	N/A	0	N/A	0	N/A	230
Interpreter Support	MIPR	DOS	480	0	N/A	0	N/A	0	N/A	480
Subtotal Management Services			710	0		0		0		710
Project Total Cost			105,604	0		0		0		105,604

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Decisions																																
Program Termination																																

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Decisions								
Program Termination	1Q-4Q							

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0811 Ballistic Missile Defense Radars Block 2004/2006	110,018	260,519	272,243	263,367	60,437	92,953	0	0
RDT&E Articles Qty	0	1	0	1	0	0	0	0

Note:
In FY 2004 the Airborne Infrared Surveillance (AIRS) program was funded in STSS project 0812, Space Tracking and Surveillance System Block 2006.

A. Mission Description and Budget Item Justification

The mission of the Missile Defense Agency (MDA) is to develop an integrated layered Ballistic Missile Defense Systems (BMDS) to defend the United States, its deployed forces, friends and allies from ballistic missiles of all ranges and in all phases of flight. The MDA Sensors Directorate mission is to develop, acquire, field and operate BMDS sensors utilizing the Block approach to deliver increasing capabilities. The Sensors Directorate provides a BMDS vs. Element-Centric focus to enhance BMDS sensor synergy. The BMDS sensor architecture objective is to continue to close sensor coverage gaps by implementing a layered sensor approach. Expanding the layered sensor architecture will improve BMDS ability to detect, track and engage ballistic missiles in all phases of their flight.

MDA identifies BMDS capabilities, architectures and element contributions to counter the threat and organizes them by Engagement Sequence Groups (ESGs). These ESGs describe a combination of weapons, sensors and C2BMC capabilities that must work together to detect, track and intercept an enemy missile - the complete kill chain from the time the threat missile is first detected through the intercept of the target. Through ESGs, the responsible engineering organization (REO) identifies the necessary interfaces required to deliver a usable configuration of the BMDS. ESGs are also useful in helping the operator plan and train for operation of that capability, and they provide a means to track and test future improvements to the system. The increased sensor coverage will give BMDS more ways (expands Engagement Sequence Groups) and opportunities to engage ballistic missile threats which improves the probability of successfully destroying the target.

FBX-T #1 is a Block 2006 sensor that has been accelerated to a Block 2004 operational asset.

Block 2006 efforts include:

- Deployment of Forward Based X-Band Radar-Transportable (FBX-T) radars;
- CLS contract to support deployed FBX-T Radars; and
- Working with the MDA Battle Management/Command and Control Directorate (BC) and other MDA Elements to implement sensor netting.

The BMDS is deploying forward based radars that support a layered sensor architecture. The Forward Based X-Band Radar-Transportable (FBX-T) will provide a capability to detect ballistic missiles early in their flight and provide precise tracking information for use by the BMDS. This approach provides overlapping sensor coverage and the potential for BMDS weapons to extend their effective range beyond local sensors by using more sophisticated engagement strategies. This will enhance the capability of the BMDS to defend the United States and our allies, friends, and deployed forces from ballistic missiles of all ranges in all phases of flight.

The FBX-T radar will pass target data to the command and control system for use by midcourse and terminal sensors and weapons for tracking and subsequent intercept. Earlier detection with forward based radars, coupled with layered sensors, gives the BMDS a tracking and discrimination capability with more shot opportunities to engage the target, resulting in an increased probability of successful engagement. The radar broadens the BMDS capability in the near future, adding robustness against a wide range of threats and may be used to provide support for increased protection of

forward based military assets, allies, and friends. In recognition of the difficulty in predicting our adversaries or the location of future battlefields, the FBX-T is planned to be ground based and re-locatable with the potential for sea-basing. The radar capability now under development will extend the BMDS battlespace; allow for rapid reconfiguration of the BMDS; and complicate an enemy's ability to penetrate the defense system.

The FBX-T is a high-resolution, X-band, phased array radar based upon the Terminal High Altitude Area Defense Radar (THAAD) hardware and software design. This commonality allowed for the accelerated procurement and development of a forward based capability. Up to three FBX-T's may be developed and deployed to meet the national objective of protecting the United States from Intercontinental Ballistic Missiles (ICBMs) and medium range threats.

FBX-T will include modified software algorithms for tracking and discrimination from a forward-based perspective. The radar will have a direct interface with the BMDS command and control system. The radar will perform surveillance autonomously or as cued by other sensors, and it will acquire, track and discriminate threat missiles and missile components, and pass this information to other BMDS tracking, discrimination, and fire control radars downstream. The land-based FBX-T is designed to be air transportable, roll-on/roll-off ship transportable, and rail transportable. The radar consists of a solid-state, phased-array antenna supported by an electronics unit and a cooling unit. Acquire generators, a radar support trailer, and two supply containers also are part of the deployable radar.

The FBX-T #1 is on schedule to deliver a search and track capability in Block 2004. Discrimination enhancements will be added in Block 2006 as part of the BMDS Test Bed. Advanced capabilities will be added through upgrades and improvement programs via a series of spiral software enhancements. Acquisition of two additional Forward Based X-Band Radars, Block 2006 and Block 2008 assets, will reduce sensor gaps in multiple threat areas.

A Contractor Logistics Support (CLS) contract will be awarded to deploy, operate and sustain the radar at its forward based location. The contract will also include radar site survey, site preparations, personnel training, and radar system maintenance.

Efforts will include investigation of Electro-Optical/Infrared (EO/IR) sensors in the Airborne Infrared Surveillance (AIRS) program. The program's primary objective is to evaluate the AIRS ability to operate as the primary sensor in an Engagement Sequence Group (i.e., use AIRS data to engage ballistic missile threats).

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Capability Development	110,018	245,915	228,443	212,327
RDT&E Articles (Quantity)	0	1	0	1

The FBX-T radars provide a capability to detect ballistic missiles early in their flight and provide precise tracking information for use by the BMDS.

FY 2004 Accomplishments:

- Definitized contract for initial FBX-T
- Continued sensor analysis to support definition of BMDS sensor architecture
- Defined BMDS sensor architecture and roadmap

- Developed test plans and began algorithm assessment with TPS-X radar
- Continued to evaluate forward based algorithms with TPS-X radar
- Completed assembly of FBX-T hardware
- Conducted FBX-T Near Field Range testing
- Acquired 2nd FBX-T radar
- Completed software requirements for FBX-T Capability Release 1 (CR1)
- Began planning for FBX-T deployment

FY 2005 Planned Accomplishments:

RDT&E Test Article: Acquisition of one FBX-T #1 radar was initiated in FY 2003 for delivery in FY 2005 with search and track functionality

- Complete testing and validation of Forward-based algorithms with TPS-X
- Complete FBX-T software CR1
- Acquire Generators
- Commence activities necessary to deploy FBX-T #1
- Implement Anti-Tamper program and complete security documentation
- Integrate and test C2BMC interface for FBX-T
- Develop FBX-T software Capability Release 2 (CR2)
- Continue sensor analysis to support definition of BMDS sensor architecture
- Complete Final Integration and Test of FBX-T #1
- Develop Mission Plans for FBX-T #1
- Evaluate AIRS performance parameters to identify areas for improvement
- Demonstrate AIRS ability to close fire control loop in off line test

FY 2006 Planned Program:

- Deploy FBX-T #1 with search and track functionality
- Develop Site requirements for FBX-T #1
- Develop Capabilities Release (CR2) software implementing forward based capability
- Continue manufacture of FBX-T #2 radar

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

FY 2007 Planned Program:

RDT&E Test Article: Acquisition of FBX-T #2 radar was initiated in FY 2004 for delivery in FY 2007 with forward base capability.

- Deploy FBX-T #2
- Continue Algorithm Integration and Test

	FY 2004	FY 2005	FY 2006	FY 2007
Sustainment	0	14,604	43,800	51,040
RDT&E Articles (Quantity)	0	0	0	0

MDA will fund CLS which will include the radar operators and maintainers. Host command, host nation or CLS Contract will provide physical security based on individual sites. All FBX-T radars will be deployed overseas. Host command or host nation will provide Force Protection.

FY 2004 Accomplishments:

- Developed CLS acquisition strategy

FY 2005 Planned Accomplishments:

- Award Contractor Logistics Support (CLS) contract for FBX-T Operation and Sustainment
- Conduct site surveys at overseas sites
- Prepare site for early FY06 radar installation
- Acquire spares to support overseas deployment
- Operate and sustain radar at Vandenberg Air Force Base during final integration & test

FY 2006 Planned Program:

- Install radar and ensure readiness for operational use
- Operate and sustain FBX-T #1 radar at overseas site
- Repair and replace failed parts
- Conduct site surveys for FBX-T #2 overseas site
- Prepare site design plans/specifications for FBX-T #2
- Acquire spares to support FBX-T #2 overseas deployment
- Develop Mission Plans for FBX-T radars

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

FY 2007 Planned Program:

- Install radar and ensure readiness for operational use
- Operate and sustain FBX-T radars #1 and #2 at overseas sites
- Develop Mission Plans for FBX-T radars

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

D. Acquisition Strategy

The Forward X-Band Radar-Transportable (FBX-T) radar project will follow the Missile Defense Agency's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks. This acquisition strategy includes working with the FFRDC's and utilizing the TPS-X radar as a risk reduction asset for the BMDS Sensors.

The BMDS radar (FBX-T) project used an existing radar design to minimize development costs and schedule to the FBX-T. Design enhancements focus on software changes for the forward based algorithms and modified C2BMC connectivity. The contract is a cost plus award fee effort for three radars to support Blocks 04, 06, and 08.

A Contractor Logistics Support (CLS) contract will be awarded in FY 2005 to operate and maintain the FBX-T radar. The CLS contract will provide the operations and support activities required for site surveys, planning, and relocation; depot maintenance; failure reporting, analysis, and corrective action system; system operations; repair and replacement; and obsolescence management.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Capability Development										
FBX-T Radar #1	SS/CPAF	Raytheon/ MA	93,324	140,286	1Q	0	N/A	0	N/A	233,610
FBX-T Spiral Upgrade	SS/CPAF	Raytheon/ MA	0	0	N/A	125,700	1Q	170,504	1Q	296,204
FBX-T Radar #2	SS/CPAF	Raytheon/ MA	7,000	57,841	1Q	82,200	1Q	20,682	1Q	167,723
AIRS	SS/CPAF	OK City/ OK	0	7,150	1Q	0	N/A	0	N/A	7,150
FBX-T Radar #3	SS/CPAF	Raytheon/ MA	0	16,996	1Q	0	N/A	0	N/A	16,996
Subtotal Product Development			100,324	222,273		207,900		191,186		721,683

Remarks

Congressional Plus up in FY 05 of $1M for Plume Study and $9M for AIRS.

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Capability Development										
Program Management	FFP	TASC/ VA	2,400	2,600	1Q	3,175	1Q	3,325	1Q	11,500
Engineering Support	FFP	CSC/ VA	2,000	2,400	1Q	2,975	1Q	3,117	1Q	10,492
Program Support	Various	Various	131	994	1Q	2,094	1Q	2,094	1Q	5,313
AIRS/ Program Support	Various	Various	0	950	3Q	0	N/A	0	N/A	950

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
TPS-X O&S	CPAF	Raytheon/ MA	0	4,685	1Q	0	N/A	0	N/A	4,685
GFE		Various	56	3,975	1Q	3,975	1Q	4,000	1Q	12,006
Gov Salaries & /Travel			0	2,218	N/A	2,087	N/A	2,223	N/A	6,528
Sustainment										
CLS	SS/CPAF	Raytheon/ MA	0	12,590	3Q	40,600	2Q	46,000	2Q	99,190
Site Maintenance	SS/CPAF	Various/ Various	0	2,014	2Q	3,200	2Q	5,040	2Q	10,254
Subtotal Support Costs			4,587	32,426		58,106		65,799		160,918

Remarks

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation										

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Capability Development										
FBX-T FFRDC/UARC	Various	MIT/LL, MITRE, JHU/APL/ Various	5,107	4,920	3Q	6,237	3Q	6,382	3Q	22,646
FBX-T FFRDC/UARC	Various	MIT/LL, MITRE, JHU/APL	0	900	1Q	0	N/A	0	N/A	900
Subtotal Management Services			5,107	5,820		6,237		6,382		23,546
Remarks										
Project Total Cost			110,018	260,519		272,243		263,367		906,147
Remarks										

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Acquisition Milestones																																
Definitize FBX-T Contract	▲																															
Acquire FBX-T #2			▲																													
Award FBX-T CLS Contract						△																										
Studies & Analyses																																
Evaluate Forward-Based Algorithms (TPS-X)	▲	▬	▬	▲	△	▬	▬	△																								
Perform Sensor Architecture Analysis	▲	▬	▬	▲	△	▬	▬	▬	▬	▬	▬	△																				
Development Milestones																																
Conduct FBX-T Capability Release-1 (CR-1) CDR					▲																											
Integrate FBX-T CR-1								△																								
Conduct FBX-T CR-2 PDR							△																									
Conduct FBX-T CR-2 CDR									△																							
Program Milestones																																
Complete FBX-T Radar #1 Integration and Test								△																								
Deliver FBX-T #1								△																								
Deliver FBX-T #2														△																		
Demonstration																																
Conduct FBX-T CR-1 Performance Demonstration								△																								
Conduct FBX-T CR-2 Performance Demonstration															△																	

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Acquisition Milestones								
Definitize FBX-T Contract	1Q							
Acquire FBX-T #2	3Q							
Finalize TPS-X Forward-Based Task Order	1Q							
Award FBX-T CLS Contract		2Q						
Studies & Analyses								
Evaluate Forward-Based Algorithms (TPS-X)	1Q-4Q	1Q-4Q						
Perform Sensor Architecture Analysis	1Q-4Q	1Q-4Q	1Q-4Q					
Development Milestones								
TPS-X Forward-Based Algorithm PDR	1Q							
TPS-X Forward-Based Algorithm CDR	3Q							
Conduct FBX-T systems Requirements Review (SRR)	1Q							
Conduct FBX-T Capability Release-1 (CR-1) CDR		1Q						
Integrate FBX-T CR-1		4Q						
Conduct FBX-T CR-2 PDR		3Q						
Conduct FBX-T CR-2 CDR			1Q					
Testing Milestones								
Support TPS-X Forward-Based Algorithm Flight Test	2Q							
FBX-T Radar Software Functional Qualification Test		3Q						
Support TPS-X Forward-Based Algorithm Flight Test		1Q,2Q,3Q						
Support FBX-T Radar High Power & Integration Test		2Q						
Support FBX-T Radar Near Field Test		1Q						
Program Milestones								
Complete FBX-T Radar System Requirements Phase	3Q							
Complete FBX-T Radar #1 Integration and Test		4Q						
Conduct TPS-X FBX-T Algorithms Progress Reviews		1Q,3Q,4Q						
Deliver FBX-T #1		4Q						

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Deliver FBX-T #2				2Q				
Demonstration								
Conduct FBX-T CR-1 Performance Demonstration		4Q						
Conduct FBX-T CR-2 Performance Demonstration				3Q				

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0911 Ballistic Missile Defense Radars Block 2008	0	0	8,100	274,600	564,491	345,473	118,679	114,800
RDT&E Articles Qty	0	0	0	0	1	1	0	0

A. Mission Description and Budget Item Justification

The mission of the Missile Defense Agency (MDA) is to develop an integrated layered Ballistic Missile Defense Systems (BMDS) to defend the United States, its deployed forces, friends and allies from ballistic missiles of all ranges and in all phases of flight. The MDA Sensors Directorate mission is to develop, acquire, field and operate BMDS sensors utilizing the Block approach to deliver increasing capabilities. The Sensors Directorate provides a BMDS vs. Element-Centric focus to enhance BMDS sensor synergy. The BMDS sensor architecture objective is to continue to close sensor coverage gaps by implementing a layered sensor approach. Expanding the layered sensor architecture will improve BMDS ability to detect, track and engage ballistic missiles in all phases of their flight.

MDA identifies BMDS capabilities, architectures and element contributions to counter the threat and organizes them by Engagement Sequence Groups (ESGs). These ESGs describe a combination of weapons, sensors and C2BMC capabilities that must work together to detect, track and intercept an enemy missile - the complete kill chain from the time the threat missile is first detected through the intercept of the target. Through ESGs, the responsible engineering organization (REO) identifies the necessary interfaces required to deliver a usable configuration of the BMDS. ESGs are also useful in helping the operator plan and train for operation of that capability, and they provide a means to track and test future improvements to the system. The increased sensor coverage will give BMDS more ways (expands Engagement Sequence Groups) and opportunities to engage ballistic missile threats which improves the probability of successfully destroying the target.

Block 2008 efforts include:

- Acquire Forward Based X-Band Radar-Transportable (FBX-T) #3;
- Acquire X-Band Dish Radars to augment FBX-T radars for extended tracking and discrimination;
- Upgrade an existing Large X-Band Dish radar to provide midcourse tracking and discrimination;
- Upgrade existing sensors for asymmetric threat coverage; and
- Implement sensor netting through sensor coordination and data collection to support improved tracking and discrimination via data fusion.

The BMDS is deploying forward based radars that support a layered sensor architecture. The Forward Based X-Band Radar-Transportable (FBX-T) will provide a capability to detect ballistic missiles early in their flight and provide precise tracking information for use by the BMDS. This approach provides overlapping sensor coverage and the potential for BMDS weapons to extend their effective range beyond local sensors by using more sophisticated engagement strategies. This will enhance the capability of the BMDS to defend the United States and our allies, friends, and deployed forces from ballistic missiles of all ranges in all phases of flight.

The FBX-T radar will pass target data to the command and control system for use by midcourse and terminal sensors and weapons for tracking and subsequent intercept. Earlier detection with forward based radars, coupled with layered sensors, gives the BMDS a tracking and discrimination capability with more shot opportunities to engage the target, resulting in an increased probability of successful engagement. The radar broadens the BMDS capability in the near future, adding robustness against a wide range of threats and may be used to provide support for increased protection of forward based military assets, allies, and friends. In recognition of the difficulty in predicting our adversaries or the location of future battlefields, the FBX-T is planned to be ground based and re-locatable with the potential for sea-basing. The radar capability now under development will extend the BMDS battlespace; allow for rapid reconfiguration of the BMDS; and complicate an enemy's ability to penetrate the defense system.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

The FBX-T is a high-resolution, X-band, phased array radar based upon the Terminal High Altitude Area Defense Radar (THAAD) hardware and software design. This commonality allowed for the accelerated procurement and development of a forward based capability. Up to three FBX-T's may be developed and deployed to meet the national objective of protecting the United States from Intercontinental Ballistic Missiles (ICBMs) and medium range threats.

FBX-T will have a direct interface with the BMDS command and control system. The radar will perform surveillance autonomously or as cued by other sensors, and it will acquire, track and discriminate threat missiles and missile components, and pass this information to other BMDS tracking, discrimination, and fire control radars downstream. The land-based FBX-T is designed to be air transportable, roll-on/roll-off ship transportable, and rail transportable. The radar consists of a solid-state, phased-array antenna supported by an electronics unit and a cooling unit. Acquire generators, a radar support trailer, and two supply containers also are part of the deployable radar.

The existing Contractor Logistics Support (CLS) contract will be used to deploy, operate and sustain all the FBX-T radars. The contract provides for radar site survey, site preparations, personnel training, and radar system maintenance. CLS effort for Block 2008 will begin in FY09.

FBX-T enhancements will be continued as part of the BMDS Test Bed. Advanced capabilities will be added through upgrades and improvement programs via a series of spiral enhancements. Acquisition of an additional FBX-T #3 will further reduce sensor gaps.

The deployment and networking of additional sensors supports the MDA goal of using a layered sensor architecture to provide a more robust BMDS. Target tracking and eventually discrimination will be performed by upgrades to an existing Large X-Band Dish radar and procurement of two smaller X-Band Dish Radars to be used in conjunction with FBX-T radars. Pairing the FBX-T radars with X-Band Dish Radars (depending on the region being covered) significantly increases the amount of time available for tracking and eventually discrimination. This strategy along with upgrading an existing Large X-Band Dish Radar will eliminate discrimination gaps for most missile trajectories emanating from specific rogue nations, and thereby increasing BMDS effectiveness.

The FBX-T's will provide BMDS precise acquisition and tracking information on ballistic missiles from boost into midcourse, providing the potential for BMDS weapons to extend their effective range beyond local sensors by using more sophisticated engagement strategies. The extended coverage provided by the adjunct dish radars will further enhance the capability of the BMDS to defend the United States and our allies, friends, and deployed forces from ballistic missiles of all ranges in all phases of flight.

Upgrades to the existing Large X-Band Dish Radar will include software and signal processing enhancements to be completed for Block 2008. Upgrades will be based on SBX functionality and will include tracking and discrimination algorithms and connectivity capabilities. Procurement of the additional X-Band Dish radars will begin in FY07 with delivery in Block 2008 and Block 2010 respectively. Contractor Logistics Support will be provided to operate and sustain the radars. Support will include radar site survey, site preparations, personnel training, and radar system maintenance.

Identify options to improve asymmetric threat coverage, which may involve upgrade and improvements to existing sensors including processors, communications capabilities, and software enhancements.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Capability Development	0	0	8,100	274,600
RDT&E Articles (Quantity)	0	0	0	0

The FBX-T radars provide a capability to detect ballistic missiles early in their flight and provide precise tracking information for use by the BMDS.

FY 2006 Planned Program:

- Continue to improve FBX-T capabilities thru Spiral Upgrades
- Continue sensor analysis to support definition of BMDS sensor architecture
- Continue manufacture of FBX-T #3 radar
- Initiate Studies for Large X-Band Dish upgrade
- Perform trade-studies and acquisition strategy development for X-Band Dish radars for FBX-T
- Evaluate, integrate and test Hercules Suite 2 algorithms
- Develop common software with added discrimination capabilities for X-Band radars

FY 2007 Planned Program:

- Complete manufacture of FBX-T #3 radar
- Award contract for upgrade of Large X-Band Dish radar
- Award contract for two X-Band Dish radars for FBX-T
- Continue to improve FBX-T thru Spiral Upgrades
- Begin asymmetric upgrades to existing sensors
- Continue sensor analysis to support definition of BMDS sensor architecture
- Continue data fusion and sensor netting efforts
- Provide software with added discrimination capabilities to other BMDS sensor programs
- Continue common software efforts for X-Band radars

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
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PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
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PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

D. Acquisition Strategy

The BMDS radar (FBX-T) project used an existing radar design to minimize development costs and schedule to the FBX-T. Design enhancements focus on software changes for the forward based algorithms and modified C2BMC connectivity. The contract is a cost plus award fee effort. The existing FBX-T contract will be used to acquire FBX-T #3 and spiral upgrades to the FBX-T radars.

FBX-T CLS for Block 2006 will be used to provide O&S for FBX-T(s) in Block 2008 and beyond. The CLS contract will provide the operations and support activities required for site surveys, planning, and relocation; depot maintenance; failure reporting, analysis, and corrective action system; system operations; repair and replacement; and obsolescence management.

An acquisition strategy will be developed in FY07 to upgrade existing Large X-Band Dish radar and to acquire two X-Band Dish radars for the FBX-T's, a Block 2008 and Block 2010 asset.

An acquisition strategy will be developed in FY07 to operate and sustain Large X-Band Dish radar and X-Band Dish radar for FBX-T radar.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Capability Development										
FBX-T Spiral Upgrade	SS/CPAF	Raytheon/ MA	0	0	N/A	5,100	1Q	106,255	1Q	111,355
FBX-T Radar #3	SS/CPAF	Raytheon/ MA	0	0	1Q	0	N/A	78,865	1Q	78,865
X-Band Dish Radar for FBX-T	C	TBD	0	0	N/A	1,000	1Q	10,000	1Q	11,000
Large X-Band Dish radar upgrade	SS/CPAF	Raytheon/ MA	0	0	N/A	2,000	1Q	19,000	1Q	21,000
Sensor for Asymmetric Threat Upgrade	CPAF	TBD	0	0	N/A	0	N/A	60,480	2Q	60,480
Subtotal Product Development			0	0		8,100		274,600		282,700

Remarks

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Support Costs										

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

Project Total Cost			0	0		8,100		274,600		282,700

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603884C Ballistic Missile Defense Sensors

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Acquisition Milestones																																
Award Contract to Upgrade Large X-Band Dish Radar													Δ																			
Contract for Asymmetric Sensor Upgrade														Δ																		
Award Contract for 2 X-Band Dish Radar for FBX-Ts														Δ																		
Program Milestones																																
Complete Upgrade to Large X-Band Dish Radar																				Δ												
Deliver 1st X-Band Dish Radar for FBX-T Radar																					Δ											
Deliver FBX-T #3																						Δ										
Complete Upgrade to Asymmetric Sensor																						Δ										

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Acquisition Milestones								
Award Contract to Upgrade Large X-Band Dish Radar				1Q				
Contract for Asymmetric Sensor Upgrade				2Q				
Award Contract for 2 X-Band Dish Radars for FBX-Ts				2Q				
Contract for Asymmetric Sensor Upgrade				2Q				
Program Milestones								
Complete Upgrade to Large X-Band Dish Radar					4Q			
Deliver 1st X-Band Dish Radar for FBX-T Radar						1Q		
Deliver FBX-T #3						2Q		
Complete Upgrade to Asymmetric Sensor						2Q		

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0011 Ballistic Missile Defense Radars Block 2010	0	0	9,400	15,700	19,000	101,000	165,863	84,565
RDT&E Articles Qty	0	0	0	0	0	0	1	0

A. Mission Description and Budget Item Justification

The mission of the Missile Defense Agency (MDA) is to develop an integrated layered Ballistic Missile Defense Systems (BMDS) to defend the United States, its deployed forces, friends and allies from ballistic missiles of all ranges and in all phases of flight. The MDA Sensors Directorate mission is to develop, acquire, field and operate BMDS sensors utilizing the Block approach to deliver increasing capabilities. The Sensors Directorate provides a BMDS vs. Element-Centric focus to enhance BMDS sensor synergy. The BMDS sensor architecture objective is to continue to close sensor coverage gaps by implementing a layered sensor approach. Expanding the layered sensor architecture will improve BMDS ability to detect, track and engage ballistic missiles in all phases of their flight.

MDA identifies BMDS capabilities, architectures and element contributions to counter the threat and organizes them by Engagement Sequence Groups (ESGs). These ESGs describe a combination of weapons, sensors and C2BMC capabilities that must work together to detect, track and intercept an enemy missile - the complete kill chain from the time the threat missile is first detected through the intercept of the target. Through ESGs, the responsible engineering organization (REO) identifies the necessary interfaces required to deliver a usable configuration of the BMDS. ESGs are also useful in helping the operator plan and train for operation of that capability, and they provide a means to track and test future improvements to the system. The increased sensor coverage will give BMDS more ways (expands Engagement Sequence Groups) and opportunities to engage ballistic missile threats which improves the probability of successfully destroying the target.

Enhancement of the existing sensor architecture will be based on continued sensor coverage gap analysis and architecture studies. The study will take into account existing sensors (land, sea, air and space based), new sensor technologies and techniques to enhance sensor coverage and advanced sensor algorithms. The analysis will result in various options to increase coverage, the best of which will be subjected to cost-study trade-offs and feasibility for inclusion in Block 10 acquisition, and follow-on spiral development efforts.

Block 2010 efforts include:

- Explore and evaluate the utilization of technologies such as Electro-Optics / Infrared to the BMDS;
- Acquire X-Band Dish Radar #2 to work in conjunction with Forward Based X-Band Radar-Transportable (FBX-T) radars for extended tracking and discrimination;
- Operate and sustain FBX-T Radars and X-Band Dish radars;
- Operate and sustain an existing Large X-Band Dish radar to provide midcourse tracking and discrimination;
- Operate and sustain upgraded existing sensors for asymmetric threat coverage; and
- Implement sensor netting through sensor coordination and data collection to support improved tracking and discrimination via data fusion.

The BMDS Block 2010 sensors provide a layered sensor architecture with the capability to detect ballistic missiles early in their flight and provide precise tracking information for use by the BMDS. This approach provides overlapping sensor coverage and the potential for BMDS weapons to extend their effective range beyond local sensors by using more sophisticated engagement strategies. This will enhance the capability of the BMDS to defend the United States and our allies, friends, and deployed forces from ballistic missiles of all ranges in all phases of flight.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

Block 2010 CLS will begin in FY11. Existing Contractor Logistics Support (CLS) contracts will be used to operate and sustain the radars. The contract will include radar site survey, site preparations, personnel training, and radar system maintenance. Advanced capabilities will be added through upgrades and improvement programs via a series of spiral enhancements.
The deployment and networking of additional sensors supports the MDA goal of using a layered sensor architecture to provide a more robust BMDS.

Efforts will include investigation of Electro-Optical / Infrared (EO/IR) sensors in the Airborne Infrared Surveillance (AIRS) program. Airborne Infrared Surveillance allows for the acquisition and tracking of targets from horizon-to-horizon through aircraft zenith. The AIRS program is a proof of concept for employing optical sensors as an operational element of the BMDS. The Airborne Infrared Surveillance program uses the High Altitude Observatory-II (HALO-II) system. Block 2006's FY05 EO/IR objective is to demonstrate the AIRS ability to operate as the primary sensor in an Engagement Sequence Group (i.e., use AIRS data to engage ballistic missile threats). The Block 2010 evaluation will include an assessment of the value that AIRS brings to the BMDS sensor architecture. A follow-on acquisition and procurement strategy may be developed in FY07 based on the evaluation of sensor performance.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Capability Development	0	0	9,400	15,700
RDT&E Articles (Quantity)	0	0	0	0

FY 2006 Planned Program:

- Continue development to the EO/IR concept

FY 2007 Planned Program:

- Initiate planning for X Band Dish Radars interface to BMDS
- Initiate series of trade studies for EO/IR

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

D. Acquisition Strategy

Contractor Logistics Support (CLS) contracts established in the prior Blocks will be used to operate and sustain the FBX-T radars, X-Band Dish radars, upgraded Large X-Band Dish and the upgraded asymmetrical sensors.

A second X-Band Dish radar for the FBX-T's will be acquired through the contract established in Block 2008 for the first X-Band Dish.

Acquisition Strategy for EO/IR is predicated on the AIRS effort through FY 2005.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Capability Development										
X-Band Dish Radar for FBX-T	C	TBD	0	0	N/A	0	1Q	1,700	1Q	1,700
EO/IR		TBD	0	0	N/A	9,400	1Q	14,000	1Q	23,400
Subtotal Product Development			0	0		9,400		15,700		25,100

Remarks

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation										

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										
Remarks										
Project Total Cost			0	0		9,400		15,700		25,100
Remarks										

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Acquisition Milestones																																
Acquire 2ndX-Band Dish Radar for FBX-T																					Δ											
Development Milestones																																
Evaluate ABIR close fire control loop test offline										Δ																						
Conduct trade studies for ABIR													Δ																			
Program Milestones																																
Deliver 2nd X-Band Dish Radar for FBX-T																										Δ						

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Acquisition Milestones								
Acquire 2nd X-Band Dish Radar for FBX-T						1Q		
Development Milestones								
Evaluate ABIR close fire control loop test offline			2Q					
Conduct trade studies for ABIR				1Q				
Program Milestones								
Deliver 2nd X-Band Dish Radar for FBX-T							2Q	

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0602 Program-Wide Support	5,348	13,106	8,321	21,595	36,294	32,494	25,896	25,417
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

Program-Wide Support provides funding for common support functions across the entire program such as strategic planning, program integration, cost estimating, contracting, and financial management to include preparation of financial statements, reimbursement of financial services provided by DFAS, internal review and audit, earned-value management, and program assessment. Includes costs for both government civilians performing these functions as well as support contractors providing government staff augmentation in these areas. Applies to costs at the MDA HQ as well as its Executing Agents in the Services: Army Space and Missile Defense Command, Army PEO Space and Missile Defense, Office of Naval Research, and various Air Force laboratory and acquisition activities. Other costs include physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses at the various MDA Executing Agent locations, which at the MDA HQ are generally funded from the Management Headquarters Program Element (0901598C). Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Civilian Salaries and Support	5,348	13,106	8,321	21,595
RDT&E Articles (Quantity)	0	0	0	0

See Section A: Mission Description and Budget Item Justification

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603884C Ballistic Missile Defense Sensors**

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Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total PE Cost	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507
0013/R113 Ballistic Missile Defense Interceptor Block 2010/2012	100,652	267,411	218,749	420,160	604,631	961,096	1,189,257	1,453,512
R216 Space Test Bed	0	0	0	0	44,997	149,998	247,995	229,993
0602 Program-Wide Support	14,017	12,404	10,909	24,740	27,615	26,243	31,575	34,002
Amount Included in PE 0904903D	0	0	0	0	0	0	0	-189,088
Total PE Cost Reflected in R-1	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,528,419

A. Mission Description and Budget Item Justification

The mission of the Missile Defense Agency (MDA) is to develop an integrated layered Ballistic Missile Defense System (BMDS) to defend the United States, its deployed forces, friends and allies from ballistic missiles of all ranges and in all phases of flight. The BMDS Interceptor program element funds our next generation mobile, multi-use (boost, ascent, and midcourse phase) kinetic intercept capabilities. Our development plan exploits the synergistic attributes of basing mobility, battle space engagement flexibility, and evolutionary payload integration with a common booster to cost-effectively add layers and defense robustness to the BMDS. We are designing a single containerized interceptor round that is highly compatible with mobile land and sea platforms. Our BMDS-focused design approach fully leverages and builds upon existing and planned BMDS sensor and command control, battle management, and communication capabilities developed in other program elements. The BMDS interceptor program addresses capability objectives that are corner stones of our integrated system acquisition strategy. The program develops a kinetic boost/ascent layer as a backup to our primary boost intercept capability, the Airborne Laser. The boost/ascent phase is the engagement regime where target intercepts and observations offer the greatest defensive payoff. We will decide in FY08 whether to continue the development of the kinetic boost/ascent layer based on the performance achievements of Airborne Laser (first intercept test in 08) and Kinetic Energy Interceptor (KEI) (first booster flight test in 08). For wide-area midcourse defense against stressing complex countermeasures and asymmetric threats, we plan to integrate the common booster with our multi-use kill vehicle and advanced discrimination payloads (e.g. MKV) to flexibly augment fixed site (GMD) and legacy mobile defenses (THAAD, Aegis BMD, and PAC-3).

The BMDS interceptor program element funds the BMDS Interceptor Block 12/14 Test Bed as well as the Space Test Bed. The BMDS Interceptor Block 12/14 Test Bed includes Kinetic Energy Interceptor Development and Test (element engineering, interceptor, command and control, battle management and communications, launcher, integration and test) and the Near Field Infrared Experiment (NFIRE). Our FY05-FY08 emphasis is on component capability risk reduction and objective element engineering. The MDA has established performance-based decision points for the BMDS interceptor projects. At these decision points the MDA Director will decide whether to continue the project as planned, terminate the effort, slow down the project, or increase out-year funding in pursuit of specific Test Bed or operational capability objectives. The Agency goal is to mitigate BMDS interceptor critical risk areas prior to making full budget commitments for Block 12/14 capabilities. In addition to BMDS interceptor project execution performance, other competing BMDS investment priorities and threat evolution will dictate budget adjustments.

The Kinetic Energy Interceptor is the first BMDS element designed after we withdrew from the Anti-Ballistic Missile treaty in 2002. Our innovative design maximizes multi-use (boost, ascent, and midcourse) intercept capabilities through the integration of mature technologies in a deployable all-up round configuration compatible with both mobile land and sea basing. We rely on the BMDS responsible engineering and test organizations, the BMDS command and control, battle management and communications development organization, and multiple MDA and external agency sensor offices to assist us in the definition and implementation of Kinetic Energy Interceptor engagement sequence groups. These engagement sequence groups describe how our interceptor, mobile launcher, and fire control capabilities interface with BMDS sensor and BMDS command and control, battle management and communications capabilities to detect, track, and intercept an enemy missile in the boost, ascent, and midcourse phases of flight. Our capability value to the BMDS is greatly enhanced by a network-centric fire control design that enables the interceptor to receive fused data from a diverse suite of ballistic missile defense sensors (land, sea, and space) integrated with the Kinetic Energy Interceptor weapon through the BMDS command and control, battle management and

communications. We believe this system vice element integration construct represents the most efficient acquisition approach. We are critically dependent on our agency partners for the BMDS-level design, development, integration, and testing of kinetic intercept capabilities.

In December 2003 we awarded the Kinetic Energy Interceptor Development and Test contract to Northrop Grumman. The Northrop Grumman-MDA Kinetic Interceptor team conducted a successful Initial Baseline Review in March 2004. The team refined the Kinetic Energy Interceptor concept design in FY04 to comply with new MDA requirements in areas such as nuclear hardening, anti-tamper, and insensitive munitions. The baseline seeker design evolved from a one-color to two-color seeker design to reduce plume-to-hardbody risk and increase engagement performance in the ascent and midcourse phases. The Kinetic Energy Interceptor team worked with BMDS capability development partners to ensure that our common booster design is compatible with other high value BMDS payloads such as the multiple kill vehicle and GMD exoatmospheric kill vehicle. The FY04 concept design update fully aligns the program with the Agency's vision for the development of a mobile, multi-use intercept capability built to the highest quality, safety and mission assurance standards.

In addition to the design update, the Northrop Grumman team developed and tested key subcomponent and assembly capabilities during FY04. Our Kinetic Energy Interceptor command and control, battle management and communications team developed and evaluated real-time fire control algorithm performance with Defense Support Program (DSP) sensor data. These early tests confirmed our initial simulation predictions of Kinetic Energy Interceptor engagement timeline functionality and predicted trajectory convergence. We also developed prototype Kinetic Energy Interceptor command and control screens and conducted demonstrations to solicit feedback from the User to update our Kinetic Energy Interceptor operations concept. The interceptor team executed a thrust vector control (trapped ball) characterization test, completed multiple high burn rate propellant characterization tests, burst tested the 2nd stage rocket motor case, and enhanced the plume-to-hardbody algorithm to increase robustness against liquid target shock wave phenomenology.

The Kinetic Energy Interceptor development and test program has been restructured to focus on objective element engineering and component risk reduction. We have significantly reduced the Kinetic Energy Interceptor development and test funding in this budget request. Future funding decisions on a Block 12/14 Kinetic Energy Interceptor operational capability are explicitly tied to the outcome of FY05-FY08 development and testing of the core capabilities (booster, kill vehicle, and command and control, battle management and communications). The planned design, development and test efforts provide the capability knowledge required for a high confidence Kinetic Energy Interceptor Block 12/14 product line decision. The risk reduction tests include ten rocket motor static fires, a full scale booster flight test, a series of two-color seeker hardware-in-the-loop ground tests, a field campaign of battle management/fire control verification tests with BMDS and overhead sensor data, and canister eject tests.

During FY05-FY08 we are focused on developing and testing common capabilities that are compatible with both land and sea-based operations. We are actively working with the Navy to determine the appropriate interim sea-based platform for Kinetic Energy Interceptor integration prior to executing our long term strategy of basing KEI on the CG(X). We prefer sea-basing for the critical boost/ascent mission to mitigate the geopolitical risk of having to establish land-based sites in countries adjacent to our future adversaries. The land-based capability will complement sea-based boost/ascent and serve as the work horse for mobile midcourse defense operations. MDA and the Navy will determine the Kinetic Energy Interceptor sea-basing roadmap well in advance of the FY08 decision point we have established for the program.

MDA continues to take a disciplined approach to collecting and analyzing data to better understand the physics and phenomenology of boost/ascent targets. We participate in the BMDS measurements test program that collects relevant ICBM and space launch vehicle target of opportunity data through the use of ground, aircraft-borne and spaced-based sensors. During FY04, a joint Kinetic Energy Interceptor -Airborne Infrared Sensor team successfully collected high resolution scene data on Atlas and Minuteman launch vehicles with multiple High Altitude Observatory aircraft. The Kinetic Energy Interceptor team also worked closely with the National Sensors Integration and Rapid Prototyping project to continue the collection of overhead non-imaging infrared sensor data in support of Kinetic Energy Interceptor battle management and fire control risk mitigation. These high fidelity data products enable us to improve tracking/guidance algorithms, scene generators, and modeling and simulation tools that define Kinetic Energy Interceptor performance against the complete set of adversary capabilities. During FY 2005 and beyond we intend to conduct additional target of opportunity tests with the Responsible Test Organization.

While ground, airborne, and overhead non-imaging infrared observations have greatly increased our confidence in the interceptor's ability to acquire and track a boosting target, there remains a critical data gap. The data sets we currently have do not contain the very high resolution, near head on aspect angle phenomenology data that the terrestrial Kinetic Energy Interceptor or future space-based

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interceptor kill vehicle will encounter during endgame homing. The Near Field Infrared Experiment is built to address this specific data need. The Near Field Infrared Experiment low earth orbiting satellite provides the opportunity for multiple high resolution collections in multiple wavebands over a range of engagement geometries. The one year long experiment will collect high resolution visible and infrared imagery, integrate a space-based asset into the BMDS Test Bed, and validate the use of hyper-temporal short wave infrared sensors for early launch detection and track. Our primary objective is to collect near field visible, long, medium, and short wave infrared measurements of the rocket plume and body in the boost phase of flight to anchor our understanding of the plume phenomenology and plume to rocket body discrimination. MDA will also use this data to validate the models and simulations that are fundamental to developing the navigation, guidance and control and endgame homing algorithms for both terrestrial and space-based interceptors. MDA plans to launch the Near Field Infrared Experiment satellite in 2Q FY 2006.

The Space Test Bed project will begin in FY08. Our objective in adding a space-based interceptor layer to the BMDS is to transition our mobile terrestrial intercept capabilities to space in order to overcome the basing and geographic access limitations of our land, sea, and airborne defenses. We will build upon our terrestrial multi-use interceptor, BMDS sensor and BMDS C2BMC capabilities to achieve a cost-effective space-based layer. A limited constellation of space-based interceptors (50-100 satellites) offers thin boost/ascent defense against intercontinental ballistic missiles. The same size constellation provides multi-shot mid course defense against medium to intercontinental range ballistic missiles. Beginning in FY08, we will initiate a Space Test Bed competitive concept design phase of approximately one year. The development and test phase will start in FY09 with key milestones including multiple space-based intercept tests in Block 12/14 and a constellation production decision in Block 14. The acquisition strategy for this new project is in the early stages of development.

Program-Wide Support provides funding for common support functions across the entire program such as strategic planning, program integration, cost estimating, contracting, financial management to include preparation of financial statements, reimbursement of financial services provided by DFAS, internal review and audit, earned-value management, and program assessment. Includes costs for both government civilians performing these functions as well as support contractors providing government staff augmentation in these areas. Applies to costs at the MDA HQ as well as its Executing Agents in the Services: Army Space and Missile Defense Command, Army PEO Space and Missile Defense, Office of Naval Research, and various Air Force laboratory and acquisition activities. Other costs include physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses at the various MDA Executing Agent locations, which at the MDA HQ are generally funded from the Management Headquarters Program Element (0901598C). Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

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B. Program Change Summary	FY 2004	FY 2005	FY 2006	FY 2007
Previous President's Budget (FY 2005 PB)	117,719	511,262	1,118,599	1,717,480
Current President's Budget (FY 2006 PB)	114,669	279,815	229,658	444,900
Total Adjustments	-3,050	-231,447	-888,941	-1,272,580
Congressional Specific Program Adjustments	0	-163,000	0	0
Congressional Undistributed Adjustments	0	-68,447	0	0
Reprogrammings	4,307	0	0	0
SBIR/STTR Transfer	-7,357	0	0	0
Adjustments to Budget Years	0	0	-888,941	-1,272,580

The BMDS Interceptor program element funding and schedule profile has changed significantly from last year's request. We have significantly reduced the FY06 budget request and out-year plans to align with FY05 congressional and Agency adjustments and in response to the MDA Director's guidance for restructuring the Kinetic Energy Interceptor Development & Test program. The restructured program defers major investments in operational Kinetic Energy Interceptor Block 12/14 capabilities until after the successful completion of development verification tests and the initial Block 12/14 design review in FY07. We are maintaining our acquisition strategy emphasis on mission assurance, systems engineering, and extensive ground and flight testing in support of knowledge-based design reviews. The funding request changes delay our delivery of the kinetic multi-use intercept capabilities to the war fighter from Block 10 to Block 12/14. The acquisition of the next generation mobile intercept capabilities (boost, ascent, midcourse) for the BMDS is an integral part of our strategy to defend the United States, allies, friends, and deployed forces. Failure to develop, test, and implement these capabilities will leave us vulnerable to the increasingly sophisticated countermeasures and tactics of future adversaries.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0013/R113 Ballistic Missile Defense Interceptor Block 2010/2012	100,652	267,411	218,749	420,160	604,631	961,096	1,189,257	1,453,512
RDT&E Articles Qty	0	0	3	1	1	3	3	9

A. Mission Description and Budget Item Justification

The BMDS Interceptor Block 12/14 Test Bed project develops and tests our next generation mobile, multi-use (boost, ascent, and midcourse phase) kinetic intercept capabilities. Our development plan exploits the synergistic attributes of basing mobility, battle space engagement flexibility, and evolutionary payload integration with a common booster to cost-effectively add layers and defense robustness to the BMDS. We are designing a single containerized interceptor round that is highly compatible with mobile land and sea platforms. Our BMDS-focused design approach fully leverages and builds upon existing and planned BMDS sensor and command control, battle management, and communication capabilities developed in other program elements. The Kinetic Energy Interceptor program addresses capability objectives that are corner stones of our integrated system acquisition strategy. The program develops a kinetic boost/ascent layer as a backup to our primary boost intercept capability, the Airborne Laser. The boost/ascent phase is the engagement regime where target intercepts and observations offer the greatest defensive payoff. We will decide in FY08 whether to continue the development of the kinetic boost/ascent layer based on the performance achievements of the Airborne Laser (first intercept test in FY08) and Kinetic Energy Interceptor (first booster flight test in FY08). For wide-area midcourse defense against stressing complex countermeasures and asymmetric threats, we plan to integrate the common booster with our multi-use kill vehicle and advanced discrimination payloads (e.g. MKV) to flexibly augment legacy fixed site (GMD) and mobile defenses (THAAD, Aegis BMD, and PAC-3).

The BMDS Interceptor Block 12/14 Test Bed includes the Kinetic Energy Interceptor Development and Test program and the Near Field Infrared Experiment. We have recently implemented a performance-based decision process to incrementally determine Kinetic Energy Interceptor project investment levels. During Phase I (FY05-FY08) of this process the Kinetic Energy Interceptor program will demonstrate medium to high risk capabilities in full scale component tests. Our planned testing includes ten rocket motor static fires, an integrated tactical booster flight test, a series of kill vehicle hardware-in-the-loop tests, and a campaign of real-time battle management and fire control tests with fully integrated BMDS sensors, and BMDS command, control, battle management, and communications. We are relying on the BMDS responsible engineering and test organizations to lead the definition and BMDS Test Bed implementation of Kinetic Energy Interceptor engagement sequence groups. Based on our design, build, system integration, and test execution performance, the Director will decide on an annual basis to continue as planned, slow down, terminate, or accelerate the Kinetic Energy Interceptor program. By the end of FY08, we will have the required capability knowledge to make Block12/14 product line decisions.

The Kinetic Energy Interceptor development and test effort is comprised of element engineering, interceptor, command and control, battle management and communication, launcher, and integration and test work packages. In early FY05, the Kinetic Energy Interceptor element engineering team will complete a concept design update that incorporates MDA core standard requirements, anti-tamper technology protection features, a 2-color seeker, and expanded processing capacity for enhanced boost/ascent/midcourse defense. Our plan is to hold a Block 12/14 objective design update review in CY06 with a follow-up System Design Review in CY07. The element engineering team defines the objectives and requirements for our component development verification test to ensure maximum traceability between the risk reduction tests and the objective capability design. The element engineering team will evaluate and assess development verification test results against the objective capability specifications to develop the clear evidence that our critical risks have been mitigated. We will also use development verification test data to anchor our high fidelity component and element simulations that provide the basis for capability verification and validation across the complete performance battle space. We will incrementally deliver updated versions of the high fidelity Kinetic Energy Interceptor simulation in support of BMDS layered defense systems engineering, integrations and testing.

Our FY05-FY08 interceptor capability development and test effort includes risk reduction testing and objective design. We are reducing interceptor component risks through a series of ground and flight development verification tests. Key subcomponent demonstration areas include the kill vehicle and booster. In the kill vehicle area we will focus on seeker and propulsion development. For the seeker, we will develop and test a 2-color all-reflective prototype seeker (comprised of a 2-color focal plane array, new signal processor, and all reflective optics) to demonstrate the ability of the interceptor to acquire and track, transition from plume to hardbody, discriminate the lethal object, and select a hardbody aimpoint on boost, ascent and midcourse targets. We will manufacture a single lot of 2-color focal plane arrays demonstrating our ability to produce these devices to the quality level required to execute our mission. The prototype seeker demonstrations will use both simulated

data and data acquired from targets of opportunity and the Near Field Infrared Experiment in both open and closed loop simulation environments to demonstrate critical seeker functionality. In the area of kill vehicle propulsion, we will demonstrate the ability of the kill vehicle divert and attitude control system to support the high acceleration levels and large divert velocities required by means of divert thruster hot-fire demonstrations in FY07-08. Our team will also execute risk reduction testing of critical elements of our high performance common booster. We will conduct a comprehensive series of first and second stage static motor firings in FY05-07 to characterize the motor and thrust vector control performance in preparation for an integrated booster flight test in FY08. This flight test will validate critical aspects of the Kinetic Energy Interceptors booster design: velocity at burn out, hot staging event between the first and second stage, operation of the boost vehicle in a high dynamic pressure environment, and a flight test characterization of the first and second stage thrust vector control systems.

We will directly leverage the kill vehicle and booster risk reduction test results to engineer a robust Block 12/14 multi-use interceptor capability that is producible with high mission assurance. During FY05-08, we will perform a comprehensive set of objective interceptor trades to produce detailed component requirements and designs. Following this interceptor component engineering activity and the MDA investment decisions, we will test the interceptor in an increasingly more complex series of tests leading to element-level intercept flight testing. The robust series of ground tests includes multiple static fire tests of all three rocket motor stages and integrated kill vehicle hover testing as well as a an additional booster flight test, a partial full scale flight test and a control test vehicle flight test. The Kinetic Energy Interceptor program will culminate with a series of seven intercept flight tests from land and sea-based platforms against threat representative targets.

The Kinetic Energy Interceptor is designed as a common land/sea all-up round. The interceptor dimensions and safety features such as a gas eject launch make it compatible with both surface combatants (cruisers and destroyers) and submarines. To support a seamless sea basing transition we will begin concept design and risk reduction of a solid, throttleable divert and attitude control system for the kill vehicle starting in FY05. In FY05-08 we will focus efforts on identifying, producing and demonstrating high risk items associated with the throttleable divert and attitude control system concept. Following the FY08 decisions, we will initiate full-scale development and test of the throttleable divert and attitude control system. This will include design verification and interceptor integration testing to allow easy insertion into a sea basing capability.

Our primary Kinetic Energy Interceptor command control, battle management, and communication objective for the next four years is to design, develop, build and demonstrate a fielded prototype capability in a near operational configuration. This operational prototype will serve as a host for a series of battle management and fire control demonstrations during FY 05-08. We will begin incremental field testing of Kinetic Energy Interceptor engagement sequence groups starting in the fourth quarter of FY05. Our focus is on testing mission critical software and interfaces to include the following: message transfer mechanisms to and from the BMDS common network interface processor interface to include connectivity to a forward-based radar; ability to process a real-time direct downlink of defense support program (DSP) satellite data with objective system hardware and software; ability to process real-time data fusion of forward-based radar data with overhead non-imaging infrared data; and the ability to process real-time data fusion of multiple sources of overhead non-imaging infrared data. The command and control, battle management and communication team will conduct a FY05-FY08 campaign of target of opportunity tests against threat-representative targets and space vehicle launches to verify and validate the Kinetic Energy Interceptor engagement timeline, engagement planning, target typing, and predicted interceptor point capabilities. Additionally, we will build and test our in-flight communication transmit and receive phased-array antenna panel. In parallel with command, control, battle management, and communication component testing, we will engineer and design the Block 12/14 objective capability and conduct a series of design reviews.

For the launcher component, we are planning in FY05-FY08 to design, build and test a demonstration model canister. The demonstration model canister is common to both land and sea based launchers. In FY07, we will static fire the gas generator used to safely eject the kinetic energy interceptor from the canister at land or sea. In FY08 we will mate the gas generator with the interceptor, integrate an interceptor test unit into the demonstration model canister and conduct a full scale canister ejection test. This eject test provides us key interceptor launch loads and environmental data for Block 12/14 interceptor and canister design refinements. We will generate objective Block 12/14 designs for both land and sea-based launchers. The sea-based design will begin after an interim sea-based platform is selected by MDA and the Navy.

Our Kinetic Energy Interceptor element integration and test team plans are to 1) support the Kinetic Energy Interceptors FY05-FY08 component development verification test program execution, 2) conduct supporting long-lead activities to execute a robust intercept flight test program beginning in FY10, and 3) continue activities to facilitate a seamless transition of the Kinetic Energy Interceptors capability from land to sea. In FY04 we established (in coordination with the Responsible Test Organization) early interfaces with the test ranges and initiated test planning and range safety coordination. Our team is proactively working the BMDS Responsible Test Organization and test ranges to establish kinetic boost/ascent test concept of operations where all unique debris and

safety issues are evaluated and mitigated well in advance of our FY10 intercept testing dates. In the area of User interfaces, we worked with the MDA Force Integration and Deployment team to solicit early user inputs on the Kinetic Energy Interceptors design and concepts of operation. This included a series of interface meetings with the Army, Strategic Command (STRATCOM), and the Navy. In FY04 we completed phase one of a concept of operations study commissioned by MDA and conducted by the Navy to determine the feasibility of utilizing an Aegis cruiser or submarine for the Kinetic Energy Interceptor boost/ascent mission.

In FY05-FY08 the element integration and test team will develop (with the BMDS Responsible Engineering and Test Organizations) Kinetic Energy Interceptor test, verification, validation, and accreditation plans. Our test, validation, verification and accreditation plans will encompass all simulation, ground, and flight tests. We have already put in place contract provisions to deliver our high fidelity element simulation to both the Responsible Engineering Organization and Responsible Test Organization in support of BMDS integration and testing. We will deliver a Kinetic Energy Interceptors development master test plan to the Responsible Test Organization at each of our major design reviews. Our element integration and test team will coordinate and iterate Kinetic Energy Interceptors test strategies with the Responsible Test Organization to maximize the value of each test event based on BMDS objectives. The test team will conduct and coordinate all environmental analysis activities for the Kinetic Energy Interceptors program. We will continue to participate in war game exercises such as Nimble Titan that are essential to demonstrating the Kinetic Energy Interceptors mission capability in a layered BMDS within the context of offensive-defensive operations. War games provide us valuable feedback for both technical design and operations concept development. In FY05, we will choose a site for the Kinetic Energy Interceptors system integration facility, the element integration facility and the system integration lab. Our plan is for the Kinetic Energy Interceptors system integration lab to be operational in FY08. We will continue our active coordination with OSD DOT&E and the Responsible Test Organization in refining and implementing the Kinetic Energy Interceptor live fire test and evaluation strategy. Our safety experts will engage the Navy through the Weapon Systems Explosive Safety Review Board to define an executable roadmap for sea-based integration of the Kinetic Energy Interceptors capability.

MDA is executing the Near Field Infrared Experiment to mitigate endgame homing and guidance risk for both terrestrial (Kinetic Energy Interceptor) and future space-based boost phase interceptors. While several previous experiments have increased our confidence in the interceptor's ability to acquire and track a boosting target, the purpose of this experiment is to enhance the quantity and quality of high resolution phenomenology data. The Near Field Infrared Experiment is a low earth orbiting satellite that will provide the opportunity for multiple data collections in multiple wavebands over a range of engagement geometries. The primary objective of this effort is to collect near field visible and long, medium and short wave infrared measurements of the rocket plume and body in the boost phase of flight to anchor our understanding of the plume phenomenology and plume to rocket body discrimination. MDA will use this data to validate the models and simulations that are fundamental to developing the navigation, guidance and control and endgame homing algorithms for terrestrial and space-based interceptors. The complete set of objectives for the experiment include the collection of visible and infrared imagery, early integration of a space-based asset into the BMDS Test Bed, and hyper-temporal short wave infrared and visible data collection for early launch detect and track capability validation. The MDA held a Near Field Infrared Experiment continuation review in summer 2004 that accepted the recommendation of an Independent Review Team to remove the kill vehicle payload. The Independent Review Team determined that the removal of the kill vehicle payload would significantly reduce the program cost and schedule risk while still meeting the primary experiment objectives.

Over the one-year lifetime of the Near Field Infrared satellite, we will execute three mission types. During Mission 1 - Target of Opportunities - the satellite views non- dedicated targets, allowing collection opportunities of varying target types at distances of 100-1000 kilometers. These might include aircraft flights, space launches and operational missile tests. During Mission 2 - dedicated target fly-bys - the Near Field Infrared Experiment satellite views dedicated boosting targets from ranges of less than ten kilometers. To ensure successful collection of the sub-meter resolution near field infrared (IR) data, the Near Field Infrared Experiment will conduct two of these dedicated target missions. During Mission 4 - ground observations - the satellite tracks ground targets such as forest fires, volcanoes, and static tests of rocket engines. This mission will verify the pointing accuracy of the gimbaled system and calibrate the tracking sensors.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Element Engineering	27,694	55,977	48,603	87,985
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- Conducted contract Integrated Baseline Review
- Updated KEI concept design to incorporate new core standards, anti-tamper, and insensitive munition requirements
- Delivered KEI Simulation version 1.0
- Completed Draft KEI-BMDS Interface Control Document
- Conducted series of Land-Based KEI Concept of Operation reviews with Army
- Conducted NFIRE independent and continuation reviews
- Initiated Restructure of KEI Program to support MDA Decision Points

FY 2005 Planned Accomplishments:

- Modify KEI contract to account for program restructure and new requirements
- Conduct KEI Block 12/14 concept baseline design review
- Generate component development verification test (DVT) objectives and requirements
- Release updated element capability specification (ECS)
- Complete Ascent/Midcourse Phase performance Assessment #1
- Assess engineering manufacturing and software readiness levels across the KEI Element
- Update KEI Element risk assessment and mitigation plans
- Demonstrate through simulation KEI multi-use capability augmentation of BMDS
- Deliver KEI Simulation version 1.1 (concept design update)
- Conduct User Concept of Operation Table Top exercises
- Generate KEI concept description document in collaboration with Responsible Engineering Organization
- Define KEI Engagement Sequence Groups with Responsible Engineering Organization
- Generate KEI inputs to BMDS Master Integration Plan
- Deliver KEI basing report to Congress

FY 2006 Planned Program:

- Conduct KEI Block 12/14 baseline update review
- Continue assessment of engineering manufacturing and software readiness levels

- Update KEI Element risk assessment and mitigation plans
- Complete Ascent/Midcourse Phase Performance Assessment #2
- Demonstrate through simulation KEI multi-use capability augmentation of BMDS
- Deliver KEI Simulation version 2.0
- Conduct User Concept of Operation Table Top exercises
- Update KEI Engagement Sequence Group definitions
- Update KEI inputs to BMDS Master Integration Plan

FY 2007 Planned Program:

- Conduct KEI Block 12/14 System Design Review (SDR)
- Generate KEI Test Bed Description Document with Responsible Engineering Organization
- Continue assessment of engineering manufacturing and software readiness levels
- Update KEI element risk assessment and mitigation progress
- Demonstrate through simulation KEI multi-use capability augmentation of BMDS
- Deliver KEI Simulation version 3.0
- Release updated Block 12/14 Element Capability Spec
- Develop KEI capability verification and assessment report with Responsible Engineering Organization /Responsible Testing Organization

	FY 2004	FY 2005	FY 2006	FY 2007
Interceptor	18,496	113,557	120,643	244,520
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- Burst-tested a demonstration second stage rocket motor case
- Executed 2nd stage rocket motor thrust vector control nozzle (trapped ball) characterization test
- Matured the Interceptor mass properties baseline
- Refined and matured the booster Attitude Control System requirements and margin assessments
- Released and evaluated the 2nd and 3rd stage attitude control system proposals (Liquid and Solid)
- Enhanced Plume-To-Hard Body Algorithm vs. Liquid Target Shock Wave Phenomenology
- Performed initial Modeling and Analysis on 1st and 2nd Stage separation dynamics
- Executed high burn rate propellant characterization tests
- Developed plans for increasing Focal Plane Array production yield
- Matured requirements for staging concept development
- Optimized stage designs and splits (physical size, burn duration, and thrust profiles)

- Conducted Sea-Based Commonality/Compatibility evaluation of Land-Based Boost/Ascent Concept
- Executed interceptor configuration trade studies to incorporate additional requirements and capability
- Conducted an Interceptor Integrated Baseline Review
- Conducted Interceptor Supplier Workshops Completed initial versions of key Interceptor specifications and plans
- Conducted an Executive System Engineering Interceptor Peer Review

FY 2005 Planned Accomplishment:

- Develop objectives and requirements for booster flight
- Conduct boost flight requirements review
- Execute initial booster flight wind tunnel tests and conduct computational fluid dynamics analyses
- Conduct static firing of stage 2 rocket motor
- Perform first and second stage propellant characterization tests
- Develop requirements specification for 2-color seeker focal plane array
- Develop initial booster requirements and interface specifications

FY 2006 Planned Program:

- Execute final booster flight wind tunnel tests
- Conduct bench testing of thrust vector control actuators
- Continue static firings of rocket stages
- Complete 2-color sensor requirements
- Develop kill vehicle signal processor hardware
- Develop the Interceptor Component level simulation requirements and architecture
- Develop Software architecture, requirements analysis, and establish development tools

FY 2007 Planned Program:

- Conduct booster flight Preliminary Design Review
- Conduct booster flight Critical Design Review
- Conduct plume-to-hardbody and tracking algorithm evaluation tests with live fire and simulated data
- Perform ground testing of the boost flight avionics
- Update models incorporating Development Verification and Testing early results into KEI Simulation to update Element performance
- Conduct hot firing of kill vehicle divert thruster
- Execute hot fire testing of the second stage attitude control system
- Conduct Interceptor System Design Review
- Prototype key algorithms and develop software specifications
- Support mission planning, mission profile, and mission analysis

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
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- Complete initial safety, reliability, maintainability, security, and testability analyses
- Establish Interceptor 6 Degrees of Freedom simulation capability
- Develop Integration Validation & Verification plans

	FY 2004	FY 2005	FY 2006	FY 2007
C2BMC	10,591	23,440	24,690	49,947
RDT&E Articles (Quantity)	0	0	0	1

FY 2004 Accomplishments:

- Developed interface requirements between KEI element and BMDS Command and Control, Battle Management and Communications
- Conducted Algorithm/Timeline Demonstration
- Conducted Human Machine Interface (HMI) Demonstration to obtain user feedback
- Evaluated Contribution of other Overhead Non-imaging Infrared Sensors to KEI boost/ascent element
- Conducted Anti-Jamming and nuclear hardening study for KEI Command and Control, Battle Management and Communications
- Established KEI Command and Control, Battle Management and Communications software development environments

FY 2005 Planned Accomplishment:

- Conduct Direct Downlink Experiment (Lab)
- Conduct KEI Command and Control, Battle Management and Communications Demo Requirements Review for Pathfinder Shelter
- Update interface requirements between KEI and BMDS Command and Control, Battle Management and Communications
- Build Pathfinder Shelter with Direct Downlink Capability
- Demonstrate BMDS Command and Control, Battle Management and Communications Network Integration Processor (CNIP) connectivity to KEI Command and Control, Battle Management and Communications Lab using a message generator
- Demonstrate Continental US (CONUS) KEI data fusion processing
- Complete Design of radar interface to Pathfinder Shelter

FY 2006 Planned Program:

- Demonstrate Forward-Based Radar Interface and fusion of radar/IR data in Pathfinder Shelter
- Demonstrate Continental US (CONUS) KEI data fusion processing through BMDC CNIP to Pathfinder Shelter
- Complete communications waveform study
- Demonstrate KEI In-flight Communications (KICS) Antenna Panels in Lab Environment
- Complete design of KEI In-flight Communications (KICS) Antenna Panels for Pathfinder Shelter
- Update interface requirements between KEI and BMDS Command and Control, Battle Management and Communications components

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

FY 2007 Planned Program:

RDT&E Article: 1 C2BMC Operational Prototype

- Establish KEI Command and Control, Battle Management and Communications integration lab
- Integrate and demonstrate KEI In-flight Communications (KICS) Antenna Panels and Controller in KEI Pathfinder Shelter
- Complete design and demonstrate key KEI In-flight Communications (KICS) components in Lab Environment Test waveforms in lab environment
- Initiate Hardware/Software procurement for System Integration Lab and System Integration Facility integration
- Update interface requirements between KEI multi-use element and BMDS Command and Control, Battle Management and Communications
- Conduct KEI Command and Control, Battle Management and Communication System Design Review
- Deliver C2BMC Operational Prototype

	FY 2004	FY 2005	FY 2006	FY 2007
Launcher	3,039	3,510	6,309	19,023
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- Generated launcher development plans and schedules
- Conducted launcher trade studies
- Developed initial launcher development verification test plans
- Define Launcher functional and physical interface requirements

FY 2005 Planned Accomplishments:

- Develop Development Model Canister Specification
- Define Development Model Canister functional and physical interfaces - Support Canister Initial Design Review (IDR)
- Conduct engineering and design activities in support of DMC baseline design
- Conduct Development Model Canister Intermediate Design Reviews

FY 2006 Planned Program:

- Conduct Development Model Canister Final Design Reviews
- Manufacture Development Model Canister to support Canister Development Verification Test
- Manufacture test support equipment to support Canister Development Verification Test
- Conduct Ejection Gas Generator Static Firing Test

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

- Define Development Model Launcher functional and physical interfaces
- Develop Launcher simulation models (Trans/Mobility Model, Launch Dynamics Model)

FY 2007 Planned Program:

- Conduct Launcher System Design review (land and sea)
- Conduct requirement, interface, and baseline development analysis and trade studies
- Conduct engineering and design activities in support of Development Model Launcher baseline (DML) design
- Develop Model Launcher Specification
- Conduct engineering and design activities in support of DML detailed design
- Conduct Canister Ejection Development Verification Test

	FY 2004	FY 2005	FY 2006	FY 2007
Integration and Test	3,200	2,927	4,798	7,911
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- Initiated range and range safety planning and coordination with Pt. Mugu and Vandenberg Air Force Base
- Provided program introduction document to ranges 90 days after contract award
- Developed commercial support agreements with ranges
- Conducted user working group meetings
- Developed draft KEI Concept of Operations
- Developed initial facility requirements
- Began analyzing sites for System Integration Facility (SIF) and Element Integration Facility (EIF) development
- Developed draft Target System Requirements Document (TSRD)
- Participated in Nimble Titan Wargame
- Completed Navy Boost/Ascent Concept of Operations Study
- Initiated coordination with the Navy on design, integration and safety issues

FY 2005 Planned Accomplishments:

- Publish Developmental Master Test Plan (DMTP)
- Continue range and range safety planning and coordination
- Continue User Working Group Meetings
- Select site for facility modifications for System Integration Facility (SIF) and Element Integration Facility (EIF)

- Participate in Nimble Titan Wargame
- Publish Validation Verification & Analysis Plan
- Conduct Navy/KEI Midcourse Concept of Operations Study

FY 2006 Planned Program:

- Update Developmental Master Test Plan (DMTP)
- Participate in War Game Exercises Continue range and range safety planning and coordination
- Initiate Environmental Analysis documentation
- Publish Target System Requirements Letter
- Update Validation Verification & Analysis Plan
- Continue User Working Group Meetings
- Initiate requirements analysis on System Integration Lab (SIL)
- Initiate requirements analysis on System Integration Facility (SIF)
- Initiate requirements analysis on Element Integration Facility (EIF)
- Continue coordination with the Navy on design, integration and safety issues

FY 2007 Planned Program:

- Update Developmental Master Test Plan (DMTP)
- Participate in War Game Exercises
- Continue range and range safety planning and coordination
- Update Environmental Analysis documentation
- Update Target System Requirements Letter
- Update Developmental Master Test Plan
- Continue User Working Group Meetings
- Complete SIL, SIF, EIF Requirements and Design
- Update Validation & Verification Plan
- Update Target System Requirements Document
- Continue coordination with the Navy on design, integration and safety issues

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

	FY 2004	FY 2005	FY 2006	FY 2007
NFIRE	37,632	68,000	13,706	10,774
RDT&E Articles (Quantity)	0	0	3	0

FY 2004 Accomplishments:

- Initiated assembly, Integration and ground testing of Multi Spectral Tracking Sensor Payload
- Ground Tested Hover Kill Vehicle
- Initiated Flight Kill Vehicle assemble and integration
- Initiated assembly, integration and ground testing Spacecraft bus
- Began development of Ground Segment Mission Operations Center
- Initiated procurement for two (2) Multi Stage Boost Targets
- Initiated integration and Test of the Multi-Spectral Tracking Sensor Payload

FY 2005 Planned Accomplishments:

- Complete Calibration of the Multi-Spectral Tracking Sensor Payload
- Complete and Deliver the Multi-Spectral Tracking Sensor Payload
- Complete Space Vehicle Environmental Test
- Complete Space Vehicle Integration and Acceptance Test
- Certify Ground Segment Launch Site Readiness
- Complete ground test of flight software
- Complete Ground Segment Mission Operations Center
- Conduct Near Field Infrared Experiment Mission Training
- Conduct Near Field Infrared Experiment Mission Rehearsals
- Complete procurement of Near Field Infrared Experiment targets

FY 2006 Planned Program:

RDT&E Articles: 1 NFIRE Experiment Satellite; 2 Multi-Stage Boost Target

- Complete delivery and acceptance of Launch Vehicle
- Launch Near Field Infrared Experiment Satellite
- Conduct Initial On-Orbit Operations
- Conduct On-Orbit Calibration
- Conduct Near Field Infrared Experiment Mission 1 - Target of Opportunity

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

- Accept delivery of Two Multi-Stage Boost Target
- Conduct first of two Near Field Infrared Experiment Mission 2 , Near Field Boosting Target Fly By

FY 2007 Planned Program:

- Conduct Near Field Infrared Experiment Mission 4, Ground based Hyper Temporal Experiment
- Conduct Near Field Infrared Experiment Mission 1 – Target of Opportunity

	FY 2004	FY 2005	FY 2006	FY 2007
Program Management & Engineering	0	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

Note: Project 0013 Ballistic Missile Defense Interceptor Block 2010 has been combined with Project R113 Ballistic Missile Defense Interceptor Block 2012. All Program Management and Engineering FY04 accomplishments are described within the components of Project R113 (Government SE/PM and Contractor SE/PM).

	FY 2004	FY 2005	FY 2006	FY 2007
Experimentation & Test	0	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

Note: Project 0013 Ballistic Missile Defense Interceptor Block 2010 has been combined with Project R113 Ballistic Missile Defense Interceptor Block 2012. All Experimentation and Test FY04 accomplishments are described within the components of Project R113 (Near Field Infrared Experiment).

	FY 2004	FY 2005	FY 2006	FY 2007
Land Based	0	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

Note: Project 0013 Ballistic Missile Defense Interceptor Block 2010 has been combined with Project R113 Ballistic Missile Defense Interceptor Block 2012. All Land Based FY04 accomplishments are described within the components of Project R113 (Interceptor, Command and Control, Battle Management and Communications, Launcher and Integration and Test).

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

D. Acquisition Strategy

KEI's development and test (D&T) acquisition strategy focuses on developing multi-use kinetic energy capabilities in support of multiple basing modes (land, sea, and space). A feature distinguishing this acquisition is our early emphasis on full scale risk mitigation testing and engineering, manufacturing, and software readiness as an integral part of the design process. Our contractor team will design, build and test operationally traceable interceptor, Command and Control, Battle Management and Communication, and launcher capabilities in realistic test environments prior to the initial Block 12/14 design review in FY07. The FY05-08 development verification test (DVT) results mitigate critical program risks, and provide the agency very detailed design, performance, and programmatic knowledge to support the Block 12/14 investment decisions. This strategy also implements early proofing of critical manufacturing processes as an integral part of the design process. The payoff for these upfront program investments in systems engineering, full scale risk reduction testing, and manufacturing process development is reduced redesign and retest, fewer test failures as well as lowered manufacturing cost. The strategy has event-based knowledge points using Engineering and Manufacturing Readiness Levels (EMRL) and Software Readiness Levels (SWRL) as maturity and risk indicators for proceeding forward with detailed design, building flight hardware and having a production off-ramp. The KEI Development & Test strategy response to recent budget reductions is to maintain our event-based knowledge points and allow the event completion dates to slip. This is the basis for the program restructure from Block 10 to Block 12/14.

To implement the KEI Development & Test strategy we competitively picked a single contractor team who offered the best balance of mission assurance confidence, technological maturity, mission capability (system performance), managerial and technical team performance and price. That contractor also offered us a competitive price commitment for the hardware we will buy as well as a firm fixed price, 10 year warranty covering virtually any reliability failure or performance shortfall relative to the performance specification. The early commitment to a production price and warranty conditions are integral to our strategy. These give the contractor a huge monetary incentive to promise only what he is certain he can deliver, to design in features that enhance reliability and lower production cost and to have a robust ground test program to uncover any systemic issues before flight test.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Interceptor										
Interceptor	C/CPAF	Northrop Grumman	0	112,357	1Q	118,491	1Q	242,368	1Q	473,216
SDACS	Various	Various	0	1,200	1Q	2,152	1Q	2,152	1Q	5,504
C2BMC										
C2BMC	C/CPAF	Northrop Grumman	0	21,424	1Q	23,076	1Q	48,333	1Q	92,833
GFE	C/CPAF	Northrop Grumman	0	2,016	1Q	1,614	1Q	1,614	1Q	5,244
Launcher										
Launcher	C/CPAF	Northrop Grumman	0	3,510	1Q	6,309	1Q	19,023	1Q	28,842
Integration and Test										
Integration & Test	C/CPAF	Northrop Grumman	0	2,627	1Q	2,829	1Q	5,926	1Q	11,382
Live Fire	MIPR	Sandia National Lab	0	300	1Q	1,076	1Q	1,076	1Q	2,452
Test Planning & Execution	MIPR	ABL	0	0	1Q	893	1Q	909	1Q	1,802
NFIRE										
Spacecraft	C/CPAF	Spectrum Astro	0	13,279	1/2Q	4,386	1/2Q	3,454	1/2Q	21,119
Tracking Payload	Various	AFRL	0	3,625	1/2Q	1,375	1/2Q	1,000	1/2Q	6,000
Launch Vehicle	Various	SMC Det 12	0	11,573	1/2Q	0	N/A	0	N/A	11,573
Targets	Various	SMC Det 12	0	27,667	1/2Q	0	N/A	0	N/A	27,667
Secure Communications	MIPR	Com Sec Gear	0	500	1/2Q	0	N/A	0	N/A	500
Science Team	MIPR	Aerospace & MIT/LL	0	946	1Q	917	1Q	1,000	1Q	2,863
Mission Operations	Various	JNIC	0	9,779	1/2Q	6,534	1/2Q	5,320	1/2Q	21,633
Program Introduction	MIPR	VAFB	0	0	N/A	145	N/A	0	N/A	145
Calibration & Analysis	MIPR	AEDC	0	631	1Q	0	N/A	0	N/A	631

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Military Ops	MIPR	National Guard Flight	0	0	N/A	299	1Q	0	N/A	299
Spacecraft Shipping	MIPR	National Guard Flight	0	0	N/A	50	1Q	0	N/A	50
Land Based										
Capability Development	C/FFP	Northrop Grumman	56,508	0	N/A	0	N/A	0	N/A	56,508
MDA Service Systems Engineering	Various	Various	2	0		0		0		2
Subtotal Product Development			56,510	211,434		170,146		332,175		770,265

Remarks

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Element Engineering										
Engineering Technical Support	MIPR	NSWC/DD	0	600	1Q	0	N/A	0	N/A	600
Engineering Technical Support	MIPR	Various	0	6,590	N/A	1,038	1Q	1,347	1Q	8,975
Civilian Salaries	Various		0	1,201	1Q	1,201	1Q	1,201	1Q	3,603
SETA	C/FFP	MEI	0	6,210	1Q	0	N/A	0	N/A	6,210
SETA	C/FFP	SPARTA	0	275	1Q	0	N/A	0	N/A	275
SETA	C/FFP	Various	0	0	N/A	6,421	1Q	6,421	1Q	12,842
Government Travel	Various	Various	0	258	2Q	1,351	2Q	351	2Q	1,960
KEI BMDS Interfaces	Various	SMDC	0	2,500	1Q	0	N/A	0	N/A	2,500
KEI BMDS Interfaces	Various	Various	0	4,628	1Q	2,959	2Q	4,035	1Q	11,622
SETA	C/FFP	Paradigm	0	334	1Q	0	N/A	0	N/A	334

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APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Contractor Element Engineering	C/CPAF	Northrop Grumman	0	33,081	1Q	35,633	1Q	74,630	1Q	143,344
KEI BMDS Interfaces	MIPR	NSWC/DD	0	300	1Q	0	N/A	0	N/A	300
Program Management & Engineering										
SETA	C/FFP	MEI	3,929	0	N/A	0	N/A	0	N/A	3,929
SETA	C/FFP	PENTA	300	0	N/A	0	N/A	0	N/A	300
SETA	C/FFP	SPARTA, Inc/ Arlington, VA	250	0	N/A	0	N/A	0	N/A	250
Engineering & Technical Spt	MIPR	NSWC/DD/ Dahlgren, MD	665	0	N/A	0	N/A	0	N/A	665
Engineering & Technical Spt	MIPR	NSWC/PHD	250	0	N/A	0	N/A	0	N/A	250
Engineering & Technical Support	MIPR	Sandia National Lab	50	0	N/A	0	N/A	0	N/A	50
Engineering & Technical Support	MIPR	THAAD	1	0	N/A	0	N/A	0	N/A	1
Engineering & Technical Support	MIPR	USAADACENS B	1	0	N/A	0	N/A	0	N/A	1
IMP/IMS Replan	Various	MDA/MP	15	0	N/A	0	N/A	0	N/A	15
Subtotal Support Costs			5,461	55,977		48,603		87,985		198,026

Remarks

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Experimentation & Test										
Experimentation & Test-NFIRE	C/CPAF	Spectrum Astro	12,607	0	N/A	0	N/A	0	N/A	12,607

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Experimentation & Test - NFIRE	Various	PMS422/Raytheon	10,764	0	N/A	0	N/A	0	N/A	10,764
Experimentation Test -NFIRE	Various	AFRL/SAIC	7,158	0	N/A	0	N/A	0	N/A	7,158
Experimentation Test -NFIRE	Various	SMC Det 12	4,347	0	N/A	0	N/A	0	N/A	4,347
Experimentation & Test - NFIRE	MIPR	ComSec Gear	496	0	N/A	0	N/A	0	N/A	496
Experimentation & Test - NFIRE	MIPR	Aerospace	200	0	N/A	0	N/A	0	N/A	200
Experimentation & Test - NFIRE	Various	JNIC Mission Operations	2,070	0	N/A	0	N/A	0	N/A	2,070
Experimentation & Test	MIPR	AEDC	179	0	N/A	0	N/A	0	N/A	179
Experimentation & Test	Various	JCTE	350	0	N/A	0	N/A	0	N/A	350
Experimentation & Test	Various	VAFB	10	0	N/A	0	N/A	0	N/A	10
Subtotal Test and Evaluation			38,181	0		0		0		38,181

Remarks

IV. Management Services Cost ($ in Thousands)

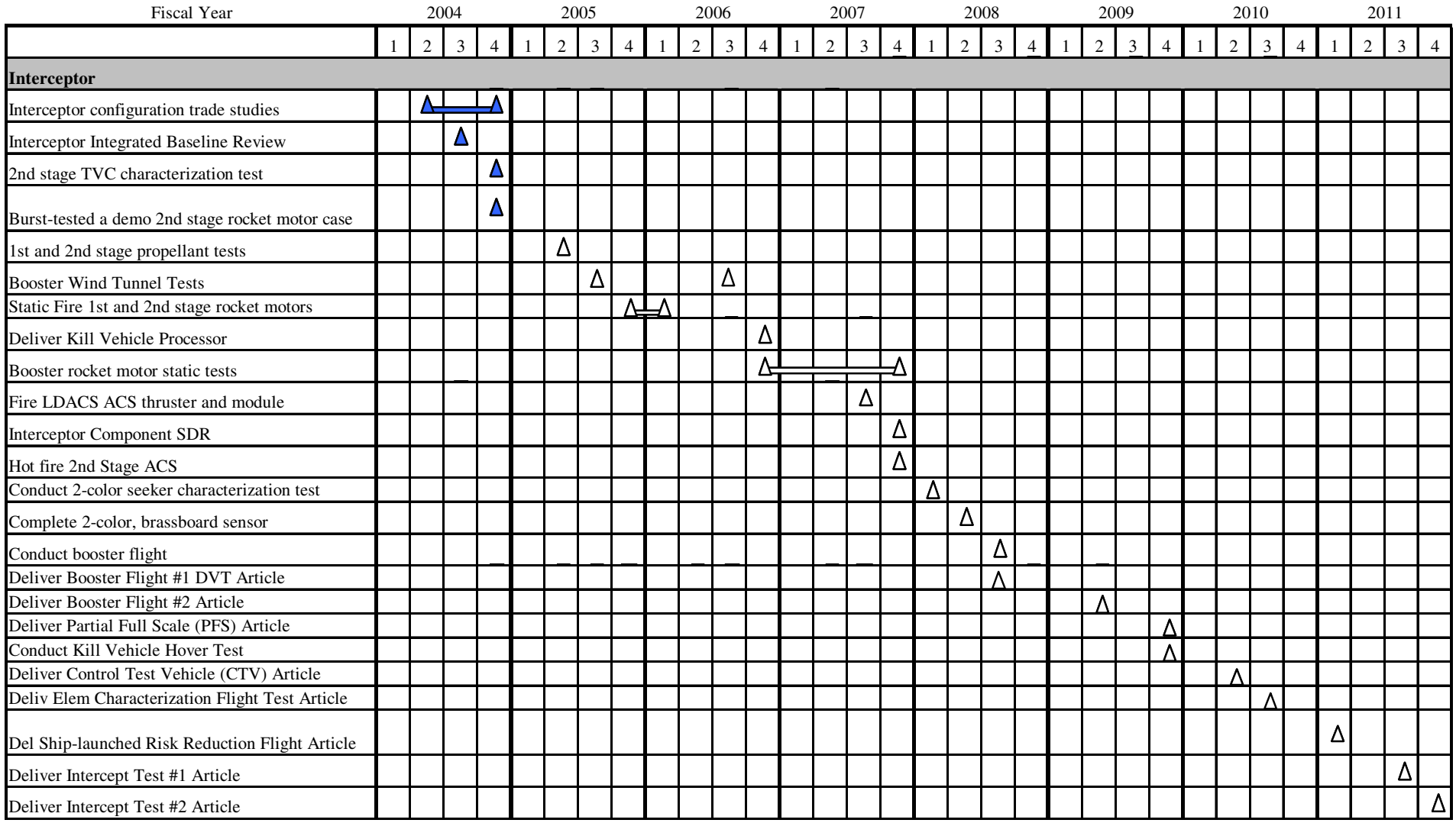
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Experimentation & Test										
FFRDC/National Laboratory	MIPR	MIT/LL	500	0	N/A	0	N/A	0	N/A	500
Subtotal Management Services			500	0		0		0		500

Remarks

Project Total Cost			100,652	267,411		218,749		420,160		1,006,972

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**



Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Element Engineering																																
Award D&T contract to SE&I contractor	▲																															
KEI IBR		▲																														
Element Design Update		▲—▲																														
KEI Block 12 concept baseline update reviews						△					△																					
DVT objectives and requirements						△																										
Deliver Report to Congress on KEI Basing						△																										
Deliver KEISIM version 1.1							△																									
Define KEI Engagement Sequence Groups							△																									
Ascent Capability Performance Assessment - 1								△																								
Simulate KEI capability augmentation of BMDS								△				△				△																
KEI inputs to BMDS Master Integration Plan								△			△				△																	
Conduct User CONOPS Table Top exercises		—	—			—		△			—																					
Ascent Capability Performance Assessment - 2												△																				
Deliver KEISIM version 2.0												△																				
KEI Test Bed Description Document with REO				—		—	—	—			—	—		—	△	—				—			—				—					
Conduct KEI Block 12 System Design Review															△	—																
Deliver KEISIM version 3.0																△																
Complete DR-0 Data Package generation																				△												
Complete DR-1 Data Package Generation																							△									
Complete DR-2 Data Package Generation																											△					

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
C2BMC																																
C2BMC Design Update																																
Conducted Algorithm/Timeline Demonstrations																																
Conduct Direct Downlink Experiment																																
Demonstrate CONUS KEI data fusion																																
Build C2BMC Pathfinder Shelter																																
Demonstrate Radar-ONIR Fusion/Timeline																																
Establish C2BMC integration lab																																
Complete C2BMC Component SDR																																
Integrate and demonstrate KICS Antenna Panels																																
Complete C2BMC DR-0																																
Deliver Production Representative C2BMC																																
Launcher																																
Conduct Initial Requirements Review																																
Conduct Canister Design Review																																
Conduct Ejection Gas Generator Static Firing Test																																
Conduct Canister Ejection Test																																

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Launcher																																
Conduct Launcher System Design Review																Δ																
Launcher Design Review-0																				Δ												
Conduct the Launcher Off-Road Mobility Test																					Δ											
Deliver Pre-Production Launcher																								Δ								
Deliver Production Representative Launcher																															Δ	
Integration and Test																																
Developed facility requirements		Δ		Δ																												
Completed Draft Land-Based KEI CONOPS			Δ																													
Navy CONOPS Assessment				Δ				Δ																								
Publish/Update VV&A Plan							Δ				Δ				Δ				Δ				Δ				Δ				Δ	
Select Element Integration Facility site								Δ																								
Select System Integration Facility site								Δ																								
Publish/Update Development Master Test Plan								Δ				Δ				Δ				Δ				Δ				Δ				Δ
Participate in Nimble Titan Wargame								Δ			Δ				Δ				Δ				Δ				Δ				Δ	
Initiate Environmental Analysis documentation									Δ			Δ																				
Initiate requirement analysis for SIL, SIF, EIF									Δ			Δ																				
Publish/Update Target System Requirements Letter											Δ				Δ				Δ				Δ				Δ				Δ	
Conduct Booster Flight #1 Dev Verif Test																			Δ													
Conduct Booster Flight #2 Test																						Δ										
Conduct Partial Full Scale (PFS) Test																								Δ								
Conduct Control Test Vehicle (CTV) Test																										Δ						

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Integration and Test																																
Deliver Targets for Flight Test																										Δ			Δ		Δ	Δ
Conduct Element Characterization Flight (ECF) Test																											Δ					
Conduct Ship-launched Risk Reduction Flight Test																													Δ			
Conduct Intercept Test #1																															Δ	
Conduct Intercept Test #2																																Δ
Near Field Infrared Experiment																																
Deliver Track Sensor Payload							Δ																									
Complete SV Integration and Acceptance Testing									Δ																							
Complete Space Vehicle Environmental Test									Δ																							
Complete delivery of Launch Vehicle components									Δ																							
Complete Launch Vehicle Integration										Δ																						
Complete Ground Segment Mission Operations Center										Δ																						
Certify Ground Segment Launch Site Readiness										Δ																						
NFIRE Launch										Δ																						
NFIRE Experiment										Δ				Δ																		
Deliver 2 Multi-Stage Boost Target											Δ	Δ																				
Type 2 Mission - Flyby											Δ	Δ																				

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Element Engineering								
Award D&T contract to SE&I contractor	1Q							
KEI IBR	2Q							
Element Design Update	2Q-3Q							
DVT objectives and requirements		2Q						
Deliver Report to Congress on KEI Basing		2Q						
KEI Block 12 concept baseline update reviews		2Q	3Q					
Define KEI Engagement Sequence Groups		3Q						
Deliver KEISIM version 1.1		3Q						
KEI inputs to BMDS Master Integration Plan		4Q	3Q	3Q				
Conduct User CONOPS Table Top exercises		4Q						
Ascent Capability Performance Assessment - 1		4Q						
Simulate KEI capability augmentation of BMDS		4Q	4Q	4Q				
Deliver KEISIM version 2.0			4Q					
Ascent Capability Performance Assessment - 2			4Q					
Conduct KEI Block 12 System Design Review				3Q				
KEI Test Bed Description Document with REO				3Q				
Deliver KEISIM version 3.0				4Q				
Complete DR-0 Data Package generation					4Q			
Complete DR-1 Data Package Generation						3Q		
Complete DR-2 Data Package Generation							3Q	
Interceptor								
Interceptor configuration trade studies	2Q-4Q							
Interceptor Integrated Baseline Review	3Q							
Burst-tested a demo 2nd stage rocket motor case	4Q							
2nd stage TVC characterization test	4Q							
1st and 2nd stage propellant tests		2Q						
Booster Wind Tunnel Tests		3Q	3Q					
Static Fire 1st and 2nd stage rocket motors		4Q	1Q					
Booster rocket motor static tests			4Q	1Q-4Q				
Deliver Kill Vehicle Processor			4Q					

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Booster Preliminary Design Review				2Q				
Fire LDACS ACS thruster and module				3Q				
Booster Critical Design Review				4Q				
Hot fire 2nd Stage ACS				4Q				
Interceptor Component SDR				4Q				
Conduct 2-color seeker characterization test					1Q			
Complete 2-color, brassboard sensor					2Q			
Conduct booster flight					3Q			
Deliver Booster Flight #1 DVT Article					3Q			
Deliver Booster Flight #2 Article						2Q		
Conduct Kill Vehicle Hover Test						4Q		
Deliver Partial Full Scale (PFS) Article						4Q		
Deliver Control Test Vehicle (CTV) Article							2Q	
Deliv Elem Characterization Flight Test Article							3Q	
Del Ship-launched Risk Reduction Flight Article								1Q
Deliver Intercept Test #1 Article								3Q
Deliver Intercept Test #2 Article								4Q
C2BMC								
C2BMC Design Update	2Q-4Q							
Conducted Algorithm/Timeline Demonstrations	4Q	4Q	3Q	3Q				
Conduct Direct Downlink Experiment		2Q						
Build C2BMC Pathfinder Shelter		3Q						
Demonstrate CONUS KEI data fusion		3Q	2Q	2Q				
Demonstrate Radar-ONIR Fusion/Timeline			3Q	3Q				
Establish C2BMC integration lab				2Q				
Integrate and demonstrate KICS Antenna Panels				4Q				
Complete C2BMC Component SDR				4Q				
Complete C2BMC DR-0					4Q			
Deliver Production Representative C2BMC								3Q
Launcher								
Conduct Initial Requirements Review		2Q						

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Conduct Canister Design Review			2Q					
Conduct Ejection Gas Generator Static Firing Test			4Q					
Conduct Canister Ejection Test				3Q				
Conduct Launcher System Design Review				4Q				
Launcher Design Review-0					4Q			
Conduct the Launcher Off-Road Mobility Test						1Q		
Deliver Pre-Production Launcher						4Q		
Deliver Production Representative Launcher								3Q
Integration and Test								
Developed facility requirements	2Q-4Q							
Completed Draft Land-Based KEI CONOPS	3Q							
Navy CONOPS Assessment	4Q	4Q						
Publish/Update VV&A Plan		3Q	3Q	3Q	3Q	3Q	3Q	3Q
Select System Integration Facility site		4Q						
Select Element Integration Facility site		4Q						
Publish/Update Development Master Test Plan		4Q	4Q	4Q	4Q	4Q	4Q	4Q
Participate in Nimble Titan Wargame		4Q	3Q	3Q	3Q	3Q	3Q	3Q
Initiate requirement analysis for SIL, SIF, EIF			1Q-4Q					
Initiate Environmental Analysis documentation			1Q-4Q					
Publish/Update Target System Requirements Letter			3Q	3Q	3Q	3Q	3Q	3Q
Conduct Booster Flight #1 Dev Verif Test					3Q			
Conduct Booster Flight #2 Test						2Q		
Conduct Partial Full Scale (PFS) Test						4Q		
Conduct Control Test Vehicle (CTV) Test							2Q	
Deliver Targets for Flight Test							2Q	1Q,3Q,4Q
Conduct Element Characterization Flight (ECF) Test							3Q	
Conduct Ship-launched Risk Reduction Flight Test								1Q
Conduct Intercept Test #1								3Q
Conduct Intercept Test #2								4Q
Near Field Infrared Experiment								
Deliver Track Sensor Payload		3Q						

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Complete delivery of Launch Vehicle components			1Q					
Complete Space Vehicle Environmental Test			1Q					
Complete SV Integration and Acceptance Testing			1Q					
Complete Launch Vehicle Integration			2Q					
Complete Ground Segment Mission Operations Center			2Q					
Certify Ground Segment Launch Site Readiness			2Q					
NFIRE Launch			2Q					
NFIRE Experiment			2Q-4Q	1Q-2Q				
Type 2 Mission - Flyby			3Q-4Q					
Deliver 2 Multi-Stage Boost Target			3Q-4Q					

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
R216 Space Test Bed	0	0	0	0	44,997	149,998	247,995	229,993
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

The Space Test Bed is an essential element of our BMDS acquisition plan. The forward-based intercept capabilities of the Airborne Laser (ABL) and Kinetic Energy Interceptor (KEI) are affected by geography and basing availability. A space-based intercept layer enables us to access to the highly valuable boost/ascent battle space independent of adversary country size or threat raid timing. A limited space-based interceptor layer also protects the United States and our Allies against asymmetric threats designed to exploit coverage and engagement gaps in our terrestrial defenses. We plan to add a space-based defensive layer to complement the evolutionary BMDS. The space-based interceptor depth of fire in the boost/ascent phase, however, is much less than that of the terrestrial boost/ascent elements. To achieve boost phase intercept raid defense from space requires very large number of satellites. We believe that a mix of terrestrial and space-basing offers the best defensive combination to defeat both rogue and near-peer adversaries.

The Kinetic Energy Interceptor program along with the Near Field Infrared Experiment (NFIRE) provides risk mitigation for the Space Test Bed project. These efforts along with other MDA development programs including the Multiple Kill Vehicle (MKV) will address fundamental spaced-based interceptor technical challenges and risk areas. Another key technology advancement is the evolution of the commercial electronics and computing industry. This industry has been able to offer electronics of increasingly lighter weight with more computing power, while increasing product quality and production rates. Our initial concept analysis indicates that there is a design opportunity starting in FY08 to integrate these evolving technologies into a lightweight, affordable, and high performance space-based interceptor that will add a flexible, multi-use intercept layer to the BMDS.

We plan to start a competitive concept design phase in FY08. Contractors selected in the concept design phase will produce a Space Test Bed concept detailing the functional architecture, capability design, mission performance, and development plan. In FY09, MDA will select a contractor team(s) to continue into the Space Test Bed Development and Test phase. During this phase the contractor will develop the spacecraft bus/interceptor housing, modify the KEI command, control, battle management and communications component, qualify a kill vehicle for space operations, and develop the axial stage interceptor motors. Much like the Kinetic Energy Interceptor contract, this development will produce high engineering and manufacturing readiness level components that will proof the production system during the development and test phase. The contractor will launch 5 space-based interceptors and perform space-based intercept testing against medium to intercontinental range ballistic missile targets. We anticipate the Development and Test phase to run through FY15 in order to enter a production phase for a small space layer in FY16.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Funding in this Project is not programmed until FY 2008.	0	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

D. Acquisition Strategy

The Space Test Bed acquisition strategy is in the early stages of development. Our primary objective is to acquire a limited space-based intercept layer that builds upon existing and planned BMDS capabilities in order to address high priority system performance shortfalls where space-basing offers the best or only solution. We plan to define an integrated contractual approach across BMDS interceptor, sensor, and command control, battle management and communication product development centers that will enable us to efficiently transition our multi-use (boost, ascent, and midcourse) intercept capabilities from terrestrial to space-based interceptors. By fully leveraging terrestrial intercept capability development products such as kill vehicles, command and control, battle management, and sensors we will greatly shorten the development timeline and cost of realizing an initial space intercept capability. We plan on competitively acquiring the Space Test Bed. This acquisition process will begin with the release of a request for proposal in early FY08. We anticipate awarding 2-4, approximately one year concept design contracts to qualified industry teams in 2Q FY08. We will use team performance during the competitive concept design phase to select a Space Test Bed lead contractor for the development and test phase. It is likely that we will structure the acquisition so that the winning Space Test Bed contractor will be automatically teamed with our existing BMDS C2BMC and BMDS sensor contractors to facilitate terrestrial capability reuse and emphasize BMDS-level integration.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

Project Total Cost										

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Space Test Bed																																
Concept Definition Award to 2-3 Contractors																																
Concept Definition Competition																																
Development and Test Award																																
Development																																
Technology Investments																																

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Space Test Bed								
Concept Definition Award to 2-3 Contractors					2Q			
Concept Definition Competition					1Q			
Development						2Q-4Q	1Q-4Q	1Q-4Q
Development and Test Award						2Q		
Technology Investments					1Q-4Q	1Q-4Q	1Q-4Q	

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0602 Program-Wide Support	14,017	12,404	10,909	24,740	27,615	26,243	31,575	34,002
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

Program-Wide Support provides funding for common support functions across the entire program such as strategic planning, program integration, cost estimating, contracting, financial management to include preparation of financial statements, reimbursement of financial services provided by DFAS, internal review and audit, earned-value management, and program assessment. Includes costs for both government civilians performing these functions as well as support contractors providing government staff augmentation in these areas. Applies to costs at the MDA HQ as well as its Executing Agents in the Services: Army Space and Missile Defense Command, Army PEO Space and Missile Defense, Office of Naval Research, and various Air Force laboratory and acquisition activities. Other costs include physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses at the various MDA Executing Agent locations, which at the MDA HQ are generally funded from the Management Headquarters Program Element (0901598C). Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Civilian Salaries and Support	14,017	12,404	10,909	24,740
RDT&E Articles (Quantity)	0	0	0	0

See Section A: Mission Description and Budget Item Justification

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
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PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603886C Ballistic Missile Defense System Interceptors**

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Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total PE Cost	612,333	718,049	617,456	676,388	600,273	634,868	652,773	661,152
0304 Test & Evaluation	334,564	239,064	187,919	188,451	181,662	198,485	204,416	210,774
0704 Test & Evaluation Block 2004	41,328	143,375	0	0	0	0	0	0
0804 Test & Evaluation Block 2006	2,201	20,557	169,996	139,392	2,600	0	0	0
0904 Test & Evaluation Block 2008	0	0	686	71,918	203,831	140,389	3,225	0
0004 Test & Evaluation Block 2010	0	0	0	0	0	68,981	208,628	144,351
R104 Test & Evaluation Block 2012	0	0	0	0	0	0	100	69,899
0305 Targets & Countermeasures Core	17,393	19,423	19,825	20,478	20,354	20,714	20,955	21,464
0705 Targets & Countermeasures Block 2004	182,708	176,407	0	0	0	0	0	0
0805 Targets & Countermeasures Block 2006	0	112,984	222,194	208,246	0	0	0	0
0905 Targets & Countermeasures Block 2008	0	0	10,293	37,991	177,463	163,430	0	0
0005 Targets & Countermeasures Block 2010	0	0	0	0	4,188	32,379	200,479	204,974
0602 Program-Wide Support	34,139	6,239	6,543	9,912	10,175	10,490	14,970	9,690

Note:
The decrease in Project 0304 funding between FY 2004 and FY 2005 is primarily due to the transfer of Critical Measurements and Countermeasures (CMCM) funds to the Projects 0704, 0804, 0904, 0004, and R104 in FY05 and beyond.

A. Mission Description and Budget Item Justification

The mission of the Missile Defense Agency (MDA) is to develop an integrated layered Ballistic Missile Defense System (BMDS) to defend the United States, its deployed forces, friends and allies from ballistic missiles of all ranges and in all phases of flight. In late 2004 the United States fielded a limited capability to defeat a ballistic missile threat. Continuing through the Future Years Defense Plan (FYDP), the breadth and depth of this initial capability will be expanded by adding and networking forward-deployed sensors, interceptors at sea and on land, and layers of increasingly capable weapons and sensors. Today's MDA activities are focused on five objectives: 1) complete development, initial fielding, and verification of Block 2004; 2) provide BMDS sustainment and Warfighter (Combatant Commanders) support; 3) develop a totally integrated capability for Block 2006 and beyond based on a strong core research and development program and improving the BMDS incrementally over time to meet future challenges; 4) execute an increasingly complex test program; and 5) establish a robust international foundation for missile defense.

MDA identifies BMDS capabilities, architectures and element contributions to counter the threat and organizes them by Engagement Sequence Groups (ESGs). These ESGs describe a combination of weapons, sensors and C2BMC capabilities that must work together to detect, track and intercept an enemy missile - the complete kill chain from the time the threat missile is first detected through the intercept of the target. ESGs also provide the management framework to be able to identify and engineer the necessary interfaces required to deliver a usable configuration of the BMDS, help the operator plan and train for operation of that capability, and provide a means to track and test future improvements to the system.

As part of the total BMDS, the Test and Targets Program Element (PE) provides the resources, including targets and countermeasures development, for an integrated system-level test approach, bringing together the capabilities of the BMDS elements. This PE consists of twelve projects: Test & Evaluation (T&E); T&E Block 2004; T&E Block 2006; T&E Block 2008; T&E Block 2010; T&E Block 2012; Targets & Countermeasures Core; Targets & Countermeasures Block 2004; Targets & Countermeasures Block 2006; Targets & Countermeasures Block 2008; Targets & Countermeasures Block 2010, and Program-Wide Support that includes personnel, related support costs and fiscal requirements.

Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

Test and Evaluation and Targets and Countermeasures Core (Projects 0304 and 0305, respectively) provide for the implementation of test and target functions that span multiple Blocks. These projects also assist in expanding the capabilities of the BMDS in future Blocks, and develop capabilities not yet foreseen as part of a current or future Block. Block functions (e.g., Project 0704 - T&E Block 2004 and Project 0705 - Targets and Countermeasures Block 2004) include all efforts (e.g., detailed planning, hardware procurement, test execution, analysis, and reporting) necessary to test and assess a specific BMDS Block. Element participation in system-level testing, including test article procurement and test conduct, is captured in the respective PE.

The T&E projects provide consolidated MDA-wide capabilities and resources to support the management and execution of BMDS System and Element-level testing. With the evolution of the BMDS, testing needs have expanded beyond those of the individual elements to include testing of BMDS engagement sequences that rely on multiple BMDS elements. MDA's Responsible Test Organization (RTO) structure centralizes all authority and responsibility for all BMDS testing. The BMDS Responsible Engineering Organization (REO) provides the system test objectives to the RTO to test and assess BMDS capability. The RTO makes use of a BMDS Combined Test Force to plan and execute BMD system testing. The RTO also develops the necessary test policy, test plans, and test infrastructure to conduct an effective test program. RTO activities are grouped into four functional areas; Test Policy and Integration, BMDS Combined Test Force (CTF), Test Resources, and Facilities, Siting, and Environmental management. The Test Policy and Integration program supports the development and implementation of test policy, standards, and procedures for creating a unified BMD test process. This program also includes funding for the BMDS On-alert Capability Assessment (BOCA) and funding for the Service Operational Test Agencies (OTAs) to conduct a BMDS Operational Assessment (OA). The BMDS CTF consolidates the personnel, processes, and resources across MDA, including the BMDS elements, into a unified, cohesive team to execute the BMDS test program. The BMDS CTF provides for core support that spans multiple Blocks as well as the individual efforts required for the test and assessment of specific Blocks. The Test Resources program supports the development, operation, maintenance, and modernization of the T&E infrastructure supporting both BMDS System and Element-level testing. The MDA test program provides data and information to anchor the models and simulations used to verify BMDS capabilities and to support BMDS characterization and assessment.

The BMDS RTO uses a top-down approach to develop BMDS test plans based on engagement sequence groups, system test objectives, and the overall system design provided by the BMDS REO. The BMDS CTF uses these inputs to create an integrated system-level test approach, bringing together the contributions of the various BMDS elements into combined system test events. These system test events are comprised of two or more elements interacting to verify the capability of the system in one or more of the engagement sequences; these events are documented in the Integrated Master Test Plan (IMTP). The IMTP is the foundation for developing the element Developmental Master Test Plans that detail the element contributions to the overall test program. Elements design their component test programs to support the IMTP and participate in the overall BMD system level test program. The development and acquisition of new test facilities and instrumentation are integrated into a Test Resources Master Plan that supports the overall test approach.

The Targets and Countermeasures Program is a supporting BMDS program that provides targets to test the integrated, layered BMDS, including targets to support testing prior to initial defensive operational capability. This program funds new target and countermeasure development, risk reduction flights (tests of target prototypes), subsystem characterization, and the acquisition and maintenance of long lead target material items. Specifically, the Targets and Countermeasures program provides capability-based ballistic missile target systems to include missile subsystems and common target components, such as boosters, re-entry vehicles (RVs), countermeasures, guidance and control components, data and instrumentation packages, and launch support systems. Additionally, the Targets and Countermeasure program supports aging surveillance, refurbishment, and reuse of existing government furnished equipment such as Minuteman II and Lance missile hardware. Utilizing existing government inventories and the development of common target components, a BMDS target system is integrated and tested, thus reducing the cost and cycle time of developing and acquiring new target system hardware. To assist the government in this endeavor, a ten year prime contract was awarded in FY04 to design, develop, and test all BMDS targets.

Program-Wide Support provides funding for common support functions across the entire program such as strategic planning, program integration, cost estimating, contracting, financial management to include preparation of financial statements, reimbursement of financial services provided by DFAS, internal review and audit, earned-value management, and program assessment. Includes costs for both government civilians performing these functions as well as support contractors providing government staff augmentation in these areas. Applies to costs at the MDA HQ as well as its Executing Agents in the Services: Army Space and Missile Defense Command, Army PEO Space and Missile Defense, Office of Naval Research, and various Air Force laboratory and acquisition activities. Other costs include physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses at the various MDA Executing Agent locations, which at the MDA HQ are generally funded from the Management Headquarters Program Element (0901598C). Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

B. Program Change Summary	FY 2004	FY 2005	FY 2006	FY 2007
Previous President's Budget (FY 2005 PB)	633,782	713,658	665,854	648,563
Current President's Budget (FY 2006 PB)	612,333	718,049	617,456	676,388
Total Adjustments	-21,449	4,391	-48,398	27,825
Congressional Specific Program Adjustments	0	3,000	0	0
Congressional Undistributed Adjustments	0	1,391	0	0
Reprogrammings	-17,480	0	0	0
SBIR/STTR Transfer	-3,969	0	0	0
Adjustments to Budget Years	0	0	-48,398	27,825

Funding changes in FY 2004 - FY2007 from the Previous President's Budget (FY 2005 PB) to the Current President's Budget (FY 2006 PB) are due to changes in the Missile Defense Agency's (MDA) priorities required to develop, field, and sustain an integrated layered Ballistic Missile Defense System (BMDS) to defend the United States, its deployed forces, friends and allies from ballistic missiles of all ranges and in all phases of flight.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0304 Test & Evaluation	334,564	239,064	187,919	188,451	181,662	198,485	204,416	210,774
RDT&E Articles Qty	4	2	0	0	0	0	0	0

Note:
The decrease in Project 0304 funding between FY 2004 and FY 2005 is primarily due to the transfer of Critical Measurements and Countermeasures (CMCM) funds to the Projects 0704, 0804, 0904, 0004, and R104 in FY05 and beyond.

FY04 RDT&E Articles: Two (2) Castor IVB Boosters with threat-like R-Vs for CMP-4. Purchase and delivery of HALO-I and HALO-II platforms.

FY05 RDT&E Articles: Delivery of Two (2) Transportable Telemetry Systems

A. Mission Description and Budget Item Justification

The T&E projects provide consolidated MDA-wide capabilities and resources to support the management and execution of BMDS System and Element-level testing. With the evolution of the BMDS, testing needs have expanded beyond those of the individual elements to include testing of BMDS engagement sequences that rely on multiple BMDS elements. MDA's Responsible Test Organization (RTO) structure centralizes all authority and responsibility for all BMDS testing. The RTO relies on the Responsible Engineering Organization (REO) to provide the system test objectives to test and assess BMDS capability. The RTO makes use of a BMDS Combined Test Force to plan and execute BMD system testing. The RTO also develops the necessary test policy, test plans, and test infrastructure to conduct an effective test program. RTO activities are grouped into four functional areas; Test Policy and Integration, BMDS Combined Test Force (CTF), Test Resources, and Facilities, Siting, and Environmental management.

The Test Policy and Integration program supports the development and implementation of test policy, standards and procedures for creating unified BMD test processes which reflect the best practices of existing element processes. Mission Assurance is integrated into the entire MDA test program through the identification and application of T&E best practices into test processes and procedures for flight, software and ground testing. Target certification reports are also developed to ensure that targets are suitable to meet test objectives. The Test Policy and Integration program provides policy and guidance on Knowledge Management (KM) practices, establishing standardized documentation for test planning, test reporting, and data archiving. The program also develops, coordinates, and manages RTO inputs into the overall BMDS Program Plans. The Test Policy and Integration program supports two major assessments of the BMDS: The BMDS On-Alert Capability Assessment (BOCA) and System-Level Operational Assessments. The BOCA will provide a non-advocate, independent assessment of the BMDS throughout its life-cycle. Where possible, BOCA team-members will recommend changes to the current test program and mitigation efforts to reduce performance degradation, implementation, and integration risks. Operational Test Agencies (OTAs) will perform operational assessments of the BMDS. The OTAs will maintain their assessments in the OTA database which will reflect a living document of the BMDS assessment. Element-level assessments will continue to be supported by the respective element budgets.

BMDS CTF Core funding supports the implementation and execution of the Measurements Program and the Applied Data Analysis Center (ADAC). (Funding associated with Critical Measurements and Counter Measures (CMCM) flight tests are captured in projects 0704, 0804, 0904, 0004 and R104 but is managed as part of the Measurements Program.) The Measurements Program is an integrated test program established to ensure a coherent, complete, cost effective, and disciplined approach to collecting data/measurements to support characterization of the BMDS mission space. Measurements requirements are collected, prioritized and validated by the Measurements Program Assessment Team (MPAT) to support Block Characterization, M&S Validation, Phenomenology, Advanced Concepts, and Lethality. Requirements are then allocated to specific tests. Target Characterization and Lethality Tests (also known as the Intercept Debris Measurements Program (IDMP)) are also planned and executed under the Measurements Program. Under the Target Characterization Program, the CTF is responsible for collecting target signature data for new target performance characterization analysis, and to support Element algorithm development. The Applied Data Analysis Center (ADAC) represents the primary measurements analysis effort and supports development of the BMDS Measurements test program. The ADAC encompasses mission sensor planning, data collection, analysis, and exploitation activities of the Optical Data Analysis (ODA) and Radar Data Analysis (RDA) efforts. In addition, the ADAC exploits Measurements and Systems Test data to improve future BMD Systems. This project funds the Kill Assessment Program and support for data collection and analysis of International & Special Programs. This also includes participation by the Kill Assessment (KA) Program in most MDA flight test events. To support the BMDS Test

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

Program development, program objectives, and performance characterization, MDA Test and Evaluation provides resources to support the activities of the Radar Data Exploitation (RDE) and Test Planning. This activity supports data planning, collection and analysis of radar for missions supported by Observation Island and Gray Star.

The Test Resources Program develops, sustains, and modernizes the core T&E facilities of the BMDS test bed to support system and element-level testing and assessment. This also includes development, maintenance and modernization of the sensors, instrumentation, BMD-unique ground test facilities, and MDA data centers. All of these assets provide program risk reduction and test implementation capability in support of BMDS test activities. Because this core test capability is corporately sustained, the individual BMDS elements pay only the direct costs associated with their specific test efforts. The Test Resources Program uses the engagement sequences to evaluate how the BMDS might test in future Blocks. A continuous analysis pitting collection requirements and test scenarios versus existing and planned test assets is used to identify the test infrastructure needed to test the BMDS, BMDS elements, and element components as part of the engagement sequences. The Test Resources Program also includes the Pacific Range Support Team (PRST) to support the BMDS CTF with test mission planning and execution, development of common standards and mission assurance, and to recommend development or modification of mobile instrumentation to support MDA testing.

The Facilities, Siting and Environmental program provides guidance, environmental impact analysis and documentation, real property facility siting, acquisition, and facility operational support for the BMD systems. This program oversees facility acquisition of the Military Construction (MILCON) and RDT&E construction programs. This program also provides guidance and supports the Environmental Assessment and Environmental Impact Statement process, environmental compliance, pollution prevention, and other environmental efforts. This program ensures environmental compliance of all BMDS activities with federal, state, local, DOD and international law, treaties and regulations.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Test Resources	165,731	165,643	116,542	113,207
RDT&E Articles (Quantity)	2	2	0	0

FY 2004 Accomplishments

RDT&E Articles: Purchase and Delivery of HALO-I and HALO-II

- Provided for operations, sustainment, and modernization of the core corporate test and evaluation infrastructure components of the BMDS Test Bed. This included ranges and instrumentation, airborne sensors, mobile launch platform and ground test facilities to support element and system-level testing. Continued to improve test infrastructure in terms of capability and quantity, as recommended from continuing MDA studies. These improvements build on the existing core test infrastructure to support element and system-level testing.
- Provided level-of-effort funding to ranges (White Sands Missile Range (WSMR), Kauai Test Facility (KTF), Wake Island, Pacific Missile Range Facility (PMRF), Reagan Test Site (RTS), Western Range / Vandenberg Air Force Base (VAFB), Naval Air Warfare Center (NAWC), Kodiak Launch Complex (KLC)) to maintain MDA-unique test facilities and instrumentation for MDA tests.
- Procured airborne sensor platforms High Altitude Observatory I & II (HALO-I) and (HALO-II). Continued to operate, maintain and improve airborne sensors instrumentation platforms HALO-I, HALO-II and WASP to support BMDS testing and development activities.
- Maintained the MDA-unique ground test facilities, including wind tunnels, space-environment chambers, light gas gun, ladar performance lab, hardware-in-the-loop simulation facility, rocket-plume sensor capabilities and the hover test facility.
- Supported BMDS test ranges transition to a common test management and execution process as well as provided upgrades and improvements to test range hardware and software based planning and execution tools.
- Used the Pacific Range Support Team (PRST) to provide efficient planning, coordination and management of range resources and infrastructure in support of BMDS Flight Testing throughout the Pacific Test bed.

- Coordinated with OSD test resources community/programs (DTRMC, CTEIP, etc.).
- Standardized flight safety procedures, analysis tools, flight hardware, and safety officer training through a three-phase program.
- Maintained the MDA Data Centers Program to provide efficient data archiving, access, distribution and furnish relevant expertise for MDA Mission oriented data.
- Developed and awarded contract with Alaska Aerospace Development Corporation (AADC) to provide for operation and sustainment of the Kodiak Launch Complex (KLC) to support MDA target launches.
- Participated in DOT&E's six-month Defense Science Board study to assess national needs for nuclear-weapon-effect simulation facilities.
- Developed the Transportable Telemetry System (TTS) to provide ultra high band width telemetry collection, processing, and real time test data transmission capability thereby supporting the data collection requirements of future BMDS missions.
- Continued Upgrades to PMRF Sensors, Command and Control Systems, Data Analysis Tools, and Range Safety Systems to support BMDS testing. (Congressional Adds)
- Maintained and operated the Kauai Test Facility (KTF) to enable the launch of target systems supporting BMD Test Activities. (Congressional Earmark)
- Characterized advanced technology in the terrestrial neutron environments which allows simulation of unique BMD Environments at the Indiana University Cyclotron Facility. (Congressional Add)

FY 2005 Planned Program:

RDT&E Articles: Delivery of Two (2) Transportable Telemetry Systems

The Test Resources program will provide for operations, sustainment, and modernization of the core corporate test and evaluation infrastructure components of the BMDS Test Bed. This includes ranges and instrumentation, airborne sensors, mobile launch platform and ground test facilities to support element- and system-level testing. This program will continue to improve test infrastructure in terms of capability and quantity, as recommended from continuing MDA studies. These improvements build on the existing core test infrastructure to support element and system-level testing.

The Test Resources Program will:

- Develop, maintain, integrate and upgrade MDA unique range facilities and instrumentation at the following ranges: White Sands Missile Range (WSMR), Kauai Test Facility (KTF), Wake Island, Pacific Missile Range Facility (PMRF), Reagan Test Site (RTS), Western Range / Vandenberg Air Force Base (VAFB), Naval Air Warfare Center (NAWC), and the Kodiak Launch Complex (KLC).
- Use the Pacific Range Support Team (PRST) to provide efficient planning, coordination and management of range resources and infrastructure in support of BMDS Flight Testing throughout the Pacific Test bed.
- Coordinate with OSD test resources community/programs (DTRMC, CTEIP, etc.).
- Perform major maintenance of the Mobile Launch Platform (MLP).
- Complete Development and delivery of two Transportable Telemetry Systems (TTS) which provides long range missile telemetry acquisition, processing and archiving capability.
- Upgrade the Kwajalein Mobile Range Safety System (KMRSS).
- Sustain the Mobile Range Safety System (MRSS).
- Maintain and upgrade MDA unique Ground Test Facilities to support all the BMDS developmental program hardware and software testing. These facilities include: Kinetic Kill Vehicle Hardware in the Loop Simulators, Hypervelocity Wind Tunnel Number 9, Infrared And Blackbody Standards at the National Institute of Standards and Technology (NIST), Hypervelocity Ballistic Range G Light Gas Gun, Von Karman Facilities (VKF) at AEDC, 7V/10V Space Chambers, Army Missile Optical Range (AMOR), Aero-Optic and Aero-Thermal Evaluation Center, Holloman High Speed Test Track, and Innovative Science And Technology Experimentations Facility.
- Provide centralized data management, archival and distribution services to reduce the risks and cost of BMDS Block Development and Operational Deployment. The Data Centers comprise MDA's official archive for all MDA mission related scientific and technical data. These centers include: Advanced Missile Signature Center, Ballistic Missile Defense System Integration Data Center, Missile Defense Data Center, and Navy Surface Warfare Center.

- Complete Wide Body Airborne Sensor Platform (WASP) Development.
- Operate High Altitude Observatory II (HALO-II), WASP, High Altitude Observatory (HALO-I) for data collection services and services of BMD Flight Test.
- Develop and Upgrade PMRF Sensors, Command and Control Systems, Data Analysis Tools, and Range Safety Systems. (Congressional Adds)
- Maintain and operate the Kauai Test Facility (KTF) to enable the launch of target systems supporting BMD Test Activities. (Congressional Earmark)
- Characterize advanced technology in the terrestrial neutron environments which allows simulation of unique BMD Environments at the Indiana University Cyclotron Facility. (Congressional Add)

FY 2006 Planned Program:

The Test Resources program will provide for operations, sustainment, and modernization of the core corporate test and evaluation infrastructure components of the BMDS Test Bed. This included ranges and instrumentation, airborne sensors, mobile launch platform and ground test facilities to support element- and system-level testing. This program will continue to improve test infrastructure in terms of capability and quantity, as recommended from continuing MDA studies. These improvements build on the existing core test infrastructure to support element- and system-level testing.

The Test Resources Program will:

- Develop, maintain, integrate and upgrade MDA unique range facilities and instrumentation at the following ranges: White Sands Missile Range (WSMR), Kauai Test Facility (KTF), Wake Island, Pacific Missile Range Facility (PMRF), Reagan Test Site (RTS), Western Range / Vandenberg Air Force Base (VAFB), and the Kodiak Launch Complex (KLC).
- Use the Pacific Range Support Team (PRST) to provide efficient planning, coordination and management of range resources and infrastructure in support of BMDS Flight Testing throughout the Pacific Test bed.
- Coordinate with OSD test resources community/programs (DTRMC, CTEIP, etc.).
- Maintain and upgrade MDA unique Ground Test Facilities to support all the BMDS developmental program hardware and software testing. These facilities include: Kinetic Kill Vehicle Hardware in the Loop Simulators, Hypervelocity Wind Tunnel Number 9, Infrared And Blackbody Standards at the National Institute of Standards and Technology (NIST), Hypervelocity Ballistic Range G Light Gas Gun, Von Karman Facilities (VKF) at AEDC, 7V/10V Space Chambers, Army Missile Optical Range (AMOR), Holloman High Speed Test Track, and Innovative Science And Technology Experimentations Facility.
- Provide centralized data management, archival and distribution services to reduce the risks and cost of BMDS Block Development and Operational Deployment. The Data Centers comprise MDA's official archive for all MDA mission related scientific and technical data. These centers include: Advanced Missile Signature Center, Ballistic Missile Defense System Integration Data Center, Missile Defense Data Center, and Navy Surface Warfare Center.
- Operate High Altitude Observatory II (HALO-II), Wide Body Airborne Sensor Platform (WASP), High Altitude Observatory (HALO-I) for data collection services and services of BMD Flight Test.
- Maintain and operate the Kauai Test Facility (KTF) to enable the launch of target systems supporting BMD Test Activities.
- Upgrade the Kwajalein Mobile Range Safety System (KMRSS).
- Sustain the Mobile Range Safety System (MRSS).

FY 2007 Planned Program:

The Test Resources Program will continue to provide the resources for the development, sustainment, and modernization of core corporate T&E infrastructure facilities of the BMDS test bed to support system and element-level testing. This includes support at BMD-unique ground test facilities and MDA Data Centers. The Test Resources Program will continue to use the engagement sequences and the Pacific Range Support Team (PRST) to evaluate how the BMDS elements and components might test in future Blocks. This analysis will be used to identify the test infrastructure needed to test the BMDS elements and components as part of the engagement sequences. The Test Resources Program will conduct annual reviews to ensure infrastructure is ready to support changing block requirements.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

	FY 2004	FY 2005	FY 2006	FY 2007
BMDS CTF Core	146,822	43,975	40,021	42,005
RDT&E Articles (Quantity)	2	0	0	0

FY 2004 Accomplishments

RDT&E Articles: Two (2) Castor IVB Boosters with threat-like RVs for CMP-4.

- Organized Combined Test Force (CTF) to conduct BMD System Flight Testing to verify BMDS element and component interoperability.
- Collect, prioritize, validate, and document requirements for MDA Measurements Program. Allocate requirements to test.
- Conducted test planning for CMP-4a&b and execution of CMP-4a.
- Conducted test planning, sensor planning, range integration, and design reviews in support of FT 04-2 (CMCM-1) and FT 04-4 (CMCM-2).
- Conducted test planning, test execution, and post test analysis for Long Range Air Launched Target (LRALT) Characterization for LRALT Risk Reduction Flight.
- Conducted test planning, test execution, and post test analysis for Short Range Air Launched Target (SRALT) Characterization for SRALT Risk Reduction Flight.
- Conducted test planning, sensor planning, range integration efforts, and design reviews in support of FT 04-2 (CMCM-1) and FT 04-4 (CMCM-2).
- Conducted test & sensor planning, range integration efforts, and design reviews in support of Medium Range Target (MRT) Characterization for MRT Risk Reduction Flight (FT 04-3).
- Continued the Advanced Data Analysis Center (Optical Data Analysis (ODA) and Radar Data Analysis (RDA) groups) effort to support BMDS data collection objectives, conduct mission planning for LRALT, SRALT, FT 04-3, FT04-02, and FT04-04, perform sensor execution for CMP-4, LRALT, and SRALT, perform data analysis for CMP-4, LRALT, SRALT, and BMD System Tests, explored phenomenology to improve future BMD systems and new mission areas, and provided characterization and assessment for Measurements and BMDS flight test programs.
- Drafted the Measurements Master Test Plan (MMTP).
- Continued Radar Data Exploitation (RDE) analysis efforts of all source data collection during foreign flight tests.
- RDE effort conducted Observation Island test participation planning for 8 domestic tests.
- Drafted and coordinated the BMDS Integrated Master Test Plan (IMTP).
- The Lethality Test Program:
  - Coordinated DOT&E approval of LFT&E strategy for GMD.
  - Supported a successful collaborative Flight Test (USFT-1) with the Israeli Arrow Program; and hardware development and planning for a collaborative Flight Test with the Army's PAC-3 program.
- The Kill Assessment Program:
  - Analyzed data collected from BMDS test events to develop decision tools in order to insert Kill Assessment (KA) decision capabilities into the BMDS Block 2006 C2BMC suite.
- The International Program:
  - Conducted test planning, test execution, sensor planning & data collection, range integration efforts, and post test analysis for Arrow Caravan #1 Flight Tests in cooperation with the Arrow Program Office and the Israeli Missile Defense Organization.
  - Leveraged the unique skills and tools of our international partners for benefits that can be applied to the US BMDS. Examples of unique tools were the measurement systems fielded by the Canadians (imaging hyper-spectral instruments) and Australians (active and passive HF detection systems).

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

FY 2005 Planned Program/Accomplishments:

- Executed CMP-4b and conducted post test analysis on CMP-4 data. (Completed CMP-4 60-Day Data Review)
- Continue to collect, prioritize, validate, and document requirements for MDA Measurements Program. Allocate requirements to test.
- Continue the Advanced Data Analysis Center (ODA, RDA, and RDE) effort to support BMDS data collection objectives, conduct mission planning for FT 04-3, FT04-02, and FT04-04, perform sensor execution for FT 04-3, FT04-02, and FT04-04, perform data analysis for CMP-4, LRALT, SRALT, MRT, FT04-02, and BMD System Tests, explore phenomenology to improve future BMD systems and new mission areas, and provide characterization and assessment for Measurements and BMDS flight test programs.
- Update the Measurements Master Test Plan (MMTP).
- Continue RDE analysis efforts of all source data collection during foreign flight tests.
- Conduct test planning, test execution, and post test analysis for Medium Range Target (FT 04-3) Characterization of FT 04-3 Risk Reduction Flight. Collect target signature data for new target performance, characterization analysis, and for algorithm development.
- Coordinate requirements, sensor planning, data collection, data analysis, and reporting for approximately 4 Tests of Opportunity (TOOs).
- Continue implementation of the Combined Test Force (CTF) to conduct BMD System Flight Testing to verify BMDS element and component interoperability.
- Continue to coordinate and revise the BMDS Integrated Master Test Plan (IMTP).
- The Lethality Test Program:
  - Conducted an Intercept Debris Measurements Program (IDMP) payload experiment on PAC-3 DT/OT-12a
- The Lethality Test Program plans to:
  - Develop the first BMD system level lethality LFT&E strategy and execute lethality cooperative flight tests with PAC-3 as well as develop test plans and target fabrication for out-year THAAD tests, ABL and Arrow events.
  - Resolve key questions pertaining to bulk chemical target payloads after BMD engagements.
- The Kill Assessment (KA) Test Program will develop, test and validate techniques that are designed to declare the Degree of Kill on BMDS Engagements. This includes developing engineering models and decision tools to support KA decision capability insertion into the BMDS Block 2006 C2BMC suite which include:
  - Developing a C2BMC schema with architecture for the BMDS that will identify potential Kill Assessment sensors, identifying kill assessment algorithms, incorporating near-real time Kill Assessment information in the C2BMC system, and displaying real-time information to decision makers.
  - Providing sensor support that develops and fields specially designed Kill Assessment sensors including the Kill Assessment Fireball Sensor (KAFS), high speed spectrometers (HSS), and high speed imagers (HSI) that can capture the necessary Kill Assessment data.
  - Conducting RV Intercept Signature Kill Assessment (RISK) Model Development to predict optical signatures resulting from target intercepts.
  - Performing Hydrocode Model Assessment to determine the utility of hydrocodes to support Kill Assessment.
- International Program plans to:
  - Participate in the US-RF proposed APEX II experiment.
  - Conduct US-UK cooperative passive radar analysis.
  - Perform analysis on US-IS DEA joint data.
  - Conduct US-CA spectral data collections and US-AU OTH radar investigations.

FY 2006 Planned Program:

- Continue the Advanced Data Analysis Center (ODA, RDA, and RDE groups) effort to support BMDS data collection objectives, conduct mission planning for FT 06-4, perform data analysis for MRT, FT04-02, FT04-04 and BMD System Tests, explore phenomenology to improve future BMD systems and new mission areas, and provide characterization and assessment for Measurements and BMDS flight test programs.
- Revise and update the Measurements Master Test Plan (MMTP).

- Continue to collect, prioritize, validate, and document requirements for MDA Measurements Program. Allocate requirements to test.
- Continue to coordinate and revise the BMDS Integrated Master Test Plan (IMTP).
- Continue implementation of the Combined Test Force (CTF) to conduct BMD System Flight Testing to verify BMDS element and component interoperability.
- The Lethality Test Program plans to:
  - Continue interface with BMDS element and corporate lethality programs, but with increased authority and responsibility for assuring BMDS lethality testing and assessments are accomplished in accordance with the BMDS Combined Test Force Concept of Operations.
  - Execute the first THAAD System level lethality Flight Test (FT-3) as well as develop test plans and target fabrication for out-year THAAD test (FT-4) and ABL.
  - Continue phenomenology; instrumentation and test methodology development; flight test planning and qualification; and component, element and system capability demonstrations.
  - Collect data required by the MDA System Engineer pertaining to post-engagement effects and consequence management analysis efforts.
  - Perform post test analysis and exploitation of data from multiple tests to identify potential phenomenologies and features that might not be apparent from individual test results.
- The Kill Assessment (KA) Test Program will develop, test and validate techniques that are designed to declare the Degree of Kill on BMDS Engagements. This includes developing engineering models and decision tools to support KA decision capability insertion into the BMDS Block 2006 C2BMC suite which include:
  - Developing a C2BMC schema with architecture for the BMDS that will identify potential Kill Assessment sensors, identifying kill assessment algorithms, incorporating near-real time Kill Assessment information in the C2BMC system, and displaying real-time information to decision makers.
  - Providing sensor support that develops and fields specially designed Kill Assessment sensors including the Kill Assessment Fireball Sensor (KAFS), high speed spectrometers (HSS), and high speed imagers (HSI) that can capture the necessary Kill Assessment data.
  - Conducting RV Intercept Signature Kill Assessment (RISK) Model Development to predict optical signatures resulting from target intercepts.
  - Performing Hydrocode Model Assessment to determine the utility of hydrocodes to support Kill Assessment.
- International Program plans to:
  - Participate in the US-RF proposed APEX II experiment.
  - Conduct US-UK cooperative passive radar analysis.
  - Perform analysis on US-IS DEA joint data.
  - Conduct US-CA spectral data collections and US-AU OTH radar investigations.

FY 2007 Planned Program:

- The Lethality Test Program to interface with BMDS element and corporate lethality programs, but with increased authority and responsibility for assuring BMDS lethality testing and assessments are accomplished in accordance with the BMDS Combined Test Force Concept of Operations.
- The Lethality Test Program will execute the second THAAD System level lethality Flight Test (FT-4) as well as develop test plans and target fabrication for out-year tests.
- The Kill Assessment (KA) Test Program will develop, test and validate techniques that are designed to declare the Degree of Kill on BMDS Engagements. This includes developing engineering models and decision tools to support KA decision capability insertion into the BMDS Block 2006 C2BMC suite.
- The Advanced Data Analysis Center (ODA, RDA, and RDE) effort will continue to support BMDS data collection objectives, conduct mission planning for FT 06-4 and FT 08-2, perform sensor execution for FT 06-4, perform data analysis for FT 06-4 and BMD System Tests, explore phenomenology to improve future BMD systems and new mission areas, and provide characterization and assessment for Measurements and BMDS flight test programs.
- Update the Measurements Master Test Plan (MMTP).
- Continue to collect, prioritize, validate, and document requirements for MDA Measurements Program. Allocate requirements to test.
- International Program plans to:
  - Participate in the US-UK cooperative passive radar analysis.
  - Perform analysis on US-IS DEA joint data. Conduct US-CA spectral data collections and US-AU OTH radar investigations.
- Continue to coordinate and revise the BMDS Integrated Master Test Plan (IMTP).

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

	FY 2004	FY 2005	FY 2006	FY 2007
Facilities, Siting & Environmental	4,875	4,514	5,668	6,155
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

The Facilities, Siting and Environmental program provided guidance, environmental impact analysis and documentation, facility siting, acquisition, and facility operational support for the BMD systems. This program provided oversight of facility acquisition of the Military Construction (MILCON) and RDT&E construction programs. This program also provided guidance and supported the Environmental Assessment and Environmental Impact Statement process, environmental compliance, pollution prevention, and other environmental efforts. The Civil Engineering and Environmental Management Program ensured environmental compliance of all BMDS testing activities for compliance with federal, state, local, DOD and international law, treaties and regulations.

- Completed 23 NEPA analyses to support MDA BMDS construction, testing, and fielding activities.
- Completed Six Environmental Assessments (EAs) and Findings of No Significant Impact (FONSIs) to support Arrow System Improvement Program testing at Vandenberg AFB (VAFB) and San Nicolas Island; Ground-based Midcourse Defense (GMD) Initial Defensive Operations Capability at VAFB; GMD Northeast Remote IDT at Ft Drum; Intercept Debris Measurement Program experiments at White Sands Missile Range (WSMR); Vertical Gun Testing at New Mexico Institute of Mining and Technology; and use of the Mobile Launch Platform in the Pacific Ocean Region.
- Completed Seventeen Records of Environmental Consideration (RECs) supporting various MDA construction and testing activities. Specific RECs include the following:
  - Terminal High Altitude Air Defense (THAAD) Flight Test at WSMR
  - THAAD Radar Integration at WSMR
  - Joint National Integration Center (JNIC) Warehouse at Schriever AFB
  - GMD Integrated Flight Test 13C (IFT-13c) at Kodiak Launch Complex (KLC) and Reagan Test Site (RTS)
  - Transportable Telemetry System (TTS) CATEX at Naval Air Station Whidbey Island (NASWI)
  - Pacific Explorer III Memorandum for Record (MFR)
  - Arrow System Improvement Program (ASIP) Modified Flight Tests at Pt Mugu
  - ABL Clean Room at Edwards AFB
  - Air Force Form 813 for Ground Testing of the ABL ARS Laser at Cape Canaveral
  - Air Force Form 813 for Beddown of BMDS Radars at Vandenberg AFB (VAFB)
  - Air Force Form 813 for ABL Proteus Beddown
  - Integrated Flight Test 14 (IFT-14) from VAFB
  - Medium Range Target System (MRT) testing at PMRF
  - Critical Measurements and Countermeasures FT 04-2 Flight Tests at PMRF
  - THAAD Ancillary Radar Site at PMRF
  - Fort Greely Construction Access
  - Fort Greely Communication Cable
- Updated the environmental compliance awareness training class for MDA-wide distribution; and held MDA's Environmental Integrated Program Team (IPT) Meeting to discuss ongoing compliance issues and potential compliance issues likely to affect MDA's mission.
- Prepared the draft BMDS Programmatic Environmental Impact Statement and distributed for public comment.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

FY 2005 Planned Program

The Facilities, Siting and Environmental program will provide guidance, environmental impact analysis and documentation, facility siting, acquisition, and facility operational support for the BMD systems. This program will oversee facility acquisition of the Military Construction (MILCON) and RDT&E construction programs. This program will also provide guidance and supports the Environmental Assessment and Environmental Impact Statement process, environmental compliance, pollution prevention, and other environmental efforts. The Civil Engineering and Environmental Management Program will ensure environmental compliance of all BMDS testing activities for compliance with federal, state, local, DOD and international law, treaties and regulations.

- Complete the BMDS Programmatic Environmental Impact Statement (PEIS) including public hearings to address/incorporate appropriate public comments.
- List of NEPA/Executive Order 12114 analyses that should be conducted/processed this year:
  - MDA Ballistic Missile Defense System Programmatic Environmental Impact Statement (BMDS PEIS)
  - SBX Mooring in Adak, Alaska, EA
  - Small Targets Launch Pad at VAFB EA
  - Orbital/Suborbital Program (OSP) EA
  - Mobile Sensors EA
  - HELSTF Enhanced Laser and Range Operations EA
  - High Altitude Airship (HAA) EA
  - E.O. 12114/NEPA analysis for the FBX-T (Forward Based Radar-Transportable)
  - THAAD Intercept Debris Measurement Program REC
  - MUDPACK II EA
  - FT 04-4 REC
  - MFR for FTM 04-2
  - Arrow System Improvement Program REC
  - ISTEF at Niihau, HI REC
  - E.O. 12114 Analysis for JCTV-1
  - E.O. 12114 Analysis for FT 04-5 (Cobra Dane LRALT) Flight Test

FY 2006 Planned Program:

The Facilities, Siting and Environmental program will provide guidance, environmental impact analyses and documentation, real property facility siting, acquisition, and facility operational support for the BMD systems. This program will oversee facility acquisition of the Military Construction (MILCON) and RDT&E construction programs. This program will also provided guidance and supports the Environmental Assessment and Environmental Impact Statement process, environmental compliance, pollution prevention, and other environmental efforts. This program will ensure environmental compliance of all BMDS activities with federal, state, local, DOD and international law, treaties and regulations.

FY2007 Planned Program

The Facilities, Siting and Environmental program will provide guidance, environmental impact analyses and documentation, real property facility siting, acquisition, and facility operational support for the BMD systems. This program will oversee facility acquisition of the Military Construction (MILCON) and RDT&E construction programs. This program will also provided guidance and supports the Environmental Assessment and Environmental Impact Statement process, environmental compliance, pollution prevention, and other environmental efforts. This program will ensure environmental compliance of all BMDS activities with federal, state, local, DOD and international law, treaties and regulations.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

	FY 2004	FY 2005	FY 2006	FY 2007
Test Policy and Integration	17,136	24,932	25,688	27,084
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- BMDS On-Alert Capability Assessment (BOCA) team was formed in February 2004 and initiated a non-advocate assessment of the BMDS readiness, based on analysis of test data. The BOCA team investigated BMDS performance issues and proposed mitigation plans.
- Completed Target Accreditation Reports for the USFT-1, USFT-2, PAC-3 CRI-2, IFT-13C, IFT-14, and FT 04-1 test events.
- Drafted Test Policy for the implementation and conduct of Executive Flight Test Review guidelines.
- Developed guidance and direction for the implementation of the Responsible Test Organization.
- Initiated Memorandum of Agreement (MOA) with OTAs to establish an OTA Liaison Group (OLG) to facilitate communications and interaction between the BMDS development community and Service operational test communities.

FY 2005 Planned Program/Accomplishments:

- BMDS On-Alert Capability Assessment (BOCA) team will provide a non-advocate assessment of the BMDS readiness based on an analysis of test data. The BOCA team will continue investigation of BMDS performance issues and propose mitigation plans.
- Complete Target Accreditation Reports for the FTM 04-1, FT 04-2a, FT 04-2b, FTM 04-2, THAAD FT-3, FTG 04-2, and FTG 04-3 test events.
- Initiate Target Accreditation Report for FTG 04-4a, FTG 04-4b, FTM 04-3, JCTV-1 and THAAD FT-4 test events.
- Continue to integrate mission assurance, best practices and lessons learned into test policy and procedures.
- Complete guidance and direction for RTO implementation.
- Finalize MOA with OTAs to establish the OLG.

FY 2006 Planned Program:

- BMDS On-Alert Capability Assessment (BOCA) team will continue to update the non-advocate assessment of the BMDS readiness and investigate BMDS performance issues and propose mitigation plans.
- Develop Target Accreditation Reports for the FTG 06-1a/b, FTM 06-1, JFM-1, FTT 06-1, FTT 06-2 and FT 06-1 test events.
- Continue to integrate mission assurance and best practices and lessons learned into test policy, process, and procedures.
- Continue communications and interaction between the BMDS development community and Service operational test communities as established by the MOA.

FY 2007 Planned Program:

- BMDS On-Alert Capability Assessment (BOCA) team will continue to update the non-advocate assessment of the BMDS readiness and investigate BMDS performance issues and propose mitigation plans.
- Develop Target Accreditation Reports for the FT 06-4, FTM 06-3, TMDD-1, TMDD-2, SMDD-1, SMDD-2, FTM 06-4, FTG-06-5, FTT 06-3, and FTG 06-4 test events.
- Continue to integrate mission assurance and best practices and lessons learned into test policy, processes and procedures.
- Continue communications and interaction between the BMDS development community and Service operational test communities as established by the MOA.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

D. Acquisition Strategy

The RTO directs various executing agents, including DoD agencies, Service Organizations, Laboratories and Program Offices, FFRDCs and other MDA programs to execute the various diverse efforts within the BMDS test program. Based on the specific effort / activity being conducted, acquired, or maintained, these executing agents use various acquisition strategies that conform to their respective headquarters regulations. The executing agents strive to use contracting strategies that provide the flexibility needed to test and assess to BMDS in a capabilities-based environment.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Test Resources										
Ground Test Facilities	Various	Army, Air Force/ NY, AL, FL, MD, TN, CA, NM	17,774	15,687	1Q	21,735	1Q	22,116	1Q	77,312
Ranges and Instrumentation	Various	Various/ CA,HI, NM, Marshall Is, Alaska	53,559	62,170	1Q	46,168	1Q	44,105	1Q	206,002
Airborne Sensors	C/Various	Raytheon, L3 (Aeromet)/ CA, OK	45,798	31,972	1/3Q	26,950	1Q	24,901	1Q	129,621
PMRF Upgrades (Congressional Adds)	Various	Various / HI	26,924	33,879	1Q	0	N/A	0	N/A	60,803

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603888C Ballistic Missile Defense Test and Targets

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Environmental Radiation Effects Simulation (Congressional Add)	Various	Indiana U, Bloomington, IN	937	1,450	1Q	0	N/A	0	N/A	2,387
Data Centers	Various	Various, TN, CO, AL, CA	6,263	13,165	1Q	13,612	1Q	13,869	1Q	46,909
BMDS CTF Core										
Optical Data Analysis	Various	USASMDC / Huntsville, AL	3,925	5,158	1Q	3,507	1Q	3,950	1Q	16,540
Radar Data Analysis	Various	USASMDC / Huntsville, AL	4,527	4,456	1Q	4,600	1Q	4,800	1Q	18,383
Lethality	Various	USASMDC / Huntsville, AL	3,205	5,000	1Q	2,841	1Q	2,830	1Q	13,876
Kill Assessment	Various	USASMDC / Huntsville, AL	3,089	3,501	1Q	3,639	1Q	3,792	1Q	14,021
International Programs	Various	Various including USASMDC / Huntsville, AL	979	1,070	1Q	1,124	1Q	1,178	1Q	4,351
Target Characterization	Various	USASMDC / Huntsville, AL	4,797	4,000	1Q	0	N/A	0	N/A	8,797
Special Programs	Various	MARCORSYSCOM/WSMR	212	0	N/A	2,473	1Q	1,502	1Q	4,187
CMP-4	Various	USASMDC / Huntsville, AL	16,505	0	1Q	0	N/A	0	N/A	16,505
Corporate Data Collection	Various	Various including Sandia/APL-JHU/MITLL/USAMCOM	3,920	0	1/2Q	0	N/A	0	N/A	3,920

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603888C Ballistic Missile Defense Test and Targets

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
TPS-X	Various	Various including NSWC-DD/SPAWAR/NSWC-PHD/PMRF	2,125	300	1Q	0	N/A	0	N/A	2,425
Radar Exploitation	Various	USASMDC / Huntsville, AL	2,572	2,793	1Q	2,892	1Q	2,993	1Q	11,250
FT 04-2 & FT 04-4	Various	USASMDC / Huntsville, AL	84,549	0	1Q	0	1Q	0	1Q	84,549
Facilities, Siting & Environmental										
Facilities & Siting	Various	Various	33	150	1Q	153	1Q	305	1Q	641
Environmental Compliance	Various	Various	79	150	1Q	153	1Q	156	1Q	538
Test Policy and Integration										
BOCA	Various	Various/ NJ, CA, MD, MA	6,000	8,622	1Q	9,315	1Q	9,741	1Q	33,678
Operational Test Agency Participation in System Test	Various	OTAs/ Various	0	5,556	1Q	6,003	1Q	6,313	1Q	17,872
Target Certification	Various	USASMDC/ Huntsville, AL	490	491	1Q	500	1Q	500	1Q	1,981
Subtotal Test and Evaluation			288,262	199,570		145,665		143,051		776,548

Remarks

- FY04 Funding for OTA Participation in System Test is reflected in Budget Project 0704
- PMRF Upgrades and Environmental Radiation Effects Simulation are Congressional Adds

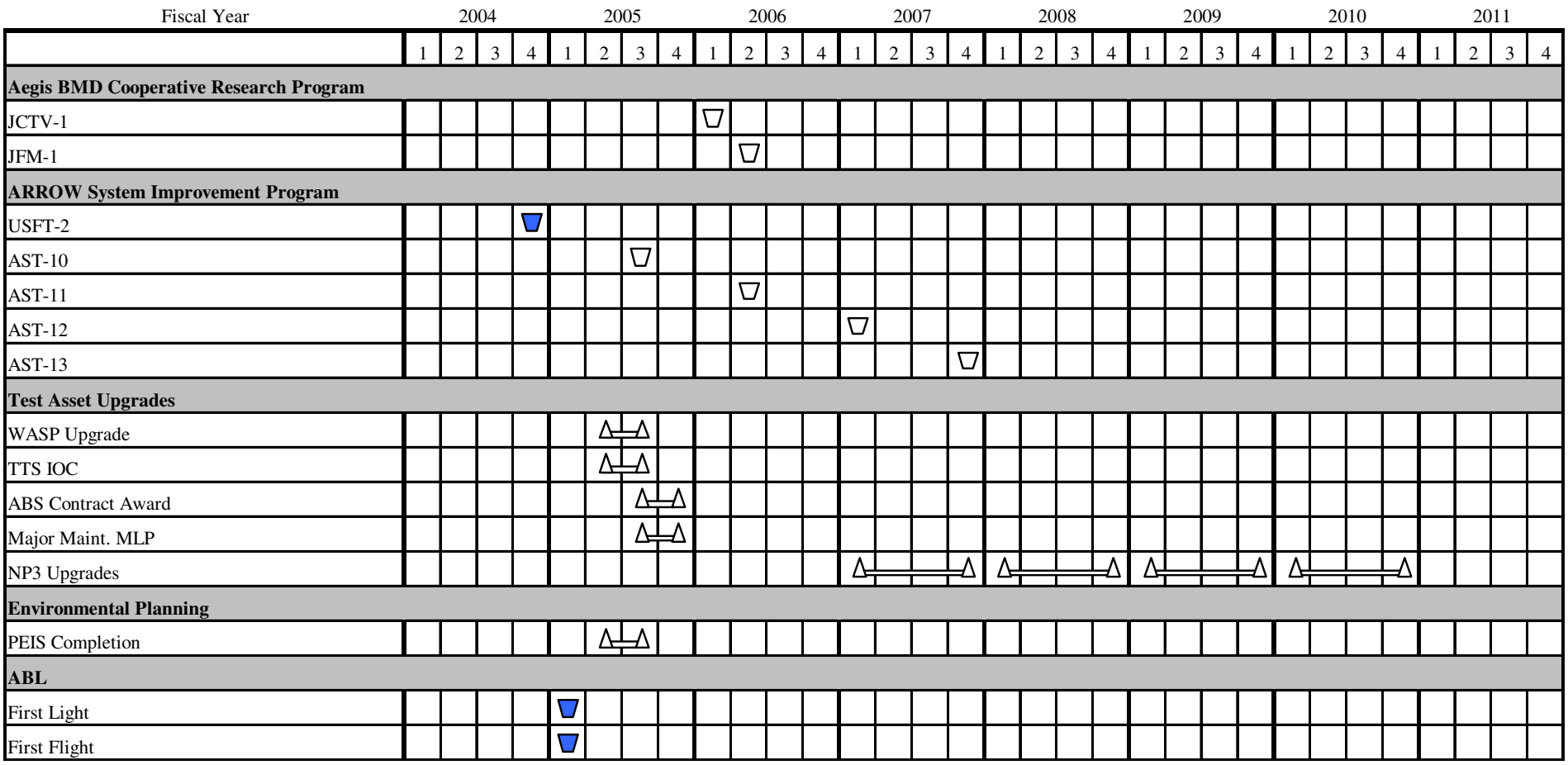
Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Test Resources										
SMDC Support	TM	USASMDC/ Huntsville, AL	2,099	1,265	1Q	2,744	1Q	2,756	1Q	8,864
Support Contracts	C/FFP	Various/ Arlington, VA	6,039	6,055	1Q	5,333	1Q	5,460	1Q	22,887
BMDS CTF Core										
SMDC Government Salaries	TM	USASMDC/ Huntsville, AL	3,795	3,890	1Q	3,446	1Q	3,493	1Q	14,624
Support Contracts	C/FFP	Various/ TASC, SPARTA, RNB Arling, VA	12,622	13,807	1Q	15,499	1Q	17,467	1Q	59,395
Facilities, Siting & Environmental										
Support Contracts	C/FFP	Various/ VA & MD	4,763	4,214	1Q	5,362	1Q	5,694	1Q	20,033
Test Policy and Integration										
TE Government Salaries	TM	Wash, DC	6,534	5,288	1Q	5,394	1Q	5,602	1Q	22,818
Support Contracts	C/FFP	TASC, SPARTA/ Arlington, VA	3,389	4,211	1Q	3,710	1Q	3,956	1Q	15,266
TE Travel	TM		521	531	1Q	530	1Q	631	1Q	2,213
SMDC Government Salaries	TM	USASMDC/ Huntsville, AL	220	233	1Q	236	1Q	341	1Q	1,030
Subtotal Management Services			39,982	39,494		42,254		45,400		167,130
Remarks										
Project Total Cost			328,244	239,064		187,919		188,451		943,678

Remarks
The Test & Evaluation program distributes the majority of its funding to Executing Agents (i.e. the Air Force, Army, Navy, Joint National Integration Center (JNIC), and DTRA) for further dissemination. These Executing Agents will use Military Interdepartmental Purchase Requests (MIPRs) and/or in-house vehicles to accomplish the tasks specified.

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**



Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603888C Ballistic Missile Defense Test and Targets

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
System Ground Tests																																
IGT-4a				▼																												
MDIE 04b				▼																												
C2BMC Sp 4.3				▼																												
IGT-2				▼																												
IGT-4b					▼																											
IGT-3					▼																											
C2BMC Sp 4.4						▽																										
WG 04-1 (IMD-04.5)						▽																										
GT 04-5 (MDIE 05a)							▽																									
WG 04-3 (IMD-5.2)							▽																									
GT 04-1 (IGT-5)								▽																								
WG 04-4 (IMD-5.3)								▽																								
C2BMC Sp 4.5								▽																								
WG 04-5 (IMD-5.4)									▽																							
WG 04-6 (IMD 6.1 Planex)									▽																							
GT 04-6 (MDIE 05b)									▽																							
GT 06-9 (BMDS IDT)										▽																						
GT 06-5 (BMDS GT)										▽																						
GT 04-2 (DGT-1)										▽																						
C2BMC Sp 6.1										▽																						

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
System Ground Tests																																
GT 06-1 (MDIE 06a)											▽																					
C2BMC Sp 6.2											▽																					
WG 06-2 (SE Sim)											▽																					
GT 06-2 (MDIE 06b)											▽																					
GT 06-6 (BMDS GT)												▽																				
GT 04-3 (IGT-6)												▽																				
WG 06-3 (PLANEX)												▽																				
GT 04-4 (DGT-2)													▽																			
WG 06-4 (IMD-7.2)													▽																			
C2BMC Sp 6.3													▽																			
GT 06-10 (BMDS IDT)														▽																		
GT 06-7 (BMDS IGT)														▽																		
GT 06-3 (MDIE 07a)														▽																		
C2BMC Sp 6.4																▽																
GT 06-4 (MDIE 07b)																▽																
GT 06-8 (BMDS IGT)																▽																
System Flight Tests																																
PAC-3 CRI-1 (DT/OT-11)				▼																												
PAC-3 CRI-2 (DT/OT-12)					▼																											
IFT-13c					▼																											

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603888C Ballistic Missile Defense Test and Targets

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
System Flight Tests																																
FT 04-3 (MRT)						▽																										
THAAD FT-1						▽																										
PAC-2 GEM: 2-1						▽																										
FTM 04-1 (FM-7)						▽																										
IFT-14						▽																										
FT 04-2 (CMCM-1)						▽																										
At Sea Demo (ASD) 3.0						▽																										
FT 04-1 (IFT-16a)							▽																									
PAC-3: 2-3							▽																									
PAC-3: 2-2							▽																									
FTM 04-2 (FM-8)							▽																									
FTG 04-1 (IFT-1b)								▽																								
FT 04-5 (Cobra Dane LRALT)								▽																								
FTM 04-3 (FM-9)								▽																								
THAAD FT-2								▽																								
FT 04-4 (CMCM-2)								▽																								
FT 06-1 (GMD RCF3)									▽																							
FTG 04-2 (IFT-1c)									▽																							
PAC-3: P6-4									▽																							
PAC-2 GEM: P6-2									▽																							
THAAD FT-3									▽																							
THAAD FT-4										▽																						

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile

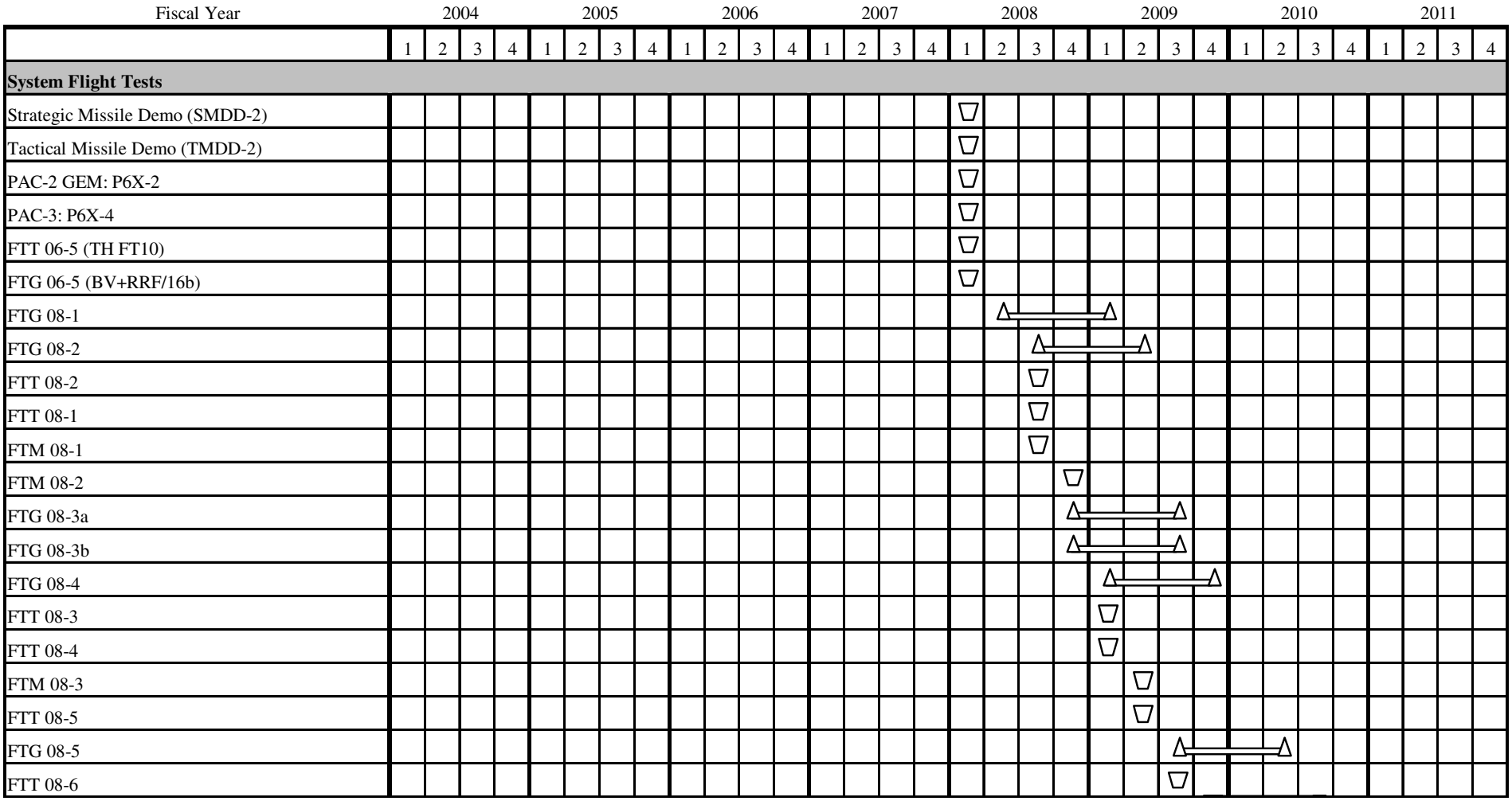
Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

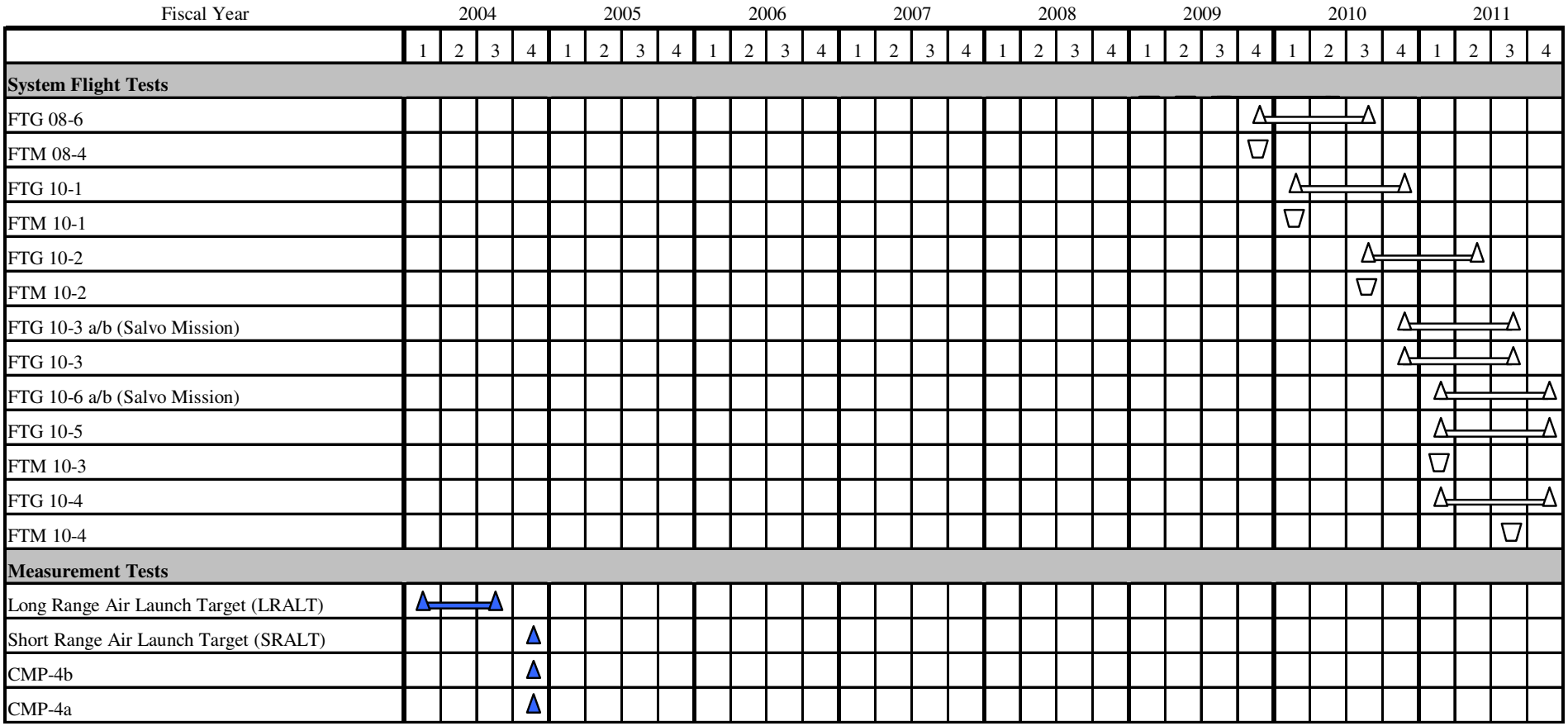
R-1 NOMENCLATURE
0603888C Ballistic Missile Defense Test and Targets

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
System Flight Tests																																
At Sea Demo (ASD) 3.1										▽																						
PAC-3: P6L-3											▽																					
PAC-2 GEM: P6L-2											▽																					
FTM 06-1 (FM-10)											▽																					
FTT 04-1 (TH FT5)												▽																				
FTM 06-2 (FM-11)												▽																				
FTG 06-1a/b (IFT 20/21)												▽																				
FTG 06-2 (IFT 22)													▽																			
PAC-3: 16-2													▽																			
FT 06-6 (GMD RCF-4)													▽																			
FTT 06-1 (TH FT6)													▽																			
FTG 06-3a/b (IFT-23/24)														▽																		
PAC-3: 16-3														▽																		
FTT 06-2 (TH FT7)														▽																		
FTT 06-3 (TH FT8)															▽																	
FTM 06-3 (FM-12)															▽																	
FT 06-4 (CMCM-4)															▽																	
Strategic Missile Demo (SMDD-1)																▽																
FTM 06-4 (FM-13)																▽																
FTT 06-4 (TH FT9)																▽																
FTG 06-4 (IFT-25)																▽																
Tactical Missile Demo (TMDD-1)																▽																
FTT 06-6																	▽															

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**



Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**



Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Glory Trips (USAF Operational)																																
GT-186				▼																												
GT-188						▽																										
GT-34							▽																									
GT-187							▽																									
GT-189								▽																								
GT-190										▽																						
GT-191											▽																					
GT-192												▽																				
GT-193														▽																		
GT-195															▽																	
GT-194															▽																	
GT-196																▽																

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Aegis BMD Cooperative Research Program								
JCTV-1			1Q					
JFM-1			2Q					
ARROW System Improvement Program								
AST-10		3Q						
AST-11			2Q					
AST-12				1Q				
AST-13				4Q				
USFT-2	4Q							
Test Asset Upgrades								
ABS Contract Award		3Q-4Q						
Airborne Sensors	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Data Center O&M	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Ground Test Facilities O&M	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
MRSS O&M	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Major Maint. MLP		3Q-4Q						
NP3 Upgrades				1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	
Ranges O&M	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
TTS IOC		2Q-3Q						
WASP Upgrade		2Q-3Q						
Environmental Planning								
PEIS Completion		2Q-3Q						
ABL								
First Flight		1Q						
First Light		1Q						
System Ground Tests								
C2BMC Sp 4.3	4Q							
C2BMC Sp 4.4		2Q						
C2BMC Sp 4.5		4Q						
C2BMC Sp 6.1			2Q					
C2BMC Sp 6.2			3Q					
C2BMC Sp 6.3				1Q				

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
C2BMC Sp 6.4				4Q				
GT 04-1 (IGT-5)		4Q						
GT 04-2 (DGT-1)			2Q					
GT 04-3 (IGT-6)			4Q					
GT 04-4 (DGT-2)				1Q				
GT 04-5 (MDIE 05a)		3Q						
GT 04-6 (MDIE 05b)			1Q					
GT 06-1 (MDIE 06a)			3Q					
GT 06-10 (BMDS IDT)				2Q				
GT 06-2 (MDIE 06b)			3Q					
GT 06-3 (MDIE 07a)				2Q				
GT 06-4 (MDIE 07b)				4Q				
GT 06-5 (BMDS GT)			2Q					
GT 06-6 (BMDS GT)			4Q					
GT 06-7 (BMDS IGT)				2Q				
GT 06-8 (BMDS IGT)				4Q				
GT 06-9 (BMDS IDT)			2Q					
IGT-2	4Q							
IGT-3		1Q						
IGT-4a	4Q							
IGT-4b		1Q						
MDIE 04b	4Q							
WG 04-1 (IMD-04.5)		2Q						
WG 04-3 (IMD-5.2)		3Q						
WG 04-4 (IMD-5.3)		4Q						
WG 04-5 (IMD-5.4)			1Q					
WG 04-6 (IMD 6.1 Planex)			1Q					
WG 06-2 (SE Sim)			3Q					
WG 06-3 (PLANEX)			4Q					
WG 06-4 (IMD-7.2)				1Q				
System Flight Tests								
At Sea Demo (ASD) 3.0		2Q						

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
At Sea Demo (ASD) 3.1			2Q					
FT 04-1 (IFT-16a)		3Q						
FT 04-2 (CMCM-1)		2Q						
FT 04-3 (MRT)		2Q						
FT 04-4 (CMCM-2)		4Q						
FT 04-5 (Cobra Dane LRALT)		4Q						
FT 06-1 (GMD RCF3)			1Q					
FT 06-4 (CMCM-4)				3Q				
FT 06-6 (GMD RCF-4)				1Q				
FTG 04-1 (IFT-1b)		4Q						
FTG 04-2 (IFT-1c)			1Q					
FTG 06-1a/b (IFT 20/21)			4Q					
FTG 06-2 (IFT 22)				1Q				
FTG 06-3a/b (IFT-23/24)				2Q				
FTG 06-4 (IFT-25)				4Q				
FTG 06-5 (BV+RRF/16b)					1Q			
FTG 08-1					2Q-4Q	1Q		
FTG 08-2					3Q-4Q	1Q-2Q		
FTG 08-3a					4Q	1Q-3Q		
FTG 08-3b					4Q	1Q-3Q		
FTG 08-4						1Q-4Q		
FTG 08-5						3Q-4Q	1Q-2Q	
FTG 08-6						4Q	1Q-3Q	
FTG 10-1							1Q-4Q	
FTG 10-2							3Q-4Q	1Q-2Q
FTG 10-3							4Q	1Q-3Q
FTG 10-3 a/b (Salvo Mission)							4Q	1Q-3Q
FTG 10-4								1Q-4Q
FTG 10-5								1Q-4Q
FTG 10-6 a/b (Salvo Mission)								1Q-4Q
FTM 04-1 (FM-7)		2Q						
FTM 04-2 (FM-8)		3Q						

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
FTM 04-3 (FM-9)		4Q						
FTM 06-1 (FM-10)			3Q					
FTM 06-2 (FM-11)			4Q					
FTM 06-3 (FM-12)				3Q				
FTM 06-4 (FM-13)				4Q				
FTM 08-1					3Q			
FTM 08-2					4Q			
FTM 08-3						2Q		
FTM 08-4						4Q		
FTM 10-1							1Q	
FTM 10-2							3Q	
FTM 10-3								1Q
FTM 10-4								3Q
FTT 04-1 (TH FT5)			4Q					
FTT 06-1 (TH FT6)				1Q				
FTT 06-2 (TH FT7)				2Q				
FTT 06-3 (TH FT8)				3Q				
FTT 06-4 (TH FT9)				4Q				
FTT 06-5 (TH FT10)					1Q			
FTT 06-6					1Q			
FTT 08-1					3Q			
FTT 08-2					3Q			
FTT 08-3						1Q		
FTT 08-4						1Q		
FTT 08-5						2Q		
FTT 08-6						3Q		
IFT-13c		1Q						
IFT-14		2Q						
PAC-2 GEM: 2-1		2Q						
PAC-2 GEM: P6-2			1Q					
PAC-2 GEM: P6L-2			3Q					
PAC-2 GEM: P6X-2					1Q			

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
PAC-3 CRI-1 (DT/OT-11)	4Q							
PAC-3 CRI-2 (DT/OT-12)		1Q						
PAC-3: 16-2				1Q				
PAC-3: 16-3				2Q				
PAC-3: 2-2		3Q						
PAC-3: 2-3		3Q						
PAC-3: P6-4			1Q					
PAC-3: P6L-3			3Q					
PAC-3: P6X-4					1Q			
Strategic Missile Demo (SMDD-1)				4Q				
Strategic Missile Demo (SMDD-2)					1Q			
THAAD FT-1		2Q						
THAAD FT-2		4Q						
THAAD FT-3			1Q					
THAAD FT-4			2Q					
Tactical Missile Demo (TMDD-1)				4Q				
Tactical Missile Demo (TMDD-2)					1Q			
Measurement Tests								
CMP-4a	4Q							
CMP-4b	4Q							
Long Range Air Launch Target (LRALT)	1Q-3Q							
Short Range Air Launch Target (SRALT)	4Q							
Glory Trips (USAF Operational)								
GT-186	4Q							
GT-187		3Q						
GT-188		2Q						
GT-189		4Q						
GT-190			2Q					
GT-191			3Q					
GT-192			4Q					
GT-193				2Q				
GT-194				3Q				

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
GT-195				3Q				
GT-196				4Q				
GT-34		3Q						

Element participation in system test events is funded within the respective element budget.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0704 Test & Evaluation Block 2004	41,328	143,375	0	0	0	0	0	0
RDT&E Articles Qty	0	4	0	0	0	0	0	0

Note:
FY 2005 RDT&E Test Articles: Integrate Launch Vehicles and Payloads to produce two (2) test articles for FT 04-2 & two (2) for FT 04-4.

A. Mission Description and Budget Item Justification

The BMDS CTF Block 04 Test and Evaluation Program funds system-level flight tests (BMDS FTs), Ground Tests (BMDS GTs) and Missile Defense Integration Exercises (MDIEs), and Integrated Missile Defense (IMD) Wargames that are being executed from Jan 04 through Dec 05. This project will conduct BMD System Tests to support verification of achieved BMDS block capability and to support the verification and anchoring of Models and Simulations. These System Tests will examine the capability of the BMDS to detect, track, and engage targets. BMDS Ground Tests will demonstrate integration, functionality, and operations of the BMDS in environments that are repeatable and provide a significant number of data points to augment flight test results. Twelve major ground test events will be conducted to support characterization and verification of the Block 04 capability. This project will also provide analysis of each System Test event through the Joint Analysis Team (JAT). Critical Measurements and Countermeasure (CMCM) flight tests are also funded under this project (FY05 only), but are managed as part of the Measurements Program. CMCMs are dedicated flight tests which provide a venue for risk reduction for BMDS Block Testing, addressing phenomenology, countermeasures, and counter-countermeasures requirements, and providing critical measurements to support development and validation of algorithms, modeling and simulation, discrimination, and new technology demonstrations. CMCMs provide test venues and augment various MDA & Element test capabilities. FY05 includes FT-04-2 and FT-04-4. Both missions provide critical data for validation of the Forward Based X-Band-T Radar algorithms, and characterization of advanced countermeasures.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Flight Tests	16,155	27,299	0	0
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- Supported execution of FM-6, Patriot DT/OT-11, GT-185 to support BMD System Verification and Assessment and Modeling and Simulation Anchoring.
- Conducted PACEX III and PACEXIV to support BMD System Verification and Assessment and Modeling and Simulation Anchoring.
- Conducted test planning for IFT-13C, IFT-14, FT 04-1, FT 04-3, GT-188, SERV-1, PATRIOT 2-3, FTG 04-1, FT 04-5, FTM 04-1, FTM 04-2, FTM 04-3 to provide increasing realism in BMD System Testing and to meet BMD System test objectives.
- Constructed scenario designs for BMDS Flight Tests to support Engagement Sequence Groups (ESGs) identified in the BMDS IMTP.
- Produced the BMDS Characterization Reports in July and September to support the CVAR-04 and provide input to JTAMDO/STRATCOMMs Military Utility Assessment (MUA) and operational assessment.
- Created the BMDS Characterization Data Base to support assessments by Systems Engineering, JTAMDO/STRATCOMMS and OTAs.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

FY 2005 Accomplishments / Planned Program

- Plan and support execution of BMD System Tests; IFT-13C, IFT-14, FT04-1, FT 04-3, GT-188, SERV-1, PATRIOT 2-3, FTG04-1, FT04-5, FTM04-1, FTM04-2, and FTM04-3 to support BMD Capability Verification and Assessment.
- Conduct post test data analysis on FM-6, Patriot DT/OT-11, GT-185, IFT-13C, IFT-14, FT04-1, FT 04-3, GT-188, SERV-1, PATRIOT 2-3, FTG04-1, FT04-5, FTM04-1, FTM04-2, and FTM04-3.
- Continue to populate the BMDS Characterization Data Base with the latest test data inputs to support assessments by Systems Engineering, JTAMDO/STRATCOMMS and OTAs.

	FY 2004	FY 2005	FY 2006	FY 2007
Ground Tests	20,004	15,656	0	0
RDT&E Articles (Quantity)	0	0	0	0

FY2004 Accomplishments:

- Planned and executed MDIE 04a & 04b, IGT-2, IGT-4a, and IGT-4b which provided data for both characterization and verification efforts primarily in the areas of interoperability, validity and related system behavior.
- Performed post test data analysis of MDIE 04a and IGT-2.
- Conducted test planning of Ground Tests IGT-3, GT 04-1, GT 04-2, GT 04-5 and GT 04-6.
- Conducted test planning of Wargames IMD 04.2, IMD 04.3, IMD 4.4a, IMD 4.4b, WG 04-1, WG 04-2, WG 04-3, WG 04-4, and WG 04-5.
- Executed BMDS Wargames IMD 04.2, IMD 04.3, IMD 4.4a and IMD 4.4b.
- Performed post test data analysis of IMD 04.2 and IMD 04.3.

FY 2005 Planned Program

- Support a BMDS Ground Test with an operationally representative software and hardware version of the GMD Element and expand element participation in BMDS Ground Tests as the BMDS Block 04 elements mature and become available.
- Conduct test planning and execution of Ground Tests GT 04-1, GT 04-2, GT 04-5 and GT 04-6.
- Perform post test data analysis of MDIE 04b, IGT-4a, IGT-4b, IGT-3, GT 04-1, GT 04-2, GT 04-5 and GT 04-6.
- Conduct test planning and execution of WG 04-1, WG 04-2, WG 04-3, WG 04-4, and WG 04-5.
- Perform post test data analysis of IMD 4.4a, IMD 4.4b, WG 04-1, WG 04-2, WG 04-3, WG 04-4, and WG 04-5.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

	FY 2004	FY 2005	FY 2006	FY 2007
Measurements Tests	0	100,420	0	0
RDT&E Articles (Quantity)	0	4	0	0

Note: FY 2004 CMCM funding is located in Budget Project 0304.

FY 2005 Accomplishments / Planned Program

RDT&E Articles: Integrate and deliver two (2) test articles for FT 04-2 (CMCM-1) & two (2) for FT 04-4 (CMCM-2).

- Designed FT 04-2 & FT 04-4 to support: Countermeasures/Counter-Countermeasures (CM/CCM) characterization, M&S validation, algorithm development & testing, technologies, CONOPS, and to address other MDA System Engineering CM/CCM focus areas.
- Continue to do test planning, sensor planning, range integration efforts, and design reviews in support of FT 04-2 and FT 04-4.
- Deliver two launch vehicles/payloads for FT 04-2 and two launch vehicles/payloads for FT 04-4.
- Flight Test Qualify 2 payloads for FT 04-2 and 2 for FT 04-4.
- Integrate Launch Vehicles and Payloads to produce two (2) Test Articles for FT 04-2 and two (2) for FT 04-4.
- Execute dedicated flight tests FT 04-2 and FT 04-4.
- Perform post-test data analysis for FT 04-2 and FT 04-4.

	FY 2004	FY 2005	FY 2006	FY 2007
Test Policy & Integration	5,169	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

Note: Funding for Operational Test Agency (OTA) Participation in System Test is contained in Budget Project 0304 in FY05 and beyond.

FY04 Accomplishments:

- Initiated a Memorandum of Agreement (MOA) with Operational Test Agencies (OTAs) to establish an OTA Liaison Group (OLG) to facilitate communications and interaction between the BMDS development community and Service operational test communities.
- Provided LOE funding in support of OTA Operational Assessment (OA).

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

D. Acquisition Strategy

The RTO directs various executing agents, including DoD agencies, Service Organizations, Laboratories and Program Offices, FFRDCs and other MDA programs to execute the various diverse efforts within the BMDS test program. Based on the specific effort / activity being conducted, acquired, or maintained, these executing agents use various acquisition strategies that conform to their respective headquarters regulations. The executing agents strive to use contracting strategies that provide the flexibility needed to test and assess to BMDS in a capabilities-based environment.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Flight Tests										
BMDS FT	Various	Various including USASMDC	16,155	8,563	1Q	0	N/A	0	N/A	24,718
Test Planning & Operations	Various	Various APL-JHU/MITLL/Sandia/WSMR/NSWC	0	11,836	1Q	0	N/A	0	N/A	11,836
TA&R/JAT	Various	Various including USASMDC/USAMCOM	0	6,900	1Q	0	N/A	0	N/A	6,900
Ground Tests										
MDIE	Various	JNIC, Colorado Springs, CO	11,270	11,356	1Q	0	N/A	0	N/A	22,626

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
IMD Wargames	Various	JNIC, Colorado Springs, CO	8,734	4,300	1Q	0	N/A	0	N/A	13,034
Measurements Tests										
FT 04-2 & FT 04-4	Various	Various/ including USASMDC	0	100,420	1Q	0	N/A	0	N/A	100,420
Test Policy & Integration										
OTA Participation	Various	Various/ CSTE-OTC/SMC-ISP	5,169	0	N/A	0	N/A	0	N/A	5,169
Subtotal Test and Evaluation			41,328	143,375		0		0		184,703

Remarks

Funding for OTA Participation beyond FY04 is reflected in Budget Project 0304.

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										
Project Total Cost			41,328	143,375		0		0		184,703

Remarks

The Test & Evaluation program distributes the majority of its funding to Executing Agents (i.e. the Air Force, Army, Navy, Joint National Integration Center (JNIC), and DTRA) for further dissemination. These Executing Agents will use Military Interdepartmental Purchase Requests (MIPRs) and/or in-house vehicles to accomplish the tasks specified.

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
System Flight Tests																																
PAC-3 CRI-1 (DT/OT-11)				▼																												
PAC-3 CRI-2 (DT/OT-12)					▼																											
IFT-13c					▼																											
IFT-14						▽																										
THAAD FT-1						▽																										
PAC-2 GEM: 2-1						▽																										
FTM 04-1 (FM-7)						▽																										
FT 04-2 (CMCM-1)						▽																										
FT 04-3 (MRT)						▽																										
At Sea Demo (ASD) 3.0						▽																										
PAC-3: 2-3							▽																									
PAC-3: 2-2							▽																									
FT 04-1 (IFT-16a)							▽																									
FTM 04-2 (FM-8)							▽																									
FT 04-5 (Cobra Dane LRALT)								▽																								
THAAD FT-2								▽																								
FT 04-4 (CMCM-2)								▽																								
FTG 04-1 (IFT-1b)								▽																								
FTM 04-3 (FM-9)								▽																								
THAAD FT-3									▽																							
PAC-3: P6-4									▽																							

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603888C Ballistic Missile Defense Test and Targets

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
System Flight Tests																																
PAC-2 GEM: P6-2									▽																							
FT 06-1 (GMD RCF3)									▽																							
FTG 04-2 (IFT-1c)									▽																							
THAAD FT-4										▽																						
ARROW System Improvement Program																																
USFT-2				▼																												
AST-10						▽																										
Aegis BMD Cooperative Research Program																																
JCVT-1									▽																							
Glory Trips (USAF Operational)																																
GT-186				▼																												
GT-188						▽																										
GT-34							▽																									
GT-187							▽																									
GT-189								▽																								
ABL																																
First Light					▼																											
First Flight					▼																											
System Ground Tests																																
MDIE 04b				▼																												
IGT-2				▼																												
C2BMC Sp 4.3				▼																												
IGT-4a				▼																												

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
System Ground Tests																																
IGT-3					▼																											
IGT-4b					▼																											
C2BMC Sp 4.4						▽																										
WG 04-1 (IMD-04.5)						▼																										
GT 04-5 (MDIE 05a)							▽																									
WG 04-3 (IMD-5.2)							▽																									
WG 04-4 (IMD-5.3)								▽																								
C2BMC Sp 4.5								▽																								
GT 04-1 (IGT-5)								▽																								
WG 04-5 (IMD-5.4)									▽																							
GT 04-6 (MDIE 05b)									▽																							
WG 04-6 (IMD 6.1 Planex)									▽																							
GT 04-2 (DGT-1)										▽																						
GT 04-3 (IGT-6)												▽																				
GT 04-4 (DGT-2)													▽																			

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
System Flight Tests								
At Sea Demo (ASD) 3.0		2Q						
FT 04-1 (IFT-16a)		3Q						
FT 04-2 (CMCM-1)		2Q						
FT 04-3 (MRT)		2Q						
FT 04-4 (CMCM-2)		4Q						
FT 04-5 (Cobra Dane LRALT)		4Q						
FT 06-1 (GMD RCF3)			1Q					
FTG 04-1 (IFT-1b)		4Q						
FTG 04-2 (IFT-1c)			1Q					
FTM 04-1 (FM-7)		2Q						
FTM 04-2 (FM-8)		3Q						
FTM 04-3 (FM-9)		4Q						
IFT-13c		1Q						
IFT-14		2Q						
PAC-2 GEM: 2-1		2Q						
PAC-2 GEM: P6-2			1Q					
PAC-3 CRI-1 (DT/OT-11)	4Q							
PAC-3 CRI-2 (DT/OT-12)		1Q						
PAC-3: 2-2		3Q						
PAC-3: 2-3		3Q						
PAC-3: P6-4			1Q					
THAAD FT-1		2Q						
THAAD FT-2		4Q						
THAAD FT-3			1Q					
THAAD FT-4			2Q					
ARROW System Improvement Program								
AST-10		2Q						
USFT-2	4Q							
Aegis BMD Cooperative Research Program								
JCVT-1			1Q					
Glory Trips (USAF Operational)								

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
GT-186	4Q							
GT-187		3Q						
GT-188		2Q						
GT-189		4Q						
GT-34		3Q						
ABL								
First Flight		1Q						
First Light		1Q						
System Ground Tests								
C2BMC Sp 4.3	4Q							
C2BMC Sp 4.4		2Q						
C2BMC Sp 4.5		4Q						
GT 04-1 (IGT-5)		4Q						
GT 04-2 (DGT-1)			2Q					
GT 04-3 (IGT-6)			4Q					
GT 04-4 (DGT-2)				1Q				
GT 04-5 (MDIE 05a)		3Q						
GT 04-6 (MDIE 05b)			1Q					
IGT-2	4Q							
IGT-3		1Q						
IGT-4a	4Q							
IGT-4b		1Q						
MDIE 04b	4Q							
WG 04-1 (IMD-04.5)		2Q						
WG 04-3 (IMD-5.2)		3Q						
WG 04-4 (IMD-5.3)		4Q						
WG 04-5 (IMD-5.4)			1Q					
WG 04-6 (IMD 6.1 Planex)			1Q					

Element participation in system test events is funded within the respective element budget.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0804 Test & Evaluation Block 2006	2,201	20,557	169,996	139,392	2,600	0	0	0
RDT&E Articles Qty	0	0	0	2	0	0	0	0

Note:
FY 2007 RDT&E Test Articles: Integrate Launch Vehicles and Payloads to produce two test articles for FT 06-4 (CMCM-4).

A. Mission Description and Budget Item Justification

The BMDS CTF Block 06 Test and Evaluation funds system-level flight tests (BMDS FTs), Ground Tests (BMDS GTs) and Integrated Missile Defense (IMD) Wargames that are being executed from Jan 06 through Dec 07. This project will conduct BMD System Tests to support verification of achieved BMDS block capability. System Flight Tests will examine the capability of the BMDS to detect, track, and engage targets. In Block 06, more advanced tests are planned which will provide data to support verification of Block 06 Engagement Sequence Groups (ESGs). Test scenario highlights during this period include: multiple target engagements by Aegis BMD (FTM 06-3 & FTM 06-4); a THAAD engagement on an Aegis BMD cue (FTT 06-4); GMD launching on a Forward Based X-Band -T (FBX-T) Radar (FTG 06-4) cue; and multiple simultaneous target engagements by Aegis BMD (FTM 06-4). This project will also provide analysis of each System Test event through the Joint Analysis Team (JAT). Critical Measurements and Countermeasure (CMCM) flight tests are also funded under this project, but are managed as part of the Measurements Program. CMCMs are dedicated flight tests which provide a venue for risk reduction for BMDS Block Testing, addressing phenomenology, countermeasures, and counter-countermeasures requirements, and providing critical measurements to support development and validation of algorithms, modeling and simulation, discrimination, and new technology demonstrations. CMCMs provide test venues and augment various MDA and Elements test programs. FY06s include preliminary planning for FT 06-4* which will provide risk reduction for the Miniature Kill Vehicle Program, continue to characterize advanced countermeasures, and demonstrate new technologies. This test is scheduled for 3QFY07.

*Note: FT 06-4 was originally funded under Project 0904 (Block 2008), however, in an effort to better align the CMCMs with the block of execution, FT 06-4 has been moved to Project 0804 (Block 2006).

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Flight Tests	2,201	3,713	73,566	42,577
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- Completed preliminary planning for Block 06 BMDS Flight Test Program.
- Coordinated integration of multiple elements and components. Refined scenario designs for BMDS Flight Tests to support Engagement Sequence Groups (ESGs) identified in the BMDS IMTP.
- Populate the BMDS Characterization Data Base with the latest test data inputs to support capability assessments by Systems Engineering, JTAMDO/STRATCOMMS and OTAs, and provide validation data for models and simulations.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

FY 2005 Planned Program:

- Support and coordinate target development including target systems requirements, integration and component testing.
- Initiate multi-element integration into the design of BMD System Fight Test scenarios.
- Conduct test planning for FT-4, FTT 04-1, FTT 06-1, FTT 06-2, FTM 06-1, FTM 06-2, FTG 06-1a, FTG 06-1b, FTG 06-2, FT 06-1, FT 06-2, and FT 06-3.
- Continue to coordinate integration of multiple elements and components. Refine scenario designs for BMDS Flight Tests to support Engagement Sequence Groups (ESGs) identified in the BMDS IMTP.
- Continue to populate the BMDS Characterization Data Base with the latest test data inputs to support capability assessments by Systems Engineering, JTAMDO/STRATCOMMS and OTAs, and provide validation data for models and simulations.

FY 2006 Planned Program:

- Plan and support executing system flight tests FT-4, FTT 04-1, FTT 06-1, FTT 06-2, FTM 06-1, FTM 06-2, FTG 06-1a, FTG 06-1b, FTG 06-2, FT 06-1, FT 06-2, and FT 06-3.
- Conduct test planning for PATRIOT 16-2 and 16-3, FTG 06-3, FTG 06-4, FTG 06-5, FTT 06-3, FTT 06-4, FTT 06-5, FTM 06-3, FTM 06-4, SMDD-1, SMDD-2, TMDD-1, and FT 06-6.
- Plan and support FT 06-6.
- Continue to coordinate target development including target systems requirements, integration and component test.
- Plan and acquire long lead items for systems test and plan system execution and reporting.
- Continue to coordinate integration of multiple elements and components. Refine scenario designs for BMDS Flight Tests to support Engagement Sequence Groups (ESGs) identified in the BMDS IMTP.
- Continue to populate the BMDS Characterization Data Base with the latest test data inputs to support capability assessments by Systems Engineering, JTAMDO/STRATCOMMS and OTAs, and provide validation data for models and simulations.

FY 2007 Planned Program:

- Plan and support test execution and conduct post test analysis for PATRIOT 16-2 and 16-3, FTG 06-3, FTG 06-4, FTG 06-5, FTT 06-3, FTT 06-4, FTT 06-5, FTM 06-3, FTM 06-4, SMDD-1, SMDD-2, TMDD-1, and FT 06-6.
- Conduct post test analysis of system flight tests FT-4, FTT 04-1, FTT 06-1, FTT 06-2, FTM 06-1, FTM 06-2, FTG 06-1a, FTG 06-1b, FTG 06-2, FT 06-1, FT 06-2 and FT 06-3.
- Continue to support and coordinate target development including target systems requirements, integration and component test.
- Continue to coordinate integration of multiple elements and components. Refined scenario designs for BMDS Flight Tests to support Engagement Sequence Groups (ESGs) identified in the BMDS IMTP.
- Continue to populate the BMDS Characterization Data Base with the latest test data inputs to support capability assessments by Systems Engineering, JTAMDO/STRATCOMMS and OTAs, and provide validation data for models and simulations.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

	FY 2004	FY 2005	FY 2006	FY 2007
Ground Tests	0	7,350	26,877	21,190
RDT&E Articles (Quantity)	0	0	0	0

FY 2005 Planned Program/Accomplishments:

- Support a BMDS Ground Test with an operationally representative software and hardware version of the GMD Element and expand element participation in BMDS Ground Tests as the BMDS Block 06 elements mature and become available.
- Conduct test planning for Ground Tests GT 06-9, GT 06-1, GT 06-2, GT 06-5.
- Conduct test planning for BMDS Wargames WG 06-1, WG 06-2, and WG 06-3.

FY 2006 Planned Program:

- Continue to expand element participation in BMDS Ground Test Program.
- Plan and support execution of Ground Tests GT 06-9, GT 06-1, GT 06-2, and GT 06-5.
- Conduct test planning for GT 06-3, GT 06-4, GT 06-7, GT 06-8, and GT 06-10.
- Perform post test data analysis of Ground Tests GT 06-9, GT 06-1, GT 06-5 and GT 06-2.
- Plan and support execution of BMDS Wargames WG 06-1, WG 06-2, and WG 06-3.
- Conduct post-test data analysis on Wargames WG 06-1 and WG 06-2.
- Conduct test planning for BMDS Wargame WG 06-4.

FY 2007 Planned Program:

- Continue to expand element participation in BMDS Ground Test Program
- Plan and support execution of Ground Tests GT 06-3, GT 06-4, GT 06-7, GT 06-8, and GT 06-10.
- Perform post-test data analysis for BMDS Ground Tests GT 06-3, GT 06-4, GT 06-7, GT 06-8 and GT 06-10.
- Plan and support execution of Wargame WG 06-4.
- Perform post-test data analysis for BMDS Wargames WG 06-3 and WG 06-4.

	FY 2004	FY 2005	FY 2006	FY 2007
Measurements Tests	0	9,494	69,553	75,625
RDT&E Articles (Quantity)	0	0	0	2

FY 2005 Planned Program/Accomplishments:

- Determine Target and Interceptor requirements for FT 06-4 (CMCM-4).
- Initiate test planning, sensor planning and range integration for FT 06-4.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

FY 2006 Planned Program:

- Purchase 2 Booster stack-ups for FT 06-4 campaign.
- Conduct test planning, sensor planning, range integration efforts, and design reviews in support of FT 06-4.

FY 2007 Planned Program:

RDT&E Articles: Integrate and deliver two (2) test articles for FT 06-4.

- Conduct sensor planning, test planning, execution and post-test analysis for dedicated flight test FT 06-4.
- Deliver two Launch Vehicles/payloads for FT 06-4. Flight Test Qualify 2 payloads for FT 06-4.
- Integrate Launch Vehicles and Payloads to produce 2 Test Articles for FT 06-4.

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

D. Acquisition Strategy

The RTO directs various executing agents, including DoD agencies, Service Organizations, Laboratories and Program Offices, FFRDCs and other MDA programs to execute the various diverse efforts within the BMDS test program. Based on the specific effort / activity being conducted, acquired, or maintained, these executing agents use various acquisition strategies that conform to their respective headquarters regulations. The executing agents strive to use contracting strategies that provide the flexibility needed to test and assess to BMDS in a capabilities-based environment.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Flight Tests										
BMDS FT	Various	Various including USASMDC	2,201	3,413	1Q	57,600	1Q	29,375	1Q	92,589
TA&R/JAT	Various	USASMDC	0	300	1Q	8,701	1Q	5,758	1Q	14,759
Test Planning & Operations	Various	Various	0	0	N/A	7,265	1Q	7,444	1Q	14,709
Ground Tests										
BMDS GT/MDIE	Various	JNIC, Colorado Springs, CO	0	6,623	1Q	19,152	1Q	12,283	1Q	38,058
IMD Wargames	Various	JNIC, Colorado Springs, CO	0	727	1Q	7,725	1Q	8,907	1Q	17,359

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Measurements Tests										
FT 06-4	Various	USASMDC, Huntsville, AL	0	9,494	1Q	69,553	1Q	75,625	1Q	154,672
Subtotal Test and Evaluation			2,201	20,557		169,996		139,392		332,146

Remarks

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

Project Total Cost			2,201	20,557		169,996		139,392		332,146

Remarks

The Test & Evaluation program distributes the majority of its funding to Executing Agents (i.e. the Air Force, Army, Navy, Joint National Integration Center (JNIC), and DTRA) for further dissemination. These Executing Agents will use Military Interdepartmental Purchase Requests (MIPRs) and/or in-house vehicles to accomplish the tasks specified.

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603888C Ballistic Missile Defense Test and Targets

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
System Flight Tests																																
At Sea Demo (ASD) 3.1										▽																						
FTM 06-1 (FM-10)											▽																					
PAC-3: P6L-3											▽																					
PAC-2 GEM: P6L-2											▽																					
FTM 06-2 (FM-11)												▽																				
FTG 06-1a/b (IFT 20/21)												▽																				
FTT 04-1 (TH FT5)												▽																				
FTG 06-2 (IFT 22)													▽																			
PAC-3: 16-2													▽																			
FT 06-6 (GMD RCF-4)													▽																			
FTT 06-1 (TH FT6)													▽																			
FTG 06-3a/b (IFT-23/24)														▽																		
PAC-3: 16-3														▽																		
FTT 06-2 (TH FT7)														▽																		
FT 06-4 (CMCM-4)															▽																	
FTT 06-3 (TH FT8)															▽																	
FTM 06-3 (FM-12)															▽																	
Strategic Missile Demo (SMDD-1)																▽																
FTM 06-4 (FM-13)																▽																
FTT 06-4 (TH FT9)																▽																
FTG 06-4 (IFT-25)																▽																

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603888C Ballistic Missile Defense Test and Targets

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
System Flight Tests																																
Tactical Missile Demo (TMDD-1)																▽																
FTT 06-6																	▽															
Tactical Missile Demo (TMDD-2)																	▽															
FTG 06-5 (BV+RRF/16b)																	▽															
PAC-3: P6X-4																	▽															
PAC-2 GEM: P6X-2																	▽															
FTT 06-5 (TH FT10)																	▽															
Strategic Missile Demo (SMDD-2)																	▽															
ARROW System Improvement Program																																
AST-11									▽																							
AST-12										▽																						
AST-13													▽																			
Aegis BMD Cooperative Research Program																																
JFM-1										▽																						
Glory Trips (USAF Operational)																																
GT-190										▽																						
GT-191											▽																					
GT-192												▽																				
GT-193														▽																		
GT-194															▽																	
GT-195															▽																	
GT-196																▽																

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603888C Ballistic Missile Defense Test and Targets

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
System Ground Tests																																
C2BMC Sp 6.1									▽																							
GT 06-9 (BMDS IDT)										▽																						
GT 06-5 (BMDS GT)										▽																						
WG 06-2 (SE Sim)											▽																					
GT 06-2 (MDIE 06b)											▽																					
GT 06-1 (MDIE 06a)											▽																					
C2BMC Sp 6.2											▽																					
WG 06-3 (PLANEX)												▽																				
GT 06-6 (BMDS GT)												▽																				
C2BMC Sp 6.3													▽																			
Aegis BMD Block 6													▽																			
GT 06-3 (MDIE 07a)														▽																		
GT 06-10 (BMDS IDT)														▽																		
GT 06-7 (BMDS IGT)														▽																		
WG 06-4 (IMD-7.2)																▽																
GT 06-4 (MDIE 07b)																▽																
C2BMC Sp 6.4																▽																
Aegis BMD Block 6																▽																
GT 06-8 (BMDS IGT)																▽																

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
System Flight Tests								
At Sea Demo (ASD) 3.1			2Q					
FT 06-4 (CMCM-4)				3Q				
FT 06-6 (GMD RCF-4)				1Q				
FTG 06-1a/b (IFT 20/21)			4Q					
FTG 06-2 (IFT 22)				1Q				
FTG 06-3a/b (IFT-23/24)				2Q				
FTG 06-4 (IFT-25)				4Q				
FTG 06-5 (BV+RRF/16b)					1Q			
FTM 06-1 (FM-10)			3Q					
FTM 06-2 (FM-11)			4Q					
FTM 06-3 (FM-12)				3Q				
FTM 06-4 (FM-13)				4Q				
FTT 04-1 (TH FT5)			4Q					
FTT 06-1 (TH FT6)				1Q				
FTT 06-2 (TH FT7)				2Q				
FTT 06-3 (TH FT8)				3Q				
FTT 06-4 (TH FT9)				4Q				
FTT 06-5 (TH FT10)					1Q			
FTT 06-6					1Q			
PAC-2 GEM: P6L-2			3Q					
PAC-2 GEM: P6X-2					1Q			
PAC-3: 16-2				1Q				
PAC-3: 16-3				2Q				
PAC-3: P6L-3			3Q					
PAC-3: P6X-4					1Q			
Strategic Missile Demo (SMDD-1)				4Q				
Strategic Missile Demo (SMDD-2)					1Q			
Tactical Missile Demo (TMDD-1)				4Q				
Tactical Missile Demo (TMDD-2)					1Q			
ARROW System Improvement Program								
AST-11			1Q					

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
AST-12			2Q					
AST-13				1Q				
Aegis BMD Cooperative Research Program								
JFM-1			2Q					
Glory Trips (USAF Operational)								
GT-190			2Q					
GT-191			3Q					
GT-192			4Q					
GT-193				2Q				
GT-194				3Q				
GT-195				3Q				
GT-196				4Q				
System Ground Tests								
Aegis BMD Block 6				1Q,4Q				
C2BMC Sp 6.1			1Q					
C2BMC Sp 6.2			3Q					
C2BMC Sp 6.3				1Q				
C2BMC Sp 6.4				4Q				
GT 06-1 (MDIE 06a)			3Q					
GT 06-10 (BMDS IDT)				2Q				
GT 06-2 (MDIE 06b)			3Q					
GT 06-3 (MDIE 07a)				2Q				
GT 06-4 (MDIE 07b)				4Q				
GT 06-5 (BMDS GT)			2Q					
GT 06-6 (BMDS GT)			4Q					
GT 06-7 (BMDS IGT)				2Q				
GT 06-8 (BMDS IGT)				4Q				
GT 06-9 (BMDS IDT)			2Q					
WG 06-2 (SE Sim)			3Q					
WG 06-3 (PLANEX)			4Q					
WG 06-4 (IMD-7.2)				4Q				

Element participation in system test events is funded within the respective element budget.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0904 Test & Evaluation Block 2008	0	0	686	71,918	203,831	140,389	3,225	0
RDT&E Articles Qty	0	0	0	0	2	2	0	0

Note:
FY 2008 RDT&E Test Articles: Integrate Launch Vehicles and Payloads to produce two test articles for FT 08-2 (CMCM-6).

FY 2009 RDT&E Test Articles: Integrate Launch Vehicles and Payloads to produce two test articles for FT 08-4 (CMCM-8).

A. Mission Description and Budget Item Justification

The BMDS CTF Block 08 Test and Evaluation funds system-level flight tests (BMDS FTs), BMDS Ground Tests (GTs) and Integrated Missile Defense (IMD) Wargames that are being executed from Jan 08 through Dec 09. This project will conduct BMD System Tests to support verification of achieved BMDS block capability. These System Flight Tests will examine the capability of the BMDS to detect, track, and engage targets. This project will also provide analysis of each System Test event through the Joint Analysis Team (JAT). To support the BMDS Test Program development, program objectives, and performance characterization, MDA Test and Evaluation provides resources to support the activities of the Radar Data Exploitation (RDE) and Test Planning. This activity supports data planning, collection and analysis of radar for missions supported by Observation Island and Gray Star. Critical Measurements and Countermeasure (CMCM) flight tests are also funded under the Block 08 Project, but are managed as part of the Measurements Program. CMCMs are dedicated flight tests which provide a venue for risk reduction for BMDS Block Testing, addressing phenomenology, countermeasures, and counter-countermeasures requirements, and providing critical measurements to support development and validation of algorithms, modeling and simulation, discrimination, and new technology demonstrations. CMCMs provide test venues for MDA Organizations that do not possess dedicated test agents, and augment MDA Element test programs. FT 08-2* is scheduled for 3QFY08 and FT 08-4* is scheduled for 3QFY09.

*Note: FT 06-4 was originally funded under Project 0904 (Block 8) However, in an effort to better align the CMCMs with the current Block development requirements, FT 06-4 has been moved to Project 0804 (Block 6) and FT 08-2 and FT 08-4 are now in Project 0904 (Block 8). CMCM-5, CMCM-7 and CMCM-9 have been cancelled.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Ground Tests	0	0	0	3,975
RDT&E Articles (Quantity)	0	0	0	0

FY 2007 Planned Program:

- Support a BMDS Ground Test with an operationally representative software and hardware version of the GMD Element and expand element participation in BMDS Ground Tests as the BMDS Block 08 elements mature and become available.
- Conduct test planning for BMDS Block 08 Ground Tests.
- Conduct test planning for BMDS Block 08 Wargames.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

	FY 2004	FY 2005	FY 2006	FY 2007
Flight Tests	0	0	686	12,638
RDT&E Articles (Quantity)	0	0	0	0

FY 2007 Planned Program:

- Conduct test planning for Block 2008 System Flight Tests.
- Continue to coordinate target development including target systems requirements, integration and component test.
- Acquire long lead items for systems test and plan system execution and reporting. Continue to coordinate integration of multiple elements and components. Refine scenario designs for BMDS Flight Tests to support Engagement Sequence Groups (ESGs) identified in the BMDS IMTP.
- Continue to populate the BMDS Characterization Data Base with the latest test data inputs to support capability assessments by Systems Engineering, JTAMDO/STRATCOMMS and OTAs, and provide validation data for models and simulations.

	FY 2004	FY 2005	FY 2006	FY 2007
Measurements Test	0	0	0	55,305
RDT&E Articles (Quantity)	0	0	0	0

FY 2006 Planned Program:

- Initiate identification of Target and Interceptor requirements for FT 08-2 (CMCM-6) and FT 08-4 (CMCM-8).
- Begin test planning, sensor planning, range integration efforts, and design reviews for FT 08-2.

FY 2007 Planned Program:

- Continue to determine Target and Interceptor requirements for FT 08-2 and FT 08-4.
- Continue to conduct test planning, sensor planning, range integration efforts, and design reviews for FT 08-2.
- Complete purchase of 2 Launch Vehicles for FT 08-2.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

D. Acquisition Strategy

The RTO directs various executing agents, including DoD agencies, Service Organizations, Laboratories and Program Offices, FFRDCs and other MDA programs to execute the various diverse efforts within the BMDS test program. Based on the specific effort / activity being conducted, acquired, or maintained, these executing agents use various acquisition strategies that conform to their respective headquarters regulations. The executing agents strive to use contracting strategies that provide the flexibility needed to test and assess to BMDS in a capabilities-based environment.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Ground Tests										
BMDS GT/MDIE		JNIC, Colorado Springs, CO	0	0	N/A	0	N/A	3,294	1Q	3,294
IMD Wargames		JNIC, Colorado Springs, CO	0	0	N/A	0	N/A	681	1Q	681
Flight Tests										
BMDS FT			0	0	N/A	686	1Q	10,425	1Q	11,111
TA&R/JAT			0	0	N/A	0	N/A	384	1Q	384
BMDS Risk/ECPs			0	0	N/A	0	N/A	1,829	1Q	1,829
Measurements Test										
FT 08-2 & FT 08-4	Various	Various, USASMDC	0	0	N/A	0	1Q	55,305	1Q	55,305
Subtotal Test and Evaluation			0	0		686		71,918		72,604

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

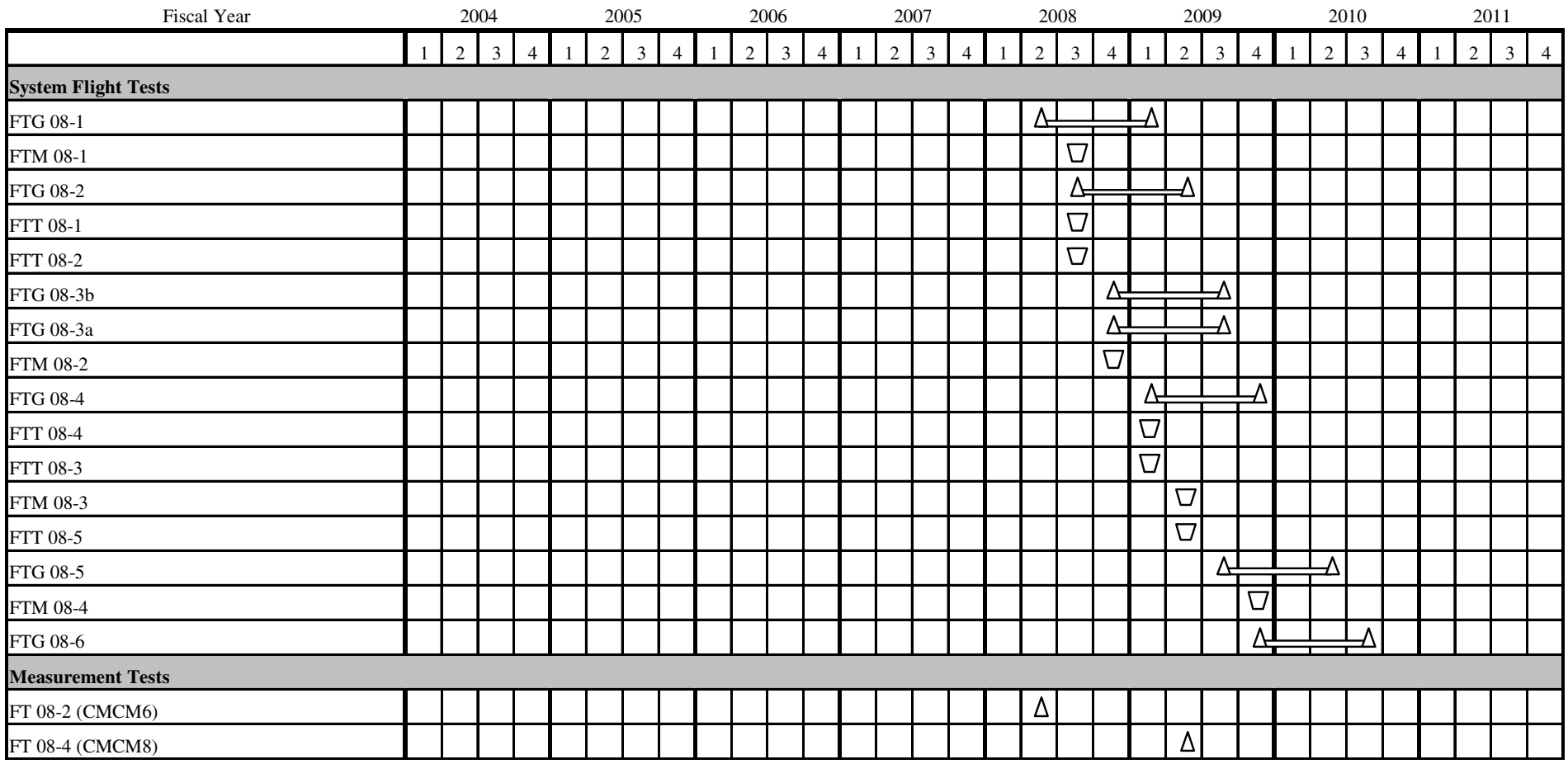
IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										
Remarks										
Project Total Cost			0	0		686		71,918		72,604

Remarks

The Test & Evaluation program distributes the majority of its funding to Executing Agents (i.e. the Air Force, Army, Navy, Joint National Integration Center (JNIC), and DTRA) for further dissemination. These Executing Agents will use Military Interdepartmental Purchase Requests (MIPRs) and/or in-house vehicles to accomplish the tasks specified.

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**



Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
System Flight Tests								
FTG 08-1					2Q-4Q	1Q		
FTG 08-2					3Q-4Q	1Q-2Q		
FTG 08-3a					4Q	1Q-3Q		
FTG 08-3b					4Q	1Q-3Q		
FTG 08-4						1Q-4Q		
FTG 08-5						3Q-4Q	1Q-2Q	
FTG 08-6						4Q	1Q-3Q	
FTM 08-1					3Q			
FTM 08-2					4Q			
FTM 08-3						2Q		
FTM 08-4						4Q		
FTT 08-1					3Q			
FTT 08-2					3Q			
FTT 08-3						1Q		
FTT 08-4						1Q		
FTT 08-5						2Q		
Measurement Tests								
FT 08-2 (CMCM6)					2Q			
FT 08-4 (CMCM8)						2Q		

Element participation in system test events is funded within the respective element budget.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0004 Test & Evaluation Block 2010	0	0	0	0	0	68,981	208,628	144,351
RDT&E Articles Qty	0	0	0	0	0	0	2	2

Note:
FY 2010 RDT&E Test Articles: Integrate Launch Vehicles and Payloads to produce two test articles for FT 10-2.

FY 2011 RDT&E Test Articles: Integrate Launch Vehicles and Payloads to produce two test articles for FT 10-4.

A. Mission Description and Budget Item Justification

The BMDS CTF Block 10 Test and Evaluation funds system-level flight tests (BMDS FTs), Ground Tests (BMDS GTs) and Integrated Missile Defense (IMD) Wargames that are being executed from Jan 2010 through Dec 2011. This project will conduct BMD System Tests to support verification of achieved BMDS block capability. These System Flight Tests will examine the capability of the BMDS to detect, track, and engage targets. This project will also provide analysis of each System Test event through the Joint Analysis Team (JAT). Critical Measurements and Countermeasure (CMCM) flight tests are also funded under the Block 10 Project, but are managed as part of the Measurements Program. CMCMs are dedicated flight tests which provide a venue for risk reduction for BMDS Block Testing, addressing phenomenology, countermeasures, and counter-countermeasures requirements, and providing critical measurements to support development and validation of algorithms, modeling and simulation, discrimination, and new technology demonstrations. CMCMs provide test venues for MDA organizations that do not possess dedicated test agents, and augment MDA Element test programs.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Funding in this Project is not programmed until FY 2009.	0	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
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PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

D. Acquisition Strategy

The RTO directs various executing agents, including DoD agencies, Service Organizations, Laboratories and Program Offices, FFRDCs and other MDA programs to execute the various diverse efforts within the BMDS test program. Based on the specific effort / activity being conducted, acquired, or maintained, these executing agents use various acquisition strategies that conform to their respective headquarters regulations. The executing agents strive to use contracting strategies that provide the flexibility needed to test and assess to BMDS in a capabilities-based environment.

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
System Flight Tests																																
FTM 10-1																																
FTG 10-1																																
FTG 10-2																																
FTM 10-2																																
FTG 10-3																																
FTG 10-3 a/b (Salvo Mission)																																
FTG 10-5																																
FTM 10-3																																
FTG 10-6 a/b (Salvo Mission)																																
FTG 10-4																																
FTM 10-4																																

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
System Flight Tests								
FTG 10-1							1Q-4Q	
FTG 10-2							3Q-4Q	1Q-2Q
FTG 10-3							4Q	1Q-3Q
FTG 10-3 a/b (Salvo Mission)							4Q	1Q-3Q
FTG 10-4								1Q-4Q
FTG 10-5								1Q-4Q
FTG 10-6 a/b (Salvo Mission)								1Q-4Q
FTM 10-1							1Q	
FTM 10-2							3Q	
FTM 10-3								1Q
FTM 10-4								3Q

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
R104 Test & Evaluation Block 2012	0	0	0	0	0	0	100	69,899
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

The BMDS CTF Block 12 Test and Evaluation funds system-level flight tests (BMDS FTs), Ground Tests (BMDS GTs) and Integrated Missile Defense (IMD) Wargames that are being executed from Jan 2012 through Dec 2013. This project will conduct BMD System Tests to support verification of achieved BMDS block capability. These System Flight Tests will examine the capability of the BMDS to detect, track, and engage targets. This project will also provide analysis of each System Test event through the Joint Analysis Team (JAT). Critical Measurements and Countermeasure (CMCM) flight tests are also funded under the Block 10 Project, but are managed as part of the Measurements Program. CMCMs are dedicated flight tests which provide a venue for risk reduction for BMDS Block Testing, addressing phenomenology, countermeasures, and counter-countermeasures requirements, and providing critical measurements to support development and validation of algorithms, modeling and simulation, discrimination, and new technology demonstrations. CMCMs provide test venues for MDA organizations that do not possess dedicated test agents, and augment MDA Element test programs.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Funding in this Project is not programmed until FY 2010.	0	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

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PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0305 Targets & Countermeasures Core	17,393	19,423	19,825	20,478	20,354	20,714	20,955	21,464
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

Targets & Countermeasures Core Support includes program office and field activity support. This includes the management of design, prototyping, development, product improvement, and qualification testing of BMDS targets in order to complete, verify, and test targets for the Initial Defensive Capability, and enhance the targets to test the BMDS capability. Since this project is comprised of entirely Program Management costs associated with Targets and Countermeasures Block development, no article quantities are reported.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Targets Support	11,005	12,288	12,519	13,027
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- Supported activities for on-site Targets and Countermeasures field activity personnel, such as rent, office equipment, travel, security, and base infrastructure necessary to conduct daily operations and execute missions.

FY 2005 Planned Accomplishments:

- Continues to support activities for on-site Targets and Countermeasures field activity personnel, such as rent, office equipment, travel, security, and base infrastructure necessary to conduct daily operations. SETA support costs are included for mission assurance to support missions.

FY 2006 Planned Program:

- Continues to support activities for on-site Targets and Countermeasures field activity personnel, such as rent, office equipment, travel, security, and base infrastructure necessary to conduct daily operations. SETA support costs are included for mission assurance to support missions.

FY 2007 Planned Program:

- Continues to support activities for on-site Targets and Countermeasures field activity personnel, such as rent, office equipment, travel, security, and base infrastructure necessary to conduct daily operations. SETA support costs are included for mission assurance to support missions.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

	FY 2004	FY 2005	FY 2006	FY 2007
Personnel Support	6,388	7,135	7,306	7,451
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- This effort funds government personnel salaries for program management, project support, project costs, and travel.

FY 2005 Planned Accomplishments:

- Continues to fund government personnel salaries for program management, project support, project costs, and travel.

FY 2006 Planned Program:

- Continues to fund government personnel salaries for program management, project support, project costs, and travel.

FY 2007 Planned Program:

- Continues to fund government personnel salaries for program management, project support, project costs, and travel.

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

D. Acquisition Strategy

Because the majority of the activities funded in this Project 0305 are considered direct government costs necessary to maintain and sustain Targets and Countermeasures personnel in the field, a particular acquisition strategy is not applicable. Funds are sent directly to government Targets and Countermeasures activities receiving entities in the field and executed accordingly. A minimal amount of Firm Fixed Price and Cost Plus Award Fee contracts are in place for administrative, computer, logistics, program management, and systems engineering support activities.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Targets Support										
Field Activity Support	C/Various	Various/ Kirtland, NM	4,289	3,700	1Q	3,979	1Q	4,246	1Q	16,214
Field Activity Support	C/Various	Various/ Huntsville, AL	6,716	8,588	1Q	8,540	1Q	8,781	1Q	32,625
Subtotal Support Costs			11,005	12,288		12,519		13,027		48,839

Remarks

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation										

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603888C Ballistic Missile Defense Test and Targets

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Personnel Support										
Government Personnel		Wash., DC	2,640	2,693	1/4Q	2,747	1/4Q	2,802	1/4Q	10,882
Government Travel		Wash., DC	160	200	1/4Q	204	1/4Q	208	1/4Q	772
Government Support	C/FFP	SPARTA/ Wash., DC	3,588	4,242	1Q	4,355	1Q	4,441	1Q	16,626
Subtotal Management Services			6,388	7,135		7,306		7,451		28,280
Remarks										
Project Total Cost			17,393	19,423		19,825		20,478		77,119
Remarks										

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0705 Targets & Countermeasures Block 2004	182,708	176,407	0	0	0	0	0	0
RDT&E Articles Qty	6	12	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

The Targets and Countermeasures program provides capability-based targets to support Block 2004 integrated and layered BMDS testing. Targets developed under this project will test and verify the Initial Defensive Capability as well as enhance the BMDS capability by providing capability-based targets of all types with an assortment of payloads and payload objects. Based on System Engineering assessments of possible threat scenarios, the targets and countermeasures program supports the Engagement Sequence Group (ESG) by launching targets to test the performance of the BMDS, ultimately enabling a weapon to engage a target. Funding for this program supports the design, prototyping, development, verification, product improvement, and qualification testing of BMDS Block 2004 targets and associated payloads. It also supports the maintenance, aging surveillance, refurbishment, and routine testing of existing government furnished equipment (GFE) boosters, as well as the purchase of long lead material assets and asset management items for short and medium range target components.

Also funded in this project is the utilization of a targets prime contractor. Lockheed Martin Space Systems Company (LMSSC), based in Denver, Colorado, was selected as the targets prime contractor. LMSSC will be central to the development and acquisition of new target systems to support integrated and layered BMDS Block testing by providing program management and systems engineering functions across the Missile Defense Agency targets portfolio. Additionally, LMSSC will develop all future target configurations, including advanced targets, design and development of target payloads (to include instrumentation, re-entry vehicles, and countermeasures), and procurement of all long lead target material components. By emphasizing the use of product lines (i.e. development of common target components and parts), it is anticipated that both cycle time and cost will be reduced (see Section D, Acquisition Strategy for more details on the targets prime contract). This program also provides the technical support of mission management/mission assurance for all Element flight tests.

Block 2004 provides some hardware, and full range support and mission management for the following BMDS element flight tests:

- Ground-Based Midcourse Defense (GMD) targets - GMD Targets will be used to test the Initial Defensive Capability in GMD Integrated Flight Tests (IFT's) IFT-13c, IFT-14, FT-04-1, FT-06-1, FTG-04-1, FTG-04-2 and FTG-04-5 (see Program Element 0603882C, Projects 0708 and 0808 for details on BMDS Flight Test). Some instrumentation efforts were moved into Block 06 Advanced Instrumentation Development since the Small Low Observable (SLO) program was canceled in FY04.
- THAAD - FT-3 and FT-4
- PAC-3 - DT/OT -12a/b
- Aegis - FTM 04-1, FTM 04-2 and FTM 04-3
- Arrow - USFT-1a and USFT-2a
- Medium Range Target (MRT)- FT-04-3

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Target Support	64,813	97,049	0	0
RDT&E Articles (Quantity)	0	0	0	0

This effort comprises a significant portion of the targets and countermeasures prime contract costs, as well as funding for Federally Funded Research and Development Centers (FFRDCs) and National Lab activities that directly support the Targets and Countermeasures program. There are no quantities of articles reported under this task since the scope of work is primarily program management, systems engineering, functional requirements analysis, and target systems design work through the Critical Design Review (CDR) systems engineering process. This effort also provides target mission management and execution, and overall mission assurance of flight tests. Includes conducting mission planning, documentation, and development of scenario plans in accordance with mission requirements. Controls target management (scheduling and configuration modifications) in support of Block 04 BMDS and Element testing. Additionally, this effort will program and plan for award fee for the entire targets prime contract, including element target delivery orders that are funded in separate Missile Defense Agency Program Elements (PE's). The acquisition and presentation of targets used in integrated and layered BMDS testing will continue to be funded by the Missile Defense Agency Elements (e.g., THAAD, Aegis, etc.) in separate Program Elements utilizing the targets prime contract vehicle.

FY 2004 Accomplishments:

- Awarded targets prime contract in 1Q/04 with Lockheed Martin Space Systems Company (LMSSC).
- Conducted System Requirements Reviews (SRR's).
- Conducted Critical Design Review (CDR) on the Short Range Liquid Fuel Target Booster in 3Q/04.
- Conducted early concept definition analyses.
- Initiated advanced target system and sub-system prototype design work.
- FFRDCs and National Labs performed unique target requirements, certification, and instrumentation analyses.
- Conducted program management reviews and Integrated Baseline Reviews (IBR's) with LMSSC.
- Provided target mission management and mission assurance of flight tests for the following target missions:
  - Aegis test FM-6.
  - Arrow tests USFT-1a.
- Critical Measurements Program-4 (CMP). Conducted CMP-4 flight test in 4Q/04.
- Completed the Short Range Air-Launched Target (SRALT) Risk Reduction Flight in support of future BMDS and Element testing.
- Completed the Long Range Air-Launched Target (LRALT) Risk Reduction Flight in support of future BMDS and Element testing.
- Completed the Foreign Military Acquisition (FMA) Risk Reduction Flight from a marine Mobile Launch Platform (MLP).

FY 2005 Planned Accomplishments:

- Continue to prepare for and conduct SRR's.
- Continue to manage and conduct program management reviews.
- Continue to prepare for and conduct Preliminary Design Reviews (PDR's).
- Continue to conduct and finalize CDR's.
- Continue to conduct early concept definition analyses.
- Continue to develop advanced target systems and sub-systems prototype design work.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

- FFRDCs and National Labs to continue unique target requirements, certification, and instrumentation analyses.
- To provide target mission management and mission assurance of flight tests for the following target missions:
  - Aegis - FTM-04-1, FTM-04-2, and FTM-04-3.
  - Arrow - USFT-2a.
  - CMCM - FT-04-2 and FT-04-4.
  - GMD - IFT-13c, IFT-14, FT-04-1, FTG-04-1, and FTG-04-2.
  - PAC-3 - DT/OT-12a/b.
  - THAAD - FT-3 & 4.
- Complete the Medium Range Target (MRT), FT-04-3, Risk Reduction Flight in support of future BMDS and Element testing.

	FY 2004	FY 2005	FY 2006	FY 2007
Target Development	92,880	42,624	0	0
RDT&E Articles (Quantity)	6	7	0	0

This effort develops, integrates, and tests short, medium, and long-range BMDS targets. It is anticipated the prime contractor will initiate the development and testing of targets in Block 06 (Targets and Countermeasures Project 0805).

FY 2004 Accomplishments:

RDT&E Test Articles: 3 SRALT's; 1 LRALT; 1 MLP; 1 GMD Target

- Completed the SRALT development and conducted a successful Risk Reduction Flight (RRF). The SRALT utilized a single SR-19 Minuteman booster and a threat-like payload package. This target was dropped from a C-17 aircraft during the risk reduction flight test. The test demonstrated a mobile, short-range target capability that allows flexibility in launch location and trajectory when tested against the integrated, layered BMDS.
- Short Range Liquid Fuel Target Booster (SR-LFTB) - This program completed engine testing culminating in a Critical Design Review (CDR) in June 2004. At that time, the contract was canceled and evaluated for potential future transition to the targets prime contractor. FY04 funding for this program was re-allocated to develop Ground-Based Missile Defense targets (see description below).
- Completed GMD Targets development to support GMD IFT 13c.
- Continuing target development for GMD targets IFT 14, FT-04-1, FT-06-1, FTG-04-1, FTG-04-2, and FTG-04-5.
- Completed the LRALT development and conducted a successful RRF. The LRALT utilized two SR-19 Minuteman boosters and a threat-like payload package. This target was dropped from a C-17 aircraft during the risk reduction flight. The test demonstrated a mobile, medium-range target capability that allows flexibility in launch location and trajectory when tested against the integrated, layered BMDS.
- Completed the MLP target development and conducted a successful RRF. The test demonstrated a mobile, short-range target capability that allows flexibility in launch location and trajectory when tested against the integrated, layered BMDS.
- Continued the MRT development and completed a Critical Design Review (CDR).
- Completed the Short Range Liquid Fuel Target Booster development, engine testing, and a CDR.
- Initiated Delivery Order (DO) 04-02 Aegis Bulk Chemical Payload.
- Initiated DO 04-04 for LRALT Cobra Dane.

- Initiated DO for FMA Exploitation.
- Initiated DO for Security Classification Guide.
- Initiated DO 04-01 for CMCM-2 Booster.

FY 2005 Planned Accomplishments:

RDT&E Test Articles: 1 MRT; 4 GMD Targets; 1 CMP-4; 1 LRALT CD

- Continue MRT development and conduct risk reduction flight in 2Q/05. This target will utilize Castor IVB boosters, and a threat-like payload package. The purpose is to demonstrate a mobile, medium-range target capability that allows flexibility in launch mode/location and trajectory when tested against the integrated, layered BMDS.
- Complete 4 GMD targets and launch to support IFT 14, FT-04-1, FTG-04-1, and FTG-04-2.
- Launch GMD target IFT-13c.
- Complete development of the LRALT CD. Test scheduled for 4Q/05.
- Initiate Scorpious development (Congressional add).
- Initiate DO 05-01 for Aegis FTM 04-2 and FTM 04-3 integration & launch.
- Initiate DO for Long Range Target (LRT).
- Initiate DO for SR-19/SR-73 Launch Vehicle.
- Initiate DO for Acquisition Logistics Management System (ALMS).

	FY 2004	FY 2005	FY 2006	FY 2007
Payload Development	14,895	23,332	0	0
RDT&E Articles (Quantity)	0	5	0	0

FTG 04-5 (IFT-19/2d)

This effort provides funding for program management and development of: 1) unique target payload components (re-entry vehicles (RV's), countermeasures, instrumentation, adaptor sections, and deployment mechanisms), as well as optical on-target data collection instrumentation used for algorithm development/evaluation and payload characterization; 2) development of Fly Along Sensor Package (FASP) flight units for BMDS testing; 3) development of advanced instrumentation systems/techniques to include data collection and transmission techniques/methods; 4) development of advanced countermeasures to support BMDS flight testing and special systems engineering studies, and; 5) development of advanced RV concepts to support BMDS testing.

Note: A payload includes components such as countermeasures, re-entry vehicles, instrumentation, adaptor sections, and deployment mechanisms.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
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FY 2004 Accomplishments:

- Commenced development of advanced sensors for integration into FASP's.
- Successfully completed Real-time Mission Monitoring prototype for LRALT mission.
- Commenced development of secure telemetry network.
- Developed prototype countermeasure concepts in conjunction with the National Laboratories in support of the MDA/TE Critical Measurements and Countermeasure Program (CMCM) -1 and 2.
- Developed, built, and characterized countermeasure objects in support of the Ground-based Midcourse Defense (GMD) flight test in support of BMDS testing.
- Developed a field programmable countermeasure ejector design to preliminary design review-level.
- Commenced development of next generation countermeasures and associated preliminary design engineering packages.
- Critical Measurements Program 4 (CMP-4) - This program is to test experimental payload packages. One successful flight test occurred in 4Q/04.

FY 2005 Planned Accomplishments:

RDT&E Test Articles: 4 M-FASP Flight Units; 1 Auxiliary Sensor Unit

- Critical Measurements & Countermeasures (CMCM) -CMCM 1 (2Q/05) & CMCM 2 (4Q/05) - These two tests will determine the effectiveness of evolving countermeasure development projects.
- Prime contractor (Lockheed Martin Space Systems Company) will initiate development of a target system using C-4 boosters for use for GMD testing in FY06.
- Complete 3 Midcourse-Fly Along Sensor Packages (M-FASP) flight units and 1 qualification unit.
- Complete development of one Auxiliary Sensor Unit, ILC 4Q 2005.
- Develop new techniques data telemetry during flight tests.
- Begin development of enhanced Real-time Mission Monitoring for BMDS missions.
- Develop enhanced auxiliary sensor unit.
- Participate in MDA wide efforts to standardize instrumentation across Product Lines for telemetry, avionics, Flight Termination/Command Destruct Systems, and Global Positioning Strategy (GPS).
- Begin development of Instrumentation Inventory to reduce cycle time required to produce targets.
- Begin development of advanced instrumentation and telemetry concepts.
- Continue development of countermeasures for the BMDS flight test programs.

	FY 2004	FY 2005	FY 2006	FY 2007
Asset Management	10,120	13,402	0	0
RDT&E Articles (Quantity)	0	0	0	0

This effort provides funding for the maintenance, storage, aging surveillance, modification, documentation, material handling, delivery of assets, refurbishment, and routine testing of government furnished equipment (Minuteman II, Peacekeeper, Lance, Pershing II, Polaris A-3, Trident C-4, Caster IVB, FMA assets) related to target boosters, payloads, instrumentation, launch support equipment, and unique target hardware components. There are no article quantities reported under this task since the hardware quantities under this task are existing government furnished equipment components and not new hardware items.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

FY 2004 Accomplishments:

- Buildup, integration, and delivery of IFT-13c STARS vehicle to KLC.
- Pathfinder, site validation, buildup, integration, and delivery of Arrow target to Mobile Launch Platform. Includes retrograde of all post mission equipment.
- Refurbishment and assembly of 2 SR 19 motors and associated equipment and deliver for LRALT RRF.
- Refurbishment and assembly of 1 SR 19 motor and associated equipment and deliver for SRALT RRF.
- Storage, maintenance and aging and surveillance program for, 84 Pershing II Reentry Vehicles and other components, 104 Lance Missiles, 19 Polaris A-3 motors, 9 Orbus Motors, Minuteman motors, 14 FMA's, and 9 Castor IVB's.
- Maintenance of existing support equipment and facilities at Redstone Arsenal, White Sands Missile Range, Kodiak, and Pacific Missile Range Facility.
- Procurement of assembled Castor IV motors using GFE cases to support future MRT missions.
- Procurement of Trident C-4 motors for future use as targets. Quantity TBD based upon negotiations with the Navy.
- Refurbishment and assembly of 1 Castor IVB motor and associated support equipment for the MRT RRF.

FY 2005 Planned Accomplishments:

- Complete refurbishment and assembly of 1 Castor IVB motor and associated support equipment and deliver as the launch vehicle for the MRT RRF.
- Continue the storage, maintenance, and aging and surveillance program for 84 Pershing II Reentry Vehicles and other components, 99 Lance Missiles, 16 Polaris A-3 motors, 6 Orbus motors, Minuteman motors, 13 FMA's and 7 Castor IVB motors.
- Continue the maintenance of existing support equipment and facilities at Redstone Arsenal, White Sands Missile Range, Kodiak, and Pacific Missile Range Facility.
- Continue the procurement of assembled Castor IV motors using GFE cases to support future MRT missions.
- Continue the procurement of Trident motors for future use as targets. Quantity TBD based upon negotiations with the Navy.
- Begin procurement of additional FMA Assets to support future target flight tests.
- Continue refurbishment and assembly of 3 Castor IVB motors and associated support equipment for FY 2006 Aegis flight tests.

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
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PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615

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PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
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PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

D. Acquisition Strategy

Targets and Countermeasures Program 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. To support this strategy, the Targets and Countermeasures Program awarded a ten year prime contract (four year base plus three 2-year option periods) to Lockheed Martin Space Systems Company (LMSSC) who will provide the targets to test against the layered and integrated BMDS. The Targets prime contract will also add a new capability for Targets and Countermeasures systems engineering and provide single system management for the Targets and Countermeasures Program. Overall objectives of this procurement are to deliver reliable target system performance, to provide system level engineering and management through an integrated prime contractor, to reduce target acquisition cycle time, to control target program costs and stimulate creative cost reduction initiatives, and to focus on components and capability-based product lines through integration and launch of target systems. The contract will be a combination of Cost Plus Award Fee and Firm Fixed Price Delivery Orders under two Contract Line Items (CLIN's). This structure allows for maximum flexibility to produce either full blown up targets to test new concepts and ideas, or product lines under which common target components will be developed, integrated, and tested. By emphasizing common target components, it is anticipated that a reduction in both cycle time and cost will be achieved. As the targets prime contract begins its first four year base period, current on-going target development contracts will generally be completed under the terms of their existing contracts. This includes a variety of individual and Task Order Cost Plus Fixed Fee and Cost Plus Award Fee contracts. Some on-going target developments, however, may transition to the prime contractor depending on the status of the contract and maturity of the target system being developed. Under this Project (0705), a majority of the four year base period of the prime contract will be completed. The government will maintain system responsibility and will ensure successful management of BMDS targets execution.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Target Support										
System Engineering	C/CPAF	Lockheed Martin/ Denver, CO	49,719	75,570	1Q	0	N/A	0	N/A	125,289
System Engineering	C/FFRDC	JHU/APL/Laurel , MD	1,891	2,127	1Q	0	N/A	0	N/A	4,018
Mission Assurance	C/Various	Northrop Grumman/ California	2,598	9,310	1/4Q	0	N/A	0	N/A	11,908
Mission Management	C/Various	Various	7,073	9,042	1/4Q	0	N/A	0	N/A	16,115
System Engineering	C/Various	Sandia National Lab/New Mexico	1,300	1,000	1Q	0	N/A	0	N/A	2,300
Target Development										
Integration	C/Various	Coleman Aerospace, Orlando, FL	7,157	3,558	1/2Q	0	N/A	0	N/A	10,715
Launch Vehicles	C/CPAF	Lockheed Martin/Denver, CO	0	19,000	1Q	0	N/A	0	N/A	19,000
Launch Vehicles	C/Various	Orbital Sciences, Chandler, AZ	8,193	6,509	1Q	0	N/A	0	N/A	14,702
System Engineering	C/CPAF	Lockheed Martin/Denver, CO	0	10,057	1Q	0	N/A	0	N/A	10,057
System Engineering	C/Various	TMI	0	500	1Q	0	N/A	0	N/A	500
System Engineering	C/Various	Multiple/ Scorpius	45,170	3,000	1/2Q	0	N/A	0	N/A	48,170
Launch Vehicles	C/Various	Northrop Grumman/ California	7,615	0	N/A	0	N/A	0	N/A	7,615
Launch Vehicles	C/Various	Various	25,908	0	N/A	0	N/A	0	N/A	25,908

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603888C Ballistic Missile Defense Test and Targets

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Payload Development										
Re-Entry Vehicles	C/CPAF	Lockheed Martin/ Denver, CO	2,313	2,500	1Q	0	N/A	0	N/A	4,813
Re-Entry Vehicles	C/Various	Various	1,069	3,125	1/2Q	0	N/A	0	N/A	4,194
Countermeasures	C/CPAF	Lockheed Martin/ Denver, CO	0	12,425	1Q	0	N/A	0	N/A	12,425
Countermeasures	C/FFRDC	JHU/APL/ Laurel, MD	1,230	1,500	1/2Q	0	N/A	0	N/A	2,730
Instrumentation	C/FFRDC	MIT/LL/ Boston, MA	1,527	2,861	1/2Q	0	N/A	0	N/A	4,388
Instrumentation	C/FFRDC	MIT/LL/ Boston, MA	4,297	921	1Q	0	N/A	0	N/A	5,218
Instrumentation	C/Various	Sandia National Lab/New Mexico	5,338	0	N/A	0	N/A	0	N/A	5,338
Instrumentation	C/Various	NSA/Ft. Meade, MD	190	0	N/A	0	N/A	0	N/A	190
Asset Management										
Logistics	C/Various	RTTC	0	581	1/2Q	0	N/A	0	N/A	581
Logistics	C/Various	Various	6,280	9,060	1Q	0	N/A	0	N/A	15,340
Logistics	C/Various	Albuquerque, NM	3,840	3,761	1Q	0	N/A	0	N/A	7,601
Subtotal Product Development			182,708	176,407		0		0		359,115

Remarks

Under Target Development/System Engineering for FY05 there is $3.000 for a Congressional Add which is Earmarked for Scorpius

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

Project Total Cost			182,708	176,407		0		0		359,115

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603888C Ballistic Missile Defense Test and Targets

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Production Milestones																																
GMD Target Development																																
Short Range Air Launch Target																																
Long Range Air Launch Target																																
Mobile Launch Platform Target																																
Medium Range Target																																
Short Range Liquid Fuel Booster																																
PDR																																
CMCM - 1																																
CMCM - 2																																
CDR																																
Mobile Launch Platform Equipment- OEM CDR																																
Short Range Liquid Fuel Booster - Integration																																
Medium Range Target																																
CMCM - 1																																
CMCM - 2																																
Testing Milestones																																
Long Range Air Launch Target - RRF																																
Medium Range Target - RRF Air																																
Mobile Launch Platform Target - RRF																																
Short Range Air Launch Target - RRF																																
Aegis FTM 04-1																																
Aegis FTM 04-2																																
Aegis FTM 04-3																																
Arrow USFT-1																																

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Testing Milestones																																
Arrow USFT-2a						◇																										
CMCM-1 FT 04-2							△																									
CMCM-2 FT 04-4								△																								
CMP-4				▲																												
GMD FT 04-1								◇																								
GMD FT-06-1									◇																							
GMD FTG 04-1								◇																								
GMD FTG 04-2									◇																							
GMD FTG 04-5									◇																							
GMD IFT-13c					◆																											
GMD IFT-14						◇																										
LRALT CD FT 04-5								△																								
PAC-3 DT/OT-12a/b				◆																												
THAAD FT-3								◇																								
THAAD FT-4									◇																							

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Production Milestones								
GMD Target Development	2Q-4Q	1Q-4Q						
Short Range Air Launch Target	1Q-3Q							
Long Range Air Launch Target	1Q-3Q							
Mobile Launch Platform Target	1Q-3Q							
Medium Range Target	1Q-4Q	1Q-2Q						
Short Range Liquid Fuel Booster	1Q-3Q							
PDR								
CMCM - 1	2Q							
CMCM - 2	3Q							
CDR								
Mobile Launch Platform Equipment- OEM CDR	1Q							
Short Range Liquid Fuel Booster - Integration	2Q							
Medium Range Target	2Q							
CMCM - 1	4Q							
CMCM - 2		2Q						
Testing Milestones								
Long Range Air Launch Target - RRF	3Q							
Medium Range Target - RRF Air		2Q						
Mobile Launch Platform Target - RRF	4Q							
Short Range Air Launch Target - RRF	3Q							
Aegis FTM 04-1		2Q						
Aegis FTM 04-2		3Q						
Aegis FTM 04-3		4Q						
Arrow USFT-1	4Q							
Arrow USFT-2a		2Q						
CMCM-1 FT 04-2		3Q						
CMCM-2 FT 04-4		4Q						
CMP-4	4Q							
GMD FT 04-1		4Q						
GMD FT-06-1			1Q					
GMD FTG 04-1		4Q						

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603888C Ballistic Missile Defense Test and Targets

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
GMD FTG 04-2			1Q					
GMD FTG 04-5			1Q					
GMD IFT-13c		1Q						
GMD IFT-14		2Q						
GMD Target (FT-04-5)	1Q-4Q							
GMD Target (FT-06-1)		1Q						
LRALT CD FT 04-5		4Q						
PAC-3 DT/OT-12a/b	4Q							
THAAD FT-3		4Q						
THAAD FT-4			1Q					
Test Bed		1Q-4Q	1Q-3Q					

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0805 Targets & Countermeasures Block 2006	0	112,984	222,194	208,246	0	0	0	0
RDT&E Articles Qty	0	0	11	7	0	0	0	0

A. Mission Description and Budget Item Justification

The Targets and Countermeasures program provides capability-based targets to support Block 2006 integrated and layered BMDS testing. Targets developed under this project will enhance the BMDS capability by providing short, medium, and long range capability-based targets with enhanced payloads. Based on the Systems Engineering assessments of possible threat scenarios, the targets and countermeasures program supports the Engagement Sequence Group (ESG) by launching targets to test the performance of the BMDS, ultimately enabling a weapon to engage a target. Funding for this program supports the continuation of targets prime contract activities, and the design, prototyping, development, certification, product improvement, and qualification testing of BMDS Block 2006 targets and associated payloads. It also supports the maintenance, aging surveillance, refurbishment, and routine testing of existing government furnished equipment (GFE) boosters, as well as the purchase of long lead material assets and asset management items for short, medium and long-range target components.

The following target will be developed and available to support Block 2006 testing:

- Long Range Foreign Material Acquisition (LR-FMA) - Under this program, long range FMA's are procured and tested for potential use as a long-range strategic target against the integrated and layered BMDS. The Long Range FMA program was initiated by the targets prime contractor in 1Q/05, with a ground-launch risk reduction flight test at a yet to be determined date. Start and end dates for this program are estimates only until the systems engineering requirements cycle is completed and detailed program content and schedule has been developed.

Ground-Based Midcourse Defense (GMD) Targets - The Targets and Countermeasures Program will continue to fund a portion of GMD FTG-06-1a/b.

The program also provides hardware and full range support and mission management for the following BMDS element flight tests in Block 2006:

- Ground-Based Midcourse Defense (GMD) targets - Flight Tests (FT) FT-06-1, FT-06- 6, FTG-04-5, FTG-06-1a/b, FTG-06-2 (Launch Vehicle 2), FTG- 06-3a/b and FTG-06-4 (see Program Element 0603882C, Projects 0708 and 0808 for details on BMDS Flight Test).
- THAAD - FTT-04-1, FTT-06-1, FTT-06-2, FTT- 06-3, FTT 06-4 and FTT 06-5
- PAC-3 - ATM-XXX and Task 7-2
- ABL - 4 FMA and 2 Lance tests
- Aegis FTM-06-1, FTM-06-2, FTM-06-3, and FTM-06-4
- Japanese Cooperative Test FTM-06-2
- KI - NFIRE-2 a and b
- Space & Tracking Surveillance System (STSS) - DTMT1 and DSMT1.
- Also included are two technology demonstration flights for Critical Measurements & Countermeasures (CMCM-3, 4).

The targets prime contractor (Lockheed Martin Space Systems Company) will develop all future target configurations with an emphasis on developing product lines of common target components, rather than full-blown individual target systems. Lockheed Martin Space Systems Company will maximize the use of existing government furnished equipment, to include the use of Foreign Material Acquisitions (FMA's) when appropriate, while minimizing the number of new developments. Lockheed Martin Space Systems Company will optimize the use of existing designs, provide capability-based and common component upgrades, and pursue target portfolio commonality in booster stages, inter stages, avionics, launch support equipment, counter-measures, and re-entry vehicles. It is

anticipated this product line approach and target component commonality will reduce both cycle time (e.g., concept definition to launch) and cost. During FY04 the Small Low Observable (SLO) program was canceled but some instrumentation efforts were moved into Block 06 Advanced Instrumentation Development.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Target Development	0	63,000	52,990	17,861
RDT&E Articles (Quantity)	0	0	2	0

This effort develops, integrates, and tests short, medium, and long-range BMDS targets. It is anticipated the prime contractor will initiate the development and testing of targets in Block 06 (Targets and Countermeasures Project 0805).

FY 2005 Planned Accomplishments:

- Initiate Delivery Order (DO) the prime contractor (Lockheed Martin Space Systems Company) to procure Long Range FMA.
- Initiate DO for GMD FTG-06-1 and FTG-06-2 (Launch Vehicle 2)
- Initiate DO for THAAD FTT 06-1 Launch Vehicle and FTT-04-1
- Initiate DO for Aegis BMD FTM-06-1
- Conduct associated engineering trade studies.
- Purchase long-lead hardware components.

FY 2006 Planned Program:

RDT&E Test Articles: 1 Launch Vehicle 2 Target; 1 Long Range Foreign Material Assets (FMA)

- Conduct Risk Reduction Flight (RRF) on the Launch Vehicle 2 target.
- Complete development on the Long Range FMA and conduct a RRF.
- Complete target development for GMD FTG-06-1 and FTG-06-2 (Launch Vehicle) targets.
- Complete target development for THAAD FTT-06-1.
- Complete development for AEGIS BMD FTM-06-1 and 2.
- Conduct associated engineering trade studies.
- Purchase long-lead hardware components.
- Purchase Modular Mechanical Ordnance Destruct System (MMODS).

FY 2007 Planned Program:

- Analyze test data from the FTG-06-2 (Launch Vehicle 2) RRF to be conducted in FY 2006.
- Analyze test data from the Long Range FMA RRF to be conducted FY 2006.
- Purchase MMODS.
- Purchase Flex Seal Nozzles.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

- Participate in SRR's, PDR's and CDR's.
- Conduct associated engineering trade studies.
- Purchase hardware components.

	FY 2004	FY 2005	FY 2006	FY 2007
Target Support	0	6,800	92,967	153,319
RDT&E Articles (Quantity)	0	0	0	0

This effort comprises a significant portion of the targets and countermeasures prime contract costs, as well as funding for Federally Funded Research and Development Centers (FFRDCs) and National Lab activities that directly support the Targets and Countermeasures program. There are no quantities of articles reported under this task since the scope of work is primarily program management, systems engineering, functional requirements analysis, and target systems design work through the Critical Design Review (CDR) systems engineering process. This effort also provides target mission management and execution, and overall mission assurance of flight tests which includes conducting mission planning, documentation, and development of scenario plans in accordance with mission requirements. Controls target management (scheduling and configuration modifications) in support of Block 06 BMDS and Element testing. Additionally, this effort will program and plan for award fee for the entire targets prime contract, including element target delivery orders that are funded in separate Missile Defense Agency Program Elements (PE's). The acquisition and presentation of targets used in integrated and layered BMDS testing will continue to be funded by the Missile Defense Agency Elements (e.g., THAAD, Aegis, etc.) in separate Program Elements utilizing the targets prime contract vehicle.

FY 2005 Planned Accomplishments:

Leveraging available and emerging technologies from foreign and domestic sources assuring that target acquisition programs are capabilities driven and employ spiral development processes.

FY 2006 Planned Program:

- Prepare for and conduct System Requirements Reviews (SRR's).
- Manage and conduct program management reviews.
- Prepare for and conduct Preliminary Design Reviews (PDR's).
- Conduct and finalize Critical Design Reviews (CDR's).
- Conduct early concept definition analyses.
- Develop advanced target systems and sub-systems prototype design work.
- FFRDCs and National Labs to continue unique target requirements, certification, and instrumentation analyses.
- Provide target mission management and mission assurance of flight tests for the following target missions:
  - Aegis tests FTM-06-1, FTM-06-2, and FTM-06-3
  - GMD tests FTG-04-5, FTG-06-1a/b, and FTG-06-2 (Launch Vehicle 2)
  - THAAD tests FTT-04-1, and FTT-06-1
  - Kinetic Energy Interceptor tests NFIRE 2 a and b

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

FY 2007 Planned Program:

- Continue to prepare for and conduct SRR's.
- Continue to manage and conduct Program Management Reviews.
- Continue to prepare for and conduct PDR's.
- Continue to conduct and finalize CDR's.
- Continue to conduct early concept definition analyses.
- Continue to develop advanced target systems and sub-systems prototype design work.
- FFRDCs and National Labs to continue unique target requirements, certification, and instrumentation analyses.
- Provide target mission management and mission assurance of flight tests for the following target missions:
  - Aegis tests FTM-06-4 and FTM-06-5
  - PAC-3 tests FT-16-2 and FT-16-3
  - THAAD tests FTT-06-2, FTT-06-3, and FTT-06-4
  - GMD tests FT-06-6, FTG-06-3a/b, and FTG-06-4
  - STSS tests DTMT-1 and DSMT-1
  - CMCM-4

	FY 2004	FY 2005	FY 2006	FY 2007
Payload Development	0	40,184	60,588	26,254
RDT&E Articles (Quantity)	0	0	8	7

This effort provides funding for program management and development of: 1) unique target payload components (re-entry vehicles (RV's), countermeasures, instrumentation, adaptor sections, and deployment mechanisms), as well as optical on-target data collection instrumentation used for algorithm development/evaluation and payload characterization; 2) development of Fly Along Sensor Package (FASP) flight units for BMDS testing; 3) development of advanced instrumentation systems/techniques to include data collection and transmission techniques/methods; 4) development of advanced countermeasures to support BMDS flight testing and special systems engineering studies, and; 5) development of advanced RV concepts to support BMDS testing.

FY 2005 Planned Accomplishments:

- Continue development of secure telemetry network for operational testing.
- Continue production of two M-FASP units for inventory.
- Continue development of advanced sensors for integration into SDS (High Speed Camera, High Speed Spectrometer & Radiometer).
- Continue development and implement new techniques data telemetry during flight tests.
- Continue development of Spatially Diverse Sensor (SDS) platform (next generation FASP).
- Continue development of enhanced Real-time Mission Monitoring for BMDS missions.
- Continue development of Instrumentation Inventory, including SDS to reduced cycle time required to produce targets.
- Continue development of advanced instrumentation and telemetry concepts.
- Participate efforts to standardize instrumentation across Product Lines for TM, avionics, Flight Termination/Command Destruct Systems, GPS, etc.
- Complete development of re-entry vehicles (MBRV-2's).

- Transition-to-limited-production of legacy-GMD countermeasure designs from the National Labs to the Targets and Countermeasures Prime Contractor (TCPC).
- Design flight test countermeasures in support of the CMCM-4 program.
- Build and characterize countermeasure objects for BMDS flight tests.
- Conduct studies on legacy countermeasures to down-select designs for transition-to-limited production.
- Develop techniques, materials and processes for new prototype countermeasures.
- Conduct design studies to bring countermeasures designs to the Critical Design Review-level.
- Begin development of countermeasure inventory to reduce cycle time required to produce targets.

FY 2006 Planned Program:

RDT&E Test Articles: 6 MBRV-2's; 2 M-FASPS

- Complete the manufacturing of 6 MBRV-2's.
- Complete production of 2 M-FASP units for inventory.
- Complete development of Wireless LAN for operational testing.
- Complete development of advanced sensors for integration into SDS (High Speed Camera, High Speed Spectrometer & Radiometer).
- Complete development and implement new techniques data telemetry during flight tests.
- Continue development of Spatially Diverse Sensor (SDS) platform (next generation FASP).
- Continue development of enhanced Real-time Mission Monitoring for BMDS missions.
- Continue development of Instrumentation Inventory, including SDS to reduced cycle time required to produce targets.
- Continue development of advanced instrumentation and telemetry concepts.
- Begin development of the advanced secure telemetry network.
- Participate in efforts to standardize instrumentation across Product Lines for TM, avionics, Flight Termination/Command Destruct Systems.
- Transition-to-limited-production several countermeasure designs from the National Labs to the Targets and Countermeasures Prime Contractor (TCPC).
- Continue to develop techniques, materials and processes for new prototype countermeasures.
- Conduct design studies to bring countermeasures designs to the Critical Design Review-level.
- Continue to develop a countermeasure inventory in support of BMDS flight tests.
- Build and characterize countermeasures for GMD flight tests.

FY 2007 Planned Program:

RDT&E Test Articles: 7 MBRV-2's

- Complete the manufacturing of 7 MBRV-2's.
- Complete development of Spatially Diverse Sensor (SDS).
- Complete development of the advanced secure telemetry network.
- Continue development of enhanced Real-time Mission Monitoring for BMDS missions.
- Continue development of Instrumentation Inventory, including SDS to reduced cycle time required to produce targets
- Continue development of advanced instrumentation and telemetry concepts.
- Participate in efforts to standardize instrumentation across Product Lines for TM, avionics, Flight Termination/Command Destruct Systems, GPS, etc.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

- Transition-to-limited-production several countermeasure designs from the National Labs to the Targets and Countermeasures Prime Contractor (TCPC).
- Continue to develop techniques, materials and processes for new prototype countermeasures.
- Conduct design studies to bring countermeasures designs to the Critical Design Review-level.
- Continue to develop a countermeasure inventory in support of BMDS Flight Test.
- Build and characterize countermeasures for GMD flight tests.

	FY 2004	FY 2005	FY 2006	FY 2007
Asset Management	0	3,000	15,649	10,812
RDT&E Articles (Quantity)	0	0	1	0

This effort provides funding for the maintenance, storage, aging surveillance, modification, documentation, material handling, delivery of assets, refurbishment, and routine testing of government furnished equipment (Minuteman II, Peacekeeper, Lance, Pershing II, Polaris A-3, Trident C-4, Caster IVB, FMA assets) related to target boosters, payloads, instrumentation, launch support equipment, and unique target hardware components.

FY 2005 Planned Accomplishments:

- Initiated DO to develop C-4 Transporter Erector.
- Conduct advanced development of the C-4 Transporter Erector.
- Initiate development of the C-4 launch support system.

FY 2006 Planned Program:

RDT&E Test Articles: 1 C-4 Launch Transporter Erector

- Complete the development of the C-4 Transporter Erector.
- Complete the development of the C-4 launch support system.
- Continue the storage, maintenance, and aging and surveillance program for 84 Pershing II Reentry Vehicles and other components, 99 Lance Missiles, 16 Polaris A-3 motors, 6 Orbus motors, Minuteman motors, 13 FMA's and 7 Castor IVB motors.
- Continue the maintenance of existing support equipment and facilities at Redstone Arsenal, White Sands Missile Range, Kodiak, and Pacific Missile Range Facility.
- Continue the procurement of Trident motors for future use as targets. Quantity TBD based upon negotiations with the Navy.
- Continue the procurement of assembled Castor IV motors using GFE cases to support future MRT missions.
- Follow on procurement of additional FMA Assets to support future target flight tests.
- Continue refurbishment and assembly of 3 Castor IVB motors and associated support equipment for FY 2006 Aegis flight tests.

FY 2007 Planned Program:

- Continue the storage, maintenance, and aging and surveillance program for 84 Pershing II Reentry Vehicles and other components, 99 Lance Missiles, 16 Polaris A-3 motors, 6 Orbus motors, Minuteman motors, 13 FMA's and 7 Castor IVB motors.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

- Continue the maintenance of existing support equipment and facilities at Redstone Arsenal, White Sands Missile Range, Kodiak, and Pacific Missile Range Facility.
- Continue the procurement of Trident motors for future use as targets. Quantity TBD based upon negotiations with the Navy.
- Follow on procurement of additional FMA Assets to support future target flight tests.

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

D. Acquisition Strategy

Targets and Countermeasures 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 targets prime contractor will continue to emphasize target product lines that develop target components such as booster stages, avionics, countermeasures, etc. As target developments and existing contracts are completed under Project 0705 (Block 04), the prime contractor will optimize target designs and developments completed for Block 04 and incorporate them as necessary to support Block 06 development. The prime contractor will also continue to provide capability-based and commonality target upgrades, as well as pursue target portfolio commonality in order to reduce cycle time and cost of BMDS target systems. Under this Project (0805), the four year base period of performance will expire. The government will either exercise the first option to continue with the prime, or re-compete the effort. As with Project 0705 (Block 04), the government will continue to maintain system responsibility and will ensure successful management of targets execution.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603888C Ballistic Missile Defense Test and Targets

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Target Development										
System Engineering	C/CPAF	Lockheed Martin/ Denver, CO	0	14,000	1/4Q	26,400	1/2Q	13,200	1/2Q	53,600
System Engineering	C/Various	TMI	0	0	N/A	1,000	1/3Q	1,000	1/3Q	2,000
System Engineering	C/Various	Huntsville, AL	0	0	N/A	75	1/2Q	0	N/A	75
System Engineering	C/Various	SBIR	0	0	N/A	0	N/A	1,000	1/3Q	1,000
Integration	C/Various	Multiple/ Lockheed Martin/ Denver, CO	0	0	N/A	4,857	1/2Q	2,661	1/2Q	7,518
Launch Vehicles	C/CPAF	Lockheed Martin/ Denver, CO	0	49,000	1/2Q	20,658	1/2Q	0	N/A	69,658
Target Support										
System Engineering	C/CPAF	Lockheed Martin/ Denver, CO.	0	6,800	1Q	78,516	1Q	137,878	1Q	223,194
System Engineering	C/FFRDC	JHU/APL/ Laurel, MD	0	0	N/A	1,500	1/2Q	2,213	1/2Q	3,713
System Engineering	C/Various	Sandia National Lab/New Mexico	0	0	N/A	1,200	1/2Q	1,224	1/2Q	2,424
Mission Management	C/Various	TSI	0	0	N/A	8,538	1/4Q	8,727	1/4Q	17,265
Mission Assurance	C/Various	Northup Grumman/ California	0	0	N/A	3,213	1/4Q	3,277	1/4Q	6,490
Payload Development										
Re-Entry Vehicles	C/CPAF	Lockheed Martin/ Denver, CO	0	5,600	1Q	25,674	1Q	10,287	1/2Q	41,561

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Re-Entry Vehicles	C/Various	Huntsville, AL	0	0	N/A	1,530	1/2Q	1,561	1/2Q	3,091
Countermeasures	C/CPAF	Lockheed Martin/ Denver, CO	0	10,840	1Q	20,704	1Q	7,147	1Q	38,691
Countermeasures	C/FFRDC	JHU/APL/ Laurel, MD	0	0	N/A	1,500	1/2Q	1,500	1/2Q	3,000
Instrumentation	C/Various	Sandia National Lab/New Mexico	0	19,882	1/2Q	6,286	1/3Q	4,759	1/3Q	30,927
Instrumentation	C/CPAF	Lockheed Martin/ Denver, CO	0	0	N/A	2,174	1Q	1,000	1Q	3,174
Instrumentation	C/FFRDC	MIT/LL/ Boston, MA	0	3,350	1/3Q	2,200	1/3Q	0	N/A	5,550
Instrumentation	C/Various	NSA/ Ft. Meade, MD	0	512	1/3Q	520	1/3Q	0	N/A	1,032
Asset Management										
Logistics	C/Various	RTTC	0	0	N/A	284	1/2Q	290	1/2Q	574
Logistics	C/Various	Lockheed Martin/ Denver, CO	0	3,000	1/2Q	15,365	1/2Q	10,522	1/2Q	28,887
Subtotal Product Development			0	112,984		222,194		208,246		543,424

Remarks

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Support Costs										

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

Project Total Cost			0	112,984		222,194		208,246		543,424

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603888C Ballistic Missile Defense Test and Targets

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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																																
Pilot Test and Evaluate Classified VPN																																
C4 Development																																
Countermeasures																																
Instrumentation																																
Re-Entry Vehicles																																
Testing Milestones																																
Long Range FMA Risk Reduction Flight																																
C4 Risk Reduction Flight																																
ABL																																
Aegis FTM 06-1																																
Aegis FTM 06-2																																
Aegis FTM 06-3																																
Aegis FTM 06-4																																
CMCM-3																																
CMCM-4																																
FTM-06-2 Japanese Cooperative JFM-1																																
FTM-06-4																																
GMD FT-06-6																																
GMD FTG 06-1a/b																																
GMD FTG 06-2																																
GMD FTG-04-5																																
KEI NFIRE-2a																																
KEI NFIRE-2b																																

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Testing Milestones																																
PAC-3 ATM-XX											◇																					
PAC-3 Task 7-2																	◇															
STSS DSMT1														◇																		
STSS DTMT1														◇																		
THAAD FTT 04-1											◇																					
THAAD FTT 06-1												◇																				
THAAD FTT 06-2													◇																			
THAAD FTT 06-3															◇																	
THAAD FTT 06-4																◇																
THAAD FTT 06-5																	◇															

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Development Milestones								
Pilot Test and Evaluate Classified VPN		1Q-4Q	1Q-3Q					
C4 Development		1Q-4Q	1Q-2Q					
Countermeasures		2Q-4Q	1Q-4Q	1Q-4Q	1Q			
Instrumentation		2Q-4Q	1Q-4Q	1Q-4Q	1Q			
Re-Entry Vehicles	4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q			
Testing Milestones								
Long Range FMA Risk Reduction Flight			4Q					
C4 Risk Reduction Flight			3Q					
ABL			3Q,4Q	3Q,4Q				
Aegis FTM 06-1			3Q					
Aegis FTM 06-2			4Q					
Aegis FTM 06-3				2Q				
Aegis FTM 06-4				4Q				
CMCM-3			3Q					
CMCM-4				3Q				
FTM-06-2 Japanese Cooperative JFM-1			2Q					
FTM-06-4				2Q				
GMD FT-06-6				1Q				
GMD FTG 06-1a/b			4Q					
GMD FTG 06-2				1Q				
GMD FTG-04-5			2Q					
KEI NFIRE-2a			2Q					
KEI NFIRE-2b			3Q					
PAC-3 ATM-XX			3Q					
PAC-3 Task 7-2					1Q			
STSS DSMT1				2Q				
STSS DTMT1				2Q				
THAAD FTT 04-1			3Q					
THAAD FTT 06-1			4Q					
THAAD FTT 06-2				1Q				
THAAD FTT 06-3				3Q				

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
THAAD FTT 06-4				4Q				
THAAD FTT 06-5					1Q			

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0905 Targets & Countermeasures Block 2008	0	0	10,293	37,991	177,463	163,430	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

The Targets and Countermeasures program provides capability-based targets to support Block 2008 integrated and layered BMDS testing. Targets developed under this project will test and enhance the BMDS capability by providing short, medium, and long range capability based targets with more complex payloads. Based on System Engineering assessments of possible threat scenarios, the targets and countermeasures program supports the Engagement Sequence Group (ESG) by launching targets to test the performance of the BMDS, ultimately enabling a weapon to engage a target. Funding for this program supports the continuation of targets prime contract activities, and the design, prototyping, development, certification, product improvement, and qualification testing of BMDS Block 2008 targets and associated payloads. It also supports the maintenance, aging surveillance, refurbishment, and routine testing of existing government furnished equipment (GFE) boosters, as well as the purchase of long lead material assets and asset management items for short, medium and long-range target components. This program also provides the technical support of mission management for Element flight tests. Similar to Project 0805 (Block 06), this Project (0905) will continue to rely upon the targets prime contractor to develop new target systems, as well as develop product lines of common target components. Existing designs, government furnished equipment, and Foreign Material Acquisition (FMA's) will continue to be utilized as necessary to minimize new developments, contain costs, and reduce cycle time. The Medium and Long Range Liquid Fuel Booster and the Strategic Range Air Launch Target programs were canceled.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Payload Development	0	0	10,293	37,991
RDT&E Articles (Quantity)	0	0	0	0

This effort provides funding for program management and development of: 1) unique target payload components (re-entry vehicles (RV's), countermeasures, instrumentation, adaptor sections, and deployment mechanisms), as well as optical on-target data collection instrumentation used for algorithm development/evaluation and payload characterization; 2) development of Fly Along Sensor Package (FASP) flight units / Spatially Diverse Sensor (SDS) for BMDS testing; 3) development of advanced instrumentation systems/techniques to include data collection and transmission techniques/methods; 4) development of advanced countermeasures to support BMDS flight testing and special systems engineering studies, and; 5) development of advanced RV concepts to support BMDS testing. There are no Articles of Quantity to report under this Task since the Payload Development delivery dates extend beyond FY 2007.

FY 2006 Planned Program:

- Development of unique target instrumentation.
- Development of advanced instrumentation and telemetry.
- Continue development of Spatially Diverse Sensor (SDS) platform (next generation FASP).
- Continue development of Instrumentation Inventory, including SDS to reduced cycle time required to produce targets.
- Continue to standardize instrumentation across Product Lines for telemetry, avionics, Flight Termination/Command Destruct Systems, GPS, etc.
- Continue the development and implement new techniques data telemetry during flight tests.
- Development of optical on-target data collection instrumentation used for algorithm development/evaluation and payload characterization.
- Continue development of enhanced Real-time Mission Monitoring for BMDS missions.

- Transition-to-limited-production several countermeasure designs from the National Labs to the Targets and Countermeasures Prime Contractor (TCPC).
- Continue to develop techniques, materials and processes for new prototype countermeasures.
- Conduct design studies to bring countermeasures designs to the Critical Design Review-level.
- Continue to develop a countermeasure inventory in support of BMDS flight tests.
- Build and characterize countermeasures for GMD flight tests.

FY 2007 Planned Program:

- Complete development and implement new techniques data telemetry during flight tests.
- Continue development of Instrumentation Inventory, including SDS to reduced cycle time required to produce targets. Continue to develop unique target instrumentation.
- Continue the development of advanced instrumentation and telemetry.
- Continue development of SDS platform.
- Continue to standardize instrumentation across Product Lines for telemetry, avionics, Flight Termination/Command Destruct Systems, GPS, etc.
- Continue the development of optical on-target data collection instrumentation used for algorithm development/evaluation and payload characterization.
- Continue development of enhanced Real-time Mission Monitoring for BMDS missions.
- Transition-to-limited-production several countermeasure designs from the National Labs to the TCPC.
- Continue to develop techniques, materials and processes for new prototype countermeasures.
- Conduct design studies to bring countermeasures designs to the Critical Design Review-level.
- Continue to develop a countermeasure inventory in support of BMDS flight tests.
- Build and characterize countermeasures for BMDS flight tests.

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
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PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
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PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

D. Acquisition Strategy

Targets and Countermeasures 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 targets prime contractor will continue to develop targets for use in MDA BMDS testing, with a continued emphasis on product line development and target component commonality. It is expected that the prime contractor will continue to refine and streamline the activities for which it is under contract, and as described in Section A of this Project. Under this Project (0905), the first two year option period of performance, for the prime contractor will expire, and the government will either exercise a second two year option, or re-compete the effort. As with Project 0805 (Block 06), the government will continue to maintain system responsibility and will ensure successful management of targets execution.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Payload Development										
Re-Entry Vehicles	C/CPAF	Lockheed Martin/ Denver, CO	0	0	N/A	0	N/A	19,497	1/2Q	19,497
Countermeasures	C/CPAF	Lockheed Martin/ Denver, CO	0	0	N/A	0	N/A	9,630	1/2Q	9,630
Instrumentation	C/CPAF	Lockheed Martin/ Denver, CO	0	0	N/A	6,720	1/2Q	4,535	1/2Q	11,255
Instrumentation	C/FFRDC	Sandia National Lab/New Mexico	0	0	N/A	3,573	1/2Q	3,800	1/2Q	7,373
Instrumentation	C/Various	NSA/ Ft. Meade, MD	0	0	N/A	0	N/A	529	1/2Q	529
Subtotal Product Development			0	0		10,293		37,991		48,284

Remarks

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Support Costs										

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

Project Total Cost			0	0		10,293		37,991		48,284

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603888C Ballistic Missile Defense Test and Targets

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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																																
Instrumentation																																
Countermeasures																																
Re-Entry Vehicles																																
Testing Milestones																																
ABL																			◇	◇	◇	◇	◇	◇								
Aegis FTM 08-1																				◇												
Aegis FTM 08-2																						◇										
Aegis FTM 08-3																							◇									
Arrow USFT-3																		◇														
Arrow USFT-4																		◇														
CMCM-5																			◇													
CMCM-6																							◇									
GMD FT 08-1																					◇											
GMD FTG 08-2																		◇														
GMD FTG 08-3a/b																				◇												
GMD FTG 08-4																						◇										
GMD FTG 08-5																							◇									
GMD FTG 08-6a/b																								◇								
PAC-3 Task 7-3																		◇														
STSS DSMT2																			◇													
STSS DTMD3&4																				◇												
STSS DTMT2																		◇														
THAAD FTT 08-1																			◇													

Project: 0905 Targets & Countermeasures - Block 2008

MDA Exhibit R-4 (PE 0603888C)

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Testing Milestones																																
THAAD FTT 08-2																			◇													
THAAD FTT 08-3																					◇											
THAAD FTT 08-4																					◇											
THAAD FTT 08-5																						◇										
THAAD FTT 08-6																						◇										

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603888C Ballistic Missile Defense Test and Targets

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Development Milestones								
Instrumentation			1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q		
Countermeasures				1Q-4Q	1Q-4Q	1Q-4Q		
Re-Entry Vehicles				1Q-4Q	1Q-4Q	1Q		
Testing Milestones								
ABL					3Q,4Q	1Q,2Q,3Q,4Q		
Aegis FTM 08-1					4Q			
Aegis FTM 08-2						2Q		
Aegis FTM 08-3						3Q		
Arrow USFT-3					2Q			
Arrow USFT-4					2Q			
CMCM-5					3Q			
CMCM-6						3Q		
GMD FT 08-1						1Q		
GMD FTG 08-2					2Q			
GMD FTG 08-3a/b					4Q			
GMD FTG 08-4						2Q		
GMD FTG 08-5						3Q		
GMD FTG 08-6a/b						4Q		
PAC-3 Task 7-3					2Q			
STSS DSMT2					3Q			
STSS DTMD3&4					4Q			
STSS DTMT2					2Q			
THAAD FTT 08-1					3Q			
THAAD FTT 08-2					3Q			
THAAD FTT 08-3						1Q		
THAAD FTT 08-4						1Q		
THAAD FTT 08-5						2Q		
THAAD FTT 08-6						2Q		

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0005 Targets & Countermeasures Block 2010	0	0	0	0	4,188	32,379	200,479	204,974
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

The Targets and Countermeasures program provides capability-based targets to support Block 2010 integrated and layered BMDS testing. Targets developed under this project will test and enhance the BMDS capability by providing short, medium, and long range capability based targets with more complex payloads. Based on Missile Defense National Team (MDNT) assessments of possible threat scenarios, the targets and countermeasures program supports the Engagement Sequence Group (ESG) by launching targets to test the performance of the BMDS, ultimately enabling a weapon to engage a target.

Funding for this program supports the continuation of targets prime contract activities, and the design, prototyping, development, certification, product improvement, and qualification testing of BMDS Block 2010 targets and associated payloads. It also supports the maintenance, aging surveillance, refurbishment, and routine testing of existing government furnished equipment (GFE) boosters, as well as the purchase of long lead material assets and asset management items for short, medium and long-range target components. This effort provides funding for program management and the development of various countermeasures for BMDS flight testing, including characterization and ground testing of those countermeasure systems. This program also provides the technical support of mission management/mission assurance for all Element flight tests and advanced development for long range strategic targets. Similar to Project 0905 (Block 08), this Project (0005) will continue to rely upon the targets prime contractor to develop new target systems, as well as develop product lines of common target components. Existing designs, government furnished equipment, and Foreign Material Acquisition (FMA's) will continue to be utilized as necessary to minimize new developments, contain costs, and reduce cycle time. .

The Enhanced Target Delivery System (ETDS) target will be developed and available to support Block 2010 testing:

- The ETDS is a conceptual target which will emulate a long-range strategic target used to test the integrated and layered BMDS. It is anticipated that the ETDS development will be initiated by the targets prime contractor in FY09, with a booster demonstration occurring in FY10. These dates for beginning and completing the ETDS reflect a delay of program start. Decision to delay start of this target, which would have heavier lift and longer range capacity, was based on the pace of testing for the Ground-Based Midcourse Defense and BMDS, and the need to rebalance based on current priorities. Start and end dates for this program are notional until the systems engineering requirements cycle is completed and detailed program content and schedule has been developed.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Funding in this Project is not programmed until FY 2008.	0	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

C. Other Program Funding Summary

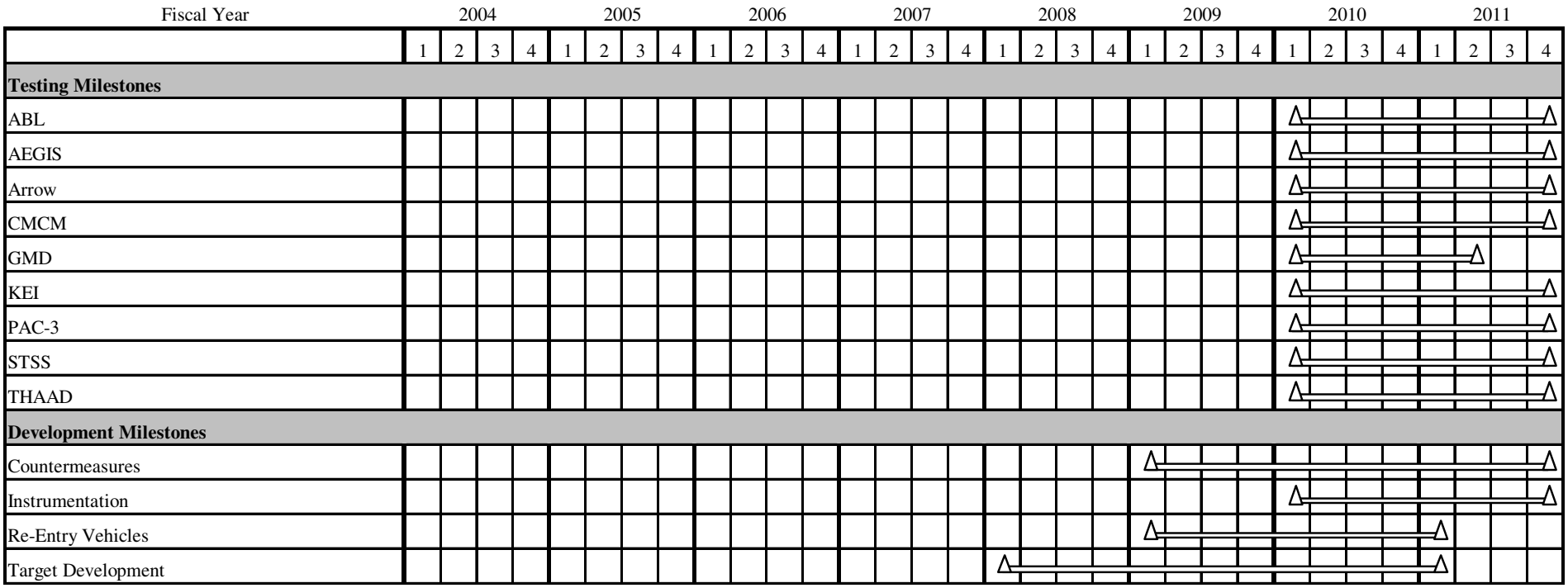
	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

D. Acquisition Strategy

Targets and Countermeasures 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 targets prime contractor will continue to develop targets for use in MDA BMDS testing, with a continued emphasis on product line development and target component commonality. It is expected that the prime contractor will continue to refine and streamline the activities for which it is under contract. Under this Project (0005), the second two year option period of performance, for the prime contractor will expire, and the government will either exercise a third two year option, or re-compete the effort. As with Projects 0805 (Block 06) and 0905 (Block 08), the government will continue to maintain system responsibility and will ensure successful management of targets execution.

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**



Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Testing Milestones								
ABL							1Q-4Q	1Q-4Q
AEGIS							1Q-4Q	1Q-4Q
Arrow							1Q-4Q	1Q-4Q
CMCM							1Q-4Q	1Q-4Q
GMD							1Q-4Q	1Q-2Q
KEI							1Q-4Q	1Q-4Q
PAC-3							1Q-4Q	1Q-4Q
STSS							1Q-4Q	1Q-4Q
THAAD							1Q-4Q	1Q-4Q
Development Milestones								
Countermeasures						1Q-4Q	1Q-4Q	1Q-4Q
Instrumentation							1Q-4Q	1Q-4Q
Re-Entry Vehicles						1Q-4Q	1Q-4Q	1Q
Target Development					1Q-4Q	1Q-4Q	1Q-4Q	1Q

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0602 Program-Wide Support	34,139	6,239	6,543	9,912	10,175	10,490	14,970	9,690
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

Program-Wide Support provides funding for common support functions across the entire program such as strategic planning, program integration, cost estimating, contracting, financial management to include preparation of financial statements, reimbursement of financial services provided by DFAS, internal review and audit, earned-value management, and program assessment. Includes costs for both government civilians performing these functions as well as support contractors providing government staff augmentation in these areas. Applies to costs at the MDA HQ as well as its Executing Agents in the Services: Army Space and Missile Defense Command, Army PEO Space and Missile Defense, Office of Naval Research, and various Air Force laboratory and acquisition activities. Other costs include physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses at the various MDA Executing Agent locations, which at the MDA HQ are generally funded from the Management Headquarters Program Element (0901598C). Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Civilian Salaries and Support	34,139	6,239	6,543	9,912
RDT&E Articles (Quantity)	0	0	0	0

See Section A: Mission Description and Budget Item Justification

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603888C Ballistic Missile Defense Test and Targets**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
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PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total PE Cost	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729
0701 Command and Control, Battle Management and Communications (C2BMC) Block 2004	92,457	154,001	22,536	16,200	0	0	0	0
0801 Command and Control, Battle Management and Communications (C2BMC) Block 2006	52,480	24,033	142,138	153,042	23,801	16,700	0	0
0901 Command and Control, Battle Management and Communications (C2BMC) Block 2008	687	10,798	75,900	100,000	197,026	166,031	65,745	56,075
0001 Command and Control, Battle Management and Communications (C2BMC) Block 2010	0	0	0	11,500	60,600	104,566	217,755	223,633
0702 Hercules Block 2004	4,575	0	0	0	0	0	0	0
0802 Hercules Block 2006	26,956	37,161	7,521	0	0	0	0	0
0902 Hercules Block 2008	22,532	46,095	52,096	48,755	23,881	13,319	0	0
0002 Hercules Block 2010	0	0	11,000	18,451	42,000	52,000	65,071	65,856
0703 Joint Warfighter Support Block 2004	32,748	24,178	0	0	0	0	0	0
0803 Joint Warfighter Support Block 2006	0	0	56,518	66,047	0	0	0	0
0903 Joint Warfighter Support Block 2008	0	0	0	0	61,571	62,774	0	0
0003 Joint Warfighter Support Block 2010	0	0	0	0	0	0	64,887	68,564
0204 Joint National Integration Center (JNIC)	53,830	71,367	76,895	80,688	82,661	84,736	85,925	86,581
0602 Program-Wide Support	23,684	16,197	10,548	15,299	17,621	16,473	16,634	15,020
Amount Included in PE 0904903D	0	0	0	0	-67,100	-64,600	-64,100	-52,900
Total PE Cost Reflected in R-1	309,949	383,830	455,152	509,982	442,061	451,999	451,917	462,829

Note:
Beginning in FY 2005, all funding transitioned from BMD System Core PE (0603890C - Project 0201) to the BMD Products PE (0603889C - Projects 0701, 0801, 0901 and 0001).

A. Mission Description and Budget Item Justification

The mission of the Missile Defense Agency (MDA) is to develop an integrated layered Ballistic Missile Defense System (BMDS) to defend the United States, its deployed forces, friends, and allies from ballistic missiles of all ranges and in all phases of flight. Integrated layered BMDS provides defense in depth to the warfighter with global command and control of overlapping and complimentary sensors and weapon systems acting in concert with the unitary purpose of defending against all ranges of ballistic missile threats. The Ballistic Missile Defense Products program element funds specific system-level efforts that deliver integrated BMDS to the warfighter. This program element consists of four mission essential BMDS projects: Command and Control, Battle Management, and Communications (C2BMC), Hercules, and Joint Warfighter Support with efforts articulated across Blocks 2004, 2006, 2008, and 2010; and, the Joint National Integration Center.

C2BMC is the lynchpin of the BMDS, without which there is no integrated layered defense. While traditional ballistic missile defense development efforts produced individual elements highly capable of addressing specific threat sets, they were only loosely connected point-to-point in a systems-of-systems approach - i.e., they were part of a ballistic missile defense system but were not an

integrated ballistic missile defense system. This loose federation of weapon systems, each with its own unique sensors, weapons, and fire control was unable to share information and data such that the optimum sensor-weapon system combination could simultaneously address individual or multiple range threats. The Ballistic Missile Defense Products C2BMC Program will deliver integrated layered defense by networking and unifying (common purpose) individual element components (sensors, weapon systems, fire control) with all military echelons across the globe. It will allow the President, SECDEF, and Combatant Commanders at strategic and tactical levels to systematically plan the fight (Planner), commonly see it unfold (Situation Awareness), dynamically direct/adjust (Battle Management) networked sensors and weapons systems (Network) to optimally engage (one shot - one kill) ballistic missile threats at any range, in any phase of flight, at any time. Although long desired by DoD, networking of sensors and weapons systems on this scale with world-wide military command and control echelons has never been done before.

Prioritizing work on those elements and components identified by Engagement Sequence Group through MDA's systems engineering process, the Command and Control, Battle Management and Communications (C2BMC) Program delivers integrated, layered Ballistic Missile Defense (BMD) to the warfighters by developing and delivering products that provide: the warfighter the capability to conduct collaborative and dynamic, real-time BMD planning for layered defense among Combatant Commanders; common BMD situational awareness of the global battlespace at all BMD leadership levels, from Combatant Commanders to the Secretary of Defense and the President; sensor netting (i.e. combining and optimizing geographically distributed sensors and weapons) to maximize the capability to detect and track all ballistic missile threats; the warfighter the capability to coordinate BMD weapon-system engagements (i.e. manage the battle) real-time by selecting the best sensor-weapon combination to achieve the highest probability of kill; and, integrated BMD capabilities through global grid data and communication networks. By enabling integrated, layered BMD, the C2BMC Program provides the warfighter the capability to: rapidly identify and concurrently track multiple ballistic missile threats; dynamically adjust BMD system resources to maintain multiple ballistic missile threats in a BMD kill zone through all phases of flight; and concurrently engage multiple ballistic missile threats in any area of responsibility, in any phase of flight, at any time. The program sequentially builds upon ever increasing BMDS capability while also optimizing use of other emerging DoD communication and data networks. The BMDS' underlying success depends on planning for a defense design to optimize engagement sequences, ability to observe the battle as it unfolds, and ability to dynamically adjust available sensors and weapons to attain the highest probability of kill. Multiple assessments have confirmed C2BMC is the biggest challenge for an integrated BMDS. Funding reductions in this area will jeopardize MDA's ability to integrate multiple components being developed and fielded by multiple prime contractors into a single integrated system.

Project Hercules contributes to the C2BMC Program and BMDS weapons and sensor components by providing and integrating advanced sensor netting and battle manager algorithms. This is a national effort to develop robust detection, tracking, and discrimination algorithms to counter off nominal and evolving missile threats. Hercules is also developing a physics-based Decision Architecture that applies advanced decision theory to future BMDS command, control, and battle management (C2BM) concepts. In addition to a general program to develop algorithms useful against targets in all phases of flight, Hercules has specific projects to develop algorithms for forward based sensors, the Decision Architecture, and mitigating countermeasures. Hercules develops algorithms to enhance BMDS element capabilities in Block 06, 08 and beyond and will provide these algorithms to the BMDS elements for insertion into their respective programs.

The Joint Warfighting community (the Combatant Commands [COCOMS], and the Services) have a critical role in developing the BMDS. MDA must work collaboratively with this community. The Joint Warfighter Support Program (JWSP) is the vehicle to enable this collaborative interaction. The JWSP allows MDA to work with the Joint Warfighters to define applicable BMD capabilities, develop operational concepts, formulate logistical sustainment policies and procedures, and enable deployment of these capabilities by providing the means for the COCOMS to rehearse for and validate their BMD missions. The JWSP interacts with the BMDS user community via a series of exercises, war games, seminars, studies, and training/education modules.

The Joint National Integration Center (JNIC) operates and maintains concurrent Research, Development, Test and Evaluation and warfighter operations centers for the C2BMC and Ground-based Midcourse Defense elements of the Ballistic Missile Defense System (BMDS). It provides mission critical system technical capabilities and subject matter expertise in a dedicated and adaptable environment that enables developers, testers, and operators to evolve, assess and quickly deliver the capabilities required to field a viable BMDS required for BMDS Engagement Sequence Group execution. As the field-operating activity for MDA in Colorado Springs, CO, the JNIC consists of a highly secure research and development building and a consolidated support facility totaling almost a million square feet. It provides MDA with worldwide secure communications connectivity throughout the missile defense community. The JNIC is the premier missile defense BMC3 integration and interoperability facility and a modeling and simulation center for wargaming and testing.

Program-Wide Support provides funding for common support functions across the entire program such as strategic planning, program integration, cost estimating, contracting, financial management to include preparation of financial statements, reimbursement of financial services provided by DFAS, internal review and audit, earned-value management, and program assessment. Includes costs for both government civilians performing these functions as well as support contractors providing government staff augmentation in these areas. Applies to costs at the MDA HQ as well as its

Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Executing Agents in the Services: Army Space and Missile Defense Command, Army PEO Space and Missile Defense, Office of Naval Research, and various Air Force laboratory and acquisition activities. Other costs include physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses at the various MDA Executing Agent locations, which at the MDA HQ are generally funded from the Management Headquarters Program Element (0901598C). Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

B. Program Change Summary	FY 2004	FY 2005	FY 2006	FY 2007
Previous President's Budget (FY 2005 PB)	305,309	418,608	421,049	445,971
Current President's Budget (FY 2006 PB)	309,949	383,830	455,152	509,982
Total Adjustments	4,640	-34,778	34,103	64,011
Congressional Specific Program Adjustments	0	-13,500	0	0
Congressional Undistributed Adjustments	0	-21,278	0	0
Reprogrammings	4,757	0	0	0
SBIR/STTR Transfer	-117	0	0	0
Adjustments to Budget Years	0	0	34,103	64,011

FY 2005

- Congressional reductions and undistributed reductions

FY 2006/FY 2007

- Added C2BMC Program content to address:
  - Asymmetric and non-traditional threats, through a globally integrated weapon system and sensor architecture.
  - Ability to defend Deployed Forces/Friends and Allies through an integrated BMDS incorporating additional sensors and weapons.
- A 15% reduction in new RF and EO/IR tracking, discrimination, and battle management algorithms, reducing BMDS boost, midcourse, and terminal layer robustness and slowing upgrades for handling several potential enemy countermeasures.
- A 20% reduction in testing of algorithms, increasing BMDS component risk associated with inserting advanced tracking, discrimination, and battle management concepts.
- A 12% reduction in performance improvement and technology integration studies, increasing the risk associated inserting advanced tracking, discrimination, and battle management technologies.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0701 Command and Control, Battle Management and Communications (C2BMC) Block 2004	92,457	154,001	22,536	16,200	0	0	0	0
RDT&E Articles Qty	11	7	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

In collaboration with the Missile Defense Agency's Systems Engineering and Integration defined architectures and system specifications, the Command and Control, Battle Management and Communications (C2BMC) Program provides the warfighter the capability of planning the Ballistic Missile Defense (BMD) fight while concurrently: tracking all potential ballistic missile threats; directing weapons to engage via a distributed network and paring any sensor with any weapon system to defeat ballistic missile threats at any range, in any phase of flight, in all theaters, and with coalition partners.

FY 2005 Congressional and undistributed funding reductions significantly impacted the following Block 2004 activities: a. Deferred to future block the development and delivery of essential situational awareness information on health and status of BMDS elements for warfighter decision-making process. Without this capability, warfighters must default to secure phone communications which adds cost and complexity to operations as well as workload to the operators; b. Deferred to future block the development and delivery of BMDS Network Management for global fault-management, configuration management, accounting, performance, and security (FCAPS). Fault management is the detection and correction of global network problems to keep the global network operational. Additionally, potential future problems are identified, and steps are taken to prevent them from occurring or recurring. Configuration management of the BMDS Network is controlling hardware and programming changes to include the addition of new equipment and programs, modification of existing systems, and removal of obsolete systems and programs. BMDS Network accounting is devoted to distributing resources optimally and fairly among network subscribers. This makes the most effective use of the systems available, minimizing the cost of operation. BMDS Network performance management involves managing the overall performance of the network: throughput is maximized, bottlenecks are avoided, and potential problems are identified. A major part of the effort is to identify which improvements will yield the greatest overall performance enhancement. BMDS Network security is the protection against hackers, unauthorized users, potential adversaries, and physical or electronic sabotage. The security systems also allow network administrators to control what each individual authorized user can (and cannot) do with the system; c. Deferred to future block the development of essential interface of the sea-based X-band radar (SBX) to the BMDS Network. Until the interface is designed, developed, and delivered, the SBX utility to the BMD mission is limited to a single element. The warfighter will not have the option to employ the SBX in any engagement sequences other than those involving GMD until this interface is delivered to the BMDS. This further delays the realization of a layered defense capability to our warfighters.

By the end of Block 2004, the C2BMC Program will deliver the rudimentary foundation for integrated, layered defense by delivering new and enhanced capabilities for BMD Planner, BMD Situational Awareness, Advanced Battle Manager, and the BMDS Network. Specifically, the C2BMC Program will: design and deliver initial displays that portray the BMD battlespace and provide initial Force level planning to the warfighter; develop and deliver a battle management prototype incorporating Forward Deployed X-Band (FBX-T) sensor management; and, deliver redundant communication paths to ensure a robust network. These capabilities will enable Engagement Sequence Groups (ESG) that involve the following BMDS elements and components: Ground Based Interceptor (GBI), Standard Missile 3 (SM-3), Cobra Dane Upgraded Early Warning Radar, SPY-1 Sensor, and Forward Based X-Band (FBX-T) Sensor. Additionally, C2BMC installation sites have been or will be activated and supported as a part of Block 2004 to enable the warfighter to perform BMD. As the number of activated sites and maturity of the C2BMC capability increases, the C2BMC Program continues concurrent development and operational integration and testing, as well as sustains fielded capabilities. Thus, Block 2004 includes infrastructure development, testing activity and operations and support to ensure accomplishment of all block objectives.

C2BMC ELEMENT

The C2BMC Element accomplishes block objectives by balancing the development of it's four principle product lines: Situational Awareness, Planner, Battle Management, and Network. This approach ensures that mature capabilities can be integrated and incrementally delivered to the warfighter. Two major and two minor incremental deliveries, or Spirals, are planned in each two-year Ballistic Missile Defense System (BMDS) Block. Each spiral represents an improvement in capability and functionality over the previous spiral. The delivery of these Spirals includes the software,

hardware, and network connectivity needed to operate an integrated BMDS. The capability delivered in the Spirals enables BMDS ESGs by providing the proper interfaces, planning and coordination to allow the System elements and components to work together effectively.

Situational Awareness and Planner products comprise the Command and Control (C2) portion of C2BMC. The Situational Awareness and Planner architecture is based on several design features emphasizing flexibility and interoperability. The architecture is designed to utilize an open system approach. This approach also provides an evolution path for technology upgrades. The Situational Awareness and Planner architecture is also designed to be scalable and utilizes a multi-vendor enterprise. The Planner aspect of C2 emphasizes planning for both theater and global missile defense through all planning phases: deliberate, crisis and execution. The planner will provide the capability to coordinate with all weapon system elements in an integrated, layered fashion. This type of coherent planning will result in BMD for the full range and complexity of ballistic missile threats. To ensure that the full C2BMC capability is realized by all weapon system elements, the architecture will migrate to a net-centric (vice point to point) planner to ensure both vertical and horizontal collaboration. Block 2004 development includes the following Situational Awareness and Planner capabilities: sensor management display (FBX-T Sensor) and Integrated Ballistic Missile Picture (IBMP), BMDS Summary Screen (SS), Executive Displays (displays all BMDS track and status data); provide basic force level planning capability; planning load robustness that protects against incomplete/inaccurate planning data; initial external XML interface with Air and Missile Defense Work Station (AMDWS) planner. Situational Awareness development also integrates current planning tools and development from the Defense Information Services Agency (DISA), Command and Control Information Control System (CCI2S), and various Joint Development Planners.

Battle Management comprises the decisions and actions executed in direct response to the activities of enemy forces in support of the Joint Chiefs of Staff's concept of precision engagement. In Block 2004, the battle management portion of C2BMC develops and delivers FBX-T Sensor Management including Operational State Control, Sensor Tasking (cue), and Resource Management increasing the effectiveness of the radar system within the BMDS. Initial type interface with X-Band is also developed. In addition, track data management capability is improved to include forwarding of FBX-T tracks to Ground Based Missile Defense Fire Control (GFC), track filtering and Launch event association improving the battlespace depiction and targeting information for BMDS weapon systems. Initial development also starts on the Advanced Battle Manager

The Network Communications portion of C2BMC ensures that communications and networking are not the limiting factor in fielding or operation of the BMDS. The intent is to develop and deliver products that provide robust connectivity to quickly and unambiguously share information across the global BMD and with external users. Effective networking will rely on an interconnection of a variety of platforms and capabilities. In Block 2004, network capability is delivered to enable AEGIS-GMD engagement sequence groups (ESG), Joint Range Extension for SATCOM interface, initial network monitoring and management, FBX-T initial deployment, Communications Network Equipment (CNE) auto-failover, network operations and security center and support of dual redundant suites. The C2BMC Program not only develops the network architecture but also fields and maintains communications lines procured through DISA, as well as fielding and maintaining joint range extension equipment to enable a global network grid.

As the C2BMC products mature they are engineered and integrated into fielded Spirals. The C2BMC element uses spiral development (incremental development, test, and fielding) to produce the software required to provide a system-wide integrated BMD capability. Block 2004 matured products are integrated in Spirals 4.1 through 4.5 and delivered to the field for concurrent development testing and operational use in conjunction with the schedules and guidance of MDA's Responsible Test organization/Responsible Engineering Organization (REO/RTO). Spirals 4.1 and 4.2 provided infrastructure (including the development environment and initial message and track processing) and deliberate and dynamic planning (including planning tools and additional message processing and collaborative tools). Spiral 4.3 focuses on developing Initial Defensive Operations (IDO) capability, and is updated with spiral 4.4. Block 2004 is completed with the development and delivery of Spiral 4.5.

Spirals 4.3 and 4.5 deliver specific capabilities, with successive spirals improving in capability and functionality. Spiral 4.3 emphasizes the command and control products of Situational Awareness and Planner. The capabilities delivered consist of 2D and 3D track displays, weapon and sensor engagement timeline, system health and status, GO/NO GO summary displays, executive displays, data synchronization and Distributed Multi-Echelon Training System (DMETS) Initial Training capability. In addition, Network functionality is provided in Communication Node Equipment (CNE), Joint Range Extension (JRE) and network management tools. Spiral 4.4 serves as an update to the previous spiral version, incorporating knowledge gained from BMDS Test Bed activity and user feedback. Spiral 4.5 deploys the complete Block 2004 capability, providing improved capability and functionality in all C2BMC product lines. Situational Awareness updates: the sensor management display to show all BMDS track and status information; IBMP, BMDS Summary Screen (SS), and Executive Displays adding FBX-T. Network communications capability is increased, adding CNE failover,

network and security center and initial sensor netting. Battle Management capability consists of FBX-T sensor state control and monitoring, sensor tasking for FBX-T, track forwarding of FBX-T data to GFC/GBI, and initial GMD ability to engage on network information.

SITE ACTIVATION

In addition to Block 2004 spiral software, fielding capability in FY 2005 for Block 2004 includes installation and activation of C2BMC dual suites at STRATCOM and NORTHCOM, one suite at PACOM, National Capital Region (NCR) Situational Awareness Capability, one workstation with 4 monitors and 2 C2BMC communications racks at the MDA Operations Center (MOC), Communications Connectivity from STRATCOM to Ft. Greely and additional communication links to FBX-T. The STRATCOM suites consist of 8 Enterprise Work Stations (EWS) with 4 monitors at each station, 2 C2BMC Server racks and 2 C2BMC communications racks. The NORTHCOM suites consist of 9 EWS with a total of 23 monitors, 2 C2BMC Server racks, 2 C2BMC Communications racks and 1 EWS and monitor at JNIC. The PACOM suite consists of 1 communications rack, 2 Joint Range Extension (JRE) Systems, 2 UHF antennas, 1 GPS antenna and 4 situational awareness web browsers. NCR situational awareness capability will consist of 2 web browsers and situational awareness video distribution equipment. The activation of these sites will result in improved reliability, availability and initial Concurrent Test and Operations (CTO) capability.

INTEGRATION AND TEST

The C2BMC Program developed and maintains a Test Bed at the Joint National Integration Center on Shriever AFB, CO for software integration and testing, system exercises, and operational support. The JNIC hosts three C2BMC Spiral integration and testing laboratories (BITC), and the C2BMC-Experimental Laboratory (C2BMC-X). Capabilities and functions located at the JNIC supporting the development of the BMDS C2BMC include: integration and test of C2BMC software Spirals; C2BMC experimentation supported by broad area announcements for independently developed software which may have application in the BMDS and C2BMC operations and maintenance, licenses and upgrades for the BITC and C2BMC-X laboratories. Additional software development laboratories are also maintained at the prime contractor's facilities in Huntsville AL and Colorado Springs CO.

OPERATIONS AND SUPPORT

C2BMC Program Operations and Support consists of On-Site Support, Help Desk activities, and hardware/software maintenance. On-Site Support provides assistance to the System Administrator, assigned by the site (e.g. Component Commands), with the general operational support of the C2BMC system, integration of the C2BMC support processes into the site's support regimen, and daily network operations and security support for the C2BMC system as part of a transition plan. Prime contractor personnel provide ``over-the-shoulder`` support to users when requested, or alternatively, contact the Help Desk. The Help Desk is located in Colorado Springs, CO. The help desk provides technical support to onsite personnel and to the C2BMC end-user, review of hardware/software problems and coordination of Commercial Off-the-Shelf (COTS) developer/vendor service calls, trouble ticket work-off, tracking and implementing documented escalation procedures, collecting of metrics and maintenance of the Help Desk website. This service will be delivered on a 24x7x365 basis. Maintenance of the C2BMC Element covers both software and hardware maintenance. The goal is to maintain the BMDS C2BMC at a pre-determined availability. Software maintenance support will be based on the use of Help Desk personnel who will field incoming trouble calls and request software engineering support as required. Scheduled (preventative and non-critical remedial) and unscheduled hardware maintenance issues will be managed by the prime contractor as appropriate.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
C2BMC Element	51,771	102,951	6,600	0
RDT&E Articles (Quantity)	1	2	0	0

The C2BMC Element accomplishes block 2004 objectives by balancing the development of four principle product lines -- Situational Awareness, Planner, Battle Management, and Network -- so that mature capabilities can be integrated and incrementally delivered to the warfighter via Spirals. Block 2004 includes infrastructure development, testing activity, as well as sustainment of fielded capabilities.

FY 2004 Accomplishments:

FY 2004 RDT&E Articles: Spiral 4.3

- Began Spiral 4.4 development
- Began Spiral 4.5 development
- Delivered Spiral 4.3 (RDT&E Article) with the following capabilities:
    - Situational Awareness
        - 2D and 3D Track Display
        - Weapon/Sensor Engagement Timeline
        - Health and Status
        - Go Summary Display
        - Execute Display Data Synchronization
        - Distributed Multi-Echelon Training System (DMETS)
    - Deliberative Planner Created
        - Defense Design
        - Analyzed Defense Design
        - Merged Defense Design
    - Network
        - Communication Node Equipment (CNE)
        - Joint Range Extension Network Management Tools

FY 2005 Planned Accomplishments:

FY 2005 RDT&E Articles: Spiral 4.4 & Spiral 4.5

- Complete Spiral 4.4 development
- Complete Spiral 4.5 development
- Deliver Spiral 4.4 (RDT&E Article) which will provide high priority fixes to Spiral 4.3 based on warfighter feedback

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- Deliver Spiral 4.5 (RDT&E article) providing:
  - Situational Awareness
    - FBX-T Sensor Management Display
    - IBX, SS, Executive Displays
    - Adds FBX-T
  - Deliberative Planner
    - Improve User Interface
    - Performance Enhancements
  - Battle Management
    - FBX-T Sensor Control/Monitor
    - Sensor Tasking for FBX-T
    - Track Forwarding FBX-T data to GFC/GBI
    - Initial GMD engage on net
  - Network
    - CNE Auto Failover
    - Network Operations and Security Center
    - Initial Sensor Netting

FY 2006 Planned Program:

- Conduct Block 2004 Functional and Physical Configuration Audit
- Identify system anomalies and, concurrently with the user, prepare System Modification Reports (SMR)
- Design, Develop, and test fixes to resolve SMR's.

	FY 2004	FY 2005	FY 2006	FY 2007
C2BMC Site Activation	13,944	8,600	0	0
RDT&E Articles (Quantity)	10	5	0	0

Site Activation efforts address fielding of the C2BMC Suites (both full and remote configuration), fielding supporting Communications Gateways, and fielding web browser based C2BMC nodes. This activity consists of two primary tasks. The first task includes planning for and installing C2BMC Components and completing required site surveys and Site Activation Plans and Site Installation Documents. The second task is to provide activation support, including equipment procurement, staging and inventory control.

FY 2004 Accomplishments:

FY 2004 RDT&E Articles: 2 Full C2BMC Suites, 4 Remote Workstations, 1 Web Browser, 3 Gateways.

- Installed full C2BMC Suite at STRATCOM (RDT&E Article)
- Installed full C2BMC Suite at JNIC (RDT&E Article)
- Installed Remote Workstation at NORTHCOM (RDT&E Article)

- Installed Remote Workstation at the MOC (RDT&E Article)
- Installed Distributed Training Remote Workstation (RDT&E Article)
- Installed NCR Remote Workstation at National Military Command Center, SECDEF Executive Support Center, and White House Situation Room and Presidential Emergency Operations Center(RDT&E Article)
- Installed PACOM Web Browser (RDT&E Article)
- Installed Tech Ops Gateway (RDT&E Article)
- Installed Pacific Gateway to support GMD-Aegis engagement (RDT&E Article)
- Installed Ft. Greely Gateway (RDT&E Article)

FY 2005 Planned Accomplishments:

FY 2005 RDT&E Articles: 3 Full C2BMC Suites, 1 Gateway, 1 Web Browser

- Install full STRATCOM Suite (RDT&E Article)
- Install full NORTHCOM Suite (RDT&E Article)
- Install full PACOM Suite (RDT&E Article)
- Install FBX-T Gateway (RDT&E Article)
- Install National Capital Region Browser (RDT&E Article)

	FY 2004	FY 2005	FY 2006	FY 2007
C2BMC Integration, Test Experimentation And Operation	17,000	25,530	0	0
RDT&E Articles (Quantity)	0	0	0	0

The Joint National Integration Center (JNIC) is host to three C2BMC Spiral Integration & Testing Laboratories (BITC), and the C2BMC-Experimental Laboratory (C2BMC-X). The following capabilities and functions located at the JNIC support the MDNTB(I)'s development of the BMDS C2BMC Element: Integrate and test of C2BMC software Spiraling deliveries from the Development Team to the Integration &Test (I&T) team; C2BMC experimentation supported by Broad Area Announcements for independently developed software which may have applications in the BMDS; Operational Support to the USNORTHCOM C2BMC Suite located at the JNIC; C2BMC Operations & Maintenance, Licenses and Upgrades for the BITC and C2BMC-X laboratories.

FY 2004 Accomplishments:

- Spiral 4.2 and 4.3 element integration
- Spiral 4.3 and 4.4 Cycle 3 testing
- Developed the Test Environment and the C2BMC Test Article Simulation Environment
- Initiated development of BMDS C2BMC Concept of Operations
- Build-out of BITC-3 labs for Spiral 4.3
- Ran full schedule of C2BMC-X events and Experimentation including support of:
    - Integrated Missile Defense (IMD) 03
    - Missile Defense Integration Exercises (MDIE)-04 A
    - Missile Defense Integration Exercises (MDIE)-04 B

- Pacific Explorer (PACEX) III
- Pacific Explorer (PACEX) IV
- Ground Test (GT)-185
- Integrated Ground Test (IGT)-4
- Integrated Missile Defense (IMD) 4.2
- Integrated Missile Defense (IMD) 4.4

FY 2005 Planned Accomplishments:

- Spiral 4.4 and 4.5 Cycle 3 testing
- Upgrade Test Environment and the C2BMC Test Article Simulation Environment
- Continue development of C2BMC Concept of Operations
- Upgrade CNE for BITC Lab Spiral 4.3
- Continue full schedule of C2BMC-X Events and Experimentation
- Add new Communications and Connectivity, C4I Tools
- Run full schedule of C2BMC-X Events and Experimentation including support of:
  - Integrated Missile Defense War Games 04-2, 04-3 and 04-4
  - EUCOM Exercise
  - Integrated Ground Test 5 and 6
  - Missile Defense Integration Exercise 05a
  - Distributed Ground Test 1 and 2

	FY 2004	FY 2005	FY 2006	FY 2007
Operations And Support	9,742	16,920	15,936	16,200
RDT&E Articles (Quantity)	0	0	0	0

Operations and Support procedures are in place for all existing sites. Maintenance agreements were established, spares were procured and delivered to each site. At each location an agreement in the form of a site installation plan was drafted and approved to outline roles and responsibilities of all stakeholders. A follow-on engineering site implementation document was developed to lay out the details for activating the site.

FY 2004 Accomplishments:

- Established Help Desk at JNIC
- Established on-site support teams at USSTRATCOM, USNORTHCOM (JNIC), USNORTHCOM (PAFB), USNORTHCOM (CMOC), USPACOM, NCR 1-3, and the MDA Operations Center (MOC)
- Trained 282 C2BMC Operators across all activated sites
- Developed and published an Integrated Logistics Support Plan (ILSP)
- Developed and published a Contractor Logistics Support Plan (CLSP)

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FY 2005 Planned Accomplishments:

- Continue to maintain Help Desk at JNIC
- Establish on-site support team at PACOM
- Continue on-site C2BMC Support of Fielded Sites
- Continue C2BMC Operator training
- Update ILSP and CLSP as needed
- Initiate Planning and design of Network Operations and Security Center at STRATCOM

FY 2006 Planned Program:

- Continue to maintain Help Desk at JNIC for Block 2004 fielded capabilities
- Continue on-site C2BMC Support of Fielded Sites for Block 2004 fielded capabilities
- Continue C2BMC Operator training for Block 2004 fielded capabilities
- Update ILSP and CLSP as needed for block 2004 fielded capabilities
- Establish on-site support at additional COCOM site
- Complete Standup of Network Operations Security Center at STRATCOM

FY 2007 Planned Program:

- Establish logistics support concept for fielding C2BMC Mobile Capability
- C2BMC Deployed Mobile Capability Support
- Establish on-site support at additional COCOM site
- Continue to maintain Help Desk at JNIC
- Continue on-site C2BMC Support of Fielded Sites
- Continue C2BMC Operator training
- Update ILSP and CLSP as needed

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C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

D. Acquisition Strategy

The C2BMC acquisition strategy is consistent with the Missile Defense Agency's capability based acquisition strategy that emphasizes testing, spiral development, evolutionary acquisition, and knowledge based funding through the use of two-year capability blocks. The Missile Defense National Team C2BMC (Industry) (MDNTB(I)) led by Lockheed Martin Mission Systems is the C2BMC prime contractor via an Other Transactions Agreement. They are charged with the development, fielding and support of the C2BMC prototype and perform development and testing of C2BMC products in Arlington VA, Huntsville AL, and Colorado Springs CO. C2BMC element government, FFRDC/UARC, and SETA personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
C2BMC Element										
C2BMC HW/SW Development, I&T	SS/CPAF	MDNTB/ Col. Springs, Co	5,799	24,327	1Q	2,244	1Q	0	N/A	32,370
C2BMC HW/SW Development, I&T	SS/CPAF	MDNTB/ Huntsville, AL	2,597	6,439	1Q	594	1Q	0	N/A	9,630
C2BMC Product Engineering & Development	SS/CPAF	MDNTB/ Washington, DC	7,190	40,782	1Q	3,762	1Q	0	N/A	51,734
EW/CEW; GCCS; JDP; JRE; ISC2; SBIRS-DSP; PATRIOT-JTAGS		Services, DISA, Agencies/ Various	22,680	20,143	1Q	0	N/A	0	N/A	42,823
Federally Funded Research Development Center	SS/CPAF	MITRE, IDA, ORNL, MIT/LL/ Washington, DC	6,774	5,750	1Q	0	N/A	0	N/A	12,524
Scientific Engineering and Technical Assistance	SS/CPFF	Sparta/CSC/ MDA HQ, Arlington, VA	6,731	5,510	1Q	0	N/A	0	N/A	12,241
C2BMC Site Activation										
Suites and Comms Gateways	SS/CPAF	MDNTB(I)/ Various COCOMS	13,944	8,600	1Q	0	N/A	0	N/A	22,544
C2BMC Integration, Test Experimentation And Operation										
Integration & Test	C/FFP	Northrop Grumman Mission Sys/ Colorado Springs, CO	17,000	17,500	1/2Q	0	N/A	0	N/A	34,500
Lab Development	SS/CPAF	MDNTB/ Washington, DC	0	8,030	1Q	0	N/A	0	N/A	8,030

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Operations And Support										
CLS, Operations Support, COCOM Training	SS/CPAF	MDNTB(I)/ Various COCOMS	2,360	14,920	1Q	15,936	1Q	16,200	1/Q	49,416
Operation and Sustainment Support	MIPR	Various COCOMS	7,382	2,000		0	N/A	0	N/A	9,382
Subtotal Product Development			92,457	154,001		22,536		16,200		285,194

Remarks

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation										

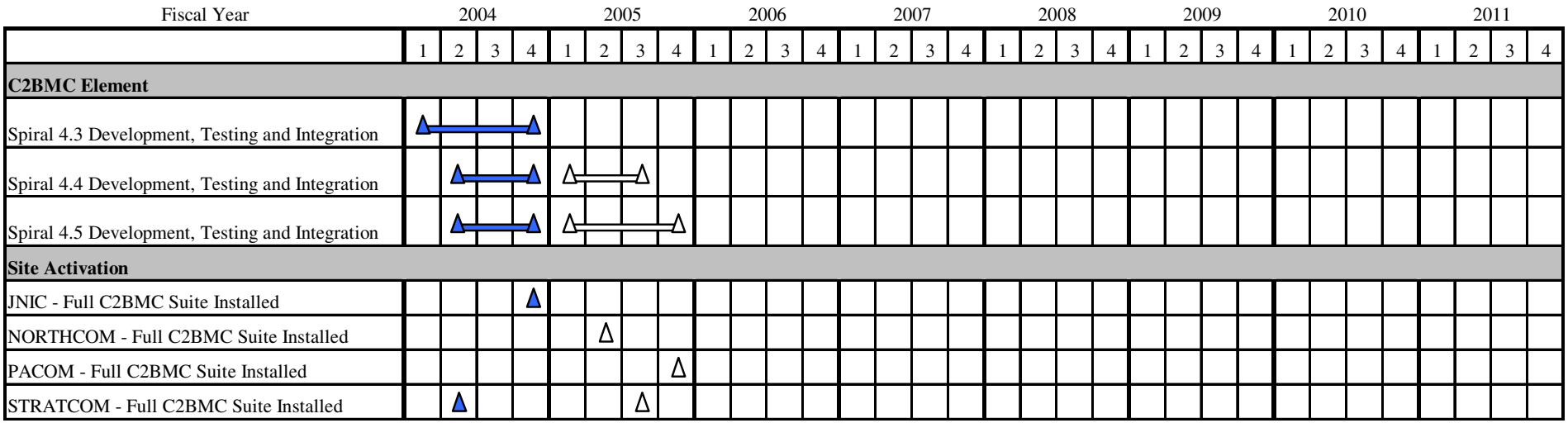
Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										
Remarks										
Project Total Cost			92,457	154,001		22,536		16,200		285,194
Remarks										

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**



Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
C2BMC Element								
Spiral 4.3 Development, Testing and Integration	1Q-4Q							
Spiral 4.4 Development, Testing and Integration	2Q-4Q	1Q-3Q						
Spiral 4.5 Development, Testing and Integration	2Q-4Q	1Q-4Q						
Block 2004 F/PCA			1Q					
Site Activation								
DECC Gateway Installed	3Q							
DMETS (Initial) - Remote Workstation Installed	4Q							
FBX-T Gateway Installed		4Q						
Ft. Greely Gateway Installed	4Q							
JNIC - Full C2BMC Suite Installed	4Q							
MOC - Remote Workstation Installed	3Q							
NCR - Remote Workstation Installed	4Q							
NCR - Web Browser Installed		3Q						
NORTHCOM - Full C2BMC Suite Installed		2Q						
NORTHCOM - Remote Workstation Installed	2Q							
PACOM - Full C2BMC Suite Installed		4Q						
PACOM - Web Browser Installed	3Q							
STRATCOM - Full C2BMC Suite Installed	2Q	3Q						
Tech Ops Gateway Installed	2Q							

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0801 Command and Control, Battle Management and Communications (C2BMC) Block 2006	52,480	24,033	142,138	153,042	23,801	16,700	0	0
RDT&E Articles Qty	0	0	8	7	0	0	0	0

A. Mission Description and Budget Item Justification

In collaboration with the Missile Defense Agency's Systems Engineering and Integration defined architectures and system specifications, the Command and Control, Battle Management and Communications (C2BMC) Program will provide the warfighter the capability to systematically plan the fight (Planner), see it unfold (Situation Awareness), and dynamically direct/adjust networked (Network) sensors and weapons (Battle Management) to engage and defeat ballistic missile threats at any range, in any phase, in all theaters. The C2BMC products will provide the warfighter the capability to optimize ballistic missile defense from a global level which can conflict with the planned defense and execution by an individual element. As such, the global optimization will occur for the greater good and defense of our Nation so that the defense from the perspective of a single element does not negatively impact on the defense of our Nation, our deployed forces, and our allies.

FY 2005 Congressional and undistributed funding reductions impacted Block 2006 development activities by delaying development of an Advanced Battle Manager capability by six (6) months and deferring JNIC lab upgrades needed for Block 2006 from FY 2005 to FY 2006.

In Block 2006, the C2BMC program will deliver to the warfighters the complete foundation for an integrated, layered defense. The BMD Planner will deliver the capability to design and implement a BMD layered defense. The BMD Situational Awareness will extend the monitoring of the BMD battlespace to the Combatant Commander's theaters and regions of activities. The Advanced Battle Manager will deliver the capability to develop dependable and trustworthy discriminated, correlated track data and distribute this track information to the BMDS elements and BMD Situational Awareness. The BMDS Network will deliver an expanded information transport capability, and add increased operational availability through redundant information transport solutions as well as the global network management capabilities to sustain network operations. These capabilities will enable Engagement Sequence Groups (ESG) that involve the following BMDS elements and components: Aegis, Terminal High Altitude Area Defense (THAAD), Sea Based X-Band Sensor (SBX) and Space Based Infrared Sensor (SBIR). In addition, C2BMC installation sites will be activated as a part of Block 2006 to increase the effectiveness the BMD warfighter. Also, high availability, redundant networks will be installed. These networks will be supported by Communications Nodal Equipment (CNE) suites designed for automated operation, management and monitoring which ensure the command and control nodes, sensors, and information flow to the weapon systems retain a capability despite large scale or subversive attack. Operations and support activities will continue in Block 2006 to ensure infrastructure availability and integrity. Block 2004 integration and testing activities are improved upon in Block 2006 with upgraded infrastructure (e.g., development lab hardware and software tools) and increased capability resulting from block development.

C2BMC ELEMENT

The C2BMC Element accomplishes block objectives by designing, developing, and delivering enhanced and new capabilities to the four product lines: BMD Planner, BMD Situational Awareness, Advanced Battle Manager, and the BMDS Network. Two major and two minor incremental deliveries, or Spirals, are planned in each two-year BMDS Block. Each major spiral, such as 6.2 or 6.4, represents an improvement in capability and functionality over the previous spiral. The delivery of these Spirals includes the software, and the hardware and network connectivity, needed to operate an integrated BMDS.

Situational Awareness and Planner products comprise the Command and Control portion of C2BMC. The Situational Awareness (SA) and Planner architecture is based on several design features emphasizing flexibility and interoperability. The architecture is designed to utilize an open system approach. This approach also provides an evolution path for technology upgrades. The Planner aspect of C2 emphasizes planning as you will fight. This includes planning for both theater and global missile defense through all planning phases: deliberate, crisis and execution. The planner will provide the Combatant Commands with the capability to build, analyze and coordinate global layered defense designs across all levels of command, from strategic to operational down to tactical weapon systems in a specific Combatant Command and across multiple Combatant Commands with all weapon system elements in an integrated, layered fashion. This type of coherent planning will result in BMD for the full range and complexity of ballistic missile threats. To ensure that the full C2BMC capability is realized by all weapon system elements, the architecture will migrate to a net-

centric (vice point to point) planner to ensure both vertical and horizontal collaboration. The Situational Awareness aspect of C2 emphasizes a common, Single Integrated Ballistic Missile Picture from the President down to Operational Level of Command. It provides the decision makers at all levels of command the capability to direct weapon release authority for certain weapon platforms to engage, provides the health of the overall BMDS system and its ability to engage on multiple ranges of threats and take action across multiple mission areas (offensive and defensive). SA also provides the Distributed Multi-Echelon Training system to enable the Combatant Commands to conduct daily BMDS training at their specific location.

Specific Block 2006 development includes the following Situational Awareness and Planner capabilities: executive summary screen enhancements which provide additional critical information and better organize and mange information for the President, SECDEF, and other senior civilian leadership; initial protection capability which provides the Combatant Commander with a real time assessment of the ability for the BMDS to engagement on multiple ranges of threats to protect homeland, regional, and theater areas based on the health of the individual sensors and weapons systems; integrated missile warning and missile defense displays which provide the Combatant Commanders the ability to correlate and take advantage of the additional data provided by the BMDS sensors so as to advise the President on critical strategic decisions once confirmed by certified systems; tactical planner interface enhancements which provide the ability for the operational level of command to quickly develop/coordinate tactical sensors and weapon systems placement and taskings; and, basic consequence management planning which provides the Combatant Commander with the capability to determine the consequences of a specific action to aid in decision making of a specific response; Distributed Multi-Echelon Training System (DMETS) which provides the warfighter the ability to conduct BMDS training daily at their Commands and across the Combatant Commands and National Capital Region to remain proficient in the ability to conduct all the necessary planning and execution actions to engage a ballistic missile. The DMETS also enables the Combatant Commands to conduct training across multiple mission areas (offensive/defensive). Battle Management comprises the decisions and actions executed in direct response to the activities of enemy forces in support of the Joint Chiefs of Staff's concept of precision engagement.

The Battle Management (BM) product delivers a near-term product to support current BMD operations and a longer-term product to support future BMD operations. As it matures, the longer-term product, or Advanced Battle Manager (ABM) will assume BMDS battle management functions from the current BM. The C2BMC Program will deliver a globally distributed, real-time, ABM that exhibits highly predictable system behavior, fault -tolerant of runtime errors, and trustworthy battle-management operations. The ABM will receive sensor information from land, sea, and air sensors and commit land-, sea-, and air-based weapon systems to fire at identified targets. The ABM will offer the following benefits: (1) predictable battle management behavior for all possible inputs, (2) rapid insertion of new capabilities via component-based software engineering, (3) software that meets real-time deadlines in the BMD battlespace and (4) automated test oracles and test procedures that facilitate specification testing, software coding, element integration and fielding. By the end of Block 2006, the ABM will field the operational capability to discriminate both radar and space-sensor track data and associated features, correlate track information to the current BMD battlespace information, automatically redirect radar energy to a specific track of interest, and provide dependable ballistic missile track information to the BMDS elements and warfighter situational-awareness displays

The Network Communications portion of C2BMC ensures that communications and networking are not the limiting factor in fielding or operation of the BMDS. The intent is to develop products that provide robust, high availability connectivity to quickly and unambiguously share information across the global BMDS consisting of multiple Sensors and, Weapon Systems and Command and Control nodes, as well as external users. Effective networking management and operations will rely on the ability to manage, coordinate and integrate a wide variety of platforms, interfaces and information standards and capabilities. In Block 2006 the Network aspect of C2BMC will: develop additional sensor interfaces and communication links, develop and deliver the ability to incorporate systems of disparate information standards and protocols, enhance data synchronization between decision makers, and improve automated failover to minimize the impact of failed equipment, and ensure continuing operations with a combat capability.

As the C2BMC products mature they are engineered and integrated into fielded Spirals. The C2BMC element uses spiral development (incremental development, test, and fielding) to produce the software required to provide a system-wide integrated BMD capability. Block 2006 matured products are integrated in Spirals 6.1 through 6.4 and delivered to the field for concurrent development testing and operational use in conjunction with Responsible Test Organization (RTO) and Responsible Engineering Organization (REO) schedules and guidance.

Spiral 6.1 serves as an update to Spiral 4.5, incorporating BMDS Test Bed experience and user feedback. Spiral 6.2 is the initial delivery of Block 2006 capability. This Spiral focuses on battle management enhancements such as improved sensor management (including Sea-Based X-Band (SBX) and Forward Based X-Band (FBX-T) sensors), track forwarding and launch on network capability allowing geographically distributed elements to participate in BMD effectively. Situational Awareness capability is also enhanced by improving executive summary screen display features and introducing initial Protection Capability (PROCAP) that allows operator evaluation of BMDS PROCAP based on individual element's Operations Capability (OPSCAP). Spiral 6.2 also improves the network functionality by introducing new interfaces with sensors in various geographic locations and improving the manual failover feature while refining and expanding the auto failover features,

network management and operations, the ability to manage the entire network in real time, as well as continued expansion with tactical networks. Spiral 6.3 provides an update to Spiral 6.2, incorporating BMDS Test Bed experience and user feedback. Spiral 6.4 delivers complete Block 2006 capability. Situational Awareness and Planner are also improved upon with the following capabilities delivered as a part of Spiral 6.4: integration of missile warning and missile defense information allowing enhanced coordination, integrated offensive and defensive BMD planning and a tactical planner interface providing enhanced tactical planning coordination between the BDMS elements. Battle management capability delivered as a part of spiral 6.4 includes: advanced battle management capability including weapon system engagement control, improved sensor management and track forwarding, system level sensor track correlation and discrimination and engage on network capability. Finally, Network capability will continue to grow with an expansion of the tactical networks capabilities with newly developed MIL-STDS for information exchange, initial Network Centric Enterprise Service operations in concert with DISA's evolution of the Global Information Grid (GIG), automated COMSEC management and operations, and expansion of the strategic network to incorporate additional sensors and command and control nodes, each with high availability and redundancy.

SITE ACTIVATION

In addition to Block 2006 spiral software, fielding capability also includes installation and activation of CBMC Suites at CENTCOM, EUCOM and the National Capital Region (NCR) , as well as upgrades at STRATCOM, NORTHCOM and PACOM. The Suites consist of monitors, C2BMC Server racks and C2BMC communications racks. The activation of these sites will result in improved capability of the BMDS to meet global threats.

INTEGRATION AND TEST

The C2BMC Program developed and maintains a Test Bed at the Joint National Integration Center on Shriever AFB, CO for software integration and testing, system exercises, and operational support. The JNIC hosts three C2BMC Spiral integration and testing laboratories (BITC), and the C2BMC-Experimental Laboratory (C2BMC-X). Capabilities and functions located at the JNIC supporting the development of the BMDS C2BMC include: integration and test of C2BMC software Spirals; C2BMC experimentation supported by broad area announcements for independently developed software which may have application in the BMDS and C2BMC operations and maintenance, licenses and upgrades for the BITC and C2BMC-X laboratories. Additional software development laboratories are also maintained at the prime contractor's facilities in Huntsville AL and Colorado Springs CO.

OPERATIONS AND SUPPORT

C2BMC Program Operations and Support consists of On-Site Support, Help Desk activities, and hardware/software maintenance. On-Site Support provides assistance to the System Administrator, assigned by the site (e.g. Component Commands), with the general operational support of the C2BMC system, integration of the C2BMC support processes into the site's support regimen, and daily operational support for the C2BMC system as part of a transition plan. Prime contractor personnel provide ``over-the-shoulder`` support to users when requested, or alternatively, contact the Help Desk. The Help Desk is located in Colorado Springs, CO. The help desk provides technical support to onsite personnel and to the C2BMC end-user, review of hardware/software problems and coordination of Commercial Off-the-Shelf (COTS) developer/vendor service calls, trouble ticket work-off, tracking and implementing documented escalation procedures, collecting of metrics and maintenance of the Help Desk web site. This service will be delivered on a 24x7x365 basis. Maintenance of the C2BMC Element covers both software and hardware maintenance. The goal is to maintain the BMDS C2BMC at a pre-determined availability. Software maintenance support will be based on the use of Help Desk personnel who will field incoming trouble calls and request software engineering support as required. Scheduled (preventative and non-critical remedial) and unscheduled hardware maintenance issues will be managed by the prime contractor as appropriate.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
C2BMC Element	52,480	24,033	110,138	107,964
RDT&E Articles (Quantity)	0	0	2	2

The C2BMC Element accomplishes block objectives by balancing the development of the four principle product lines (Situational Awareness, Planner, Battle Management, and Network) so that mature capabilities can be integrated and incrementally delivered to the warfighter. Peak development occurs in FY 2006 and FY 2007. Two major and two minor incremental deliveries, or Spirals, are planned in each two-year BMDS Block.

FY 2004 Accomplishments:

Defined initial C2BMC architecture and network

- Began Spiral 6.1 and 6.2 definition
- Conducted Block 2006 Ballistic Missile Defense System Support (BMDSS)
- Conducted Block 2006 Executive Content Review (ECR)

FY 2005 Planned Accomplishments:

- Approve Spiral 6.1 and Spiral 6.2 Content Agreements
- Begin Spiral 6.1 and 6.2 design and development
- Begin Spiral 6.3 and 6.4 definition

FY 2006 Planned Program:

FY 2006 RDT&E Articles: Spiral 6.1 & Spiral 6.2

- Approve Spiral 6.3 and Spiral 6.4 Content Agreements
- Begin Spiral 6.3 and 6.4 design and development
- Complete Spiral 6.1 Development
- Conduct Spiral 6.2 Verification Readiness Review (VRR)
- Complete Spiral 6.2 Development
- Complete Spiral 6.3 Development
- Deliver Spiral 6.1 (RDT&E article) providing high priority updates to Spiral 4.5 (delivered in Block 2004)
- Deliver Spiral 6.2 (RDT&E article) with the following capabilities:
    - Battle Management
        - Basic Sensor Registration
        - Improved FBX-T Management
        - Limited Cross-Net Correlation (includes FBX-T)

- Forward Tracks from FBX-T to Aegis
- Launch on Network
- Advanced Battle Management Prototype
- Situational Awareness
  - Executive Summary Screen Enhancements
  - Initial Protection Capability (PROCAP) Processing and display
  - Full DMETS (Distributed Multi-Echelon Training System)
- Network
  - Manual Failover
  - Enhanced Synchronized Data between COCOMs (includes OPSCAP)

FY 2007 Planned Program:

FY 2007 RDT&E Articles: Spiral 6.3 & Spiral 6.4

- Deliver Spiral 6.3 (RDT&E Article) which will provide high priority updates to Spiral 6.2
- Deliver Spiral 6.4 (RDT&E Article) which will provide the following capabilities:
  - Battle Management
    - Task FBX-T for targeting and hit assessment
    - Cross-Net Correlation (Includes FBX-T and other elements)
    - Track Forwarding to all elements
    - Engage on Network
    - Advanced Battle Management Capabilities
  - Situational Awareness
    - Display Nuclear Detonation (NUDET) Information
    - Missile Warning and Missile Defense integration
    - Auto-Parse United States Message Text Format (USMTF) messages (facilitates ROE)
    - Correlate and Display Situational Awareness History
    - Initial Offensive / Defensive Integration
  - Planning
    - Tactical Planner Interface
    - Intelligence Data Integration
    - JC2 Interoperability
  - Network
    - Automated COMSEC Management
    - Expand Tactical Network capabilities

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

	FY 2004	FY 2005	FY 2006	FY 2007
Site Activation	0	0	11,700	11,940
RDT&E Articles (Quantity)	0	0	6	5

Block 2006 Site Activation efforts will continue to address the fielding and upgrade of all C2BMC associated Hardware and Software (Suites, Workstations, Communications Equipment).

FY 2006 Planned Program:

FY 2006 RDT&E Articles: 3 Full C2BMC Suites, 3 Upgraded C2BMC Suites

- C2BMC Full Suite Capability and Enterprise workstations at USCENTCOM (RDT&E Article)
- C2BMC Full Suite Capability and Enterprise workstations at EUCOM (RDT&E Article)
- C2BMC Full Suite Capability at an (COCOM) site (RDT&E Article)
- Upgrades suites at STRATCOM, PACOM and NORTHCOM (3 RDT&E Articles)

FY 2007 Planned Program:

FY 2007 RDT&E Articles: 2 Full C2BMC Suites, 3 Upgraded C2BMC Suites

- C2BMC Full Suite Capability at two COCOM sites (RDT&E Article)
- Upgrade NORTHCOM Suite, Gateway, and Remote workstation (3 RDT&E Articles)

	FY 2004	FY 2005	FY 2006	FY 2007
Integration and Test	0	0	20,300	33,138
RDT&E Articles (Quantity)	0	0	0	0

Block 2006 will see the Joint National Integration Center (JNIC) continue providing the capabilities and functions which support development of the BMDS C2BMC Element: Integrate and test of C2BMC software Spiral deliveries; C2BMC experimentation supported by Broad Area Announcements for independently developed software which may have applications in the BMDS; Operational Support to the USNORTHCOM C2BMC Suite located at the JNIC; C2BMC Operations & Maintenance, Licenses; and, Upgrades for the BITC and C2BMC-X laboratories.

FY 2006 Planned Program:

- Run full schedule of C2BMC-X Events and Experimentation including support of:
    - Missile Defense Integration Exercises (MDIE) 05b, 06a, and 06b
    - Integrated Missile Defense War Games (IMD WG) 04-5, 04-6, 06-1, and 06b
    - Integrated Ground Test (IGT) 06-5 and 06-6

- Distributed Ground Test (DGT) 06-9
- Spiral 6.1 and 6.2 Cycle 3 Testing

- Upgrade Test Environment and the C2BMC Test Article Simulation Environment
- Continue C2BMC Concept of Operations
- Upgrade CNE for BITC Lab Spiral 6.2
- Continue full schedule of C2BMC-X Events and Experimentation
- Enhance Communications and Connectivity, C4I Tools

FY 2007 Planned Program:

- Run full schedule of C2BMC-X Events and Experimentation including support of:
  - MDIE 07a, and 07b
  - IMD WG 06-3, and 06-4
  - IGT 06-7 and 06-8
  - DGT 06-10
  - Spiral 6.3 and 6.4 Cycle 3 Testing
- Upgrade Test Environment and the C2BMC Test Article Simulation Environment
- Continue Operational Concept Team project
- Upgrade CNE for BITC Lab Spiral 6.4
- Continue full schedule of C2BMC-X Events and Experimentation
- Add new Communications and Connectivity, C4I Tools

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

D. Acquisition Strategy

The C2BMC acquisition strategy is consistent with the Missile Defense Agency's capability based acquisition strategy that emphasizes testing, spiral development, evolutionary acquisition, and knowledge-based funding through the use of two-year capability blocks. The Missile Defense National Team C2BMC (Industry) (MDNTB(I)) led by Lockheed Martin Mission Systems is the C2BMC prime contractor via an Other Transactions Agreement. They are charged with the development, fielding and support of the C2BMC prototype and perform development and testing of C2BMC products in Arlington VA, Huntsville AL, and Colorado Springs CO. C2BMC element government, FFRDC/UARC, and SETA personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
C2BMC Element										
C2BMC HW/SW Development/I&T	SS/CPAF	MDNTB/ Colorado Springs, CO	20,152	3,197	1Q	23,240	1Q	27,787	1Q	74,376
C2BMC HW/SW Development/I&T	SS/CPAF	MDNTB/ Huntsville, CO	14,200	933	1Q	18,232	1Q	17,187	1Q	50,552
C2BMC Product Engineering & Development	SS/CPAF	MDNTB/ Washington, DC	16,351	5,353	1Q	19,722	1Q	21,400	1Q	62,826
EW/CEW; GCCS; JDP; JRE; ISC2; ECPs	Various	Services, DISA, Agencies/ Various	0	3,290	1Q	22,964	1Q	28,110	1Q	54,364
Federally Funded Research Development Centers	SS/CPAF	MITRE, IDA, ORNL, MIT/LL/ Washington, DC	1,520	5,750	1Q	14,300	1Q	7,200	1Q	28,770
Scientific Engineering Technical Assistance	SS/CPFF	Sparta/CSC/ Arlington, VA	257	5,510	1Q	11,680	1Q	6,280	1Q	23,727
Site Activation										
Suites and Comms Gateways	SS/CPAF	MDNTB(I)/ Various COCOMS	0	0	N/A	11,700	1Q	11,940	1Q	23,640
Integration and Test										
Integration & Test Personnel	C/FFP	IDA,SRS Technologies/ Colorado Springs, CO	0	0	N/A	0	N/A	0	N/A	
Integration & Test	C/FFP	Northrop Grumman Mission Sys/ Colorado Springs, CO	0	0	N/A	20,300	1Q	17,300	1Q	37,600

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Lab Development	SS/CPAF	MDNTB/ Washington DC	0	0	N/A	0	N/A	15,838	1Q	15,838
Subtotal Product Development			52,480	24,033		142,138		153,042		371,693

Remarks

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation										

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										
Remarks										
Project Total Cost			52,480	24,033		142,138		153,042		371,693
Remarks										

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
C2BMC Element																																
Spiral 6.1 Development, Testing and Integration																																
Spiral 6.2 Development, Testing and Integration																																
Spiral 6.1 and 6.2 Content Agreement																																
Spiral 6.3 Development, Testing and Integration																																
Spiral 6.3 and 6.4 Content Agreement																																
Spiral 6.4 Development, Testing and Integration																																
Site Activation																																
USCENTCOM - Full C2BMC Suite and EWS Installed																																
Full C2BMC Suite Installed at COCOM																																
EUCOM - Full C2BMC Suite and EWS Installed																																

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
C2BMC Element								
Spiral 6.1 Development, Testing and Integration		1Q-4Q	1Q-2Q					
Spiral 6.2 Development, Testing and Integration		1Q-4Q	1Q-4Q					
Spiral 6.1 and 6.2 Content Agreement		3Q						
Spiral 6.2 VRR			1Q					
Spiral 6.3 Development, Testing and Integration		3Q-4Q	1Q-4Q	1Q-2Q				
Spiral 6.3 and 6.4 Content Agreement			3Q					
Spiral 6.4 Development, Testing and Integration		3Q-4Q	1Q-4Q	1Q-4Q				
Block 2006 System Requirement Review		1Q						
Block 2006 BMDSS	4Q							
Block 2006 ECR	4Q							
Block 2006 F/PCA					1Q			
Site Activation								
USCENTCOM - Full C2BMC Suite and EWS Installed			2Q					
Full C2BMC Suite Installed at COCOM			4Q	4Q				
EUCOM - Full C2BMC Suite and EWS Installed			4Q					
Upgrade STRATCOM, PACOM, and JNIC				3Q-4Q				
Upgrade Suites at STRATCOM, PACOM, and JNIC			3Q-4Q					

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0901 Command and Control, Battle Management and Communications (C2BMC) Block 2008	687	10,798	75,900	100,000	197,026	166,031	65,745	56,075
RDT&E Articles Qty	0	0	0	0	6	0	0	0

A. Mission Description and Budget Item Justification

In collaboration with MDA Systems Engineering and Integration defined architectures and system specifications, the Command and Control, Battle Management and Communications (C2BMC) Program will provide the warfighter the capability to plan the Ballistic Missile Defense (BMD) fight while concurrently: tracking all potential ballistic missile threats, directing weapons to engage on a distributed network and paring any sensor with any shooter to defeat ballistic missile threats at any range, in any phase, in all theaters, with coalition partners.

The objective of the C2BMC Program in Block 2008 is to deliver a complete baseline capability for an integrated, layered defense. The C2BMC Program will increase the capabilities of the four C2BMC product lines (BMD Planner, BMD Situational Awareness, Advanced Battle Manager, and the BMDS Network) to accommodate the additions of new and enhanced sensors, new and enhanced weapon systems, and an increasing ballistic missile threat in terms of lethality, mobility, and numbers. Additionally in Block 2008, the C2BMC Program must add the capability to process asymmetric and non-traditional threats against our Nation, our deployed forces, and our allies. While FY 2008 and FY 2009 are peak years for Block 2008 development, FY 2006 and FY 2007 constitute significant precursory development to meet anticipated asymmetric and non-traditional threats. Work must be accomplished in these years to meet Block 2008 fielding timelines. The C2BMC Program accomplishes these efforts through a more refined Advanced Battle Management (ABM) system and sensor netting capability, as well as a greater level of planning and situational awareness sophistication. Specifically, the C2BMC element will: maintain system level weapons management and discrimination, provide advanced consequence management (ability to identify launch, kill, and impact results on population centers), provide fully integrated (ability to pass and use data from individually developed systems from Combatant Commanders down to tactical elements) planners, and provide a Global Reach BMDS. In addition, The C2BMC Element will integrate new sensors and an increasing number of weapons into the BMDS as part of defense against asymmetric and non-traditional threats. An expanded network centric (worldwide connectivity of separately developed sensors and weapon systems) capability, built upon Block 2006 groundwork, will extend the BMDS mission success by providing information management and quality of service to the individual user. In addition, C2BMC installation sites will be activated as a part of Block 2008 to increase the effectiveness the BMD warfighter and expand global C2BMC coverage. Operations and support activities will continue in Block 2008 for fielded and new C2BMC Sites to ensure infrastructure availability and integrity. FY 2006 integration and testing and concurrent operation activities continue in Block 2008 with improved infrastructure and increased capability resulting from block development.

C2BMC ELEMENT

In Block 2008, the C2BMC program will deliver to the warfighters a complete baseline for an integrated, layered defense. The BMD Planner will deliver the capability to design and implement a BMD layered defense to support multiple courses of action with different BMD architectures. The BMD Situational Awareness will extend the monitoring of the BMD battlespace to the homeland defense against asymmetric and non-traditional threats. The Advanced Battle Manager will deliver the capability to develop weapon-system/target pairing solutions and task weapon systems to engage on specific tracks. The BMDS Network will deliver an expanded information transport capability through the integration of the delivered GIG BE as well as the global network management capabilities to sustain network operations.

The C2BMC Element accomplishes block objectives by demonstrating and operationalizing advancements in four product lines -- Situational Awareness, Planner, Battle Management, and Network -- so that mature capabilities can be integrated and incrementally delivered to the warfighter. Two major and two minor incremental deliveries, or Spirals, are planned in each two-year BMDS Block. Each major spiral within Block 08 represents an improvement in capability and functionality over the previous spiral. The delivery of these Spirals includes the software, and the hardware and network connectivity, needed to operate an integrated BMDS that consists of a greater number of radars and tactical weapon systems. The hardware and software in Block 2008 will allow network sharing of target data to enable launch/engage on sensors that are not organic to the individual weapon system, but rather belong to the BMDS network as a system. The capability delivered in the

Spirals enable BMDS Block 08 engagement sequences by delivering the key interfaces, integrating and refining the distributed system models for efficient and maintainable planning and coordinating the missile defense fight. This coordination allows the system elements and components to work together more effectively by extending the range and reach of the weapon systems.

The Block 2008 C2BMC Situational Awareness and Planner product lines continue the development of flexible, interoperable and open system architecture. For Block 2008, Situational Awareness refines the Block 06 capabilities by adding decision-level aids for the Combatant Commanders, especially in dynamically replanning the fight once engaged, and improving display functionality in the areas of system health and status. Redundant capability, including both data and hardware, is also incorporated during Block 2008. The improved displays also enable enhanced battlespace coordination and deconfliction, and include advanced consequence management to support the asymmetric threat and large US region. The C2BMC Planner adds capability that fully integrates, for the first time, disparate BMD architectures and automates and consolidates BMD information databases, improving data synchronization and handling to facilitate the warfighter's decision making process. The Block 2008 Planner includes integrated air and missile defense planning information and incorporates element status on planner displays. A consolidated planner is also developed ensuring data from various elements is available immediately to the operator.

During the Block 08 timeframe, there will be increased numbers Aegis BMD systems with SM-3, FBX-T radars, Patriot batteries, THAAD weapon systems, and a sea-based x-band (SBX) Radar. Due to the Block 08 complexity, the planner will be a critical tool for the Combatant Commander to develop layered defense plans during deliberative, crisis, and execution planning/dynamic (real-time) replanning. The planner will have the ability to access high fidelity simulations of sensor and weapon systems in a network centric approach to perform complex analysis of multiple Courses of Action (COA) for the placement and tasking of multiple sensors/weapons systems to engage multiple ranges of threats across multiple regions. The planner capability will enable the Combatant Commands to optimize the placement of sensors and weapons and shot doctrine to increase the overall probability of engagement success against multiple ranges of threats to protect the homeland, regional and theater areas of interest. The planner will have the capability to quickly develop new COAs or defense designs based on health status of current systems to allow for dynamic (real-time) retasking of sensor and weapon systems based on threat and defense region priorities. As part of the planner, data of current battle is collected to provide decision aides in assisting the operator in making adjustments of defense design, including placement of assets and tasking in real time, based on responding to off - nominal threats, enemy actions etc.

In Block 2008, the Advanced Battle Manager (ABM) will build on the system-level track information work from Block 2006 and focus upon the weapon-system assignment capability that will pair identified ballistic missile threats to available BMD weapon systems by the end of the Block. For this work, the ABM will provide the capability to network radar and space sensors to provide fused track information that is based upon observed track features, and the capability to task all BMD radars to track assigned tracks to support the capabilities to launch-on and engage-on remote track information. The ABM will build weapon-system assignment capability that will be either fully automated with human override or provide assignment recommendations to a warfighter for his selection, as established in the BMD planning function. To accomplish weapon-system assignment, the ABM will incorporate the rules of engagement, shot doctrine, weapon-system authorities, prioritized defended asset list, weapon-system health and status, ballistic missile threat trajectory, range, altitude, other engagements, and inventory leveling to develop an optimized weapon-system assignment. Given the challenge of defending the battlespace for all ballistic missiles in all phases of flight at any range, the ABM includes development of weapon-system assignment software as real-time software to handle a large number of concurrent engagements. Development activities also include the incorporation of a mobile Experiments Lab (X-Lab), based on the JNIC X-Lab, into the global C2BMC architecture. This mobile capability can deploy to user sites for redundancy or exercises, as well as deploy to remote locations as needed.

The C2BMC Network product features a more redundant network diverse path and increased communications support to the BMDS elements to include added sensors and weapons to the overall BMDS. With the introduction of Internet Protocol Version 6 (IPV6), the BMDS will be able to classify information by the particular user to ensure required quality of service, accountability, and classification is maintained on an integrated network. Capabilities such as real-time network management and monitoring will enable the warfighter to monitor the connection to BMDS weapons and anticipate and remedy any issues as they occur, vice having to wait for a human in the loop to report a problem up the change and push a correction back down.

As the C2BMC products mature they are engineered and integrated into fielded Spirals. The C2BMC element uses spiral development (incremental development, test, and fielding) to produce the software required to provide a system-wide integrated BMD capability. Block 2008 matured products are integrated in Spirals 8.1 through 8.4 and delivered to the field for concurrent development testing and operational use in conjunction with Responsible Test Organization (RTO) and Responsible Engineering Organization (REO) schedules and guidance.

Spiral 8.1, consists of upgrades and updates to the previous spiral 6.4. The content of spiral 8.1 will be based on BMDS Test Bed experience and user input. Spiral 8.2 will be delivered in the second half of FY 2008 and provide the BMDS with Battle Management weapon-target assignment and advanced discrimination algorithms. Spiral 8.2 will also include improvements to the Situational

Awareness, Planner and Network areas of C2BMC. These improvements are contained in improved displays and display options, engagement sequencing and collaboration tools and increase network quality of service monitoring. Spiral 8.3 serves as an upgrade to Spiral 8.2 featuring the same concept of upgrading the previous spiral with knowledge gained from BMDS Test Bed activity and user feedback. Spiral 8.4 delivery in the second half of FY 2009 enables full Block 2008 capability. This spiral features improvements in engagement options and planning, further improved situational awareness displays, full implementation of the advanced battle manager, the introduction of a common planning database and deconfliction capability, and increased BMDS element network connectivity and support.

SITE ACTIVATION

Site Activation in this Block will be determined to best meet the needs of the BMDS. In FY 2006, development begins for a deployed mobile C2BMC capability providing mobile C2BMC suite capability for missile defense. This mobile capability, delivered in FY 2007, will improve ability to concurrently test and operate the BMDS by allowing the operational system to remain on-line during exercises. It also serves as a ready backup C2BMC capability for any threat contingency.

INTEGRATION AND TEST

The C2BMC Program developed and maintains a Test Bed at the Joint National Integration Center on Shriever AFB, CO for software integration and testing, system exercises, and operational support. The JNIC hosts three C2BMC Spiral integration and testing laboratories (BITC), and the C2BMC-Experimental Laboratory (C2BMC-X). Capabilities and functions located at the JNIC supporting the development of the BMDS C2BMC include: integration and test of C2BMC software Spirals; C2BMC experimentation supported by broad area announcements for independently developed software which may have application in the BMDS and C2BMC operations and maintenance, licenses and upgrades for the BITC and C2BMC-X laboratories. Additional software development laboratories are also maintained at the prime contractor's facilities in Huntsville AL and Colorado Springs CO.

OPERATIONS AND SUPPORT

C2BMC Program Operations and Support consists of On-Site Support, Help Desk activities, and hardware/software maintenance. On-Site Support provides assistance to the System Administrator, assigned by the site (e.g. Component Commands), with the general operational support of the C2BMC system, integration of the C2BMC support processes into the site's support regimen, and daily operational support for the C2BMC system as part of a transition plan. Prime contractor personnel provide ``over-the-shoulder`` support to users when requested, or alternatively, contact the Help Desk. The Help Desk is located in Colorado Springs, CO. The help desk provides technical support to onsite personnel and to the C2BMC end-user, review of hardware/software problems and coordination of Commercial Off-the-Shelf (COTS) developer/vendor service calls, trouble ticket work-off, tracking and implementing documented escalation procedures, collecting of metrics and maintenance of the Help Desk website. This service will be delivered on a 24x7x365 basis. Maintenance of the C2BMC Element covers both software and hardware maintenance. The goal is to maintain the BMDS C2BMC at a pre-determined availability. Software maintenance support will be based on the use of Help Desk personnel who will field incoming trouble calls and request software engineering support as required. Scheduled (preventative and non-critical remedial) and unscheduled hardware maintenance issues will be managed by the prime contractor as appropriate.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
C2BMC Element	687	10,798	75,900	94,900
RDT&E Articles (Quantity)	0	0	0	0

The goal remains to develop a globally distributed, real-time software intensive Battle Management system that exhibits highly predictable system-software behavior in which the system receives sensor information from land, sea, air, and space, and commits land, sea and air based weapons to fire at identified targets.

FY 2004 Accomplishments:

- Block 2008 Definition

FY 2005 Planned Accomplishments:

- Block 2008 Capabilities definition
- Begin Block 2008 Spiral definition
- Identify risk areas and risk reduction activity
- Begin identification of interfaces to support defense of friends and allies

FY 2006 Planned Program:

- Begin development of Block 2008 Product line capabilities, including:
  - Situational Awareness
    - Redundant capability, including both data and hardware
    - Improved displays and display options which also enable enhanced battlespace coordination and deconfliction
    - Advanced consequence management
  - Planner
    - Integrated air and missile defense planning information
    - element status on planner displays
    - consolidated planner ensuring data from various elements is available immediately to the operator
  - Battle Manager
    - Integrated composite depiction of weapon systems engagement envelopes for battle space analysis and coordination
    - Increase coordination and synchronization of the sensors and improved EW reporting to the operator
    - Weapon-target assignment and advanced discrimination logarithms
    - Refine real-time Battle Manager
  - Network
    - Develop strategies to migrate to IPV 6 with no impact to operational capability
    - Define and develop requirements by user for quality of service, classification, and accountability of information
    - Design and develop architecture to support new Command and Control nodes, sensors, and weapon systems
- Begin Block 2008 risk reduction

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

- Begin to identify advanced technology to enable fielding of future C2BMC capability
- Define C2BMC Mobile Capability concept, equipment and architecture
- Design C2BMC Mobile Capability to be consistent with JNIC capability
- Develop C2BMC Mobile Capability, including support of concurrent test and operations out to CNIP deployments

FY 2007 Planned Program:

- Approve Spiral 8.1 and Spiral 8.2 Content Agreement
- Begin Spiral 8.1 and Spiral 8.2 design and development
- Begin Spiral 8.3 and Spiral 8.4 definition
- Continued development of product line capabilities, including Situational Awareness, Planner, Battle Manager and Network
- Continue risk reduction activity
- Continue to identify and pursue advanced technology to enable fielding of future C2BMC capability

	FY 2004	FY 2005	FY 2006	FY 2007
Integration and Test	0	0	0	1,200
RDT&E Articles (Quantity)	0	0	0	0

FY 2007 Planned Program

- JNIC Missile Defense Space Tool Upgrade
- Development of Early Warning Models

	FY 2004	FY 2005	FY 2006	FY 2007
Site Activation	0	0	0	3,900
RDT&E Articles (Quantity)	0	0	0	0

The C2BMC Mobile Capability provides remote C2BMC functions to include Planning displays and deployable communications support options for exercises, quick reaction tests and experimentation.

FY 2007 Planned Program

- Deliver C2BMC Mobile Capability including Operator Van, Vehicle mounted computer equipment and CNE and a transportable, vehicle mounted tactical SATCOM terminal that is MILSTAR compatible.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

D. Acquisition Strategy

The C2BMC acquisition strategy is consistent with the Missile Defense Agency's capability based acquisition strategy that emphasizes testing, spiral development, evolutionary acquisition and knowledge-based funding through the use of two-year capability blocks. The Missile Defense National Team C2BMC (Industry) (MDNTB (I)) led by Lockheed Martin Mission Systems is the prime contractor via an Other Transactions Agreement. They are charged with the development, fielding, and support of the C2BMC prototype. The MDNTB(I) performs development and testing of C2BMC products in Arlington VA, Huntsville AL, and Colorado Springs, CO. C2BMC element government, FFRDC/UARC, and SETA personnel are also fully integrated as part of the MDNTB to function in an Integrated Product Team Environment Element for the BMD System. The MDNTB is composed of Government, Federally Funded Research and Development Centers (FFRDC), University Affiliated Research Centers (UARC), System Engineering and Technical Assistance (SETA), and industry contractors. An Other Transactions Agreement was awarded to Lockheed Martin Mission Systems as the prime contractor for the industry team (MDNTB (I)).

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
C2BMC Element										
C2BMC HW/SW Development/I&T	SS/CPAF	MDNTB/ Colorado Springs, CO	0	3,399	1Q	20,731	1Q	38,600	1Q	62,730
C2BMC HW/SW Development/I&T	SS/CPAF	MDNTB/ Hunstville, AL	0	900	1Q	20,250	1Q	17,942	1Q	39,092
C2BMC Product Engineering & Development	SS/CPAF	MDNTB/ Washington, DC	0	5,699	1Q	31,272	1Q	21,408	1Q	58,379
EW/CEW; GCCS; JDP; JRE; ISC2; ECPs	Various	Services, DISA, Agencies/ Various	0	800	1Q	3,647	1Q	3,900	1Q	8,347
Federally Funded Research Development Centers	SS/CPAF	MITRE, IDA, ORNL, MIT/LL/ Washington, DC	687	0	N/A	0	N/A	7,250	1Q	7,937
Scientific Engineering and Technical Assistance	SS/CPFF	Sparta/CSC/ Arlington, VA	0	0	N/A	0	N/A	5,800	1Q	5,800
Integration and Test										
Integration & Test	C/FFP	Northrup Grumman Mission Sys/ Colorado Springs, CO	0	0	N/A	0	N/A	1,200	1Q	1,200
Site Activation										
Suites and Comms Gateways	SS/CPAF	MDNTB/ Various COCOMS	0	0	N/A	0	N/A	3,900	1Q	3,900
Subtotal Product Development			687	10,798		75,900		100,000		187,385

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

Project Total Cost			687	10,798		75,900		100,000		187,385

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
C2BMC Element																																
Spiral 8.1 Development, Testing & Integration																																
Spiral 8.2 Development, Testing & Integration																																
Spiral 8.1 and 8.2 Content Agreement																																
Spiral 8.3 Development, Testing & Integration																																
Spiral 8.4 Development, Testing & Integration																																
Spiral 8.3 and 8.4 Content Agreement																																
Site Activation																																
Full C2BMC Suite Installed - COCOM Site																																

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
C2BMC Element								
Spiral 8.1 Development, Testing & Integration				1Q-4Q	1Q-2Q			
Spiral 8.2 Development, Testing & Integration				1Q-4Q	1Q-4Q			
Spiral 8.1 and 8.2 Content Agreement				3Q				
Spiral 8.2 VRR					1Q			
Spiral 8.3 Development, Testing & Integration				3Q-4Q	1Q-4Q	1Q-2Q		
Spiral 8.4 Development, Testing & Integration				3Q-4Q	1Q-4Q	1Q-4Q		
Spiral 8.3 and 8.4 Content Agreement					3Q			
Block 2008 BMDSS			4Q					
Block 2008 ECR			4Q					
Block 2008 SRR				1Q				
Block 2008 F/PCA					1Q			
Site Activation								
Full C2BMC Suite Installed - COCOM Site					4Q	4Q		
Upgrade Three C2BMC Sites					3Q-4Q	3Q-4Q		

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0001 Command and Control, Battle Management and Communications (C2BMC) Block 2010	0	0	0	11,500	60,600	104,566	217,755	223,633
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

In collaboration with MDA Systems Engineering and Integration defined architecture and system specifications, the Command and Control, Battle Management and Communications (C2BMC) Element will provide the warfighter the capability to plan the Ballistic Missile Defense (BMD) fight while concurrently: tracking all potential ballistic missile threats, directing weapons to engage on a distributed network and paring any sensor with any shooter to defeat ballistic missile threats at any range, in any phase of flight, in all theaters, with coalition partners.

The objective of Block 2010 is to continue maturing and expanding BMD System level C2BMC. This is accomplished through balanced development of the four C2BMC product lines: Battle Management, Situational Awareness, Planner, and Network. Development will include real time battle management that fully utilizes the growing network of BMDS sensors and weapons. Concurrently, network capabilities will continue to expand and be integrated with evolving DOD global grid capabilities

C2BMC ELEMENT

The C2BMC Element accomplishes block objectives by balancing the development of the four product lines -- Situational Awareness, Planner, Battle Management, and Network -- so that mature capabilities can be integrated and incrementally delivered to the warfighter. Two major and two minor incremental deliveries, or Spirals, are planned in each two-year BMDS Block. Each spiral represents an improvement in capability and functionality over the previous spiral. The delivery of these Spirals includes software, and the hardware and network connectivity, needed to operate an integrated BMDS. The capability delivered in the Spirals enables BMDS ESGs by providing the proper interfaces, planning and coordination to allow the system elements and components to work together effectively.

Situational Awareness, Planner, Battle Manager and Network will all be enhanced to include additional BMDS sensors and weapons. The C2BMC Battle Manager evolves to a mature real time battle management system fully utilizing the growing network of BMDS sensors and weapons, including direct feed of space based detections and tracking to improve the timeliness of weapon delivery. The Planning function is also improved, supporting operators in rapid battle plan adjustments. Block 2010 Network capabilities continue to expand and are integrated with evolving DOD global grid capabilities. Capability to defend against an asymmetric threat is expanded from Block 2008 through greater coordination with newly established command and control sites and sensor installations. C2BMC Sites are activated to incorporate additional sensors and weapons targeting the asymmetric threat. The specific capabilities delivered in Block 2010 will become more defined as the BMDS mission in Block 2010 becomes more resolved.

As C2BMC products mature they are engineered and integrated in to fielded Spirals. The C2BMC element uses spiral development (incremental development, test, and fielding) to produce the software required to provide a system-wide integrated BMD capability. Block 2010 matured products are integrated in Spirals 10.1 through 10.4 and delivered to the field for concurrent development testing and operational use in conjunction with Responsible Test Organization and Responsible Engineering Organization schedules and guidelines.

Spiral 10.1 updates Spiral 8.4 based on Test Bed experience and user feedback. Spirals 10.2 and 10.4 will incorporate the mature capabilities from the C2BMC product lines. Spiral 10.3 is an update to Spiral 10.2 based on testbed experience and user feedback.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

SITE ACTIVATION

In addition to Block 2010 spiral software, fielding capability also includes installation and activation of C2BMC Suites at COCOM sites, as well as upgrades at previously activated sites. The suites consist of monitors, C2BMC server racks and C2BMC communications racks. The activation of these sites will result in improved BMDS capability to meet global threats.

INTEGRATION AND TEST

The C2BMC Program developed and maintains a Test Bed at the Joint National Integration Center on Shriever AFB, CO for software integration and testing, system exercises, and operational support. The JNIC hosts three C2BMC Spiral integration and testing laboratories (BITC), and the C2BMC-Experimental Laboratory (C2BMC-X). Capabilities and functions located at the JNIC supporting the development of the BMDS C2BMC include: integration and test of C2BMC software Spirals; C2BMC experimentation supported by broad area announcements for independently developed software which may have application in the BMDS and C2BMC operations and maintenance, licenses and upgrades for the BITC and C2BMC-X laboratories. Additional software development laboratories are also maintained at the prime contractor's facilities in Huntsville AL and Colorado Springs CO.

OPERATIONS AND SUPPORT

C2BMC Program Operations and Support consists of On-Site Support, Help Desk activities, and hardware/software maintenance. On-Site Support provides assistance to the System Administrator, assigned by the site (e.g. Component Commands), with the general operational support of the C2BMC system, integration of the C2BMC support processes into the site's support regimen, and daily operational support for the C2BMC system as part of a transition plan. Prime contractor personnel provide ``over-the-shoulder`` support to users when requested, or alternatively, contact the Help Desk. The Help Desk is located in Colorado Springs, CO. The help desk provides technical support to onsite personnel and to the C2BMC end-user, review of hardware/software problems and coordination of Commercial Off-the-Shelf (COTS) developer/vendor service calls, trouble ticket work-off, tracking and implementing documented escalation procedures, collecting of metrics and maintenance of the Help Desk website. This service will be delivered on a 24x7x365 basis. Maintenance of the C2BMC Element covers both software and hardware maintenance. The goal is to maintain the BMDS C2BMC at a pre-determined availability. Software maintenance support will be based on the use of Help Desk personnel who will field incoming trouble calls and request software engineering support as required. Scheduled (preventative and non-critical remedial) and unscheduled hardware maintenance issues will be managed by the prime contractor as appropriate.

Mobile X-Lab C2BMC Capability is also supported to enable a rapidly deployable, flexible C2BMC suite to meet unexpected threats, participate in exercises, or act as a back up to fixed sites.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
C2BMC Element	0	0	0	11,500
RDT&E Articles (Quantity)	0	0	0	0

FY 2007 Planned Program:

- Initiate Block 2010 definition
- Identify risk reduction efforts
- Identify and pursue advanced concepts and technology to enable fielding of future Block 2010 capability
- Ensure compliance with DOD and international networking standards
- Identify interfaces with evolving DOD network architectures

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
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PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

D. Acquisition Strategy

The C2BMC acquisition strategy is consistent with the Missile Defense Agency's capability based acquisition strategy that emphasizes testing, spiral development, evolutionary acquisition, and knowledge-based funding through the use of two-year capability blocks. The Missile Defense National Team - C2BMC (Industry) (MDNTB(I)) led by Lockheed Martin Mission Systems is the prime contractor under an Other Transactions Agreement. The prime contractor is charged with the development, fielding and support of the C2BMC prototype. The MDNTB(I) performs development and testing of C2BMC products in Arlington, VA, Huntsville, AL, and Colorado Springs, CO. C2BMC element FFRDC/UARC, SETA and Government personnel are also fully integrated as part of the MDNTB to function in an integrated product team environment.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
C2BMC Element										
C2BMC HW/SW Development/I&T	SS/CPAF	MDNTB/ Colorado Springs, CO	0	0	N/A	0	N/A	1,723	1Q	1,723
C2BMC HW/SW Development/I&T	SS/CPAF	MDNTB/ Huntsville, AL	0	0	N/A	0	N/A	2,835	1Q	2,835
C2BMC Product Engineering & Development	SS/CPAF	MDNTB/ Washington, DC	0	0	N/A	0	N/A	6,242	1Q	6,242
EW/CEW; GCCS; JDP; JRE; ISC2; ECPs	Various	Services, DISA, Agencies/ Various	0	0	N/A	0	N/A	700	1Q	700
Subtotal Product Development			0	0		0		11,500		11,500

Remarks

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Support Costs										

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

Project Total Cost			0	0		0		11,500		11,500

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
C2BMC Element																																
Spiral 10.1 Development, Testing and Integration																																
Spiral 10.2 Development, Testing and Integration																																
Spiral 10.1 and 10.2 Content Agreement																																
Spiral 10.3 Development, Testing and Integration																																
Spiral 10.4 Development, Testing and Integration																																
Spiral 10.3 and 10.4 Content Agreement																																
Site Activation																																
Full C2BMC Suite Installed - Location TBD																																

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
C2BMC Element								
Spiral 10.1 Development, Testing and Integration						1Q-4Q	1Q-2Q	
Spiral 10.2 Development, Testing and Integration						1Q-4Q	1Q-4Q	
Spiral 10.1 and 10.2 Content Agreement						3Q		
Spiral 10.2 VRR							1Q	
Spiral 10.3 Development, Testing and Integration						2Q-4Q	1Q-4Q	1Q-2Q
Spiral 10.4 Development, Testing and Integration						2Q-4Q	1Q-4Q	1Q-4Q
Spiral 10.3 and 10.4 Content Agreement							3Q	
Block 2010 BMDSS					4Q			
Block 2010 ECR					4Q			
Block 2010 SRR						1Q		
Block 2010 F/PCA							1Q	
Site Activation								
Full C2BMC Suite Installed - Location TBD							4Q	4Q
Upgrade Three C2BMC Sites							3Q-4Q	3Q-4Q

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0702 Hercules Block 2004	4,575	0	0	0	0	0	0	0
RDT&E Articles Qty	4	0	0	0	0	0	0	0

Note:
This Project covers the Block 2004 products of Project Hercules. The Hercules Block 2006, Block 2008, and Block 2010 products are described in this same PE (0603889C) under projects 0802, 0902, and 0002 respectively. The Hercules core elements are described in PE 0603890C, BMD Core, Project 0202. In FY 2005, Project 0702, funding for Hercules Block 2004 Products, is moved to Projects 0802, 0902, and 0002 to reflect the shift in focus to future Block capabilities.

A. Mission Description and Budget Item Justification

Project Hercules is a national effort to develop robust detection, tracking, and discrimination algorithms to counter off nominal and evolving missile threats. Hercules is also developing a physics-based Decision Architecture that applies advanced decision theory to future BMDS command, control, and battle management (C2/BM) concepts. In addition to a general program to develop algorithms useful against targets in all phases of flight, Hercules has specific projects to develop algorithms for forward based sensors, the Decision Architecture, and mitigating countermeasures. Hercules develops algorithms to enhance BMDS element capabilities in Block 06, 08, 10 and beyond and will provide these algorithms to the BMDS elements for insertion into their respective programs.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Algorithm Productization and Test	500	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishment:

- Hercules successfully tested an initial prototype of the Decision Architecture, an approach to applying advanced decision theory concepts to C2BMC. Elements of the Decision Architecture underwent performance characterization testing and completed real time testing on several system level tests in the BMD Test Bed. The Decision Architecture prototype was upgraded. Successful real time and digital tests for discrimination and fusion algorithms were also completed and were a part of the BMDS spiral upgrades.

	FY 2004	FY 2005	FY 2006	FY 2007
Project Hercules	4,075	0	0	0
RDT&E Articles (Quantity)	4	0	0	0

FY 2004 Accomplishments:

- Delivered three algorithms to the forward based sensor team for integration into the TPS-X BMD Test Bed radar and their BMD Radar. Completed testing on a discrimination algorithm being integrated into the SBX radar.
- Conducted yearly Project Hercules Program Review to discuss prior year progress and upcoming plans for algorithm development activities associated with weapon, sensor, and C2BMC discrimination and tracking upgrades in all future BMDS blocks.
- Completed quarterly algorithm test readiness reviews to determine algorithm maturity and readiness for algorithm performance characterization testing.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

D. Acquisition Strategy

Project Hercules follows MDA's capability-based acquisition strategy. This emphasizes assessment, spiral-development testing and evolutionary acquisition through the definition of two-year capability blocks.

Project Hercules activities are performed by subject matter experts composed of Government, Federally Funded Research and Development Centers (FFRDC), University Affiliated Research Centers (UARC), private industry including major defense contractors, Government laboratories, and System Engineering and Technical Assistance (SETA) contractors.

Battle manager, weapon, and sensor capability improvements can be transitioned into the future operational force structure by integrating the Hercules algorithms into BMDS components. BMDS component managers plan, budget, and procure the necessary hardware and software for deployed and sustained operational forces.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Project Hercules										
MDA Hercules	Various	Various	575	0	N/A	0	N/A	0	N/A	575
Subtotal Support Costs			575	0		0		0		575

Remarks

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Project Hercules										
MIT/LL	CPFF	Hanscomb, AFB	1,516	0	N/A	0	N/A	0	N/A	1,516
Northrop Grumman XonTech	CPFF	Van Nuys, CA	1,139	0	N/A	0	N/A	0	N/A	1,139
SMDC	Various	Various	1,345	0	N/A	0	N/A	0	N/A	1,345
Subtotal Test and Evaluation			4,000	0		0		0		4,000

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										
Remarks										
Project Total Cost			4,575	0		0		0		4,575
Remarks										

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Hercules																																
Hercules Program Review	▲																															
Algorithm Test Readiness Reviews	▲	▲	▲	▲																												
Post Flight Test Data Analysis	▲	▬	▬	▲																												

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Hercules								
Hercules Program Review	1Q							
Algorithm Test Readiness Reviews	1Q,2Q,3Q,4Q							
Post Flight Test Data Analysis	1Q-4Q							

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0802 Hercules Block 2006	26,956	37,161	7,521	0	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0	0

Note:
This Project covers the Block 2006 products of Project Hercules. The Hercules Block 2004, Block 2008 and Block 2010 projects are described in this same PE (0603889C) under projects 0702, 0902, and 0002 respectively. The Hercules core elements are described in PE 0603890C, BMD Core, Project 0202. In FY 2005, all of Project 0702, Hercules Block 2004 Products, is moved to Project 0802, 0902, and 0002, Hercules Block 2006, Block 2008, and Block 2010 to reflect the shift in focus to future Block capabilities. Also in FY 2005, a portion of PE 0603890C, BMDS Core, Project 0202, Hercules Core, is moved here to Project 0802, Hercules Block 06.

A. Mission Description and Budget Item Justification

Project Hercules is a national effort to develop robust detection, tracking, and discrimination algorithms to counter off nominal and evolving missile threats. Hercules is also developing a physics-based Decision architecture that applies advanced decision theory to future BMDS command, control, and battle management (C2/BM) concepts. In addition to a general program to develop algorithms useful against targets in all phases of flight, Hercules has specific projects to develop algorithms for forward based sensors, the Decision Architecture, and mitigating countermeasures. Hercules develops algorithms to enhance BMDS element capabilities in Block 06, 08, 10 and beyond and will provide these algorithms to the BMDS elements for insertion into their respective programs.

Algorithm development and testing for Block 06 is focused on spiral capability enhancements for midcourse and forward based sensors and battle management systems. These algorithms improve the functionality of the Block 06 radar and electro-optical sensors, enabling them to better perform their Engagement Sequence Group roles. Fusion and decision theory software is also under development and being provided to the C2BMC element developers for their evaluation and inclusion in Block 06 or Block 08.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Project Hercules	26,956	37,161	7,521	0
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- Provided algorithm concepts and test results to support the evaluation and subsequent integration of enhancements to radar and elector-optical systems included in Block 06.
- Successfully conducted real time testing of a multi-radar track fusion concept
- Successfully conducted real time testing of a prototype of the Decision Architecture C2BMC battle management support software.
- Conducted yearly Project Hercules Program Review to discuss prior year progress and upcoming plans for algorithm development activities associated with weapon, sensor, and C2BMC discrimination and tracking upgrades in all future BMDS blocks.
- Completed quarterly algorithm test readiness reviews to determine algorithm maturity and readiness for algorithm performance characterization testing.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

FY 2005 Planned Accomplishments:

- Provide algorithm concepts and test results to BMDS elements to support the evaluation and integration of enhancements to BMDS battle management components, weapons components, and radar and electro-optical sensing components included in Block 06.
- Deliver a prototype Decision Architecture, a real time battle management support tool that provides information supporting weapons and sensor resource allocation based upon information being received from multiple sensors throughout the layered BMDS. This prototype will be evaluated by the C2BMC acquisition team for inclusion in the C2BMC element.
- Conduct quarterly algorithm reviews to determine algorithm maturity and readiness for algorithm performance characterization testing.
- Conduct yearly Project Hercules Program Review to discuss prior year progress and upcoming plans for algorithm development activities associated with weapon, sensor, and C2BMC discrimination and tracking upgrades in all future BMDS blocks.

FY 2006 Planned Program:

- Support BMDS sensor and C2BMC component integration and testing related to algorithms selected for insertion into Block 2006.
- Conduct yearly Project Hercules Program Review to discuss prior year progress and upcoming plans for algorithm development activities associated with weapon, sensor, and C2BMC discrimination and tracking upgrades in all future BMDS blocks.

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

D. Acquisition Strategy

Project Hercules follows MDA's capability-based acquisition strategy. This emphasizes assessment, spiral-development testing and evolutionary acquisition through the definition of two-year capability blocks.

Project Hercules activities are performed by subject matter experts composed of Government, Federally Funded Research and Development Centers (FFRDC), University Affiliated Research Centers (UARC), private industry including major defense contractors, Government laboratories, and System Engineering and Technical Assistance (SETA) contractors.

Battle manager, weapon, and sensor capability improvements can be transitioned into the future operational force structure by integrating the Hercules algorithms into BMDS components. BMDS component managers plan, budget, and procure the necessary hardware and software for deployed and sustained operational forces.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Project Hercules										
Boeing	CPAF	Arlington, VA	2,200	1,944	1Q	500	1Q	0	N/A	4,644
Lockheed Martin	CPFF	Sunnyvale, CA	3,000	1,111	2Q	737	1Q	0	N/A	4,848
Raytheon	CPFF	Boston, MA	4,120	1,111	2/3Q	675	1Q	0	N/A	5,906
SPARTA	CPFF	Arlington, VA	3,470	7,419	1Q	529	1Q	0	N/A	11,418
Various	MIPR	Various	188	259	1Q	0	1Q	0	N/A	447
ONR	MIPR	Arlington, VA	250	278	1Q	250	1Q	0	N/A	778
MIT/LL	FFRDC	Hanscomb, AFB	3,361	5,167	1Q	2,049	1Q	0	N/A	10,577
Northrop Grumman XonTech	CPFF	Van Nuys, CA	1,000	2,047	1Q	607	1Q	0	N/A	3,654
SMDC Hercules	MIPR	Various	600	2,313	1Q	0	1Q	0	N/A	2,913
PRA	CPFF	Arlington, VA	1,000	0	1Q	292	1Q	0	N/A	1,292
Subtotal Product Development			19,189	21,649		5,639		0		46,477

Remarks

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Support Costs										

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Project Hercules										
SMDC Hercules	MIPR	Huntsville, Al	519	778	1Q	0	N/A	0	N/A	1,297
AFRL-Eglin AFB	MIPR	Eglin, FL	519	471	1Q	100	1Q	0	N/A	1,090
MIT/LL	CPFF	Hanscomb, AFB	1,849	7,170	1Q	557	1Q	0	N/A	9,576
Northrop Grumman XonTech	CPFF	Van Nuys, CA	1,966	4,021	1Q	0	N/A	0	N/A	5,987
Decibel Research	CPFF	Huntsville, AL	0	687	1Q	150	1Q	0	N/A	837
JNIC	MIPR	Colorado Springs, CO	0	278	1Q	0	N/A	0	N/A	278
Subtotal Test and Evaluation			4,853	13,405		807		0		19,065

Remarks

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Project Hercules										
Various	MIPR	Various	1,457	616	1Q	575	1Q	0	N/A	2,648
SMDC Hercules	MIPR	Huntsville, AL	1,457	1,491	1Q	500	1Q	0	N/A	3,448
Subtotal Management Services			2,914	2,107		1,075		0		6,096

Remarks

Project Total Cost			26,956	37,161		7,521		0		71,638

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Hercules																																
Hercules Program Review	▲				▲				△																							
Algorithm Test Readiness Reviews	▲	▲	▲	▲	▲	△	△	△	△	△	△	△																				
Post-Flight Test Data Analysis	▲			▲	△							△																				
Countermeasure Mitigation Suite to Test							△																									
Decision Architecture Prototype Delivery								△																								

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Hercules								
Hercules Program Review	1Q	1Q	1Q					
Algorithm Test Readiness Reviews	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q					
Post-Flight Test Data Analysis	1Q-4Q	1Q-4Q	1Q-4Q					
Countermeasure Mitigation Suite to Test		3Q						
Decision Architecture Prototype Delivery		4Q						

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0902 Hercules Block 2008	22,532	46,095	52,096	48,755	23,881	13,319	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0	0

Note:
This Project covers the Block 2008 products of Project Hercules. The Hercules Block 2004, Block 2006 and Block 2010 projects are described in this same PE (0603889C) under projects 0702, 0802, and 0002 respectively. The Hercules core elements are described in PE 0603890C, BMD Core, Project 0202. In FY 2005, all of Project 0702, Hercules Block 2004 Products, is moved to Project 0802, 0902, and 0002, Hercules Block 2006, Block 2008, and Block 2010 to reflect the shift in focus to future Block capabilities. Also in FY 2005, a portion of PE 0603890C, BMDS Core, Project 0202, Hercules Core, is moved here to Project 0902, Hercules Block 08.

A. Mission Description and Budget Item Justification

Project Hercules is a national effort to develop robust detection, tracking, and discrimination algorithms to counter off nominal and evolving missile threats. Hercules is also developing a physics-based Decision architecture that applies advanced decision theory to future BMDS command, control, and battle management (C2/BM) concepts. In addition to a general program to develop algorithms useful against targets in all phases of flight, Hercules has specific projects to develop algorithms for forward based sensors, the Decision Architecture, and mitigating countermeasures. Hercules develops algorithms to enhance BMDS element capabilities in Block 06, 08, 10, and beyond and will provide these algorithms to the BMDS elements for insertion into their respective programs.

Algorithm development and testing for Block 08 is focused on spiral capability enhancements for battle management systems and sensors functioning in all phases of flight. These algorithms improve the functionality of the Block 08 radar and electro-optical sensors, enabling them to better perform their Engagement Sequence Group roles. Fusion and decision theory software is also under development and being provided to the C2BMC element developers for their evaluation and inclusion in Block 06, Block 08, or Block 10.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Project Hercules	22,532	46,095	52,096	48,755
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- Provided algorithm concepts and test results to support the evaluation and subsequent integration of enhancements to radar and elector-optical systems included in Block 08.
- Initiated new algorithm studies to counter a category of countermeasure techniques.
- Conducted yearly Project Hercules Program Review to discuss prior year progress and upcoming plans for algorithm development activities associated with weapon, sensor, and C2BMC discrimination and tracking upgrades in all future BMDS blocks.
- Completed quarterly algorithm test readiness reviews to determine algorithm maturity and readiness for algorithm performance characterization testing.

FY 2005 Planned Accomplishments:

- Provide algorithm concepts and test results to BMDS elements to support the evaluation and integration of enhancements to BMDS battle management components, weapon components, and radar and electro-optical sensing components included in Block 08.

- Deliver advanced algorithms or algorithms suites to the performance characterization test team that will improve BMDS performance against countermeasures.
- Conduct research for future improvements to the Decision Architecture prototype being delivered to battle manager component developers in FY05.
- Conduct quarterly algorithm test readiness reviews to determine algorithm maturity and readiness for algorithm performance characterization testing.
- Conduct yearly Project Hercules Program Review to discuss prior year progress and upcoming plans for algorithm development activities associated with weapon, sensor, and C2BMC discrimination and tracking upgrades in all future BMDS blocks

FY 2006 Planned Program:

- Deliver an enhancement to the Decision Architecture prototype delivered in FY05, a real time battle management tool that provides information supporting weapons and sensor resource allocation based upon information being received from multiple sensors throughout the layered BMDS. These enhancements will be evaluated by the C2BMC acquisition team for inclusion in the C2BMC element.
- Conduct extensive performance characterization testing of algorithms suites developed to provide improved BMDS performance against countermeasures.
- Conduct research for future improvements to the Decision Architecture prototype being delivered to battle manager component developers in FY06.
- Conduct quarterly algorithm test readiness reviews to determine algorithm maturity and readiness for algorithm performance characterization testing.
- Conduct yearly Project Hercules Program Review to discuss prior year progress and upcoming plans for algorithm development activities associated with weapon, sensor, and C2BMC discrimination and tracking upgrades in all future BMDS blocks

FY 2007 Planned Program:

- Continue algorithm development and testing for a variety of advanced battle management and sensor discrimination and tracking techniques for both individual sensor and multiple-sensor netting discrimination and tracking function improvements.
- Deliver an enhancement to the Decision Architecture prototype delivered in FY06, a real time battle management tool that provides information supporting weapons and sensor resource allocation based upon information being received from multiple sensors throughout the layered BMDS. These enhancements will be evaluated by the C2BMC acquisition team for inclusion in the C2BMC element.
- Support BMDS sensor and C2BMC component integration and testing related to algorithms selected for insertion into Block 2008.
- Conduct extensive performance characterization testing of algorithms suites developed to provide improved BMDS performance against countermeasures.
- Conduct quarterly algorithm test readiness reviews to determine algorithm maturity and readiness for algorithm performance characterization testing.
- Conduct yearly Project Hercules Program Review to discuss prior year progress and upcoming plans for algorithm development activities associated with weapon, sensor, and C2BMC discrimination and tracking upgrades in all future BMDS blocks.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

D. Acquisition Strategy

Project Hercules follows MDA's capability-based acquisition strategy. This emphasizes assessment, spiral-development testing and evolutionary acquisition through the definition of two-year capability blocks.

Project Hercules activities are performed by subject matter experts composed of Government, Federally Funded Research and Development Centers (FFRDC), University Affiliated Research Centers (UARC), private industry including major defense contractors, Government laboratories, and System Engineering and Technical Assistance (SETA) contractors.

Battle manager, weapon, and sensor capability improvements can be transitioned into the future operational force structure by integrating the Hercules algorithms into BMDS components. BMDS component managers plan, budget, and procure the necessary hardware and software for deployed and sustained operational forces.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Project Hercules										
Lockheed Martin	CPFF	Sunnyvale, CA	2,486	2,212	2Q	4,075	1Q	4,075	1Q	12,848
Raytheon	CPFF	Boston, MA	1,789	3,993	2/3Q	5,025	1Q	5,025	1Q	15,832
SPARTA	CPFF	Arlington, VA	4,411	4,364	1Q	1,507	1Q	1,507	1Q	11,789
Various	MIPR	Various	665	1,066	1Q	1,245	1Q	563	1Q	3,539
ONR	MIPR	Arlington, VA	0	590	1Q	1,020	1Q	1,020	1Q	2,630
AFRL-Eglin AFB	MIPR	Eglin, FL	1,324	1,800	1Q	1,850	1Q	1,850	1Q	6,824
PRA	CPFF	Arlington, VA	1,355	2,209	1Q	3,249	1Q	3,249	1Q	10,062
MIT/LL	CPFF	Hanscomb, AFB	5,860	8,680	1Q	9,209	1Q	7,209	1Q	30,958
Northrop Grumman XonTech	CPFF	Van Nuys, CA	4,642	8,948	1Q	5,655	1Q	3,655	1Q	22,900
SMDC	MIPR	Huntsville, AL	0	1,474	1Q	7,375	1Q	7,370	1Q	16,219
Subtotal Product Development			22,532	35,336		40,210		35,523		133,601

Remarks

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Project Hercules										
MIT/LL	CPFF	Boston, MA	0	0	N/A	1,500	1Q	1,500	1Q	3,000
Subtotal Support Costs			0	0		1,500		1,500		3,000

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603889C Ballistic Missile Defense Products

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Project Hercules										
AFRL-Eglin AFB	MIPR	Eglin, FL	0	1,398	1Q	2,350	1/2Q	2,350	1/2Q	6,098
CSC	CPFF	Fairfax, VA	0	1,019	1Q	2,380	1/2Q	2,380	1/2Q	5,779
MIT/LL	FFRDC	Hanscomb AFB	0	2,153	1Q	4,468	1/2Q	3,964	1/2Q	10,585
Decibel Research	MIPR	Huntsville, AL	0	851	1Q	1,188	1/2Q	1,188	1/2Q	3,227
Subtotal Test and Evaluation			0	5,421		10,386		9,882		25,689

Remarks

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Project Hercules										
CSC-SETA	FFP	Fairfax, VA	0	1,334	1Q	0	N/A	1,350	1Q	2,684
SPARTA-SETA	FFP	Arlington, VA	0	1,221	1Q	0	N/A	500	1Q	1,721
Various	MIPR	Various	0	929	1Q	0	N/A	0	1Q	929
SMDC Hercules	MIPR	Huntsville, AL	0	1,854	1Q	0	N/A	0	1Q	1,854
Subtotal Management Services			0	5,338		0		1,850		7,188

Remarks

Project Total Cost			22,532	46,095		52,096		48,755		169,478

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Hercules																																
Hercules Program Review	▲				▲				△				△				△				△											
Algorithm Test Readiness Reviews	▲	▲	▲	▲	▲	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△								
Post-Flight Test Data Analysis	▲	▲	▲	▲	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△								
Decision Architecture Upgrade Delivery												△				△																

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Hercules								
Hercules Program Review	1Q	1Q	1Q	1Q	1Q	1Q		
Algorithm Test Readiness Reviews	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q		
Post-Flight Test Data Analysis	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q		
Decision Architecture Upgrade Delivery			4Q	4Q				

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0002 Hercules Block 2010	0	0	11,000	18,451	42,000	52,000	65,071	65,856
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

Project Hercules is a national effort to develop robust detection, tracking, and discrimination algorithms to counter off nominal and evolving missile threats. Hercules is also developing a physics-based Decision architecture that applies advanced decision theory to future BMDS command, control, and battle management (C2/BM) concepts. In addition to a general program to develop algorithms useful against targets in all phases of flight, Hercules has specific projects to develop algorithms for forward based sensors, the Decision Architecture, and mitigating countermeasures. Hercules develops algorithms to enhance BMDS element capabilities in Block 06, 08, 10, and beyond and will provide these algorithms to the BMDS elements for insertion into their respective programs.

Algorithm development and testing for Block 10 is focused on spiral capability enhancements for battle management systems and sensors functioning in all phases of flight. These algorithms improve the functionality of the Block 10 radar and electro-optical sensors, enabling them to better perform their Engagement Sequence Group roles. Fusion and decision theory software is also under development and being provided to the C2BMC element developers for their evaluation and inclusion in Block 06, Block 08, or Block 10.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Project Hercules	0	0	11,000	18,451
RDT&E Articles (Quantity)	0	0	0	0

FY 2006 Planned Program:

- Initiate algorithm development for discrimination and tracking improvements for new layers of the BMDS as weapons, sensors, and C2BMC components are added in Block 10 and beyond.
- Conduct quarterly algorithm reviews to determine algorithm maturity and readiness for algorithm performance characterization testing.
- Conduct yearly Project Hercules Program Review to discuss prior year progress and upcoming plans for algorithm development activities associated with weapon, sensor, and C2BMC discrimination and tracking upgrades in all future BMDS blocks.

FY 2007 Planned Program:

- Continue algorithm development for a variety of advanced sensing techniques.
- Conduct quarterly algorithm reviews to determine algorithm maturity and readiness for algorithm performance characterization testing.
- Conduct yearly Project Hercules Program Review to discuss prior year progress and upcoming plans for algorithm development activities associated with weapon, sensor, and C2BMC discrimination and tracking upgrades in all future BMDS blocks.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

D. Acquisition Strategy

Project Hercules follows MDA's capability-based acquisition strategy. This emphasizes assessment, spiral-development testing and evolutionary acquisition through the definition of two-year capability blocks.

Project Hercules activities are performed by subject matter experts composed of Government, Federally Funded Research and Development Centers (FFRDC), University Affiliated Research Centers (UARC), private industry including major defense contractors, Government laboratories, and System Engineering and Technical Assistance (SETA) contractors.

Battle manager, weapon, and sensor capability improvements can be transitioned into the future operational force structure by integrating the Hercules algorithms into BMDS components. BMDS component managers plan, budget, and procure the necessary hardware and software for deployed and sustained operational forces.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Project Hercules										
Hercules	MIPR	Arlington, Huntsville	0	0	N/A	7,000	1Q	13,000	1Q	20,000
Subtotal Product Development			0	0		7,000		13,000		20,000

Remarks

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Project Hercules										
MDA Hercules	MIPR	Huntsville, Arlington, Eglin	0	0	N/A	1,000	1Q	3,000	1Q	4,000
Subtotal Support Costs			0	0		1,000		3,000		4,000

Remarks

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Project Hercules										
MDA Hercules	MIPR	Huntsville, Arlington	0	0	N/A	2,000	1Q	1,000	1Q	3,000
Subtotal Test and Evaluation			0	0		2,000		1,000		3,000

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603889C Ballistic Missile Defense Products

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Project Hercules										
Hercules	MIPR	Arlington	0	0	N/A	1,000	1Q	1,451	1Q	2,451
Subtotal Management Services			0	0		1,000		1,451		2,451
Remarks										
Project Total Cost			0	0		11,000		18,451		29,451
Remarks										

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Hercules																																
Algorithms and DA Prototype ATT									Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ
Hercules Program Review									Δ				Δ				Δ				Δ				Δ				Δ			
Post Flight Test Data Analysis									Δ																							Δ

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Hercules								
Algorithms and DA Prototype ATT			1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q
Hercules Program Review			1Q	1Q	1Q	1Q	1Q	1Q
Post Flight Test Data Analysis			1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0703 Joint Warfighter Support Block 2004	32,748	24,178	0	0	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0	0

Note:
Starting in FY 2004, funding for this effort has been allocated across Ballistic Missile Defense Products PE 0603889C in two-year capability Blocks under Project 0703 (FY 2004-2005), Project 0803 (FY 2006-2007), Project 0903 (FY 2008-2009) and Project 0003 (FY 2010-2011).

A. Mission Description and Budget Item Justification

As part of the total BMDS, The Joint Warfighter Support Program (JWSP) enables MDA to work collaboratively with the Joint Warfighters in defining, testing, and deploying/employing the various BMDS Block capabilities.

The JWSP consists of six primary activities:

- Conducting Exercises and Wargames for mission training, qualification, certification and rehearsal of the Combatant Commanders (COCOMs) and refining development of the BMDS. This program focuses on integrating the Geographic COCOMs exercises into a Global Missile defense construct known as the Integrated Missile Defense War Game (IMD/WG) series. The IMD/ WG series address the full spectrum of the short, medium, and long range ballistic missile threat, from launch to impact, and involves the integrated planning and execution of all participating COCOMs. with the goal of improving performance and validating BMDS capabilities. The exercises and wargames also enable MDA system engineering development and BMD system level interoperability testing. Additionally, the exercises and wargames create the conditions for continued international participation in selected MDA activities and projects.
- Developing and maintaining Training and Education programs, and Resource Programming policies between MDA and the Joint Warfighters and Services. These efforts have the long range goals to developing a distributed, interactive training and wargaming capability across the BMDS; developing BMDS education capabilities within the Service Schools, and conducting training and education for selected BMDS staffs and organizations on emerging BMDS Block deployment capabilities.
- Producing Concepts, Plans and Experiments that look at evolving BMDS capabilities and their impact on the Joint Warfighter's employment of the BMDS. The results enable development of operational concepts and provide warfighter feedback to developers for incorporation in future Blocks.
- Creating, developing and coordinating of BMDS-wide Integrated Logistics Support policies and procedures. These activities ensure that the requisite logistic support policies and procedures will be in place to sustain the deployed BMDS Block capabilities. This effort develops transition plans considering doctrine, organization, training, martial, leadership, personnel, facilities (DOTMLPF) and funding to improve planning and predictability for the Military departments and Combatant Commanders. The plans include not only historical precedent, but also a forward look regarding what Services and Combatant Commands may be getting, when they will be getting, and support responsibilities.
- Geographical Combatant Commander (GCC) Support. This activity enables COCOM participation in MDA activities, such as wargames, exercise, table tops, and conferences. COCOM involvement insures that MDA and Joint Warfighter continue to work together to define, field, and make operational the initial BMDS capability and subsequent new Block capabilities.
- Sustainment and Operations Support; The MDA Operations Center (MOC). This activity facilitates communications between the MDA and operational activities: to maintain situational awareness on the status of the BMDS; coordinate, when necessary, the activities required to return it to a specified status; and ensure the safe and reliable operation of the BMDS. In this role the MOC serves as the central communications node for BMDS operations, situational monitoring, and information collection in support of the Combatant Commanders' missions to conduct missile defense.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Exercises And Wargames	26,315	20,986	0	0
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- Completed the Integrated Missile Defense - 4 Wargame series which enabled USSTRATCOM, USNORTHCOM and USPACOM to successfully rehearse for achievement of initial BMDS capability.
- Completed regional exercises Joint Project Optic Windmill number eight (JPOW 8); Eagle Resolve; Reception, Staging, Onward movement and Integration 2004 (RSOI 04); and Ulchi Focus Lens 2004 (UFL 04). These events enabled MDA to remain engaged with the Geographic COCOMs, facilitated international interest and participation in MDA activities, and enabled future integration of regional Exercises into the IMD WG construct.
- Demonstrated the employment of the BMDS in a mature Link-16/Joint Range Extension communications architecture and enabled the COCOMs to develop/validate required BMD operational concepts, plans, and procedures.

FY 2005 Planned Accomplishments:

FY05 will initiate activities to integrate regional BMD exercises/wargames into the IMD WG ``umbrella``. This integration aims to provide a seamless continuum of missile defense plans and concepts to address the full spectrum of ballistic missile threats facing both the geographic COCOMs and USSTRATCOM. It also seeks to refine the processes and procedures to allocate various BMDS capabilities among affected COCOMs. In FY05, the following recurring events (either annual or bi-annual) will be conducted, each having specific objectives tailored to MDA developmental testing and COCOM training/mission rehearsal/operational planning needs for deployed MDA BMDS capabilities.

- Integrated Missile Defense War Game IMD WG in five increments:
    - IMD WG - Exercise Juniper Cobra - Rehearses EUCOM War Plan against Southwest Asia (SWA) Shorter-Range Ballistic Missile Threats. This permits early study of multi-layer defense (Patriot-Arrow) technical and operational issues in a Link-16/Joint Range Extension communications architecture in an air and missile defense environment, incorporating the Aegis SPY-1 Radar. The evaluation of Arrow and Patriot provides risk reduction for US multi-layer (Patriot-THAAD) CONOPS and technical issues.
    - IMD WG - System Engineering-Simulation - Supports MDA Development Testing of BMDS Block 04/06 capabilities. This effort also funds COCOM development of BMDS Block 04 procedures/training.
    - IMD WG - Planning Exercise - Supports MDA Development testing of the Command and Control, Battle Management and Communications (C2BMC) element. Also supports COCOM planning for BMDS Block 04 and staff training for BMDS mission and utilization of C2BMC against Northeast Asia (NEA) threats. This exercise also supports an evaluation of C2BMC technical and operational interoperability.
    - IMD WG - BMDS Exercise - Supports COCOM mission rehearsal / certification/ training in BMDS Block 04, for NEA potential threats.
    - IMD WG - Senior Leader Seminar - Review of results, accomplishments, lessons learned, and action items from the above described events.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

	FY 2004	FY 2005	FY 2006	FY 2007
Concepts, Plans And Experiments	780	78	0	0
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- Developed operational concepts and studies to prepare for future BMDS Block deployments extending from FY06 to FY11, resulting in improved planning and concept development processes for MDA future Block capabilities.

FY 2005 Planned Accomplishments:

- Continue development of operational concepts and studies for emerging BMDS capabilities.

	FY 2004	FY 2005	FY 2006	FY 2007
GCC Support	205	20	0	0
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- Ensured that all affected COCOMs participated in MDA activities related to their preparation for, employment of, and sustainment of the emergent BMDS capabilities.

FY 2005 Planned Accomplishments:

- Continue to enable COCOM participation in MDA activities related to deploying and employing the BMDS.

	FY 2004	FY 2005	FY 2006	FY 2007
BMDS Training	3,373	337	0	0
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- Conducted BMDS training for applicable COCOM, OSD and National Capital Region staffs to facilitate planning, integration and deployment of the BMDS.
- Developed training courses and initial training materials for all levels of the BMDS in preparation for initial capability deployment.
- Developed the initial BMDS Joint training organizational architecture.
- Initiated a preliminary Distributed, Multi-Echelon Training System (DMETS) capability allowing the BMDS to conduct coordinated training, wargaming and operational tasking between key locations.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

FY 2005 Planned Accomplishments:

- Continue Training and Education Program development (DMETS, BMDS special training/education).

	FY 2004	FY 2005	FY 2006	FY 2007
BMDS Logistics	470	47	0	0
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- Developed BMDS logistic support polices, procedures and Inter Service Support Agreements to enable fielding and sustainment of the initial BMDS.
- Developed the BMDS Block 04 Activation Plan to guide COCOM and Service logistical readiness for the initial BMDS capability.

FY 2005 Planned Accomplishments:

- Continue to develop BMDS Logistics Policies, Plans and Procedures and support capabilities.

	FY 2004	FY 2005	FY 2006	FY 2007
Sustainment - MOC Operations	1,605	2,710	0	0
RDT&E Articles (Quantity)	0	0	0	0

Facilitates communications between the MDA and operational activities, to maintain situational awareness on the status of the BMDS, to coordinate, when necessary, the activities required to return it to a specified status, and to ensure the safe and reliable operation of the BMDS.

FY 2004 Accomplishments:

- Staffed and activated the MDA Operation Center (MOC).
- Enabled BMDS situational awareness and allowed MDA to monitor and influence the development/deployment of the BMDS, in accordance with national goals.

FY 2005 Planned Accomplishments:

- Continue operations through FY05; Incorporate Operation Center equipment upgrades.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

D. Acquisition Strategy

Joint Warfighter Support will continue to follow the MDA's capability-based acquisition strategy that emphasizes assessment, spiral-development testing and evolutionary acquisition through the definition of two-year capability blocks. JWSP will accomplish this through development and vetting of Operational Concepts through the Joint Theater Air and Missile Defense Office, the Combatant Commanders and the Services utilizing seminars, workshops, table tops, wargames and exercises, which also supports USSTRATCOM's Military Utility Assessment.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Exercises And Wargames										
IMD WG - JUNIPER COBRA	CPAF	JNIC/PEO AMSD/ Denver CO/Huntsville AL	0	1,404	2Q	0	N/A	0	N/A	1,404
IMD WG - System Engineering - Simulation	CPAF	JNIC/GM BOEING/PEO ASMD/ Denver CO/Huntsville AL	0	4,653	3Q	0	N/A	0	N/A	4,653
IMD WG - PLANEX	CPAF	JNIC/ Denver CO	0	1,400	3Q	0	N/A	0	N/A	1,400
IMD WG - BMDS Exercise	CPAF	JNIC/GMBOEING/PEOASMD/ Denver CO/Huntsville AL	0	5,672	3Q	0	N/A	0	N/A	5,672
IMD WG - Senior Leader Seminar	CPAF	JNIC/ Denver CO	0	457	3Q	0	N/A	0	N/A	457
Technical Support	CPAF	SPARTA/ Arlington,VA	6,495	7,355	1Q	0	N/A	0	N/A	13,850
Exercise Travel			427	45	1/4Q	0	N/A	0	N/A	472
FY04 Exercises and Wargames	Various	Various	19,393	0	N/A	0	N/A	0	N/A	19,393
Concepts, Plans And Experiments										
Concept of Operations Studies	MIPR	Various	780	78	N/A	0	N/A	0	N/A	858
Gcc Support										
Travel and Shipping Support For GCCs	MIPR	Various	205	20	N/A	0	N/A	0	N/A	225

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603889C Ballistic Missile Defense Products

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
BMDS Training										
Preliminary Distributed Multi-Echelon Training System Study	CPAF	JNIC	637	50	N/A	0	N/A	0	N/A	687
Initial BMDS Training Development	Various	Various	2,736	287	N/A	0	N/A	0	N/A	3,023
BMDS Logistics										
Develop Initial BMDS Logistics Support Policies	Various	Various	400	24	N/A	0	N/A	0	N/A	424
Develop BMDS Block Activation Plan	CPAF	JNIC	70	23	N/A	0	N/A	0	N/A	93
Sustainment & Operations - Moc										
Sustainment – MOC Operations			55	823	1Q	0	N/A	0	N/A	878
Technical Support	CPAF	SPARTA/ Rosslyn, VA	1,550	1,887	1Q	0	N/A	0	N/A	3,437
Subtotal Product Development			32,748	24,178		0		0		56,926

Remarks

Prior year costs for exercises and wargames do not track back to the specific exercises and wargames conducted in FY05. Some exercises are conducted every other year (either in odd years or even years). Other exercises and wargames, although conducted annually, have different designators, and therefore have no follow-on cost for that particular exercise. In addition, Project 0703 only covers those exercises that occur or affect Block 2004 (FY04-05). Later efforts are detailed in subsequent Block Project budget exhibits (FY06-07 are in Project 0803; FY08-09 are in Project 0903; and FY 10-11 are in Project 0003).

MDA Operations Center (MOC) efforts in FY04 consisted of developing concepts of operation, acquiring initial computer and communications equipment requirements and less than one quarter of actual operations. Full time operations, once started at the end of FY04, will continue in FY05 and beyond.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

Project Total Cost			32,748	24,178		0		0		56,926

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
BLOCK 2004																																
IDO and Fielding of Block 04	▲	—	—	▲																												
Terminal Fury (TF) 04	▲																															
GMD Training Phase II Begins		▲																														
RSOI 04		▲																														
Military Utility Assessment (MUA) VI			▲																													
Joint Project Optic Windmill 2004			▲																													
Eagle Resolve (ER) 04			▲																													
FY 04 WG Series			▲	— ▲																												
Military Utility Assessment (MUA) V2				▲																												
MDA Operation Center (MOC)				▲																												
Ulchi Focus Lens (UFL 04)				▲																												
IMD WG - Juniper Cobra							△																									
IMD WG - System Engineering Simulation							△																									
IMD WG - Planning Exercise							△																									
IMD WG - BMDS Exercise							△																									
IMD WG - Senior Leader Seminar								△																								

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
BLOCK 2004								
IDO and Fielding of Block 04	1Q-4Q							
Terminal Fury (TF) 04	1Q							
GMD Training Phase II Begins	2Q							
RSOI 04	2Q							
Military Utility Assessment (MUA) VI	3Q							
Joint Project Optic Windmill 2004	3Q							
Eagle Resolve (ER) 04	3Q							
FY 04 WG Series	3Q-4Q							
Military Utility Assessment (MUA) V2	4Q							
MDA Operation Center (MOC)	4Q							
Ulchi Focus Lens (UFL 04)	4Q							
IMD WG - Juniper Cobra		3Q						
IMD WG - System Engineering Simulation		3Q						
IMD WG - Planning Exercise		3Q						
IMD WG - BMDS Exercise		3Q						
IMD WG - Senior Leader Seminar		4Q						

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0803 Joint Warfighter Support Block 2006	0	0	56,518	66,047	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0	0

Note:
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A. Mission Description and Budget Item Justification

As part of the total BMDS, The Joint Warfighter Support Program (JWSP) element, a component of the Ballistic Missile Defense Products PE, enables and supports the BMDS as it is developed, initially deployed and upgraded in Block increments. The JWSP enables MDA to work collaboratively with the Joint Warfighters in defining, testing, and deploying/employing the various BMDS Block capabilities.

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- Supporting the Geographical Combatant Commanders (GCCs). This activity enables COCOM participation in MDA activities, such as wargames, exercise, table tops, and conferences. COCOM involvement insures that MDA and Joint Warfighter continue to work together to define, field, and make operational the initial BMDS capability and subsequent new Block capabilities.
- Sustainment & Operations: The MDA Operations Center (MOC). This activity to facilitate enables communications between the MDA and operational activities, to maintain situational awareness on the status of the BMDS, to coordinate, when necessary, the activities required to return it to a specified status, and to ensure the safe and reliable operation of the BMDS. In this role the MOC serves as the central communications node for BMDS operations, situational monitoring, and information collection in support of the Combatant Commanders' missions to conduct missile defense.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Exercises And Wargames	0	0	31,839	38,207
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 and 2005 addressed in Project 0703.

FY 2006 Planned Program:

FY 2006 efforts will focus on an increased level of integration of regional missile defense exercises into the Integrated Missile Defense War Game (IMD/WG) construct. In FY06, the following recurring events (either annual or bi-annual) will be conducted with specific objectives tailored to MDA developmental and interoperability testing and the COCOMs operational and training needs:

- Integrated Missile Defense War Game - IMD WG in five planned increments:
  - IMD WG - Exercise Joint Project Optic Windmill. A combined-joint EUCOM missile defense exercise employing live forces and simulation to investigate interoperability and integration procedures/issues/technologies in addressing the short to medium range ballistic missile threat from South-West Asia (SWA). The exercise involves participation of live U.S., German, Dutch, and Greek PATRIOT forces, live Aegis and Aegis-like allied ship based systems, and live or simulated representations of emerging MDA BMD Block 06/08 capabilities. Permits study of multi- system technical and operational issues in a Link-16/Joint Range Extension communications architecture in an air and missile defense environment, incorporating added elements and BMDS capability for Block 06.
  - IMD WG - System Engineering - Simulations. Supports annual MDA Development Testing of BMDS Block 06/08 capabilities. Supports COCOM development of BMDS procedures/training.
  - IMD WG - Planning Exercise. Supports MDA Development testing of Block 06 Command and Control, Battle Management and Communications (C2BMC). Also supports COCOM Joint Operational Planning and Execution System (JOPES) planning for BMDS Blocks and staff training for BMDS mission and utilization of C2BMC against NorthEast Asia (NEA) threats. These exercises also support evaluation of C2BMC technical and operational interoperability.
  - IMD WG - BMDS Exercise. Supports COCOM mission rehearsal / certification / training in Block 06 BMDS, for NEA potential threats.
  - IMD WG - Senior Leader Seminar. Review of results, accomplishments, lessons learned, and action items from annual WG events.
- PACOM Exercise set - a tailored combination of Ulchi Focus Lens / Rapid Thunder/RSOI, Terminal Fury, KEEN Edge exercises - Supports COCOM planning/staff training for BMDS against NEA Threat. Planning portions of exercises to be integrated into IMD WG Series.
- Exercise Eagle Resolve - Maintains MDA influence with Geographic COCOM (GCC) for utilization of BMDS versus SWA BM threat.

FY 2007 Planned Program:

FY07 efforts will focus on completing the integration of regional missile defense exercises into the Integrated Missile Defense War Game construct. In FY07, the following recurring events (either annual or bi-annual) will be conducted with specific objectives tailored to MDA developmental and interoperability testing and the COCOMs operational and training needs:

- Integrated Missile Defense War Game - Fiscal Year IMD WG in five planned increments:
  - IMD WG - Exercise Juniper Cobra. A combined-joint EUCOM missile defense exercise employing live forces and simulation to investigate interoperability and integration procedures/issues/technologies in addressing the ballistic missile threat from South-West Asia (SWA). The exercise involves participation of live U.S. and host nation forces, in a multi-layered/Link 16/JRE environment. It also permits study of multi- system technical and operational issues for Block 06/08 capabilities.
  - IMD WG - System Engineering - Simulations. Supports annual MDA Development Testing of BMDS Block 06/08 capabilities. Supports COCOM development of BMDS procedures/training.

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- IMD WG - Planning Exercise. Supports MDA Development testing of Block 06 Command and Control, Battle Management and Communications (C2BMC). Also supports COCOM Joint Operational Planning and Execution System (JOPES) planning for BMDS Blocks and staff training for BMDS mission and utilization of C2BMC against NorthEast Asia (NEA) threats. These exercises also support evaluation of C2BMC technical and operational interoperability.
- IMD WG - BMDS Exercise. Supports COCOM mission rehearsal / certification / training in Block 06 BMDS, for NEA potential threats.
- IMD WG - Senior Leader Seminar. Review of results, accomplishments, lessons learned, and action items from annual WG events.

- PACOM Exercise set - a tailored combination of Ulchi Focus Lens / Rapid Thunder/RSOI, Terminal Fury, KEEN Edge exercises - Supports COCOM planning/staff training for BMDS against NEA Threat. Planning portions of exercises to be integrated into IMD WG.
- Exercise Roving Sands - Supports BMDS/C2BMC interoperability. Supports refinement of BMDS operational and interoperability study. Supports study of BMDS Block 06/08 capabilities/issues.
- Exercise Eagle Resolve - Maintains MDA influence with Geographic COCOM (GCC) for utilization of BMDS versus SWA BM threat.

	FY 2004	FY 2005	FY 2006	FY 2007
Concepts, Plans And Experiments	0	0	1,773	1,805
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 and 2005 addressed in Project 0703.

FY 2006 Planned Program:

- BMDS Table Top Exercises- Supports Warfighter and MDA understanding of the systems and capabilities included in each new Block upgrade.
- Studies and Analyses - Studies and analyzes emergent BMDS technology impacts on Joint Warfighter requirements for Block 06/08 development efforts.

FY 2007 Planned Program:

- BMDS Table Top Exercises - Supports Warfighter and Developer understanding of the systems and capabilities included in each new BMDS system Block upgrade.
- Studies and Analyses - Studies and analyzes emergent BMDS technology impacts on Joint Warfighter requirements to aid/inform Block 08/10/12 development efforts.

	FY 2004	FY 2005	FY 2006	FY 2007
Gcc Support	0	0	2,764	2,947
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 and 2005 addressed in Project 0703.

FY 2006 Planned Program:

- Continues COCOM participation in MDA activities, such as wargames, exercises, table tops, and conferences.

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FY 2007 Planned Program:

- Continues COCOM participation in MDA activities, such as wargames, exercises, table tops, and conferences.

	FY 2004	FY 2005	FY 2006	FY 2007
BMDS Training	0	0	13,882	16,673
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 and 2005 addressed in Project 0703.

FY 2006 Planned Program:

- Continue development of BMDS Training Center at JNIC to support TR/MDA Training/Education Program.
- Continue the BMDS Training and Education Program (BTEP) to develop topics related to employment of newly emerging BMDS capabilities.
- Deliver tailored BMDS training to selected Joint Warfighting audiences.
- Continue evolution of DMETS architecture to incorporate new BMDS capabilities.
- Training Transition to the Services - Continue efforts to institutionally embed BMDS education in Service/Joint schools and Professional Military Education institutions.
- Worldwide Missile Training and Education Conference - Develops policy and strategy updates for the BMDS.

FY 2007 Planned Program:

- Continue development of BMDS Training Center.
- Continue the BMDS Training and Education Program (BTEP), to develop training modules related to employment of new BMDS capabilities.
- Present tailored BMDS training to selected Joint Warfighting audiences.
- Distributed Multi-Echelon Training System (DMETS) - Continue incorporation of new Engagement Sequence Groups into DMETS architecture .
- Continue Training Transition to the Services.
- Conduct Worldwide Missile Training and Education Conference - Develops policy and strategy updates for the BMDS.

	FY 2004	FY 2005	FY 2006	FY 2007
BMDS Logistics	0	0	1,687	1,718
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 and 2005 addressed in Project 0703.

FY 2006 Planned Program: BMDS-wide sustainment/Integrated Logistics Support (ILS) planning and Block contingency-deployment planning.

- Conduct logistics exercises with the Services and COCOMs to help develop evolving BMDS Block sustainment policies, directives and procedural information.
- Conduct the annual Integrated Logistics Support Management Team (ILSMT) Conference.

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- Update and revise the BMDS Handbook.
- Update BMDS Logistics Training curriculum and related materials.

FY 2007 Planned Program:

- Conduct BMDS-wide sustainment/ILS planning and Block contingency-deployment planning.
- Conduct Logistics Exercises with the Services and COCOMs to help develop evolving BMDS Block sustainment policies, directives and procedural information.
- Conduct the annual Integrated Logistics Support Management Team (ILSMT) Conference.
- Update and revise the BMDS Handbook.

	FY 2004	FY 2005	FY 2006	FY 2007
Sustainment - & Operations - MOC	0	0	4,573	4,697
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 and 2005 addressed in Project 0703.

FY 2006 Planned Program:

- Continue operations with appropriate MOC equipment upgrades.

FY 2007 Planned Program:

- Continue operations with appropriate MOC equipment upgrades.

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C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

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APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

D. Acquisition Strategy

Joint Warfighter Support will continue to follow the MDA's capability-based acquisition strategy that emphasizes assessment, spiral-development testing and evolutionary acquisition through the definition of two-year capability blocks. The JWSP accomplish this through development and vetting of Operational Concepts through the Joint Theater Air and Missile Defense Office, the Combatant Commanders and the Services utilizing seminars, workshops, table tops, wargames and exercises, which also support Military Utility Assessment.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Exercises And Wargames										
IMD WG - Joint Project Optic Windmill	CPAF	JNIC/PEO AMSD/ Denver CO/Huntsville AL	0	0	N/A	3,895	2Q	0	N/A	3,895
IMD WG - System Engineering Simulation	CPAF	JNIC/GM BOEING/PEO ASMD/ Denver CO/Huntsville AL	0	0	N/A	5,614	2Q	0	N/A	5,614
IMD WG - Planning Exercise	CPAF	JNIC/ Denver CO	0	0	N/A	1,677	2Q	0	N/A	1,677
IMD WG - BMDS Exercise	CPAF	JNIC/GM BOEING/PEO ASMD/ Denver CO/Huntsville AL	0	0	N/A	6,798	2Q	0	N/A	6,798
IMD WG - Senior Leader	CPAF	JNIC/ Denver CO	0	0	N/A	187	2Q	0	N/A	187
PACOM Exercise Set	CPAF	JNIC/ Denver CO	0	0	N/A	2,987	2Q	7,275	2Q	10,262
Exercise EAGLE RESOLVE 2006/2007	Various	JNIC/ CENTCOM/ Denver CO	0	0	N/A	218	2Q	222	2Q	440
Exercise ROVING SANDS 2007	CPAF	JNIC/ Denver CO	0	0	N/A	0	N/A	1,786	2Q	1,786
Technical Support	CPAF	JNIC/ Denver CO	0	0	N/A	10,463	1Q	11,174	1Q	21,637

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Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
IMD WG - JUNIPER COBRA	CPAF	JNIC/PEO AMSD/ Denver CO	0	0	N/A	0	N/A	2,554	2Q	2,554
IMD WG - System Engineering - Simulation	CPAF	JNIC/GMD BOEING/PEO ASMD/ Denver CO	0	0	N/A	0	N/A	5,975	2Q	5,975
IMD WG - PLANEX	CPAF	JNIC/ Denver CO	0	0	N/A	0	N/A	1,785	2Q	1,785
IMD WG - BMDS Exercise	CPAF	JNIC/ Denver CO	0	0	N/A	0	N/A	7,235	2Q	7,235
IMD WG - Senior Leader Seminar	CPAF	JNIC/ Denver CO	0	0	N/A	0	N/A	201	2Q	201
Concepts, Plans And Experiments										
BMDS Table Top	MIPR	Various	0	0	N/A	473	1Q	482	1Q	955
Studies & Analysis	MIPR	Various	0	0	N/A	1,300	1Q	1,323	1Q	2,623
GCC Support										
USSTRATCOM	MIPR	USSTRATCOM/ San Diego ,CA	0	0	N/A	88	1Q	105	1Q	193
EUCOM	MIPR	THAAD/ Huntsville, AL	0	0	N/A	50	1Q	65	1Q	115
USPACOM	MIPR	USPACOM/ Germany	0	0	N/A	88	1Q	105	1Q	193
USCENTCOM	MIPR	USCENTCOM/ Tampa, FL	0	0	N/A	88	1Q	105	1Q	193
USNORTHCOM	MIPR	USNORTHCOM Colorado Springs, CO	0	0	N/A	50	1Q	65	1Q	115
USFK	MIPR	USFK/ Korea	0	0	N/A	156	1Q	190	1Q	346

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

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APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603889C Ballistic Missile Defense Products

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Technical Support	CPIF	MDA/ Arlington, VA	0	0	N/A	2,244	1/4Q	2,312	1/4Q	4,556
BMDS Training										
BMDS Training Center	CPAF	JNIC/ Denver, CO	0	0	N/A	3,275	1Q	3,705	1Q	6,980
DMETS	CPAF	JNIC/ Denver, CO	0	0	N/A	7,277	1Q	7,410	1Q	14,687
Studies & Analyses	CPAF	SPARTA/ Arlington, VA	0	0	N/A	508	1Q	517	1Q	1,025
Transition to Services	CPAF	MDA/ Arlington, VA	0	0	N/A	2,822	1Q	5,041	1Q	7,863
BMDS Logistics										
BMDS Logistics	CPAF	JNIC/ Denver, CO	0	0	N/A	1,687	1Q	1,718	1Q	3,405
Sustainment - & Operations - MOC										
MOC Operations	Various		0	0	N/A	1,653	1Q	1,579	1Q	3,232
Technical Support	CPAF	SPARTA/ Rosslyn, VA	0	0	N/A	2,920	1Q	3,118	1Q	6,038
Subtotal Product Development			0	0		56,518		66,047		122,565

Remarks

Prior year costs (FY 2004-2005) are discussed in Project 0703.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

Project Total Cost			0	0		56,518		66,047		122,565

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
BLOCK 2006																																
IMD WG - Joint Project Optic Windmill										Δ																						
IMD WG - System Engineering Simulation										Δ																						
PACOM Exercise Set											Δ																					
Eagle Resolve 2006											Δ	Δ																				
IMD WG - Planning Exercise												Δ																				
IMD WG - BMDS Exercise												Δ																				
IMD WG - Senior Leader Seminar												Δ																				
IMD WG - Juniper Cobra 2007														Δ																		
Joint Project Optic Windmill											Δ																					
Roving Sands 2007															Δ																	
Eagle Resolve 2007															Δ																	
PACOM Exercise Set 2007															Δ	Δ																
IMD WG - System Engineering Simulation 2007																Δ																
IMD WG - Senior Leader Seminar 2007																Δ																
IMD WG - BMDS Exercise 2007																Δ																
IMD WG - Planning Exercise 2007																Δ																

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail

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February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603889C Ballistic Missile Defense Products

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
BLOCK 2006								
IMD WG - Joint Project Optic Windmill			2Q					
IMD WG - System Engineering Simulation			2Q					
PACOM Exercise Set			3Q					
Eagle Resolve 2006			3Q-4Q					
IMD WG - Planning Exercise			4Q					
IMD WG - BMDS Exercise			4Q					
IMD WG - Senior Leader Seminar			4Q					
IMD WG - Juniper Cobra 2007				2Q				
Joint Project Optic Windmill			3Q					
Roving Sands 2007				3Q				
Eagle Resolve 2007				3Q				
PACOM Exercise Set 2007				3Q-4Q				
IMD WG - System Engineering Simulation 2007				4Q				
IMD WG - Senior Leader Seminar 2007				4Q				
IMD WG - BMDS Exercise 2007				4Q				
IMD WG - Planning Exercise 2007				4Q				

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0903 Joint Warfighter Support Block 2008	0	0	0	0	61,571	62,774	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0	0

Note:
Starting in FY 2004, funding for this effort has been allocated across Ballistic Missile Defense Products PE 0603889C in two-year capability Blocks under Project 0703 (FY 2004-2005), Project 0803 (FY 2006-2007), Project 0903 (FY 2008-2009) and Project 0003 (FY 2010-2011).

A. Mission Description and Budget Item Justification

As part of the total BMDS, The Joint Warfighter Support Program (JWSP) element, a component of the Ballistic Missile Defense Products PE, enables and supports the BMDS as it is developed, initially deployed and upgraded in Block increments. The JWSP enables MDA to work collaboratively with the Joint Warfighters in defining, testing, and deploying/employing the various BMDS Block capabilities. The JWSP consists of six primary activities:

- Conducting Exercises and Wargames for mission training, qualification, certification and rehearsal of the Combatant Commanders (COCOMs) and refining development of the BMDS. This program focuses on integrating the Geographic COCOMs exercises into a Global Missile defense construct known as the Integrated Missile Defense War Game (IMD/WG) series. The IMD/WG series address the full spectrum of the short, medium, and long range ballistic missile threat, from launch to impact, and involves the integrated planning and execution of all participating COCOMs. with the goal of improving performance and validating BMDS capabilities. The exercises and wargames also enable MDA system engineering development and BMD system level interoperability testing. Additionally, the exercises and wargames create the conditions for continued international participation in selected MDA activities and projects
- Developing and maintaining Training and Education programs, and Resource Programming policies between MDA and the Joint Warfighters and Services. These efforts have the long range goals to developing a distributed, interactive training and wargaming capability across the BMDS; developing BMDS education capabilities within the Service Schools, and conducting training and education for selected BMDS staffs and organizations on emerging BMDS Block deployment capabilities.
- Producing Concepts, Plans and Experiments that look at evolving BMDS capabilities and their impact on the Joint Warfighter's employment of the BMDS. The results enable development of operational concepts and provide warfighter feedback to developers for incorporation in future Blocks.
- Creating, developing and coordinating of BMDS-wide Integrated Logistics Support policies and procedures. These activities ensure that the requisite logistic support policies and procedures will be in place to sustain the deployed BMDS Block capabilities. This effort develops transition plans considering doctrine, organization, training, martial, leadership, personnel, facilities (DOTMLPF) and funding to improve planning and predictability for the Military departments and Combatant Commanders. The plans include not only historical precedent, but also a forward look regarding what Services and Combatant Commands may be getting, when they will be getting, and support responsibilities.
- Geographical Combatant Commander (GCC) Support. This activity enables COCOM participation in MDA activities, such as wargames, exercise, table tops, and conferences. COCOM involvement insures that MDA and Joint Warfighter continue to work together to define, field, and make operational the initial BMDS capability and subsequent new Block capabilities.
- Sustainment and Operation Support. Supporting the MDA Operations Center (MOC). The MOC enables communications between the MDA and operational activities, to maintain situational awareness on the status of the BMDS, to coordinate, when necessary, the activities required to return it to a specified status, and to ensure the safe and reliable operation of the BMDS. In this role the MOC serves as the central communications node for BMDS operations, situational monitoring, and information collection in support of the Combatant Commanders' missions to conduct missile defense.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Funding in this Project is not programmed until FY 2008.	0	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

D. Acquisition Strategy

Joint Warfighter Support will continue to follow the MDA's capability-based acquisition strategy that emphasizes assessment, spiral-development testing and evolutionary acquisition through the definition of two-year capability blocks. JWSP will accomplish this through development and vetting of Operational Concepts through JTAMDO, the Combatant Commanders and the Services utilizing seminars, workshops, table tops, wargames and exercises, which also support the Military Utility Assessment.

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
BLOCK 2008																																
Regional Combatant Commanders Exercises																	Δ							Δ								
Eagle Resolve 2009																							Δ									
IMD WG - BMDS Exercise																				Δ												
IMD WG - BMDS Exercise 2009																								Δ								
IMD WG - Battle Planning Exercise																				Δ												
IMD WG - Battle Planning Exercise 2009																								Δ								
IMD WG - Joint Project Optic Windmill																		Δ														
IMD WG - Juniper Cobra																						Δ										
IMD WG - Planning Exercise																								Δ								
IMD WG - System Engineering Simulation																			Δ													
IMD WG - System Engineering Simulation 2009																			Δ													
PACOM Exercise Set																			Δ	Δ			Δ	Δ								
Roving Sands 2009																							Δ									

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603889C Ballistic Missile Defense Products

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
BLOCK 2008								
Regional Combatant Commanders Exercises					1Q-4Q	1Q-4Q		
Eagle Resolve 2009						3Q		
IMD WG - BMDS Exercise					4Q			
IMD WG - BMDS Exercise 2009						4Q		
IMD WG - Battle Planning Exercise					4Q			
IMD WG - Battle Planning Exercise 2009						4Q		
IMD WG - Joint Project Optic Windmill					2Q			
IMD WG - Juniper Cobra						2Q		
IMD WG - Planning Exercise						4Q		
IMD WG - System Engineering Simulation					3Q			
IMD WG - System Engineering Simulation 2009					3Q			
PACOM Exercise Set					3Q-4Q	3Q-4Q		
Roving Sands 2009						3Q		

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0003 Joint Warfighter Support Block 2010	0	0	0	0	0	0	64,887	68,564
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

As part of the total BMDS, The Joint Warfighter Support Program (JWSP) element, a component of the Ballistic Missile Defense Products PE, enables and supports the BMDS as it is developed, initially deployed and upgraded in Block increments. The JWSP enables MDA to work collaboratively with the Joint Warfighters in defining, testing, and deploying/employing the various BMDS Block capabilities. The JWSP consists of six primary activities:

- Conducting Exercises and Wargames for mission training, qualification, certification and rehearsal of the Combatant Commanders (COCOMs) and refining development of the BMDS. This program focuses on integrating the Geographic COCOMs exercises into a Global Missile defense construct known as the Integrated Missile Defense War Game (IMD/WG) series. The IMD/WG series address the full spectrum of the short, medium, and long range ballistic missile threat, from launch to impact, and involves the integrated planning and execution of all participating COCOMs. with the goal of improving performance and validating BMDS capabilities. The exercises and wargames also enable MDA system engineering development and BMD system level interoperability testing. Additionally, the exercises and wargames create the conditions for continued international participation in selected MDA activities and projects
- Developing and maintaining Training and Education programs, and Resource Programming policies between MDA and the Joint Warfighters and Services. These efforts have the long range goals to developing a distributed, interactive training and wargaming capability across the BMDS; developing BMDS education capabilities within the Service Schools, and conducting training and education for selected BMDS staffs and organizations on emerging BMDS Block deployment capabilities.
- Producing Concepts, Plans and Experiments that look at evolving BMDS capabilities and their impact on the Joint Warfighter's employment of the BMDS. The results enable development of operational concepts and provide warfighter feedback to developers for incorporation in future Blocks.
- Creating, developing and coordinating of BMDS-wide Integrated Logistics Support policies and procedures. These activities ensure that the requisite logistic support policies and procedures will be in place to sustain the deployed BMDS Block capabilities. This effort develops transition plans considering doctrine, organization, training, martial, leadership, personnel, facilities (DOTMLPF) and funding to improve planning and predictability for the Military departments and Combatant Commanders. The plans include not only historical precedent, but also a forward look regarding what Services and Combatant Commands may be getting, when they will be getting, and support responsibilities.
- Geographical Combatant Commander (GCC) Support. This activity enables COCOM participation in MDA activities, such as wargames, exercise, table tops, and conferences. COCOM involvement insures that MDA and Joint Warfighter continue to work together to define, field, and make operational the initial BMDS capability and subsequent new Block capabilities.
- Sustainment and Operation Support. Supporting the MDA Operations Center (MOC). The MOC enables communications between the MDA and operational activities, to maintain situational awareness on the status of the BMDS, to coordinate, when necessary, the activities required to return it to a specified status, and to ensure the safe and reliable operation of the BMDS. In this role the MOC serves as the central communications node for BMDS operations, situational monitoring, and information collection in support of the Combatant Commanders' missions to conduct missile defense.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Funding in this Project is not programmed until FY 2010.				
RDT&E Articles (Quantity)				

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

C. Other Program Funding Summary

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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

D. Acquisition Strategy

Joint Warfighter Support will continue to follow the MDA's capability-based acquisition strategy that emphasizes assessment, spiral-development testing and evolutionary acquisition through the definition of two-year capability blocks. JWSP will accomplish this through development and vetting of Operational Concepts through JTAMDO, the Combatant Commanders and the Services utilizing seminars, workshops, table tops, wargames and exercises, which also support the Military Utility Assessment.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0204 Joint National Integration Center (JNIC)	53,830	71,367	76,895	80,688	82,661	84,736	85,925	86,581
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

The mission of the JNIC is to develop and operate those portions of the BMDS Test Bed that comprise a robust suite of rapid prototyping and missile defense test and evaluation capabilities, which ensures BMDS elements are acquired and integrated into an interoperable, layered system, while simultaneously supporting warfighter operations of designated BMDS elements. The JNIC maintains a secure facility that includes the computers; communications; networks; flight, ground, and simulation test bed environments; wargaming complex; environmental support; and other fixed cost capabilities essential for the execution of MDA programs. It provides the enabling infrastructure to support both acquisition and warfighter communities.

In executing this mission, the JNIC establishes a core capability for exercising, evaluating, analyzing and refining advanced missile defense concepts that can then be used to improve follow-on blocks to the BMDS. It does this by planning, providing technical support, and executing Operator-in-the-Loop Wargames; Joint Warfighter Exercises and Experiments; Missile Defense Integration Exercises; and Integrated Missile Defense Analyses. These activities allow the developer, tester, and operator to assess capabilities in the same environment. The JNIC facilitates international cooperation and support of the BMDS through the development and execution of missile defense seminars, workshops, wargames, and other multinational activities. It builds and retains a corporate knowledge base comprised of leading technical experts to respond quickly to customer requirements and perform technical MDA missions.

The JNIC also supports the development and provides the enabling infrastructure for several areas. These include the overarching Command and Control, Battle Management, and Communications (C2BMC) element of the BMDS, the Missile Defense Element (MDE) of the Ground-Based Midcourse Defense (GMD) segment of BMDS, the MDA Technical Support Center (MTSC) which provides end-to-end technical reachback expertise to warfighters, and the MDA Intelligence Support Center (ISC) and the 100th Missile Defense Brigade Intelligence Cell (BIC). In addition, for the MTSC, it provides network and security upgrades and process development implementation for integration and fusion of health and status data on both the BMDS test bed and BMDS elements. The JNIC supports the GMD Mission Control Center Facility (MCCF), as well as the USNORTHCOM C2BMC servers, Interim BMDS Operations Center (IBOC), the C2BMC Integration and Test Center (BITC) and the C2BMC Experimentation Laboratories (X-Labs). It provides infrastructure support of the Satellite Tracking and Surveillance System's (STSS) JNIC Satellite Control Facility; the Near Field Infrared Experiment's JNIC Mission Operations Center (JMOC); and developmental support, as directed, of a common satellite ground station and sensor netting test bed for designated BMDS elements. It also plans, conducts, and supports BMDS Engagement Sequence Group testing and analysis with the responsible engineering organization (REO) and responsible test organization (RTO).

The JNIC designs, implements, verifies, operates, maintains and manages secure IT infrastructure and service interfaces, communication circuit connectivity, and tiered service levels. It provides physical security upgrades to protect BMDS capabilities, accommodates the System Security Level protections required per DEPSECDEF guidance dated July 2004, and provides additional labor and diagnostic tools for 24X7 information management, security, and facilities operation and maintenance technical support. This technical support, provided outside normal duty hours, is crucial to warfighter mission critical system outage restoral, coordination, and reporting.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
JNIC Development & Ops	53,830	71,367	76,895	80,688
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- Supported proof of concept demonstrations with USN Aegis systems in the areas of command and control and radar tracking.
- Conducted Integrated Missile Defense wargames to refine Combatant Commander Concepts of Operations and tactics, techniques, and procedures (TTPs).
- Tested warfighter communications and tactical message data flows during Missile Defense Integrated Exercises.
- Supported demonstration of prototypical intercept boosters and communications during a BMDS integrated flight test.
- Established infrastructure enhancements to support warfighter mission critical systems.
- Provided enabling infrastructure supporting MDA RDT&E efforts at the JNIC for:
    - GMD Mission Control Center Facility (MCCF) build out and support
    - C2BMC Integration and Test Center (BITC) & C2BMC Experimentation Laboratories (X-Labs)
    - Satellite Tracking and Surveillance System's (STSS) JNIC Satellite Control Facility (JSCF)
    - Near Field Infrared Experiment's JNIC Mission Operations Center (JMOC)
    - Integrated Missile Defense (IMD) Wargame series execution
    - Combatant Commander exercise support
    - BMDS system-level flight tests
- Executed System Ground Tests for continued ESG test & assessment
- Provided enabling infrastructure supporting BMDS operational capability development for:
    - Missile Defense Element (MDE) servers and warfighter data and voice net connections.
    - C2BMC servers and enterprise work stations.
    - MDA Technical Support Center (MTSC), BMDS Watch Officer (BWO), BMDS Safety Officer (BSO).
    - MDA Intelligence Support Cell (ISC) and the 100th Missile Defense Brigade Intelligence Cell (BIC).

FY 2005 Planned Accomplishments:

- Support demonstrations with USN Aegis ships to show interactions with BMDS command and control, radar tracking, and intercept capability.
- Provide wargame scenarios to enhance understanding of current missile defense capabilities and investigate options for future capabilities.
- Conduct Nimble Titan wargame which allows warfighters to employ TTPs to protect the homeland.
- Conduct Integrated Missile Defense Distributed Wargames, which involve globally distributed warfighters using equipment in their remote command and control centers.
- Conduct Missile Defense Integrated Exercise(s) to assess ESGs and to improve interoperability and integration.
- Provide enabling infrastructure supporting MDA RDT&E efforts at the JNIC for:
    - GMD Mission Control Center Facility (MCCF)
    - C2BMC Integration and Test Center (BITC) & C2BMC Experimentation Laboratories (X-Labs)
    - Satellite Tracking and Surveillance System's (STSS) JNIC Satellite Control Facility (JSCF)
    - Near Field Infrared Experiment's JNIC Mission Operations Center (JMOC)

- Combatant Commander exercise support
- BMDS system-level flight tests

- Provide enabling infrastructure supporting BMDS operational capability development for:
  - Missile Defense Element (MDE) servers and warfighter data and voice net connections.
  - C2BMC servers and enterprise work stations.
  - MDA Technical Support Center (MTSC), BMDS Watch Officer (BWO), BMDS Safety Officer (BSO).
  - MDA Intelligence Support Cell (ISC) and the 100th Missile Defense Brigade Intelligence Cell (BIC).

FY 2006 Planned Program:

- Support fleet demonstrations to show that deployed Aegis ships are capable of integrating into the BMDS command and control structure, can conduct radar tracking, and possess limited intercept capability.
- Create a virtual Pacific War scenario for the Integrated Missile Defense PACOM wargame, to allow PACOM warfighters to investigate options and develop various concepts of operations.
- Create a virtual war scenario where warfighters can train using available simulated missile defense capabilities for the Nimble Titan Wargame.
- Provide enabling infrastructure supporting MDA RDT&E efforts at the JNIC for:
  - GMD Mission Control Center Facility (MCCF)
  - C2BMC Integration and Test Center (BITC) & C2BMC Experimentation Laboratories (X-Labs)
  - Satellite Tracking and Surveillance System's (STSS) JNIC Satellite Control Facility (JSCF)
  - Near Field Infrared Experiment's JNIC Mission Operations Center (JMOC)
  - Combatant Commander exercise support
  - BMDS system-level flight tests
  - Block 06 sensor integration and test
- Provide enabling infrastructure supporting BMDS operational capability development for:
  - Missile Defense Element (MDE) servers and warfighter data and voice net connections.
  - C2BMC servers and enterprise work stations.
  - MDA Technical Support Center (MTSC), BMDS Watch Officer (BWO), BMDS Safety Officer (BSO).
  - MDA Intelligence Support Cell (ISC) and the 100th Missile Defense Brigade Intelligence Cell (BIC).
- Provide repair, sustainment, and recapitalization of mission critical infrastructure to include data storage, electronic security system, and power and computing upgrades.

FY 2007 Planned Program:

- Continue to support the integration of capable deployed USN Aegis ships into the BMDS command and control structure.
- Create a Eurasian war scenario for an Integrated Missile Defense EUCOM/CENTCOM Wargame that allows EUCOM and CENTCOM warfighters to investigate their options and develop various concepts of operations.
- Create a virtual war scenario for the Nimble Titan Wargame which allows warfighters to practice TTPs they would employ during an actual global conflict.
- Provide enabling infrastructure supporting MDA RDT&E efforts at the JNIC for:
  - GMD Mission Control Center Facility (MCCF)
  - C2BMC Integration and Test Center (BITC) & C2BMC Experimentation Laboratories (X-Labs)
  - Satellite Tracking and Surveillance System's (STSS) JNIC Satellite Control Facility (JSCF)

- Near Field Infrared Experiment's JNIC Mission Operations Center (JMOC)
- Combatant Commander exercise support

- Support integration of additional deployed sensors during ground and flight test events
- Execute System Ground Tests for continued ESG test & assessment.
- Provide enabling infrastructure supporting BMDS operational capability development for:
  - Missile Defense Element (MDE) servers and warfighter data and voice net connections.
  - C2BMC servers and enterprise work stations.
  - MDA Technical Support Center (MTSC), BMDS Watch Officer (BWO), BMDS Safety Officer (BSO).
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Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

D. Acquisition Strategy

The strategy for JNIC mission execution is to employ an integration contract to simultaneously perform all of the BMDS RDT&E tasks with integrated operation and sustainment. The JNIC is operated by missile defense subject matter experts composed of Government military and civilian personnel, Federally Funded Research and Development Center (FFRDC), JNIC Technical Advisory and Assistance Services (JTAAS), and major defense contractors.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
JNIC Development & Ops										
JNIC		JNIC/ Colorado Springs, CO	3,494	3,483	1/4Q	3,529	1Q	3,678	1Q	14,184
USN		Naval Research Laboratory/ Colorado Springs, CO	968	1,002	1/4Q	1,036	1Q	1,070	1Q	4,076
JNIC/MDA		JNIC/ Colorado Springs, CO	0	2,938	1/4Q	2,997	1Q	2,997	1Q	8,932
Subtotal Product Development			4,462	7,423		7,562		7,745		27,192

Remarks

Funds provide government services--manpower.

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
JNIC Development & Ops										
JNIC	MIPR	50 Space Wing/ Schriever AFB, CO	891	1,087	1Q	1,104	1Q	1,124	1Q	4,206
Subtotal Support Costs			891	1,087		1,104		1,124		4,206

Remarks

These funds are for utilities and base communications as specified in the Interservice Support Agreement with the 50th Space Wing.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
JNIC Development & Ops										
JNIC	C/CPAF	Northrop Grumman Mission Sys./ CO	42,467	56,651	2Q	61,828	2Q	65,303	2Q	226,249
Subtotal Test and Evaluation			42,467	56,651		61,828		65,303		226,249

Remarks

These funds are executed by the Integration Center Research and Development Contractor.

Funds include FY 2005 Congressional Add of $2.5 million for International Missile Defense Events and Activities.

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
JNIC Development & Ops										
JNIC	C/FFP	SRS/ Colorado Springs, CO	4,445	4,757	1Q	4,835	1Q	4,922	1Q	18,959
JNIC	C/FFRDC	Mitre Corp/ Colorado Springs, CO	1,565	1,449	1Q	1,566	1Q	1,594	1Q	6,174
Subtotal Management Services			6,010	6,206		6,401		6,516		25,133

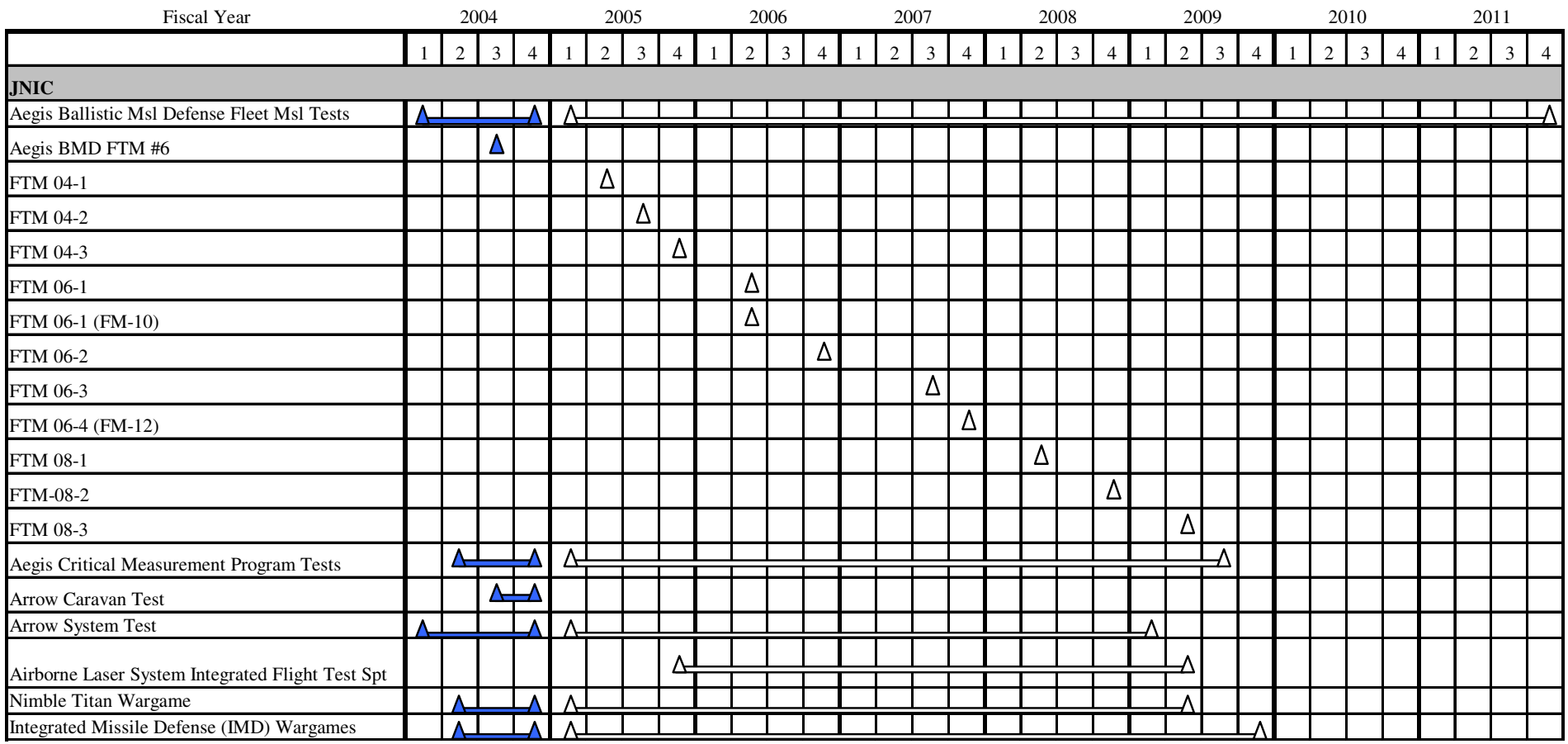
Remarks

These funds provide FFRDC and Technical Advisory and Assistance Services employees, for JNIC operations and oversight of the Integration Center Research and Development Contractor.

Project Total Cost			53,830	71,367		76,895		80,688		282,780

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**



Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
JNIC																																
IMD 04-1 Battle Planning Exercise		▲																														
IMD 04-1 Command & Control Simulations		▲	▲																													
IMD 04-1 Wargame				▲																												
IMD 05-1 Battle Planning Exercise				▲																												
IMD 05-1 Command & Control Simulations						△																										
IMD 05-1 Wargame						△																										
IMD 05-2 Battle Planning Exercise								△																								
IMD 05-2 Command & Control Simulations						△																										
IMD 05-2 Wargame									△																							
IMD 06 Battle Planning Exercise							△																									
IMD 06 Command & Control Simulations										△																						
IMD 06 Wargame												△																				
IMD 07 Battle Planning Exercise															△																	
IMD 07 Command & Control Simulations														△																		
IMD 07 Wargame																△																
IMD 08 Battle Planning Exercise																			△													
IMD 08 Command & Control Simulations																		△														

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
JNIC																																
IMD 08 Wargame																				Δ												
IMD 09 Battle Planning Exercise																							Δ									
IMD 09 Command & Control Simulations																						Δ										
IMD 09 Wargame																								Δ								
Missile Defense Integrated Exercises (MDIE)		▲		▲	Δ																		Δ									
MDIE 4a		▲																														
MDIE 4b			▲																													
MDIE 5a						Δ																										
MDIE 5b							Δ																									
MDIE 6a										Δ																						
MDIE 6b											Δ																					
MDIE 7a														Δ																		
MDIE 7b															Δ																	
MDIE 8a																		Δ														
MDIE 8b																			Δ													
MDIE 9a																						Δ										
MDIE 9b																							Δ									

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
JNIC																																
Multinational Wargame																																
Multinational Wargame 06 Battle Planning Exercise																																
Multinational Wargame 06 Cmd & Control Simulations																																
Multinational Wargame 06																																
Multinational Wargame 07 Battle Planning Exercise																																
Multinational Wargame 07 Cmd & Control Simulations																																
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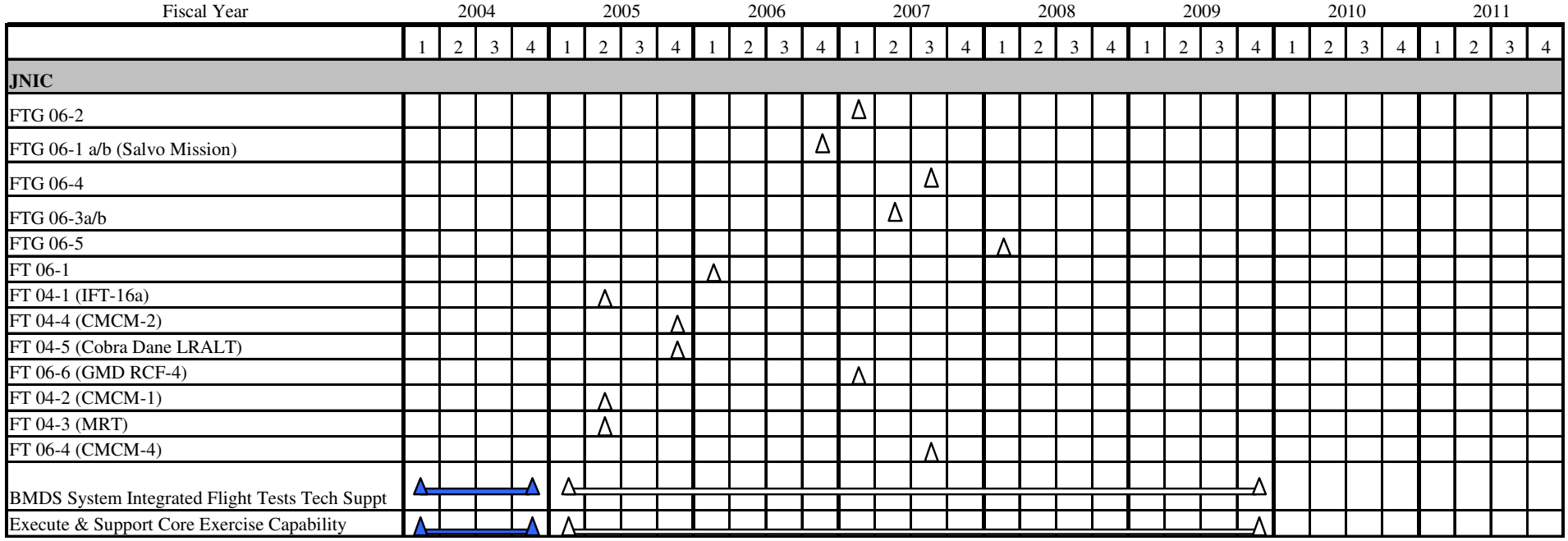
Multinational Wargame 08																																
Multinational Wargame 09 Battle Planning Exercise																																
Multinational Wargame 09 Cmd & Control Simulations																																
Multinational Wargame 09																																
IFT 13C																																
IFT14																																
FTG 04-1																																
FTG 04-5																																
FTG 04-2																																

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603889C Ballistic Missile Defense Products



Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
JNIC								
Aegis Ballistic Msl Defense Fleet Msl Tests	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Aegis BMD FTM #6	3Q							
FTM 04-1		2Q						
FTM 04-2		3Q						
FTM 04-3		4Q						
FTM 06-1			2Q					
FTM 06-1 (FM-10)			2Q					
FTM 06-2			4Q					
FTM 06-3				3Q				
FTM 06-4 (FM-12)				4Q				
FTM 08-1					2Q			
FTM-08-2					4Q			
FTM 08-3						2Q		
Aegis Critical Measurement Program Tests	2Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-3Q		
Arrow Caravan Test	3Q-4Q							
Arrow System Test	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q		
Airborne Laser System Integrated Flight Test Spt		4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-2Q		
Nimble Titan Wargame	2Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-2Q		
Integrated Missile Defense (IMD) Wargames	2Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q		
IMD 04-1 Battle Planning Exercise	2Q							
IMD 04-1 Command & Control Simulations	2Q,3Q							
IMD 04-1 Wargame	4Q							
IMD 05-1 Battle Planning Exercise	4Q							
IMD 05-1 Command & Control Simulations		2Q						
IMD 05-1 Wargame		2Q						
IMD 05-2 Battle Planning Exercise		4Q						
IMD 05-2 Command & Control Simulations		2Q						
IMD 05-2 Wargame			1Q					
IMD 06 Battle Planning Exercise		3Q						
IMD 06 Command & Control Simulations			2Q					
IMD 06 Wargame			4Q					

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
IMD 07 Battle Planning Exercise				3Q				
IMD 07 Command & Control Simulations				2Q				
IMD 07 Wargame				4Q				
IMD 08 Battle Planning Exercise					3Q			
IMD 08 Command & Control Simulations					2Q			
IMD 08 Wargame					4Q			
IMD 09 Battle Planning Exercise						3Q		
IMD 09 Command & Control Simulations						2Q		
IMD 09 Wargame						4Q		
Missile Defense Integrated Exercises (MDIE)	2Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-3Q		
MDIE 4a	2Q							
MDIE 4b	3Q							
MDIE 5a		2Q						
MDIE 5b		3Q						
MDIE 6a			2Q					
MDIE 6b			3Q					
MDIE 7a				2Q				
MDIE 7b				3Q				
MDIE 8a					2Q			
MDIE 8b					3Q			
MDIE 9a						2Q		
MDIE 9b						3Q		
Multinational Wargame			2Q-4Q	1Q-4Q	1Q-4Q	1Q-3Q		
Multinational Wargame 06 Battle Planning Exercise			2Q					
Multinational Wargame 06 Cmd & Control Simulations			3Q					
Multinational Wargame 06			3Q					
Multinational Wargame 07 Battle Planning Exercise				2Q				
Multinational Wargame 07 Cmd & Control Simulations				3Q				
Multinational Wargame 07				3Q				
Multinational Wargame 08 Battle Planning Exercise					2Q			

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603889C Ballistic Missile Defense Products

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Multinational Wargame 08 Cmd & Control Simulations					3Q			
Multinational Wargame 08					3Q			
Multinational Wargame 09 Battle Planning Exercise						2Q		
Multinational Wargame 09 Cmd & Control Simulations						3Q		
Multinational Wargame 09						3Q		
IFT 13C	4Q							
IFT14		4Q						
FTG 04-1		3Q						
FTG 04-5			1Q					
FTG 04-2		4Q						
FTG 06-2				1Q				
FTG 06-1 a/b (Salvo Mission)			4Q					
FTG 06-4				3Q				
FTG 06-3a/b				2Q				
FTG 06-5					1Q			
FT 06-1			1Q					
FT 04-1 (IFT-16a)		2Q						
FT 04-4 (CMCM-2)		4Q						
FT 04-5 (Cobra Dane LRALT)		4Q						
FT 06-6 (GMD RCF-4)				1Q				
FT 04-2 (CMCM-1)		2Q						
FT 04-3 (MRT)		2Q						
FT 06-4 (CMCM-4)				3Q				
BMDS System Integrated Flight Tests Tech Suppt	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q		
Execute & Support Core Exercise Capability	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q		

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0602 Program-Wide Support	23,684	16,197	10,548	15,299	17,621	16,473	16,634	15,020
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

Program-Wide Support provides funding for common support functions across the entire program such as strategic planning, program integration, cost estimating, contracting, and financial management to include preparation of financial statements, reimbursement of financial services provided by DFAS, internal review and audit, earned-value management, and program assessment. Includes costs for both government civilians performing these functions as well as support contractors providing government staff augmentation in these areas. Applies to costs at the MDA HQ as well as its Executing Agents in the Services: Army Space and Missile Defense Command, Army PEO Space and Missile Defense, Office of Naval Research, and various Air Force laboratory and acquisition activities. Other costs include physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses at the various MDA Executing Agent locations, which at the MDA HQ are generally funded from the Management Headquarters Program Element (0901598C). Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Civilian Salaries and Support	23,684	16,197	10,548	15,299
RDT&E Articles (Quantity)	0	0	0	0

See Section A: Mission Description and Budget Item Justification

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603889C Ballistic Missile Defense Products**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total PE Cost	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832
0101 Systems Engineering & Integration	271,916	241,293	112,790	115,879	116,353	115,984	127,932	134,356
0105 Countermeasures/Counter-Countermeasures (CM/CCM)	19,511	29,557	24,700	26,522	26,700	27,700	23,028	23,366
0201 Command and Control, Battle Management and Communications Core	18,311	1,667	0	0	0	0	0	0
0102 Intelligence and Security	16,568	20,659	21,294	23,346	25,727	27,286	27,892	28,510
0103 Producibility & Manufacturing Technology	28,267	36,254	27,313	36,211	38,597	41,564	42,462	43,378
0202 Hercules Core	20,955	0	0	0	0	0	0	0
0104 BMD Information Management Systems	37,535	61,453	125,257	184,869	166,755	156,754	140,597	145,213
0106 Modeling & Simulation	0	0	103,680	106,497	108,090	110,120	111,397	112,713
0107 Safety, Quality and Mission Assurance	0	0	19,694	20,800	21,123	21,890	20,654	21,143
0602 Program-Wide Support	36,684	8,946	12,278	24,318	29,067	29,636	26,717	23,153

Note:
In FY 2004, Project 0102 Intelligence and Security captures funding for Intelligence efforts. In FY 2005 through FY 2011, Project 0102 captures funding for Intelligence, Counterintelligence, and BMDS Certification.

In FY 2004, Project 0104 BMD Information Management Systems was increased to ensure Information Assurance (IA) and Information Technology (IT) security operations were in place for the BMDS Initial Defensive Operations (IDO). In FY 2006 through FY 2011, there is an increase in Project 0104 due to the Computing Infrastructure, Computing and Network Management Services, and Information Distribution Services being consolidated from PE 0901598C into this PE and Project. In addition, FY 2007 has an increase of $42M to the Computing Infrastructure initiative to fund the IM/IT infrastructure, operations and maintenance costs required to accomplish the consolidation of MDA employees in the National Capital Region (NCR) into an MDA campus environment.

In FY 2004 and FY 2005, funding for Project 0106 Modeling and Simulation is captured under Project 0101 Systems Engineering and Integration.

The prior year (PY) and the FY05 funding for Software Acquisition Improvement Program in the amount of $4.362M is captured in Project 0101, and for Safety, Quality, and Mission Assurance the amount of $12.000M is captured in PE 0603882C Project 0602.

A. Mission Description and Budget Item Justification

The mission of the Missile Defense Agency (MDA) is to develop and field an integrated, layered Ballistic Missile Defense System (BMDS) to defend the United States, its deployed forces, friends, and allies from ballistic missiles of all ranges in all phases of flight. In late 2004, the United States fielded an initial, limited capability to defeat a ballistic missile threat; through the Future Years Defense Plan (FYDP), this initial capability will be expanded by adding and networking forward-deployed sensors, interceptors at sea and on land, and layers of increasingly capable weapons and sensors.

MDA Systems Engineering and Integration's (SE&I) mission is to plan, define, design, integrate and verify capability of the Ballistic Missile Defense System (BMDS) to defend the United States, and its friends, and allies; to enhance these capabilities over time through Block upgrades; and to support transition of these capabilities to operational use. Beginning this year, MDA SE&I has significantly modified its strategy for executing and delivering critical system engineering functions and products. The new approach significantly reduces the size of the system engineering team and includes a revised incentive structure with industry to reduce cost. As an additional cost saving measure, the team has been rebalanced to reduce the level of industry participation and increase use of

more cost effective Scientific, Engineering and Technical Assistance (SETA) and Federally Funded Research and Development Center (FFRDC) staff. Additionally, the revised approach reshapes and rescopes system engineering efforts to rely more heavily on the detailed system engineering support provided within the element program offices. These initiatives, the result of careful analysis, provide the minimal manpower requirements required to perform critical BMDS system engineering and integration efforts. The result is a lean product focused system engineering effort which provides increased emphasis on collaborative system engineering activities with BMDS element systems for improved efficiency in program execution. Further reductions within this project may jeopardize the Government's ability to perform the system integration role and compel use of a prime contract for system integration with increased cost and schedule risk.

BMDS-level systems engineering and integration is vital to achieving an integrated BMDS system. This capability requires a dynamic and redundant operational architecture with an unprecedented level of systems engineering, coordination and integration across the Department of Defense (DoD), the Services, other Government Agencies, laboratories, and industry. The system must operate in real-time and provide global battle management, command, control, and communications extending from the National Command Authority (NCA) to ships at sea, aircraft in flight, and troops in the field. The challenge is enormous to provide vast geographic coverage and robust layered defense-in-depth through networking of a broad assortment of sensor assets (space, sea, air, and ground-based that encompass detection, cueing, track, discrimination, engagement and hit/kill assessment to support an array of dispersed engagement assets including boost, mid-course, and terminal interceptors and directed energy weapons. Systems Engineering and Integration is the only MDA organization capable of providing this collaborative and detailed systems engineering and integration process required across the entire spectrum of BMD Elements, adversary capability, and geographical regions. In late 2004, the Systems Engineering and Integration team conducted the engineering trade studies and developed the top-level plans, objectives, and designs allocating functional requirements, interface specifications, information exchange requirements and key performance parameters to BMDS sub-systems (Elements) necessary to achieve BMDS Initial Defensive Capability. MDA will expand this capability through the FYDP.

To execute its system engineering and integration oversight responsibilities, the Systems Engineering and Integration team conducts an on-going series of engineering and integration studies the purpose of which is to assess BMDS development progress, evaluate emerging and proposed capability improvements, conduct performance trades, and recommend program adjustments to optimize system-wide performance, fill capability gaps, and enable timely delivery of ever increasing BMDS capability to the warfighter. To date these efforts have produced a series of strategic plans to guide incremental development and delivery of progressively more robust BMDS capability to defeat increasingly sophisticated rogue ballistic missile threats launched from any point on the globe.

Missile Defense Plan I, defined by MDA Systems Engineering and Integration, introduces and integrates forward-Based radars into the BMDS architecture to complement and supplement Ground Based Missile Defense Element Sensors. The introduction of these forward-Based radars, AEGIS Destroyers and Cruisers with Surveillance and Tracking capability and a Forward-Based X-Band radar increases Ground-Based Missile Defense capability and extends battlespace by providing earlier detection, track and engagement of incoming threats. The data these radars provide enable earlier engagements with higher probabilities of engagement success and multiple engagement opportunities. In addition, the plan integrates AEGIS equipped ships with the Standard Missile-3 interceptor and incorporates additional PATRIOT PAC-3 missile inventory. This provides initial protection of the U.S. from long range threats and protection of deployed forces, allies and friends. Specific Engagement Sequence Groups include several within the Terminal Defense Segment to include four involving PATRIOT and seven Midcourse Defense Segment Engagement Sequence Groups (engage on AEGIS, launch on AEGIS, engage on Cobra Dane, engage on Upgraded Early Warning Radars (UEWRs-Beale and Fylingdales), engage on Sea-Based X-Band radar (SBX), and launch on Forward-Based X-Band Radar (FBX)). These are the focus of the Initial Defensive Capability (IDC). Block 2004 Midcourse Engagement Sequence Groups represent the early development and fielding of the Initial Defensive Capability including ground-based interceptors, an updated Cobra Dane radar, upgraded Early Warning Radars, a Sea-Based X-Band radar, In-flight Interceptor Communications System (IFICS) data terminals, Fire Control and Communications Nodes, and communications networks including fiber and satellite.

Missile Defense Plan II integrates additional forward-based sensors (more Forward Based X-Band Radars, AEGIS ships and adds THAAD Radars) to the BMDS and upgrades their ability to identify the reentry vehicles in the face of countermeasures by including advanced countermeasure algorithms from the Hercules Program into the radar processors. In addition, more interceptors are fielded including Ground Based Missile Defense Ground Based Interceptors, Standard Missile-3 interceptors on AEGIS equipped ships, more PATRIOT PAC-3 missiles, and the first Terminal High Altitude Area Defense (THAAD) firing unit with missiles and radar. This completes protection of the U.S., expands coverage to allies and friends, and increases countermeasure resistance and capability against shorter-range threats. An additional three Midcourse Engagement Sequence Groups (engage on Upgraded Early Warning Radar (Thule), launch on Defense Support Program / Space-Based Infra-Red Sensor (DSP/SBIRS), and engage on Forward-Based X-Band Radar) are defined and developed. Block 2006 includes continued development and fielding of Ground-Based capabilities, integrated testing of the Multi-layered BMDS components, implementing the concept of a rotating pool of interceptors to ensure latest capabilities are fielded. Additionally, Block 2006 focuses on AEGIS Ballistic Missile Defense element development of improved prototype radar discrimination and increased AEGIS Weapon System to BMDS Integration enhancing or increasing capabilities of AEGIS to launch and/or engage on other BMDS radars. Block 2008 incorporates two additional Midcourse Engagement Sequence Groups (launch/engage on Electro-Optical / Infra-Red Sensor, and

launch/engage on Terminal High Altitude Area Defense (THAAD) Radar) while adding additional terminal defense Engagement Sequence Groups providing robust regional missile defense against short and intermediate range missiles.

Missile Defense Plan III will continue to keep pace with rogue threat inventories, address more complex threats, address asymmetric attack, and provide the development foundation to address the near-peer threat. Potential capabilities are the initial fielding of the Space Surveillance Test Bed Constellation and X-Band Dish Radars and upgrade of Early Warning Radars to address the asymmetric threat.

Systems Engineering and Integration employs integrated working groups to achieve broad engineering collaboration across MDA. Test Bed Planning determines technology needs, develops concept descriptions (CDs), and defines Engagement Sequence Groups (ESGs). Engagement Sequence Groups describe combinations of weapons, sensors and Command and Control, Battle Management, and Communications (C2BMC) capabilities that must work together to detect, track and intercept an enemy missile - the complete kill chain from the time the threat missile is first detected through intercept. Test Bed Planning also finalizes recommended Engagement Sequence Group assignments to Test Bed development levels. BMDS design allocates the functions required to execute all Engagement Sequence Groups to individual Elements and components in the BMDS specifications and interface control documents. In turn, the Elements perform detailed design of their portions of the system. The SE&I team builds a time-phased Master Integration Plan (MIP) to define integration phases within the block, which becomes the building blocks to achieve final capability. Integrated functionality is then tested and verified in accordance with the Responsible Test Organization's Integrated Master Test Plan (IMTP) and the system engineering Capabilities Verification and Assessment Plan (CVAP). The system engineering Verification group develops verification plans, target requirements, and the Capabilities Verification and Assessment Report (CVAR). Finally, Operational Integration and Support provides User support to the Warfighter and ensures consideration of military operations in the engineering design process. The Responsible Test Organization leads MDA's Test Program.

The BMDS Core Program Element funds the Systems Engineering and Integration; Modeling and Simulation; Command and Control, Battle Management and Communications Core; Intelligence; Producibility and Manufacturing Technology; Countermeasures/Counter-Countermeasures; Hercules core; Ballistic Missile Defense Information Management Systems; and Program-Wide Support element portions of Test bed Blocks 2006, 2008 and 2010 and other mission area investment activities. These activities comprise a set of critical, inter-related, mutually supporting activities that span the development of the BMDS, reducing duplication and promoting employment of common, fundamental, rigorous engineering practices. The BMDS System Engineer provides the cross-cutting System-level engineering necessary to develop and deliver the integrated BMDS.

(0101) Systems Engineering and Integration (SE&I): SE&I provides the framework, processes, and direction necessary to provide an integrated BMDS capability. It employs a Test Bed development approach to set the conditions for on-going evolutionary improvements to the system. A collaborative relationship with the weapons, sensors, command and control, battle management and communications developers is the foundation for ensuring unity of effort in the development of subsystems and architecture designs to deliver system-level capability. The overarching engineering activities for future BMDS capabilities are developed and integrated into the Test Bed consisting of the system engineering phases of plan, design, develop, test, verify, and integrate into operations. The planning effort assesses gaps in system performance and mission accomplishment, and identifies and evaluates proposed improvements. The design effort determines the functionality, capabilities, and interfaces required to implement the new or modified capability. During the design phase, as the system designer MDA SE&I ensures that the interface designs will effectively connect the elements/components while looking ahead to standardize the interfaces for future expansion of the BMDS. The SE&I led integration effort defines and facilitates implementation of BMDS integration phases by ensuring element program content reflects and supports integration themes. Additionally, SE&I is responsible for BMDS technical configuration management. Development efforts encompass all subsystem and component activities to plan, program, design, and execute the design in accordance with integration, phasing, and verification direction. Verification and assessment efforts verify the capability of the “as built system” and assess integrated development and emerging integration concepts with respect to requirements from the Test Bed System Specification, parameters from the Adversary Data Package (ADP) and the system Technical Objectives and Goals (TOG). Operational integration efforts are essential to produce specific engagement sequences that combine sensors, weapons, and Command, Control, Battle Management and Communications in the operational BMDS.

(0105) Countermeasures/Counter-Countermeasures (CM/CCM): As a critical activity in SE&I Organization, the Countermeasures/Counter-Countermeasures (CM/CCM) Program assesses technical risks, identifies mitigation approaches and integrates engineering changes to the baseline BMDS to improve its performance against adversary capabilities, focusing primarily on defeating countermeasures. The CM/CCM Program determines the range of feasible engineering approaches an adversary could use to defeat or degrade the BMDS, and develops conceptual countermeasures to realize those approaches. The CM/CCM Program works in conjunction with Threat Systems Engineering to ensure consistency of these adversary capabilities. The CM/CCM Program brings

together capabilities from across MDA; to conduct integrated engineering assessments of BMDS performance against countermeasures and the technical risks posed by these countermeasures. High-risk areas are identified, and counter-countermeasure options are proposed to mitigate these risks. An independent team of senior experts, funded by the CM/CCM Program, reviews the adversary capabilities, BMDS performance analyses, risks, and counter-countermeasure proposals and provides their assessment to the MDA Director.

(0201) Command, Control, Battle Management, and Communications (C2BMC) Core: This project funds the civilian salaries for the C2BMC team that integrates the Command, Control, Battle Management, and Communications portion of the BMDS into the Command and Control (C2) structure of the Combatant Commanders and into that of allies and friends.

(0102) Intelligence and Security: This project funds four specific efforts focused on maximizing actionable threat information and ensuring the safety of both the BMDS and its personnel: 1) intelligence, 2) counterintelligence, 3) BMDS information assurance systems certification, and 4) security. Together these efforts provide critical information regarding threat ballistic missile system capabilities (via intelligence); protection of personnel, activities, and technology from espionage and terrorism through active and passive activities (via counterintelligence); BMDS system vulnerabilities (via BMDS certification); and challenges to the security of the BMDS, its personnel, and associated facilities (via security).

(0103) Producibility and Manufacturing Technology: A component of rigorous systems engineering practices, Producibility and Manufacturing is essential because it funds programs that provide common, integrated programs across the Ballistic Missile Defense System Elements to ensure mature industrial manufacturing capabilities are available to the Blocks through risk reduction, cost reduction/avoidance, and performance enhancement. Producibility and Manufacturing promotes efforts in commonality and spreads best practices for producibility and manufacturing across the system Elements by cooperatively funding and leveraging efforts. It provides crosscutting manufacturing risk assessments, industrial capability assessments, and near term producibility enhancements. Manufacturing risk assessments are accomplished through Engineering and Manufacturing Readiness Level (EMRL) Assessments, the Producibility and Manufacturing Technology systems engineering tool that employs widespread industry and BMDS Element interaction to analyze the maturity of manufacturing processes as a factor in the BMDS Risk Management Process. Industrial Capability Assessments (ICAs) are accomplished across the BMDS Industrial Base where trades are performed to assess and analyze the original equipment manufacturers (OEMs), supplier base, and others that produce end items for the system. Near Term Producibility Improvements are accomplished through efforts in a number of key investment areas: Power Systems, Radiation Hardening (RAD HARD), Manufacturing Process Improvements, Electro-Optics/Infrared (EO/IR), Radar and RF, Propulsion, and Advanced Materials and Structures.

(0202) Project Hercules: Project Hercules is a national effort to develop robust detection, tracking, and discrimination algorithms to counter off nominal and evolving missile threats. Hercules is also developing a physics-based Decision Architecture that applies advanced decision theory to future BMDS command, control, and battle management (C2BM) concepts. In addition to a general program to develop algorithms useful against targets in all phases of flight, Hercules has specific projects to develop algorithms for forward based sensors, the Decision Architecture, and mitigating countermeasures. Hercules develops algorithms to enhance BMDS element capabilities in Test Bed Block 06, 08 and beyond and will provide these algorithms to the BMDS Elements for insertion into their respective programs.

(0104) BMD Information Management Systems: The Ballistic Missile Defense (BMD) Information Management Systems Project integrates and supports every aspect of the BMDS by providing a secure and reliable Information Technology (IT) infrastructure and the Information Management/Information Technology (IM/IT) services necessary to enable the BMDS Elements and operators to collaborate and share information which is essential to accomplishing the complex integrated BMDS mission. This project is an essential and integral component of the Ballistic Missile Defense SE&I Organization and BMDS Core Program Element because it funds the Agency's communications backbone and infrastructure that enables all the Projects in all the Program Elements to communicate in a safe, secure and affordable manner. MDA Information Management/Information Technology assets are administered, acquired, managed and operated in compliance with and meet the goals of existing statutes and DoD regulations, in particular the President's Management Agenda, the Clinger-Cohen Act, the E-Government Act of 2002, the Government Paperwork Elimination Act, and the Office of Management and Budget (OMB) requirements to align IT investments with the Federal Enterprise Architecture (FEA).

(0106) Modeling and Simulation: Modeling and Simulation is responsible for defining, developing, and maintaining a comprehensive modeling and simulation strategy necessary to support the spiral development of the BMDS. MDA Systems Engineering and Integration provides the BMDS model, parameters and characteristics to be simulated for each time frame. In addition, MDA Systems Engineering and Integration provides the detailed threat and environments which are used by Modeling and Simulation to build standardized models for use across the agency to evaluate performance. This comprehensive modeling and simulation program establishes and aligns enterprise Modeling and Simulation processes. These Modeling and Simulation tools provide a credible basis for acquisition and operational decisions. Modeling and Simulation functional responsibilities include development and promulgation of policy for phenomenology, lethality, common simulation and

threat environment, system-level simulations, and international Missile Defense initiatives. The integration of vertical and horizontal system-level tools is critical to supporting the system-level engineering and development across the SE&I Organization and is critical to future Modeling and Simulation development. The Modeling and Simulation program will oversee, coordinate, and manage all development, maintenance, requirements engineering, configuration management, verification and validation (V&V), accreditation, information assurance, and program protection responsibilities required to provide credible Modeling and Simulation tools.

(0107) Safety, Quality and Mission Assurance: As a critical activity in the BMDS, the mission of the Safety, Quality, and Mission Assurance (SQMA) Directorate is to develop and implement BMDS-wide policies, and perform engineering and technical studies that foster and ensure MDA system-wide safety, quality and mission assurance. In addition, the SQMA directorate supports the Agency/Elements and their prime contractors, sub-contractors and suppliers through direct on-site support and through emergent/surge requirements as dictated by technical/quality issues throughout the fiscal year to meet evolving requirements from MDA leadership. This includes embedding mission assurance specialists at supplier and government locations, as well as at program element sites; standing up independent technical review teams; and providing independent technical assessments. Support includes advising senior management on the viability of industry to meet contractual requirements, oversight and insight into current manufacturing safety support for all launch facilities and industry, and an overall Agency-wide BMDS quality perspective to ensure requirements are met to achieve a cohesive BMD system. In addition, SQMA is responsible for implementing Section 804 of the 2003 Defense Authorization Act, which requires MDA to establish and implement a program to improve the software acquisition process. Software acquisition improvement activities encompass the development, engineering, testing, production, and fielding of ballistic missile defense elements under the cognizance of MDA. SQMA efforts enable the development, testing, and fielding of an effective, reliable, and safe missile defense capability. Within the directorate, the safety, quality and mission assurance responsibilities are functionally allocated to four groups: Assurance Integration, Mission Assurance, Quality Assurance, and Safety.

(0602) Program-Wide Support: Program-Wide Support provides funding for common support functions across the entire program such as strategic planning, program integration, cost estimating, contracting, financial management to include preparation of financial statements, reimbursement of financial services provided by DFAS, internal review and audit, earned-value management, and program assessment. Includes costs for both government civilians performing these functions as well as support contractors providing government staff augmentation in these areas. Applies to costs at the MDA HQ as well as its Executing Agents in the Services: Army Space and Missile Defense Command, Army PEO Space and Missile Defense, Office of Naval Research, and various Air Force laboratory and acquisition activities. Other costs include physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses at the various MDA Executing Agent locations, which at the MDA HQ are generally funded from the Management Headquarters Program Element (0901598C). Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

B. Program Change Summary	FY 2004	FY 2005	FY 2006	FY 2007
Previous President's Budget (FY 2005 PB)	445,356	479,764	492,988	527,541
Current President's Budget (FY 2006 PB)	449,747	399,829	447,006	538,442
Total Adjustments	4,391	-79,935	-45,982	10,901
Congressional Specific Program Adjustments	0	-70,200	0	0
Congressional Undistributed Adjustments	0	-9,735	0	0
Reprogrammings	5,565	0	0	0
SBIR/STTR Transfer	-1,174	0	0	0
Adjustments to Budget Years	0	0	-45,982	10,901

Funding changes in FY 2004 - FY 2007 from the Previous President's Budget (FY 2005 PB) to the Current President's Budget (FY 2006 PB) are due to changes in the Missile Defense Agency's (MDA) priorities required to develop, field, and sustain an integrated layered Ballistic Missile Defense System (BMDS) to defend the United States, its deployed forces, friends and allies from ballistic missiles of all ranges and in all phases of flight.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0101 Systems Engineering & Integration	271,916	241,293	112,790	115,879	116,353	115,984	127,932	134,356
RDT&E Articles Qty	0	0	0	0	0	0	0	0

Note:
In FY 2004 and FY 2005, funding for the Modeling and Simulation program is captured under Project 0101. Starting in FY 2006 the funding for this effort is in Project 0106.

A. Mission Description and Budget Item Justification

The System Engineering and Integration (SE&I) mission is to engineer a fully integrated BMDS by defining, managing, and integrating all engineering development for the BMD System. Coordinating the design, development and integration of the various Elements and segments is a program imperative. Beginning this year, MDA System Engineering has significantly modified its strategy for executing and delivering critical system engineering functions and products. The new approach significantly reduces the size of the system engineering team and includes a revised incentive structure with industry to reduce cost. As an additional cost saving measure, the team has been rebalanced to reduce the level of industry participation and increase use of more cost effective Scientific, Engineering and Technical Assistance (SETA) and Federally Funded Research and Development Center (FFRDC) staff. Additionally, the revised approach reshapes and rescopes system engineering efforts to rely more heavily on the detailed system engineering support provided within the element program offices. These initiatives, the result of careful analysis, provide the minimal manpower requirements required to perform critical BMDS System Engineering and Integration efforts. The result is a lean product-focused system engineering effort which provides increased emphasis on collaborative system engineering activities with BMDS element systems for improved efficiency in program execution. Further reductions within this project may jeopardize the Government's ability to perform the system integration role and compel use of a prime contract for system integration with increased cost and schedule risk.

Coordinating developments across several interrelated programs employing several prime contractors, combined with the requirement for the BMDS to operate as a unified system stretched across nine time zones, is an enormous challenge. The MDA SE&I Team is defining architectures, defining critical interfaces, identifying information exchange requirements, reviewing technical and performance risks and developing mitigation strategies, overseeing program development maturity across segments and managing configuration baselines within block development cycles to ensure continuous availability of a proven performance baseline system for defense of the United States, friends, allies and deployed forces. System engineering is further tasked to assess feasibility of BMDS evolutionary development concepts and make performance trade-offs and investment recommendations through the collaborative system engineering process which defines required system-wide behavior, validate Element system designs, and assess and verify system capability. The system engineering process involves five-phases: 1) Test Bed Planning 2) design 3) integration 4) test and verification and 5) operational integration. It enables functional allocation of required capabilities across Elements in a time-phased approach focused on delivery and improvement of the BMDS system capability. The process is temporally organized within two-year development Test Beds which enable the SE&I function to define a baseline system architecture and set time-phased technical goals and objectives to guide the design, development and delivery of evolutionary enhanced BMDS capabilities. Additionally, this engineering process includes Advanced Systems; Force Structure Integration and Deployment; Producibility and Manufacturing Technology; Targets and Countermeasures; and other functional areas. Collaborative Engineering ensures that components (weapons, Sensors, C2BMC), and the Elements are part of an integrated system design.

BMDS capabilities are matured using a block engineering development process within a Test Bed framework. The Test Bed represents two year blocks for maturation, integration, and test of Elements contributing to a time-phased improvement of BMDS capability. It is a management framework enabling MDA to execute configuration management, focus development activities, perform trade-offs, and prioritize investments to ensure end-to-end functionality across a discrete segment of BMDS Elements. For example, Test Bed 2004 refers to the Research and Development effort underway during CYs 2004 and 2005. Verified capabilities and associated subsystem changes mature to an additional defensive capability which is then available for transition to an operational capability as Block Upgrades. Block 2004 currently includes eleven BMDS Engagement Sequence Groups (ESGs) which define the sequence of events used to enable the BMDS weapon to engage ballistic missile target(s). The ESGs provide the structure for measuring the level of performance and integration maturity of the Elements within the overall BMDS. They provide the framework to focus systems engineering efforts and define and assess system architectures, interfaces, and information exchange requirements. The Block 2004 ESGs include a Terminal Defense Segment as well as a land and sea-based Midcourse Segment. The BMD Terminal Defense capability uses the PATRIOT system with the PAC-3 Interceptor while the Midcourse Segment capability uses both the GBI and SM-3 interceptors and various sensors depending upon the threat to be countered. Specifically, the Test Bed/Block 2004 Midcourse ESGs provide the BMDS capability to engage on Cobra Dane, engage on Upgraded Early Warning Radars (UEWRs) (Beale, and Fylingdales), engage on the Sea-Based X-Band radar (SBX), launch on the Forward-Based X-Band Radar - Transportable (FBX-T)

and engage on AEGIS, launch on AEGIS. These are the focus of the BMDS Initial Defensive Capability (IDC) and maturation to a Block 2004 capability which spans thru the 31 Dec 2005 timeframe. Maturation and integration of the BMDS elements for the Block 2006 Test Bed includes continued development and fielding of Ground-Based capabilities, integrated testing of the Multi-layered BMDS components, and implementation of a rotating pool of interceptors to ensure latest capabilities are fielded. Additionally, Block 2006 focuses on an expanded capability of the FBX-T radar with the initial inclusion of advanced discrimination algorithms via the Hercules Suite 1 delivery, AEGIS BMD development of improved prototype radar discrimination, increased AEGIS Weapon System - BMDS Integration, and a maturation of THAAD interceptor capability to a Level 1 ESG. Block 2008 incorporates additional BMDS Midcourse ESGs (launch/engage on Electro-Optical/Infrared (EO/IR), and integration of the launch/engage on THAAD to increase our BMDS multi-layered terminal defense capability for robust regional missile defense against short and intermediate range missiles. While top level system engineering activities are focused on integrating the various Elements to provide an end-to-end seamless BMDS capability, additional systems engineering activities are focused on integrating advanced technologies to improve performance of available defensive capabilities. These efforts include new interceptor technology, improved discrimination and tracking algorithms, counter/countermeasures, enhanced battle management and decision support systems, and improved kill vehicles (EKV). These technology efforts will generate enhanced ESGs and also lead to new ESGs.

The Test Bed planning function is initiated by assessing many inputs, such as maturing technology possibilities, and candidate concepts enhancing capability of the BMDS. These inputs include the previous Test Bed system specifications, Element configurations, gap analysis, adversary capability descriptions, technical objectives and goals, technology assessments, international participation and director's guidance. Concepts for adding Concurrent Test and Operations capabilities are being evaluated as well as new concepts for enhancements based upon the addition of the Kinetic Energy Interceptor (KEI) capability. These concept descriptions and their ESGs are the foundation for the improvements to the BMDS and form the building blocks for the Element programs. Concepts demonstrating the most potential for improving BMDS effectiveness are integrated into BMDS program planning. Test Bed 06 currently has 21 concepts under evaluation and has already identified 14 mature ESGs and 31 maturing test bed ESGs which may be developed during the Test Bed 06-12 time frame. Concept Descriptions are being evaluated which may lead to solutions to current gaps caused by countermeasures requiring more discrimination capabilities. These include concepts for enhancements to EKV, Multiple kill Vehicles (MKV), additional physics-Based Algorithms for Advanced Discrimination, and Decision Architectures for Advanced Discrimination. These concept descriptions and their associated Engagement Sequence Groups (ESGs) are the foundation for the improvements to the BMDS and form the building blocks for the Element programs. Without the identification of these concepts and the associated ESG improvements, the Elements would not have the interface requirements necessary to make these ESGs operational. Approved ESGs are incorporated in BMDS design and description documentation to ensure Element programs include required hardware, interfaces and information exchange requirements to support attainment of ESG capability within desired timeframe. This process is executed collaboratively with the BMDS Element system engineers, and other stakeholders to include the warfighter. The result is the disciplined flow-down of requirements to BMDS system specifications. The planning function enables the MDA to review system integration maturity across the individual Element programs, assess Element maturity, and to provide tailored program direction consistent with the readiness of a specific Element for BMDS integration. Planning activities focus on system integration horizontally across BMDS Elements to ensure bounded efforts for enhancing existing BMDS capability and also vertically through the individual Elements to ensure program plans focus on the most promising technologies and objectives attainable within the test bed period. System improvements within the test bed below the level of BMDS system-wide integration are available for system-wide integration in subsequent Test Bed epochs. For example, a system conducting ground testing or initiating its first flight tests may be part of Test Bed 2004 (through calendar year 2005), however it may not be planned for system level integration into the BMDS until Test Bed 2006, and may not be part of the available defensive capability until graduating from the Test Bed as a Block 2008 capability.

Approved system architectures and operational concepts are documented in the BMDS Test Bed System Specifications. These documents provide a common set of requirements and design parameters to facilitate development of subordinate Element designs and component specifications, and the specifications drive Element designs ensuring integration across Elements within the Test Bed. The system engineering performed during the design phase develops functional requirements, information exchange requirements, interfaces, and key interoperability requirements to ensure successful attainment of desired functionality among BMDS Elements. Individual Element designs and specifications are coordinated and approved through SE&I. Furthermore, Element designs and specifications drive strategies for verification and assessment of Element performance and capability. The objective is to make enhanced capabilities available for Additional Defensive Capability by the end of the Operational Block for which it is planned. The end state is an approved architecture design and resulting ESGs which form the basis for test bed engineering and testing activities.

The range of system engineering integration activities vary from analytical/simulation-based integration of concepts to development of specific interfaces for early integration of components. Integration describes those system engineering activities and events required to structure an integrated and “seamless” end-to-end BMDS capability composed of Elements working alone and in conjunction with other Elements to effect a ballistic missile defense engagement. The Integration phase begins with the building of a time-phased Master Integration Plan (MIP) to define phases within the block, and to allocate the ESG functionality captured in the system specification and interface documents to those phases. The System Engineering led integration team participates in

Element level design reviews including document review and conducts system level design reviews to ensure system specifications are being properly implemented. Using a Planning Allocation Matrix (PAM) tool, the integration team tracks the time-phase implementation of allocated functionality in Element software builds. In addition to design reviews, system engineering conducts routine program execution and technical reviews with MDA leadership to ensure subordinate system engineering activities remain within the BMDS engineered parameters to describe functionality within the planned timeframe. Internal interface status reports are provided weekly to monitor interface implementation and identify issues. When deviations arise in planned schedules either from technical challenges or other unforeseen events the System Engineering integration team in coordination with the Element system engineers develop risk mitigation strategies (design alternatives), and adjust plans and priorities. Engineering studies and analysis are conducted to explore alternative approaches to attaining an ESG, assessing feasibility and affordability.

System verification and assessment evaluates the “as built system” in accordance with the system specification. New capabilities are critically assessed against established Technical Objectives and Goals in a consistent manner. This phase of the systems engineering process completes the systems engineering cycle providing feedback for entering the next phase of development; as well providing the warfighter knowledge of the system's capabilities, military utility assessment (MUA) and operational test and evaluation (OTA). This facilitates development or deployment decisions by the Department. Verification and assessment of the BMDS is similar to evaluation of strategic offensive forces. Namely, that testing cannot be done for all operational conditions and situations. MDA is pursuing system level verification and assessment, which is highly dependant on analysis and grounded in the use of accredited system models. Ground and flight tests are selected to gather data anchoring system models used to determine the effectiveness of the system under realistic scenarios. The ESGs provide a common lexicon to measure performance of various combinations of the sub-systems, enabling greater understanding of the complexities and interactions of the system. Verification is accomplished through collection of pre-defined performance test data supporting verification and assessment of BMDS capability, identification of shortfalls, and guidance on future development and testing requirements. The pre-defined data is specified in verification objectives for hardware-in-the-loop, wargame, and flight test and analysis events. Verification objectives are keyed to Test Bed system specification compliance statements to gather data essential to verify the as-built capability. Integration and testing is structured around exercise of specific engagement sequence groups derived from approved BMDS architecture designs. The engagement sequence group approach enables System Engineering, working with the Responsible Test Organization (RTO), to develop detailed test plans. Furthermore, integration and verification at the component and subsystem level permits System Engineering to evaluate technical maturity and component performance contributing to overall BMDS capability. Integration and verification cut horizontally across elements and vertically down through element component development (i.e. radar, missile, launcher, C2BMC) providing important feedback for ensuring time-phased insertion of technologies and capabilities meeting prescribed entrance and exit criteria to the BMDS. MDA employs system-wide tests providing data necessary to conduct extensive modeling and simulation-based analyses to verify and assess BMDS performance against the Test Bed specification and established technical goals and objectives. The results of system level tests and assessments are captured in Capability Verification and Assessment Reports (CVAR). DoD uses CVAR information as inputs for readiness decisions for transitioning and declaring an operational capability available or for development decisions.

The Operational integration function accomplishes the transition of an available defensive capability to the warfighter providing the connection between the system engineering and user. This ensures successful transition of operational BMDS capability. The BMDS user handbooks, maintenance requirements, Concept of Operations (CONOPs), operator and leader training on system performance and operation are key operational integration activities. Through sustaining engineering the SE&I team is providing the warfighter operational support. The SE&I team, through simulations and training exercises obtains feedback from the warfighter necessary to refine system interfaces, CONOPs, maintenance and facilities to enhance system reliability, maintainability, suitability and effectiveness. Operational tests conducted by the RTO are an important data source for lessons learned.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Test Bed Planning	31,264	22,280	18,328	18,329
RDT&E Articles (Quantity)	0	0	0	0

Test Bed planning is a continuous process of assessing and choosing BMDS technical alternatives that can be included in the BMDS Test Bed. The planning process includes the synthesis of emerging technology and concept input, assessment of these concepts against agency metrics and goals using gap analysis and adversary capabilities, production of formal Concept Descriptions

(CDs), update of associated Engagement Sequence Groups (ESGs), presentation of new concepts and ESGs to the MDA Design Review Board, convening of integrated working groups to coordinate planning and programming efforts, and finally the preparation of the Test Bed Description Document. CDs being evaluated include six concepts for enhanced discrimination and ability to deal with countermeasures, three concepts for enhancing the KEI Element, addition of a Fly-Along-Sensor Package (FASP) as a kill assessment enabler, and concepts for enhancements to particular Element components, such as the 21-inch second stage rocket motor for the SM-3 missile. For the current 06 Test Bed there are 14 ESGs which are ready for transition to available defensive capabilities, and another 31 that are being evaluated. These ESGs are the basis of Element and system-wide improvements to BMDS capability for the next 6 years. Without the definition provided by these ESGs, the interfaces for these developing items would not be defined. Test Bed Planning produces the Test Bed Description Document (TBDD), which is the basis for decision memoranda issued to the Elements by MDA. Test Bed Planning also conducts threat system engineering and lethality assessment to characterize current and emerging threat system performance to ensure BMDS efforts keep pace with threat developments.

FY 2004 Accomplishments:

- Performed Block 08 Gap Analysis comparing Block 06 baseline performance versus Block 08 adversary capabilities
- Performed Block 08 Architecture options analysis to mitigate gaps
- Performed BMDS Technology needs assessment tailored to Block 08 development
- Conducted Block 08 Peer review to coordinate Block 08 proposed architecture with BMDS stakeholders
- Developed and coordinated first set of BMDS Engagement Sequence Groups for BMDS Test Bed focused on evolution planning
- Development and coordination of Adversary Data Packages (ADPs) which included Element characterization of missile systems and countermeasures
- Development of Adversary Capability Document (ACD)
- Provide Adversary Engineering support to System Engineering and Integration Systems Analysis
- Developed, coordinated with Elements, and delivered Block-specific Adversary Data Packages to provide characterization of missile systems and countermeasures to be utilized for system design, analysis, and verification efforts; packages were published for Initial Defensive Capabilities, Block 04 System, Block 06 System, and Block 08 System
- Developed and distributed Adversary Capability Document 5.0 to support availability of detailed missile descriptions, behaviors, and countermeasure capabilities for threat missile systems
- Adversary Engineering support to MDA/SE systems analysis studies and delivery to Project Hercules of countermeasure suite concepts and specifications
- Supported CM/CCM Black Team: delivered Thesis Threat Package and performed CM susceptibility assessments for Elements
- Initiated efforts for obtaining actual post-engagement lethality information through data collection and analysis on BMDS Element and system flight test opportunities
- Provided analysis on dispersion of persistent nerve agents and reported on submunition survivability resulting from a missile engagement
- Initiated lethality data and analysis on chemical/biological agents at altitudes to support BMDS Elements

FY 2005 Planned Accomplishments:

- Update the Technical Objectives and Goals (TOG)
- Continue the development of the Adversary Capability Document and block-specific Adversary Data Packages
- Produce Concept Descriptions and Engagement Sequence Groups for BMDS Test Bed Evolution Planning
- Finalize Test Bed 06 and draft Test Bed 08 Test Bed Description Document (TBDD)
- Facilitate Design Review Boards (DRB)
- Update Test Bed 06 and Test Bed 08 Performance Gap Analysis
- Oversee CM/CCM Program
- Oversee international program and analyze effects on future capability
- Provide critical lethality data and analysis for chemical agents including biological threats with threat representative submunitions and their simulants
- Conduct experiments to investigate properties, breakup, and demise of chemical payloads resulting from terminal phase intercepts

- Continue effort to obtain actual post-engagement lethality information through data collection and analysis on BMDS Element and system flight test opportunities
- Continue kill assessment investigation and obtaining information on post-impact debris signatures

FY 2006 Planned Program:

- Update the Technical Objectives and Goals (TOG)
- Continue the development of the Adversary Capability Document and block-specific Adversary Data Packages
- Produce Concept Descriptions and Engagement Sequence Groups for BMDS Test Bed Evolution Planning
- Initiate Test Bed 10 Test Bed Description Document
- Facilitate Design Review Boards (DRBs)
- Initiate Test Bed 10 Performance Gap Analysis
- Oversee CM/CCM Program
- Oversee international program and analyze effects on future capability
- Continue effort to provide data and analysis of actual post-engagement lethality information through efforts on BMDS Element and system flight test opportunities
- Continue to provide data and analysis of various chemical agents and their simulants, including non-traditional
- Continue kill assessment investigation and obtaining information on post-impact debris signatures

FY 2007 Planned Program:

- Update the Technical Objectives and Goals (TOG)
- Continue the development of the Adversary Capability Document and block-specific Adversary Data Package's
- Produce Concept Descriptions and Engagement Sequence Groups for BMDS Test Bed Evolution Planning
- Finalize Test Bed10 Test Bed Description Document
- Facilitate Design Review Boards
- Complete Test Bed 10 Performance Gap Analysis
- Oversee CM/CCM Program
- Oversee international program and analyze effects on future capability

	FY 2004	FY 2005	FY 2006	FY 2007
Design & Specification	17,159	16,570	14,521	15,750
RDT&E Articles (Quantity)	0	0	0	0

Design & Specification uses the data developed in the Test Bed Planning process and the existing Element specifications to develop a system specification and interface requirements. Through the system engineering process these specifications/requirements are both allocated to the Elements/subsystems and enable the integration and verification activities.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

FY 2004 Accomplishments:

- Developed the Design and associated Specification and Interface requirements that characterized the IDO configuration.
- Initiated the development of the System Specification and associated interface requirements for the Test Bed 2006 capabilities.
- Refined BMD Core Technical Standards that capture the environmental, design, and construction constraints.

FY 2005 Planned Accomplishments:

- Finalize the Design and associated Specification and Interface requirements for Test Bed 2006 capabilities.
- Initiate the development of the System Specification and associated interface requirements for the Test Bed 2008 capabilities.
- Refine BMD Core Technical Standards that capture the environmental, design, and construction constraints.
- Complete adherence planning for the Test Bed 2006 Core Standards that include waivers and deviations.

FY 2006 Planned Program:

- Finalize the Design and associated Specification and Interface requirements for Test Bed 2008 capabilities.
- Initiated the development of the System Specification and associated interface requirements for the Test Bed 2010 capabilities.
- Refined BMD Core Technical Standards that capture the environmental, design, and construction constraints.
- Complete adherence planning for the Test Bed 2008 Core Standards that include waivers and deviations.

FY 2007 Planned Program:

- Finalize the Design and associated Specification and Interface requirements for Test Bed 2010 capabilities.
- Initiated the development of the System Specification and associated interface requirements for the Test Bed 2012 capabilities.
- Refined BMD Core Technical Standards that capture the environmental, design, and construction constraints.
- Complete adherence planning for the Test Bed 2010 Core Standards that include waivers and deviations.

	FY 2004	FY 2005	FY 2006	FY 2007
Integration & Implementation	15,656	17,102	10,535	11,479
RDT&E Articles (Quantity)	0	0	0	0

Integration and Implementation focuses on the system-level engineering activities needed to successfully combine the individual parts of the Elements, components, and subsystems into one seamless interoperable BMD system. Emphasis is on Element-to-Element interfaces and functionality with cross Element dependencies. Additionally, integration produces tools and products to facilitate the understanding and monitoring of BMDS capabilities by the Combatant Commands.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

FY 2004 Accomplishments:

- Built Draft Master Integration Plan (MIP) for Block 04
- Built initial Block 04 database tool to ensure Element build and integration is consistent with system requirements (PAM)
- Delivered IDO Technical and System Integration documentation to NORTHCOM and STRATCOM to support training and initial defensive operations (e.g. provided source data for BMDS users handbook, OPSCAP/SYSCAP tool, and BMDS top-level drawings)
- Conducted three system-level Design Reviews to support IDO and Block 04
- Updated BMD System Change Process Guide (CPG)
- Published BMD System Configuration Management Plan (CMP)
- Drafted MDA Software Acquisition Plan (SWAP)
- Drafted MDA Software Acquisition Process Framework (MSAPF)
- Drafted MDA Software Readiness Levels (SWRLs) Implementation Guide

FY 2005 Planned Accomplishments:

- Update Block 04 MIP to incorporated new program content
- Conduct Block 04 Integration Design Review
- Conduct Block 04 In-Progress Technical Reviews as needed (estimate at least two)
- Draft Director's Instructions to Elements to Implement Block 04
- Build Block 06 MIP and deliver to Element developers and Test and Verification Communities
- Conduct Block 06 Integration Design Review
- Draft Director's Instructions to Elements to Implement Block 06
- Maintain MIP PAM tool for Block 04 and build integration database for Block 06
- Provide Technical and System Integration documentation to NORTHCOM and STRATCOM to support training and end of Block 04 capability (e.g. provide source data for BMDS users handbook, OPSCAP/SYSCAP tool, and BMDS top-level drawings)
- Track system interfaces and related documentation and provide monthly status

FY 2006 Planned Program:

- Conduct Block 06 In-Progress Technical Reviews as needed (estimate at least two)
- Maintain MIP PAM tool to support Block 06 test, assessment and verification
- Conduct Integration Working Group meetings to resolve Block 06 implementation issues
- Provide Technical and System Integration documentation to NORTHCOM and STRATCOM to support training and early Bock 06 integration; Source Data for BMDS Users Handbook; BMDS top-level Drawings
- Updates to Operational Capability/System Capability tool to reflect current configuration
- Track system interfaces and related documentation and provide status
- Begin advance planning for Block 08 MIP

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

FY 2007 Planned Program:

- Conduct Block 06 In-Progress Technical Reviews as needed (estimate at least two)
- Update Block 06 MIP to incorporated new program content
- Build Block 08 MIP and deliver to Element developers and Test and Verification Communities
- Conduct Block 08 Integration Design Review
- Draft Director's Instructions to Elements to Implement Block 08
- Maintain MIP PAM tool for Block 06 and build integration database for Block 08
- Provide Technical and System Integration documentation to PACOM, NORTHCOM and STRATCOM to support training and late Block 06 integration ; Source Data for BMDS Users Handbook; BMDS top-level Drawings
- Track system interfaces and related documentation and provide monthly status

	FY 2004	FY 2005	FY 2006	FY 2007
Verification & Assessment Engineering	13,963	11,710	10,262	11,130
RDT&E Articles (Quantity)	0	0	0	0

Verification and Assessment Engineering defines verification requirements in the Block System Capability Specifications (SCS) and Interface Control Specifications (ICS), assigns verification methods to BMD System level capabilities for the Verification Cross Reference Matrix (VCRM), and develops Block-specific Capability Verification and Assessment Plans. Verification and Assessment Engineering executes verification and assessment plans to evaluate performance against the System Capability Specification to verify the achieved BMDS performance. Assessments are performed against the Technical Objectives and Goals. Results are reported in Capability Verification Assessment Reports for each block iteration.

FY 2004 Accomplishments:

- Developed/Provided Block 04 System Capability Specification verification Cross Reference Matrix update for FBX-T addition
- Developed/Provided Block 06 Test Bed System Specification Verification Cross Reference Matrix (Engineering Baseline)
- Developed/Provided BMD System Test Objectives, including overlays on Element Test Objectives
- Developed Target Capability Specifications/Coordinated with Elements on Revised Target Development Process between MDA/SE and Elements
- Developed/Provided Capability Verification and Assessment Plan (with IDC and Block 04 Annexes)
- Developed IDC Analysis Plans with Modeling and Simulation requirements
- Developed/Provided IDC Capability Verification and Assessment Reports
- Developed/Provided Capability Verification and Assessment Report Addenda for individual test events

FY 2005 Planned Accomplishments:

- Develop/Provide Block 06 Test Bed System Specification Verification Cross Reference Matrix
- Develop/Provide Block 08 Test Bed System Specification Verification Cross Reference Matrix (Engineering Baseline)
- Develop/Provide BMD System Test Objectives, including overlays on Element Test Objectives
- Develop/Update Target Requirements

- Update Block 04 Capability Verification and Assessment Plan Annex
- Develop/Provide Block 06 Capability Verification and Assessment Plan Annex
- Develop Final Block 04 Verification Analysis Plans with Modeling and Simulation (M&S) requirements
- Develop Block 06 Analysis Plan with Modeling and Simulation requirements
- Develop/Provide Capability Verification and Assessment Reports
- Develop/Provide Capability Verification and Assessment Report Addenda for individual test events

FY 2006 Planned Program:

- Develop/Provide Block 08 Test Bed System Specification Verification Cross Reference Matrix
- Develop/Provide BMD System Test Objectives, including overlays on Element Test Objectives
- Develop/Update Target Requirements
- Update Block 06 Capability Verification and Assessment Plan Annex
- Develop/Provide Draft Block 08 Capability Verification and Assessment Plan Annex
- Develop Final Block 06 Verification Analysis Plans with Modeling and Simulation requirements
- Develop Block 08 Analysis Plan with Modeling and Simulation requirements
- Develop/Provide Capability Verification and Assessment Reports
- Develop/Provide Capability Verification and Assessment Report Addenda for individual test events

FY 2007 Planned Program:

- Develop/Provide Block 10 Test Bed System Specification Verification Cross Reference Matrix (Engineering Baseline)
- Verification Ledger (DOORS-based)
- Develop/Provide BMD System Test Objectives, including overlays on Element Test Objectives
- Develop/Update Target Requirements
- Update Block 06 Capability Verification and Assessment Plan Annex
- Develop/Provide Block 08 Capability Verification and Assessment Plan Annex
- Develop Block 10 Capability Verification and Assessment Plan Annex
- Develop Final Block 08 Verification Analysis Plans with Modeling and Simulation requirements
- Develop Block 10 Analysis Plan with Modeling and Simulation requirements
- Develop/Provide Capability Verification and Assessment Reports
- Develop/Provide Capability Verification and Assessment Report Addenda for individual test events

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

	FY 2004	FY 2005	FY 2006	FY 2007
System Assessment and Analysis Engineering	25,302	20,480	17,949	17,967
RDT&E Articles (Quantity)	0	0	0	0

Systems Assessment and Analysis maintains the technical staff and tools supporting a wide range of analysis needs including test bed engineering and architecture, effectiveness assessments and gap analysis. These analysis efforts also examine and respond to specific questions of feasibility and assessment from senior management.

FY 2004 Accomplishments:

- Conducted architecture analyses to support development of Technical Objectives and Goals, Test Bed Description Documents, System Specifications, Interface Control Documents, System Implementation Plan, Capabilities Verification and Assessment Plan, and the Capabilities Verification and Assessment Report
- Conducted engineering analyses and perform trade studies for system design and implementation products to include System Specification, Interface Control Documents, Target Capabilities Specification, Information Exchange Requirements and Design Parameters Experiments
- Conducted Quick reaction analyses in support of ACD, CONOPS Development, BMDS Handbook
- Developed and maintain the Element/Component Characterization Analysis and the analysis knowledge base
- Developed models and simulation requirements for submission in the MDA model and simulation process

FY 2005 Planned Accomplishments:

- Conduct architecture analyses to support development of Technical Objectives and Goals, Test Bed Description Documents, System Specifications, Interface Control, System Implementation Plan, Capabilities Verification and Assessment Plan, and the Capabilities Verification and Assessment Report
- Conduct engineering analyses and perform trade studies for system design and implementation products to include System Specification, Interface Control, Target Capabilities Specification, Information Exchange Requirements and Design Parameters Experiments
- Conduct Quick reaction analyses in support of ACD, CONOPS Development, BMDS Handbook
- Develop and maintain the Element/Component Characterization Analysis and the analysis knowledge base
- Develop models and simulation requirements for submission in the MDA model and simulation process

FY 2006 Planned Program:

- Conduct architecture analyses to support development of Technical Objectives and Goals, Test Bed Description Documents, System Specifications, Interface Control, System Implementation Plan, Capabilities Verification and Assessment Plan, and the Capabilities Verification and Assessment Report
- Conduct engineering analyses and perform trade studies for system design and implementation products to include System Specification, Interface Control, Target Capabilities Specification, Information Exchange Requirements and Design Parameters Experiments
- Conduct Quick reaction analyses in support of ACD, CONOPS Development, BMDS Handbook
- Develop and maintain the Element/Component Characterization Analysis and the analysis knowledge base
- Develop models and simulation requirements for submission in the MDA model and simulation process

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

FY 2007 Planned Program:

- Conduct architecture analyses to support development of Technical Objectives and Goals, Test Bed Description Documents, System Specifications, Interface Control, System Implementation Plan, Capabilities Verification and Assessment Plan, and the Capabilities Verification and Assessment Report
- Conduct engineering analyses and perform trade studies for system design and implementation products to include System Specification, Interface Control, Target Capabilities Specification, Information Exchange Requirements and Design Parameters Experiments
- Conduct Quick reaction analyses in support of ACD, CONOPS Development, BMDS Handbook
- Develop and maintain the Element/Component Characterization Analysis and the analysis knowledge base
- Develop models and simulation requirements for submission in the MDA model and simulation process

	FY 2004	FY 2005	FY 2006	FY 2007
Program Control	65,974	52,747	40,387	40,400
RDT&E Articles (Quantity)	0	0	0	0

Program Management and Control provides overall program operations support to Missile Defense Agency Systems Engineering to include planning, programming, budgeting and execution (PPBE), contract management, correspondence, information and document management, policy and procedures, security, and government human relations functions. Risk Management provides common expert services to MDA to include technical and program risk assessment, gap analysis, and risk and performance planning and management.

FY 2004 Accomplishments:

- Develop and maintain the BMD System Risk Management Plan
- Provide administrative support for MDA/SE staff and manage formal correspondence
- Project program management and control
- Maintain Integrated Master Schedule for System Engineering products in concert with the overall Missile Defense Agency Integrated Master Plan/Schedule
- Maintain information library of all official engineering documents and briefings
- Manage personnel and MDA site and information security
- Perform contracting officer's representative functions for all project support functions including contract cost oversight
- Manage the project budget
- Provide input to support MDA BRAC submissions

FY 2005 Planned Accomplishments:

- Maintain the BMD System Risk Management Plan
- Provide administrative support for MDA/SE staff and manage formal correspondence
- Project program management and control
- Maintain Integrated Master Schedule for System Engineering products in concert with the overall Missile Defense Agency Integrated Master Plan/Schedule
- Maintain information library of all official engineering documents and briefings
- Manage personnel and MDA site and information security

- Perform contracting officer's representative functions for all project support functions including contract cost oversight
- Manage the project budget
- Launch a comprehensive collaboration strategy to ensure appropriate participation of Agency product and service stakeholders

FY 2006 Planned Program:

- Maintain the BMD SYSTEM Risk Management Plan and provide annual BMDS Block Technical Performance Risk Summary
- Administer MDA National Team contract renewal (10 year contract, renewed every 2 years)
- Upgrade Test Bed Information sharing for both classified and unclassified environments ensuring timely access for all authorized users
- Implement robust collaboration support system to enable desktop planning and technical coordination throughout the enterprise
- Project program management and control
- Maintain Integrated Master Schedule for System Engineering products in concert with the overall Missile Defense Agency Integrated Master Plan/Schedule
- Maintain information library of all official engineering documents and briefings
- Manage personnel and MDA site and information security
- Perform contracting officer's representative functions for all project support functions including contract cost oversight

FY 2007 Planned Program:

- Maintain the BMD SYSTEM Risk Management Plan and draft annual BMDS Block Technical Performance Risk Summary
- Administer Award-fee plan determination and process self-assessments
- Implement consistent task management across all programs and contracts including performance indicators and regular reporting
- Project program management and control
- Maintain Integrated Master Schedule for System Engineering products in concert with the overall Missile Defense Agency Integrated Master Plan/Schedule
- Maintain information library of all official engineering documents and briefings
- Manage personnel and MDA site and information security
- Perform contracting officer's representative functions for all project support functions including contract cost oversight

	FY 2004	FY 2005	FY 2006	FY 2007
Operational Integration & Support	0	920	808	824
RDT&E Articles (Quantity)	0	0	0	0

The Operational Integration and Support team provides the link between the warfighting community and the SE&I team before, during and after transition of Available Defensive Capability. This activity provides sustaining engineering services for support, training, operation and sustainment of BMDS capabilities. It collects, analyzes, and disseminates user input and feedback on the BMDS for incorporation into the collaborative Systems Engineering (SE) process by supporting Force Structure Integration and Deployment.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

FY 2004 Accomplishment:

- The Operational Integration and Support Branch was conceptualized and initiated.

FY 2005 Planned Accomplishments:

- Support the Initial Defensive Operations (IDO) Task Force through the remainder of Block 04
- Support Concept of Operations (CONOPS) development
- Represent the systems engineering interfaces in the Warfighter Involvement Process (WIP) developed by USSTRATCOM
- Support warfighter surveys to collect and disseminate user input and feedback on the BMDS for incorporation into the collaborative SE process
- Support Force Structure Integration and Deployment by working with Combatant Commanders (COCOMs) in focus groups or integrated process teams involving BMDS SE issues
- Communicate SE concepts and analysis to users and stakeholders
- Manage operational system configuration control
- Participate in BMDS Handbook updates and act as a SE liaison for training tools
- Participate in the Joint Warfighter Support program and act as a SE liaison for joint or service exercises, wargames, and seminars

FY 2006 Planned Program:

- Serve as a focal point for SE actions compiled by the MDA Operations Center (MOC)
- Support Concept of Operations (CONOPS) updates
- Represent the systems engineering interfaces in the Warfighter Involvement Process (WIP) developed by USSTRATCOM
- Support warfighter surveys to collect and disseminate user input and feedback on the BMDS for incorporation into the collaborative SE process
- Support Force Structure Integration and Deployment by working with Combatant Commanders (COCOMs) in focus groups or integrated process teams involving BMDS SE issues
- Communicate SE concepts and analysis to users and stakeholders.
- Manage operational system configuration control
- Participate in BMDS Handbook updates and act as a SE liaison for training tools
- Participate in the Joint Warfighter Support program and act as a SE liaison for joint or service exercises, wargames, and seminars

FY 2007 Planned Program:

- Serve as a focal point for SE actions compiled by the MDA Operations Center (MOC)
- Support Concept of Operations (CONOPS) updates
- Represent the systems engineering interfaces in the Warfighter Involvement Process (WIP) developed by USSTRATCOM
- Support warfighter surveys to collect and disseminate user input and feedback on the BMDS for incorporation into the collaborative SE process
- Support Force Structure Integration and Deployment by working with Combatant Commanders (COCOMs) in focus groups or integrated process teams involving BMDS SE issues
- Communicate SE concepts and analysis to users and stakeholders
- Manage operational system configuration control
- Participate in BMDS Handbook updates and act as a SE liaison for training tools
- Participate in the Joint Warfighter Support program and act as a SE liaison for joint or service exercises, wargames, and seminars

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

	FY 2004	FY 2005	FY 2006	FY 2007
Modeling & Simulation Engineering	102,598	99,484	0	0
RDT&E Articles (Quantity)	0	0	0	0

Note: FY 2006 - FY 2011 funding for this effort will be captured under Project 0106 in BMD System Core PE 0603890C.

In order to strengthen the Agency's Modeling and Simulation (M&S) program, a significant effort leveraging existing element models, linked and integrated at the system-level and oriented to support future development of the BMDS, is essential. Legacy models and simulations will address near-term IDO and Block 04 objectives and provide warfighter support and sustainment for BMDS. For Block 06 and beyond, an open architecture model will assess overall BMDS performance and quality, train and operate at the system-level, and improve the BMDS through incremental improvements and Block upgrades over time.

FY 2004 Accomplishments:

- Developed Monthly Technical, Cost and Schedule Reports
- Released Parametric Endo-Exo Lethality Simulation (PEELS): Version 10.1
- Released Post Engagement Ground Effects Model (PEGEM): Version 5.1
- Released Kinetic Impact Debris Distribution (KIDD): Version 5.1
- Released CT-Analyst: Version 2
- Released EADSIM v11, THAAD Representation Benchmark for JPOW8 Wargame
- Released BEST R1.1 accepted by Gov and currently in Beta-Test by selected participants from the BMD user community
- Released Commanders Analysis and Planning Simulation (CAPS) v 8.0, International Version
- Released Missile Defense Wargame (MDWAR) v 4.3 , 5.0, 5.1

FY 2005 Planned Accomplishments:

- Initiate and complete Model Assessments
- Define Framework for Common Environment and Threat Model (CETM) for all Sim Types
- Define and Develop SIM Type 1 Simulation (Mission Effects) for Planning and Integration of BMDS With Other Warfighting Mission Areas
- Define Criteria for Accuracy/Detail per Sim Type
- Assess Existing Threat and Environment Tools
- Plan, Build and Integrate CETM Version 1.0
- Developed Monthly Technical, Cost and Schedule Reports
- Release Parametric Endo-Exo Lethality Simulation (PEELS): Version 10.2, 11.0
- Release Post Engagement Ground Effects Model (PEGEM): Version 5.2, 6.0
- Release Kinetic Impact Debris Distribution (KIDD): Version 5.6, 6.0
- Release Performance Assessment Workbench Software (PAWS): Version 2.0, 3.0
- Release CT-Analyst: Version 3
- Release EADSIM v12, THAAD Representation Accreditation to support Wargames
- Release Next Generation Flowfield Solver
- Release FLITES

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

- Release Strategic Scene Generation Model (SSGM) 99.4
- Release Commanders Analysis and Planning Simulation (CAPS) v 9.0 and 9.1
- Release Missile Defense Wargame (MDWAR) v 5.2, 6.0, 6.1

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

D. Acquisition Strategy

SE&I will provide an integrated and layered BMD System architecture, develop block technical definitions, develop element requirements, schedules, verification strategies and other products required to execute the BMD System program. In order to develop and deliver an integrated BMD System that accomplishes its mission and addresses these challenges, MDA employs a collaborative, system-centric, capability-based BMDS Test Bed Engineering process that spans many functions and organizations across MDA including System Engineering and Integration (SE&I); Test and Evaluation; and the Element programs System Engineers. The transition to a BMD System is performed by a team of Government, Federally Funded Research and Development Centers (FFRDC), University Affiliated Research Centers (UARC), System Engineering and Technical Assistance (SETA), and industry contractors. This combination of resources forms an integrated team to accomplish necessary engineering for the BMD System. The MDA Systems Engineering Director is supported by functional work groups and an advisory group overseeing specific cross cutting functions. Program Control and Cost & Investment Engineering provide administrative, program management and financial services to Functional Groups and interfaces to other MDA organizations. The strategy is for the engineering team is to ensure successful development of the BMD System through system definition & analyses, capability allocation, block integration, and verification. The organizational construct of the team, applies industrial structures to missile defense while complying with governmental acquisition regulations.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Test Bed Planning										
Industry	CPAF	Boeing/ VA	2,972	2,300	1/3Q	2,016	1/3Q	2,016	1/3Q	9,304
SETA	CPFF	Sparta/ VA	5,950	4,970	3Q	4,356	1/3Q	4,356	1/3Q	19,632
SETA	CPFF	CSC/ VA	3,332	4,860	3Q	4,259	1/3Q	4,259	1/3Q	16,710
SETA	CPFF	Anteon/ VA	0	920	3Q	806	1/3Q	806	1/3Q	2,532
Other DoD	MIPR	NSWC/ VA	2,200	710	1/3Q	622	1/3Q	622	1/3Q	4,154
Other DoD		SMDC/ AL	4,525	975	1/3Q	854	1/3Q	854	1/3Q	7,208
Other DoD	MIPR	Battelle/ OH	3,350	2,205	1/3Q	1,932	1/3Q	1,932	1/3Q	9,419
Other DoD		Air Force	1,000	275	1/3Q	241	1/3Q	241	1/3Q	1,757
Other DoD		SBCCOM/ MD	75	75	1/3Q	66	1/3Q	66	1/3Q	282
Other DoD	MIPR	Aegis/ VA	1,550	0	N/A	0	N/A	0	N/A	1,550
Design & Specification										

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603890C Ballistic Missile Defense System Core

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Industry	CPAF	Boeing/ VA	10,782	11,730	1/3Q	10,280	1/3Q	11,150	1/3Q	43,942
SETA	CPFF	Sparta/ VA	1,930	1,610	3Q	1,411	1/3Q	1,530	1/3Q	6,481
SETA	CPFF	CSC/ VA	1,292	1,680	3Q	1,472	1/3Q	1,597	1/3Q	6,041
Integration & Implementation										
Industry	CPAF	Boeing/ VA	10,247	8,050	1/3Q	7,055	1/3Q	7,651	1/3Q	33,003
SETA	CPFF	Sparta/ VA	2,214	3,258	3Q	1,499	1/3Q	1,652	1/3Q	8,623
SETA	CPFF	CSC/ VA	1,840	2,681	3Q	1,709	1/3Q	1,881	1/3Q	8,111
Other DoD	MIPR	Spawar/ CA	300	0	N/A	0	N/A	0	N/A	300
Other DoD		SMDC/ AL	40	40	1/3Q	0	N/A	0	N/A	80
Other DoD		Air Force	25	0	N/A	0	N/A	0	N/A	25
Other DoD		MDA Elements	0	1,498	1/3Q	0	N/A	0	N/A	1,498
Verification & Assessment Engineering										
Industry	CPAF	Boeing/ VA	7,271	6,210	1/3Q	5,442	1/3Q	5,902	1/3Q	24,825
SETA	CPFF	Sparta/ VA	953	1,380	3Q	1,209	1/3Q	1,312	1/3Q	4,854
SETA	CPFF	CSC/ VA	2,506	2,880	3Q	2,524	1/3Q	2,737	1/3Q	10,647
SETA	MIPR	NSWC/Crane/ IN	1,000	0	N/A	0	N/A	0	N/A	1,000

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603890C Ballistic Missile Defense System Core

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Other DoD		JNIC/ CO	1,000	0	N/A	0	N/A	0	N/A	1,000
System Assessment and Analysis Engineering										
Industry	CPAF	Boeing/ VA	13,491	4,830	1/3Q	4,233	1/3Q	4,235	1/3Q	26,789
SETA	CPFF	Sparta/ VA	6,839	10,120	3Q	8,869	1/3Q	8,873	1/3Q	34,701
SETA	CPFF	CSC/ VA	2,788	3,360	3Q	2,945	1/3Q	2,946	1/3Q	12,039
Other DoD		SMDC/ AL	20	0	N/A	0	N/A	0	N/A	20
Other DoD		MDA Elements/ VA	130	0	N/A	0	N/A	0	N/A	130
SETA		Booz Allen & Hamilton/ VA	225	0	N/A	0	N/A	0	N/A	225
Program Control										
		UK Mod/ UK	1,079	0	N/A	0	N/A	0	N/A	1,079
Operational Integration & Support										
SETA	CPFF	Anteon/ VA	0	460	3Q	404	1/3Q	412	1/3Q	1,276
SETA	CPFF	Sparta/ VA	0	460	3Q	404	1/3Q	412	1/3Q	1,276
Modeling & Simulation Engineering										

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
M&S Tools	CPAF	Northrop Grumman/ JNIC/CO	0	10,077	1/2Q	0	N/A	0	N/A	10,077
M&S Tools	TM	DSI/ GSA/LA	0	2,573	1/2Q	0	N/A	0	N/A	2,573
M&S Tools	CPAF	Teledyne Brown Eng PEO AMSD/ AL	0	4,500	1/4Q	0	N/A	0	N/A	4,500
M&S Tools	CPAF	PEO AMSD/ AL	12,266	800	1/4Q	0	N/A	0	N/A	13,066
M&S Tools	CPAF	JTAGS PEO AMSD/ AL	0	565	1/4Q	0	N/A	0	N/A	565
M&S Tools	Various	SBIRS/MCS/ Air Force	3,033	400	1/4Q	0	N/A	0	N/A	3,433
M&S Tools	Various	JNIC/ CO	19,635	600	1/4Q	0	N/A	0	N/A	20,235
M&S Tools	MIPR	GMD/ AL	0	800	2/4Q	0	N/A	0	N/A	800
M&S Tools	MIPR	SPAWAR/ CA	2,576	1,750	1/2Q	0	N/A	0	N/A	4,326
M&S Tools	Various	USA NET Design Facility/ PEO ASMD, AL	0	500	2/4Q	0	N/A	0	N/A	500
M&S Tools	MIPR	THAAD/ AL	0	1,800	1/2Q	0	N/A	0	N/A	1,800
M&S Tools	CPAF	Lockheed Martin/ PA	0	2,000	1/4Q	0	N/A	0	N/A	2,000
M&S Tools	Various	Patriot	0	450	1/4Q	0	N/A	0	N/A	450

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603890C Ballistic Missile Defense System Core

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
M&S Tools	MIPR	FBX-T/ VA	0	800	2/4Q	0	N/A	0	N/A	800
M&S Tools	MIPR	Photon Research Assoc/ VA	4,800	5,900	1/3Q	0	N/A	0	N/A	10,700
M&S Tools	CPFF	NLR/ DC	0	2,300	1/2Q	0	N/A	0	N/A	2,300
M&S Tools	CPFF	AFRL-PR/ CA	0	800	1/2Q	0	N/A	0	N/A	800
M&S Tools	CPFF	SMDC/ AL	21,228	600	1/2Q	0	N/A	0	N/A	21,828
M&S Tools	CPFF	AFRL-VS/ MA	0	200	1/2Q	0	N/A	0	N/A	200
M&S Tools	CPFF	AFRL-MN/ FL	0	100	1/2Q	0	N/A	0	N/A	100
M&S Tools	CPFF	AFRL-SN/ OH	0	100	1/2Q	0	N/A	0	N/A	100
M&S Tools	MIPR	NASIC/ OH	0	200	1/2Q	0	N/A	0	N/A	200
M&S Tools	MIPR	MSIC/ AL	0	200	1/2Q	0	N/A	0	N/A	200
M&S Tools	FFP	SPARTA/ CA	243	51	1Q	0	N/A	0	N/A	294
M&S Tools	CPIF	Teledyne Brown Eng SMDC/ AL	0	1,840	1/2Q	0	N/A	0	N/A	1,840
M&S Tools	MIPR	ITT GSA/ GA	1,050	2,215	1/2Q	0	N/A	0	N/A	3,265
M&S Tools	FFP	CSC SMDC/ GA	0	860	1/2Q	0	N/A	0	N/A	860

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
M&S Tools	FFP	Dynetics SMDC/ GA	0	250	1/2Q	0	N/A	0	N/A	250
M&S Tools	MIPR	Miltec GSA/ GA	350	875	1/2Q	0	N/A	0	N/A	1,225
M&S Tools	MIPR	BAE GSA/ GA	1,229	1,540	1/2Q	0	N/A	0	N/A	2,769
M&S Tools		NRL/ VA	0	475	1/2Q	0	N/A	0	N/A	475
M&S Framework	CPAF	TBD	0	20,163	2/4Q	0	N/A	0	N/A	20,163
M&S Tools		DSI, GSA/ AL	0	295	1/2Q	0	N/A	0	N/A	295
M&S Tools	CPIF	Teledyne Brown Engineering, SMDC/ AL	0	300	1/2Q	0	N/A	0	N/A	300
M&S Tools	MIPR	Sparta/ VA	0	380	1/3Q	0	N/A	0	N/A	380
Computational Facilities		Various/ VA	0	23,429	1/2Q	0	N/A	0	N/A	23,429
SETA		Booze Allen/ VA	6,335	0	N/A	0	N/A	0	N/A	6,335
Other DoD	MIPR	Navy	2,812	0	N/A	0	N/A	0	N/A	2,812
Industry		Boeing/ AL	2,331	0	N/A	0	N/A	0	N/A	2,331
Other DoD		Aegis/ VA	2,995	0	N/A	0	N/A	0	N/A	2,995
Subtotal Support Costs			171,809	168,225		64,608		67,442		472,084

Remarks

- FY06-11 funding for Modeling and Simulation Engineering is captured under the Ballistic Missile Defense System (BMDS), Program Element 0603890C, Project 0106
- SETA Recompete 3Q FY05
- M&S Framework category represents funding for the Block 06 common M&S framework for all system level models, which will model the entire BMDS for all venues.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Test Bed Planning										
FFRDC/UARC/DoE Labs	FFRDC	Various	4,734	4,990	1/3Q	3,176	1/3Q	3,177	1/3Q	16,077
Design & Specification										
FFRDC/UARC/DoE Labs	FFRDC	Various	1,011	1,550	1/3Q	1,358	1/3Q	1,473	1/3Q	5,392
Integration & Implementation										
FFRDC/UARC/DoE Labs	FFRDC	Various	529	1,125	1/3Q	272	1/3Q	295	1/3Q	2,221
Gov`t Personnel		SMDC/ Huntsville, AL	450	450	2Q	0	N/A	0	N/A	900
Gov`t Personnel		Air Force	12	0	N/A	0	N/A	0	N/A	12
Verification & Assessment Engineering										
FFRDC/UARC/DoE Labs	FFRDC	Various	1,253	1,240	1/3Q	1,087	1/3Q	1,179	1/3Q	4,759
System Assessment and Analysis Engineering										
FFRDC/UARC/DoE Labs	FFRDC	Various	1,809	2,170	1/3Q	1,902	1/3Q	1,913	1/3Q	7,794
Program Control										
Industry	CPAF	Boeing/ VA	36,032	35,465	1/3Q	26,244	1/3Q	26,210	1/3Q	123,951

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603890C Ballistic Missile Defense System Core

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
SETA	CPFF	Sparta/ VA	3,917	3,450	3Q	2,520	1/3Q	2,517	1/3Q	12,404
SETA	CPFF	CSC/ VA	3,774	2,400	3Q	1,753	1/3Q	1,751	1/3Q	9,678
FFRDC/UARC/DoE Labs	FFRDC	Various	2,484	4,429	1/3Q	3,329	1/3Q	3,328	1/3Q	13,570
Gov`t Personnel		WHS// DC	16,112	4,700	2Q	4,797	2Q	4,890	2Q	30,499
Travel			1,737	598	2/4Q	499	2/4Q	460	2/4Q	3,294
SETA	CPFF	Anteon/ VA	2,803	1,610	3Q	1,176	1/3Q	1,175	1/3Q	6,764
SETA	FFP	Paradigm/ VA	95	95	3Q	69	1/3Q	69	1/3Q	328
SETA		AMSAM	85	0	N/A	0	N/A	0	N/A	85
Modeling & Simulation Engineering										
SETA	FFP	MDA/ VA	662	2,148	1/3Q	0	N/A	0	N/A	2,810
FFRDC/UARCs and other govt labs	FFRDC	JHU/APL/ MD	885	3,160	1/2Q	0	N/A	0	N/A	4,045
FFRDC/UARCs and other govt labs	FFRDC	Aerospace/ CA	160	320	1/2Q	0	N/A	0	N/A	480
FFRDC/UARCs and other govt labs	FFRDC	MIT/LL/ MA	250	540	1/2Q	0	N/A	0	N/A	790
FFRDC/UARCs and other govt labs	FFRDC	MITRE/ VA	300	920	1/2Q	0	N/A	0	N/A	1,220
FFRDC/UARCs and other govt labs	FFRDC	Torch Technologies/ VA	0	58	1/2Q	0	N/A	0	N/A	58
Gov`t Personnel		MDA/ VA	1,400	1,500	2Q	0	N/A	0	N/A	2,900

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Travel			150	150	2Q	0	N/A	0	N/A	300
Subtotal Management Services			80,644	73,068		48,182		48,437		250,331

Remarks

FY06-11 funding for Modeling and Simulation Engineering is captured under the Ballistic Missile Defense System (BMDS), Program Element 0603890C, Project 0106

SETA Recompete 3Q FY05

Project Total Cost			252,453	241,293		112,790		115,879		722,415

Remarks

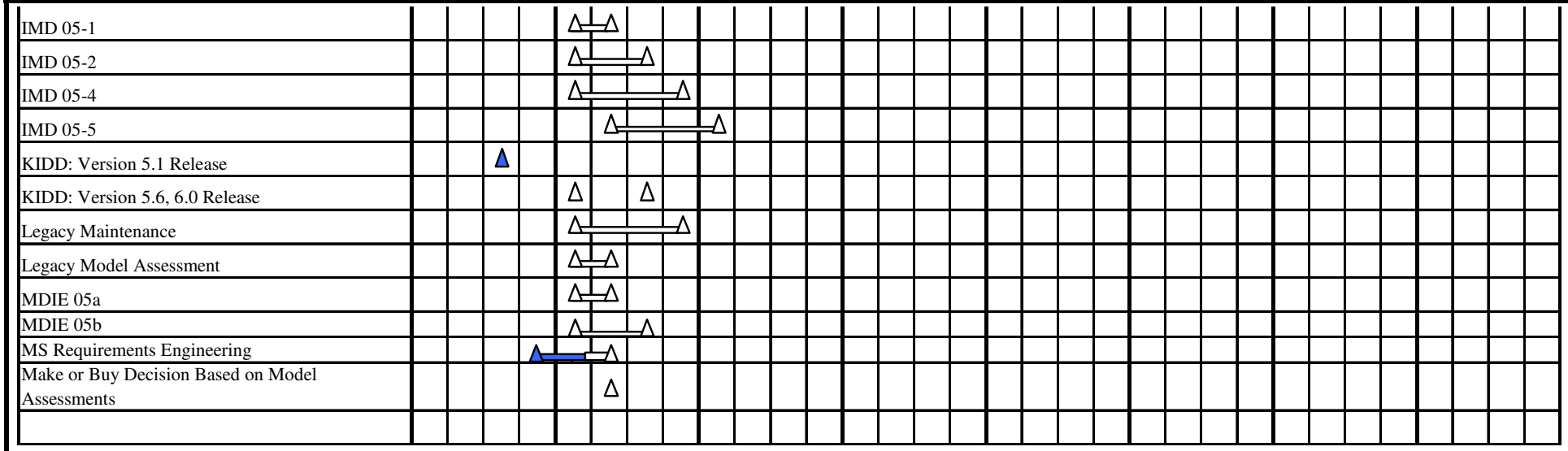
Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Milestones																																
Technical Objectives & Goals / Updates							△								△								△								△	
Adversary Capability Document/updates		▲						△				△				△				△				△				△				△
Adversary Data Package	▲	▲	▲	▲			△		△		△		△		△		△		△		△		△		△		△		△		△	
Lethality Data Update		▲				△				△				△				△				△				△				△		
Initial Defensive Operations																																
Capability Verification and Assessment Plan			▲																													
IDC/Block 04 Interface Control Specifications	▲																															
IDO Capability Verification & Assessment Report	▲			▲			△																									
BLOCK 2004																																
System Specifications			▲																													
Interface Control Specifications				▲																												
Master Integration Plan draft/final				▲	▲																											
Capability Verification and Assessment Plan/update			▲			△	△																									
Capability Verification and Assessment Report									△		△																					
BLOCK 2006																																
Test Bed Description Document (TBDD)						△																										
System Specifications			▲	▲		△																										
Interface Control Specifications						△																										
Master Integration Plan final						△																										
Capability Verification and Assessment Plan/update						△			△																							
Capability Verification and Assessment Report													△		△		△		△													

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
BLOCK 2008																																
Test Bed Description Document (TBDD)						Δ																										
System Specifications							Δ																									
Interface Control Specifications								Δ																								
Master Integration Plan final														Δ																		
Capability Verification and Assessment Plan/update													Δ				Δ															
Capability Verification and Assessment Report																					Δ		Δ		Δ		Δ					
Block 2010																																
Test Bed Description Document (TBDD)													Δ																			
System Specifications															Δ																	
Interface Control Specifications																Δ																
Master Integration Plan																						Δ										
Capability Verification and Assessment Plan/update																	Δ				Δ				Δ							
Capability Verification and Assessment Report																													Δ		Δ	
Block 2012																																
Capability Verification and Assessment Plan/update																					Δ				Δ				Δ			
Interface Control Specifications																			Δ													
Master Integration Plan																														Δ		
System Specifications																		Δ														
Test Bed Description Document (TBDD)																Δ																

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**



Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Milestones								
Technical Objectives & Goals / Updates		3Q		3Q		3Q		3Q
Adversary Capability Document/updates	2Q	4Q	4Q	4Q	4Q	4Q	4Q	4Q
Adversary Data Package	1Q,2Q,3Q,4Q	3Q	1Q,3Q	1Q,3Q	1Q,3Q	1Q,3Q	1Q,3Q	1Q,3Q
Lethality Data Update	2Q	2Q	2Q	2Q	2Q	2Q	2Q	2Q
Initial Defensive Operations								
Capability Verification and Assessment Plan	3Q							
IDC/Block 04 Interface Control Specifications	1Q							
IDO Capability Verification & Assessment Report	1Q,4Q	3Q						
BLOCK 2004								
System Specifications	3Q							
Interface Control Specifications	4Q							
Master Integration Plan draft/final	4Q	1Q						
Capability Verification and Assessment Plan/update	3Q	2Q,3Q						
Capability Verification and Assessment Report			1Q,3Q					
BLOCK 2006								
Test Bed Description Document (TBDD)		2Q						
System Specifications	3Q,4Q	2Q						
Interface Control Specifications	4Q	2Q						
Master Integration Plan final		2Q						
Capability Verification and Assessment Plan/update		2Q	1Q					
Capability Verification and Assessment Report				1Q,3Q	1Q,3Q			
BLOCK 2008								
Test Bed Description Document (TBDD)		2Q						
System Specifications		3Q						
Interface Control Specifications		4Q						
Master Integration Plan final				2Q				
Capability Verification and Assessment Plan/update				1Q	1Q			
Capability Verification and Assessment Report						1Q,3Q	1Q,3Q	
Block 2010								
Test Bed Description Document (TBDD)				1Q				
System Specifications				3Q				

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Interface Control Specifications				4Q				
Master Integration Plan						2Q		
Capability Verification and Assessment Plan/update					1Q	1Q	1Q	
Capability Verification and Assessment Report								1Q,3Q
Block 2012								
Capability Verification and Assessment Plan/update						1Q	1Q	1Q
Interface Control Specifications					3Q			
Master Integration Plan								2Q
System Specifications					2Q			
Test Bed Description Document (TBDD)				4Q				
Modeling and Simulation								
Analysis Event 1		1Q-2Q						
Analysis Event 2		1Q-4Q						
BEST R1.1	4Q							
CT-Analyst: Version 2	2Q							
CT-Analyst: Version 3		2Q						
Develop T1, T2, T3, and CETM		2Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q			
EADSIM v11	1Q							
EADSIM v12		1Q						
FLITES		2Q						
IMD 05-1		1Q-2Q						
IMD 05-2		1Q-3Q						
IMD 05-4		1Q-4Q						
IMD 05-5		2Q-4Q	1Q					
KIDD: Version 5.1 Release	3Q							
KIDD: Version 5.6, 6.0 Release		1Q,3Q						
Legacy Maintenance		1Q-4Q						
Legacy Model Assessment		1Q-2Q						
MDIE 05a		1Q-2Q						
MDIE 05b		1Q-3Q						
MS Requirements Engineering	4Q	1Q-3Q,2Q						
Make or Buy Decision Based on Model Assessments		2Q						

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Software								
Block 04 Software Acquisition Program	4Q							
Virtual Model/updates	4Q	2Q,4Q	2Q,4Q	2Q,4Q	2Q,4Q	2Q,4Q	2Q,4Q	2Q,4Q
Studies & Analyses								
2004 Summer Study	3Q-4Q							
3rd GBI Site Analysis Decision	3Q-4Q							
Advanced Concepts Studies	1Q-4Q							
Block 06 SCS Review	3Q							
Block 2006 / 2008 Development Reviews	1Q-4Q	1Q-2Q						
Block 2006 Baseline Analysis	3Q-4Q							
Block 2008 / 2010 Baseline Review	1Q							
Block 2008 Peer Review/update	1Q,3Q,4Q							
C2BMC Architecture Evolution Study	3Q							
E/CCA	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q
FDR & Midcourse Sensor Study	3Q							
IDO Block 2004/ 2006 ESG Timelines	2Q							
POM 06 & ESG Analysis	4Q	1Q						
Supported Block 06 SCS/TBSS Study	2Q-4Q							
Trade Studies	1Q-4Q							
Other								
BMDS Technical Performance and Risk Summary		1Q	1Q	1Q	1Q	1Q	1Q	1Q
BMDS Technical Risk Summary		1Q						
Risk Assessment Management Plan		2Q	2Q	2Q	2Q	2Q	2Q	2Q
Risk Mgt Plan Update	3Q							
Contractual Activities& Events								
MDNTS(I) Phase 3 Contract Award	2Q							
MDNTS(I) Phase 4 Contract Award		1Q						
MDNTS(I) Phase 5 Contract Award					1Q			
OTA Contract Award			1Q					
SE Technical Support		2Q						
General Milestones								
Adversary Engineering	1Q	1Q	1Q	1Q	1Q	1Q	1Q	1Q

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603890C Ballistic Missile Defense System Core

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Countermeasure Characterizations	4Q	4Q	4Q	4Q	4Q	4Q	4Q	4Q
Missile Characterizations	3Q	3Q	3Q	3Q	3Q	3Q	3Q	3Q
Perform Intel Threat Analysis	2Q	2Q	2Q	2Q	2Q	2Q	2Q	2Q
Special Adversary Capability Studies	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q
Lethality								
Analyze Missile Payload Lethality	2Q	2Q	2Q	2Q	2Q	2Q	2Q	2Q
Analyze Post Engagement Lethality Data	2Q	2Q	2Q	2Q	2Q	2Q	2Q	2Q
Chem-Bio Threats - Report	4Q	4Q	4Q	4Q	4Q	4Q	4Q	4Q
Kill Assessment Phenomenology	3Q	3Q	3Q	3Q	3Q	3Q	3Q	3Q
Perform Studies Chem./Bio - Agents at Altitudes	1Q	1Q	1Q	1Q	1Q	1Q	1Q	1Q
Submunition Properties	3Q	3Q	3Q	3Q	3Q	3Q	3Q	3Q
Viscoelastic Fluid Properties	3Q	3Q	3Q	3Q	3Q	3Q	3Q	3Q
Integration								
Block 2006 Integration Design Review		3Q						
Block 2008 Integration Design Review				2Q				
Integration Monthly Report	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0105 Countermeasures/Counter-Countermeasures (CM/CCM)	19,511	29,557	24,700	26,522	26,700	27,700	23,028	23,366
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

The Missile Defense Agency's (MDA) Countermeasures/Counter-Countermeasures (CM/CCM) Program assesses technical risks, identifies mitigation approaches and integrates engineering changes to the baseline Ballistic Missile Defense System (BMDS) to improve its performance against the full spectrum of adversary capabilities, focusing primarily on defeating countermeasures. The CM/CCM Program determines the range of feasible engineering approaches an adversary could use to defeat or degrade the BMDS, and develops conceptual countermeasures to realize those approaches. The CM/CCM Program conducts tailored threat system engineering to support BMDS capability improvement and works collaboratively with the Threat Systems Engineering Team to synchronize and integrate development efforts. These efforts ensure consistent representation of adversary capabilities with the MDA Adversary Capability Document. The CM/CCM Program brings together capabilities from across MDA; to include System, Element, and Component technical experts; to conduct integrated engineering assessments of BMDS performance against countermeasures and the technical risks posed by these countermeasures. High-risk areas in the BMDS are identified, and counter-countermeasure options are proposed to mitigate these risks. An independent team of senior experts, funded by the CM/CCM Program, reviews the adversary capabilities, BMDS performance analyses, risks, and counter-countermeasure proposals and provides their assessment to the MDA Director. CM/CCM Program assessments help to focus and prioritize MDA investments in counter-countermeasures that have a strong potential to mitigate the BMDS risks identified by the program. Acting through the Systems Engineering and Integration (SE&I) team, CM/CCM employs collaborative engineering throughout the entire engineering process from concept through development to operational integration to ensure that it's solutions are part of the integrated system design.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Adversary Engineering	7,300	9,740	10,452	10,952
RDT&E Articles (Quantity)	0	0	0	0

Adversary Engineering funds the engineering analysis and characterization of the adversary capabilities and countermeasure concepts for program risk assessment and studies focused on specific topical areas related to countermeasures.

FY 2004 Accomplishments:

- Reported on results of studies and experiments on adversary countermeasures capabilities and phenomenology related to countermeasure design, deployment, and performance
- Developed a detailed parametric description of adversary capabilities and conceptual countermeasures for the midcourse phase of flight
- Delivered engineering descriptions for twelve conceptual midcourse countermeasure suites to support risk assessment and mitigation effort
- Transitioned a conceptual midcourse countermeasure suite to MDA Targets and Countermeasures for potential design and development

FY 2005 Planned Accomplishments:

- Continue characterization of adversary countermeasures capabilities and phenomenology related to countermeasure design, deployment, and performance
- Update and continue development of detailed parametric descriptions of the adversary capability space and countermeasures
- Deliver engineering descriptions for up to three conceptual countermeasure suites in support of BMDS risk assessments.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

FY 2006 Planned Program:

- Continue characterization of adversary countermeasures capabilities and phenomenology related to countermeasure design, deployment, and performance
- Update and continue development of detailed parametric descriptions of the adversary capability space and countermeasures
- Deliver engineering descriptions for conceptual countermeasure suites in support of BMDS risk assessments.

FY 2007 Planned Program:

- Continue characterization of adversary countermeasures capabilities and phenomenology related to countermeasure design, deployment, and performance
- Update and continue development of detailed parametric descriptions of the adversary capability space and countermeasures
- Deliver engineering descriptions for conceptual countermeasure suites in support of BMDS risk assessments

	FY 2004	FY 2005	FY 2006	FY 2007
Independent Assessment	600	930	930	930
RDT&E Articles (Quantity)	0	0	0	0

Independent Assessment supports the operations of the analyses by a panel of senior experts of proposed adversary capabilities, conceptual countermeasures, risk assessments, and proposed mitigation approaches, and development of their independent assessment to the MDA Director.

FY 2004 Accomplishments:

- Conducted four reviews of CM/CCM Program adversary countermeasures, risk assessments, and proposed mitigation options
- Provided two independent assessments of planned BMDS capabilities to the MDA Director

FY 2005 Planned Accomplishments:

- Conduct reviews of CM/CCM Program adversary countermeasures, risk assessments, and proposed mitigation options
- Provide independent assessments of CM/CCM Program products to MDA Director

FY 2006 Planned Program:

- Conduct reviews of CM/CCM Program adversary countermeasures, risk assessments, and proposed mitigation options
- Provide independent assessments of CM/CCM Program products to MDA Director

FY 2007 Planned Program:

- Conduct reviews of CM/CCM Program adversary countermeasures, risk assessments, and proposed mitigation options
- Provide independent assessments of CM/CCM Program products to MDA Director

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

	FY 2004	FY 2005	FY 2006	FY 2007
BMDS Risk Assessment and Mitigation Engineering	11,611	18,887	13,318	14,640
RDT&E Articles (Quantity)	0	0	0	0

BMDS Risk Assessment and Mitigation Engineering funds integrated performance and risk assessments of the BMDS against projected adversary capabilities and conceptual countermeasures, and identification and characterization of counter-countermeasure options to mitigate BMDS risks posed by these adversary capabilities and countermeasures, and the system-level engineering required to identify the BMDS baseline changes required to implement and integrate the options into the operational system baseline. In order to accomplish this task, a collaborative engineering process that spans many organizations across MDA to include the BMDS Elements, Systems Engineering and Integration, Test and Evaluation and others is employed. Utilizing integration councils and task oriented working groups, collaborative products, e.g. concept descriptions, specifications, interfaces, etc., that define risk mitigation options are produced.

FY 2004 Accomplishments:

- Initiated and integrated support from Element Program Offices and contractors into the CM/CCM Program assessment of BMDS capabilities against adversary midcourse countermeasures and the identification and characterization of alternative counter-countermeasure concepts
- Conducted an assessment of the baseline BMDS target designation capabilities in the midcourse phase of flight against projected adversary capabilities and twelve conceptual countermeasure suites
- Conducted an advanced study to determine the engineering changes to the baseline BMDS required to integrate a counter-countermeasure initiative to enhance the lethality of kill vehicles
- Conducted an advanced study to determine the engineering changes to the baseline BMDS required to improve integrated midcourse sensor target designation capabilities
- Conducted an advanced study to examine potential for more effective sensor discrimination in the THAAD, Aegis, GMD, and STSS Elements Supported development of the initial Concept of Operation for an Advanced Discrimination Initiative

FY 2005 Planned Accomplishments:

- Execute system analysis to develop the strategy for a robust midcourse defense, focused on assessment of essential sensor functions and capabilities, enhanced weapon lethality, integrated battle management functions, and critical ancillary support
- Perform system engineering required to enable critical discrimination functions for Test Bed Blocks 2006 and 2008 capabilities
- Execute system analysis to develop the strategy for a robust midcourse defense, focused on assessment of essential sensor functions and capabilities, enhanced weapon lethality, integrated battle management functions, and critical ancillary support
- Perform system engineering required to enable critical discrimination functions for Test Bed Blocks 2006 and 2008 capabilities
- Identify critical discrimination functions Generate function sequences required to enable the critical discrimination functions
- Allocate critical discrimination functions to appropriate Elements for implementation/execution
- Provided alternative Block evolution paths/schedules for test and implement of critical discrimination functions.

FY 2006 Planned Program:

- Conduct assessments of BMDS performance against projected adversary capabilities and conceptual countermeasures to identify and evaluate performance risks and gaps
- Identify and characterize counter-countermeasures to mitigate BMDS risks posed by adversary ballistic missiles with countermeasures
- Conduct advanced studies to determine the engineering changes to the baseline BMDS required to integrate counter-countermeasure initiatives proposed by the CM/CCM Program.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

FY 2007 Planned Program:

- Conduct assessments of BMDS performance against projected adversary capabilities and conceptual countermeasures to identify and evaluate performance risks and gaps
- Identify and characterize counter-countermeasures to mitigate BMDS risks posed by adversary ballistic missiles with countermeasures
- Conduct advanced studies to determine the engineering changes to the baseline BMDS required to integrate counter-countermeasure initiatives proposed by the CM/CCM Program

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

D. Acquisition Strategy

The execution of program activities is a collaborative effort involving subject matter experts composed of Government, Federally Funded Research and Development Centers (FFRDC), University Affiliated Research Centers (UARC) Science Engineering and Technical Assistance (SETA), and Industry. In addition, extensive involvement by the major defense contractors responsible for the development of the BMDS, Elements, and major components is required. CM/CCM initiatives will be executed by various labs and industry contractors through the MDA Advanced Systems directorate and BMDS Element Program Offices.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Adversary Engineering										
SETA Support	CPFF	SPARTA/ VA	975	1,392	3Q	1,568	1/3Q	1,714	1/3Q	5,649
SETA Support	CPFF	CSC/ VA	125	358	3Q	509	1/3Q	551	1/3Q	1,543
Models and Signatures		Delta Research/ AL	300	527	1/3Q	665	1/3Q	742	1/3Q	2,234
Models and Simulations	MIPR	ARL/ NM	575	867	1Q	956	1Q	1,030	1Q	3,428
Analysis Support	MIPR	Battelle/ OH	368	415	1Q	445	1Q	486	1Q	1,714
Countermeasure Engineering and Analysis		Missile Defense Center/ VA	3,000	3,656	1/3Q	3,784	1/3Q	3,904	3/4Q	14,344
BMDS Risk Assessment and Mitigation Engineering										
SETA Support	CPFF	CSC/ MA	0	500	3Q	500	1/3Q	500	1/3Q	1,500
Assessment and Concept Development Support		MDA Elements	0	3,383	1/3Q	3,922	1/3Q	3,957	1/3Q	11,262
Collaborative Engineering		MDA Elements	4,237	9,197	1/3Q	2,900	1/3Q	3,722	1/3Q	20,056
Other DOD		SMDC/AL	870	1,118	1/3Q	1,260	1/3Q	1,260	1/3Q	4,508

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

Date
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APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603890C Ballistic Missile Defense System Core

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Other DOD		THADD/VA	745	1,200	4Q	1,231	1/3Q	1,231	1/3Q	4,407
Subtotal Support Costs			11,195	22,613		17,740		19,097		70,645

Remarks

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Adversary Engineering										
FFRDC/UARC/DoE Labs	MIPR	Various	1,882	2,525	1/3Q	2,525	1/3Q	2,525	N/A	9,457
Independent Assessment										
FFRDC/UARC/DoE Labs	MIPR	Various	75	930	1/3Q	930	1/3Q	930	2/4Q	2,865
BMDS Risk Assessment and Mitigation Engineering										
FFRDC/UARC/DoE Labs	MIPR	Various	2,885	3,489	1/3Q	3,505	1/3Q	3,970	1/3Q	13,849
Subtotal Management Services			4,842	6,944		6,960		7,425		26,171

Remarks

Project Total Cost			16,037	29,557		24,700		26,522		96,816

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Adversary Engineering																																
Deliver Countermeasure Concepts	▲		▲	▲	▲		△	△	△		△	△	△		△	△	△		△	△	△		△	△								
Deliver Special Studies Report			▲		▲				△				△				△				△											
BMDS Risk Assessment and Mitigation Engineering																																
Develop Annual Study Plan				▲				△				△				△				△				△								
Integrate CCM Options into BMDS Test Bed			▲	▲			△	△			△	△			△	△			△	△			△	△								
Integrate CCM Alternatives into BMDS Test Bed					▲		△	△			△	△			△	△			△	△			△	△								

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Adversary Engineering								
Award Missile Defense Center Contract	2Q	2Q	2Q	2Q	2Q	2Q		
Develop Countermeasure Concepts	1Q,2Q,3Q	1Q,2Q,3Q	1Q,2Q,3Q	1Q,2Q,3Q	1Q,2Q,3Q	1Q,2Q,3Q		
Deliver Countermeasure Concepts	1Q,3Q,4Q	1Q,3Q,4Q	1Q,3Q,4Q	1Q,3Q,4Q	1Q,3Q,4Q	1Q,3Q,4Q		
Conduct Special Studies	2Q,3Q,4Q	2Q,3Q,4Q	2Q,3Q,4Q	2Q,3Q,4Q	2Q,3Q,4Q	2Q,3Q,4Q		
Deliver Special Studies Report	3Q	1Q	1Q	1Q	1Q	1Q		
BMDS Risk Assessment and Mitigation Engineering								
Develop Annual Study Plan	4Q	4Q	4Q	4Q	4Q	4Q		
Integrate CCM Options into BMDS Test Bed	3Q,4Q	3Q,4Q	3Q,4Q	3Q,4Q	3Q,4Q	3Q,4Q		
Integrate CCM Alternatives into BMDS Test Bed		1Q,3Q,4Q	3Q,4Q	3Q,4Q	3Q,4Q	3Q,4Q		
Independent Assessment								
Provide Independent Assessments to MDA	2Q,3Q,4Q	2Q,3Q,4Q	2Q,3Q,4Q	2Q,3Q,4Q	2Q,3Q,4Q	2Q,3Q,4Q		
Review Blue Team CCM Concepts and Plans	1Q,3Q	1Q,3Q	1Q,3Q	1Q,3Q	1Q,3Q	1Q,3Q		
Mitigation Concept Engineering								
Present Counter-Counter Options to MDA CCB	1Q,4Q	1Q,4Q	1Q,4Q	1Q,4Q	1Q,4Q	1Q,4Q		

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0201 Command and Control, Battle Management and Communications Core	18,311	1,667	0	0	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0	0

Note:
Starting FY 2006, this project is captured under PE 0603889C (BMD Products) Projects 0701, 0801, 0901 and 0001.

A. Mission Description and Budget Item Justification

In collaboration with the Missile Defense Agency's Systems Engineering and Integration defined architectures and system specifications, the Command and Control, Battle Management and Communications (C2BMC) Program provides the warfighter the capability of planning the Ballistic Missile Defense (BMD) fight while concurrently: tracking all potential ballistic missile threats; directing weapons to engage via a distributed network and paring any sensor with any weapon system to defeat ballistic missile threats at any range, in any phase of flight, in all theaters, and with coalition partners.

By the end of Block 2004, the C2BMC Program will deliver the rudimentary foundation for integrated, layered defense by delivering new and enhanced capabilities for BMD Planner, BMD Situational Awareness, Advanced Battle Manager, and the BMDS Network. Specifically, the C2BMC Program will: design and deliver initial displays that portray the BMD battlespace and provide initial Force level planning to the warfighter; develop and deliver a battle management prototype incorporating Forward Deployed X-Band (FBX-T) sensor management; and, deliver redundant communication paths to ensure a robust network. These capabilities will enable Engagement Sequence Groups (ESG) that involve the following BMDS elements and components: Ground Based Interceptor (GBI), Standard Missile 3 (SM-3), Cobra Dane Upgraded Early Warning Radar, SPY-1 Sensor, and Forward Based X-Band (FBX-T) Sensor. Additionally, C2BMC installation sites have been or will be activated and supported as a part of Block 2004 to enable the warfighter to perform BMD. As the number of activated sites and maturity of the C2BMC capability increases, the C2BMC Program continues concurrent development and operational integration and testing, as well as sustains fielded capabilities. Thus, Block 2004 includes infrastructure development, testing activity and operations and support to ensure accomplishment of all block objectives.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
C2BMC Element	18,311	1,667	0	0
RDT&E Articles (Quantity)	0	0	0	0

The C2BMC Element accomplishes Block 2004 objectives by balancing the development of four principle product lines -- Situational Awareness, Planner, Battle Management, and Network -- so that mature capabilities can be integrated and incrementally delivered to the warfighter via Spirals. Block 2004 includes infrastructure development, testing activity, as well as sustainment of fielded capabilities. C2BMC Core funding supports the following Block 2004 accomplishments and plans.

FY 2004 Accomplishments:

- Began Spiral 4.4 development
- Began Spiral 4.5 development

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

FY 2005 Planned Program:

- Government Support to C2BMC

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
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PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

D. Acquisition Strategy

The C2BMC acquisition strategy is consistent with the Missile Defense Agency's capability based acquisition strategy that emphasizes testing, spiral development, evolutionary acquisition, and knowledge based funding through the use of two-year capability blocks. The Missile Defense National Team C2BMC (Industry) (MDNTB(I)) led by Lockheed Martin Mission Systems is the C2BMC prime contractor via an Other Transactions Agreement. They are charged with the development, fielding and support of the C2BMC prototype and perform development and testing of C2BMC products in Arlington VA, Huntsville AL, and Colorado Springs CO. C2BMC element government, FFRDC/UARC, and SETA personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
C2BMC Element										
C2BMC HW/SW Development	SS/CPAF	MDNTB/ Washington, DC	16,936	0	N/A	0	N/A	0	N/A	16,936
SBIRS	SS/CPAF	Lockheed Martin/ Sunnyvale, CA	1,000	0		0		0		1,000
Federally Funded Research Development Center	SS/CPAF	JHU, ORNL/ Washington DC	245	0		0		0		245
Scientific Engineering and Technical Assistance	SS/CPFF	SPARTA/MDA HQ/ Arlington, VA	130	0		0		0		130
Government		MDA HQ/ Arlington, VA	0	1,667		0		0		1,667
Subtotal Product Development			18,311	1,667		0		0		19,978

Remarks

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Support Costs										

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

Project Total Cost			18,311	1,667		0		0		19,978

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Contractual Activities& Events																																
MDNTB(I) Part 3 Contract Award		Δ																														
MDNTB(I) Part 3 Contract Integrated Baseline Rvw			Δ																													

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Contractual Activities& Events								
MDNTB(I) Part 3 Contract Award	2Q							
MDNTB(I) Part 3 Contract Integrated Baseline Rvw	3Q							

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0102 Intelligence and Security	16,568	20,659	21,294	23,346	25,727	27,286	27,892	28,510
RDT&E Articles Qty	0	0	0	0	0	0	0	0

Note:
As addressed below, this Project has been restructured to incorporate the Counterintelligence effort and the BMDS Certification effort (beginning in FY 2005). Prior to these realignments, the efforts were contained under PE 0901598C (MDA Management Headquarters). As a result of this restructuring, the fiscal profile for Project 0102 increases slightly in FY 2005 and beyond.

A. Mission Description and Budget Item Justification

In the FY 2005 President's Budget, this Project consisted of the MDA Intelligence program and was entitled the Intelligence Project. However, this project has been restructured to more accurately capture similar efforts focused on 1) maximizing actionable threat information (whether pertaining to threats the BMDS is designed to counter or threats posed by Foreign Intelligence and Security Services (FISS) and terrorist groups) and 2) ensuring the security of the BMDS. As a result, the Project now captures three specific areas: 1) intelligence, 2) counterintelligence, and 3) BMDS information assurance systems certification. Together these efforts provide critical information regarding threat ballistic missile system capabilities (via intelligence); protection of personnel, activities, and technology from espionage and terrorism through active and passive activities (via counterintelligence); and BMDS system vulnerabilities (via BMDS certification).

To better reflect these changes, the Project name is changed to Intelligence and Security, and the Project now captures the following activities:

1. Intelligence. This activity ensures the development, study and exploitation of relevant, actionable threat information, and makes this information available to all MDA organizations. Through this activity, authoritative, current and projected threat data are provided to support MDA leadership, Ballistic Missile Defense System (BMDS) architecture design, testing, modeling, and wargaming activities, and existing/future national technical means are leveraged to enhance the effectiveness of the BMDS. This information reduces risk, improves system performance, and informs the engineering and development process; it enables MDA program managers to achieve a sufficiently accurate understanding of the threat environment to respond to relevant capabilities of immediate importance, make informed decisions and invest limited resources on countering the most significant aspects of potential adversary capabilities. Other aspects of the Intelligence program are designed to gain access to, and leverage, unique, Intelligence Community developed, owned and operated capabilities for the benefit of the Missile Defense Community. Many are highly classified and require both access and expertise to exploit. The Program supports the overarching MDA objectives of BMDS on-Alert, continuing spiral development, and enhanced BMDS capabilities.

2. Counterintelligence. The MDA Counterintelligence Office serves as the MDA focal point for all counterintelligence (CI) matters and external coordination with the Services, the FBI, and other federal criminal investigative organizations. This office ensures that MDA leadership and the entire workforce are apprised of threats posed by Foreign Intelligence and Security Services (FISS) and terrorist groups worldwide. Under this MDA CI activity, a comprehensive CI education program is developed and administered; this includes 1) providing the workforce CI awareness briefings and foreign travel briefings and debriefings as needed, and 2) publishing CI awareness products. Additionally, under this CI activity, operational, investigative and CI functional support are provided to the MDA/BMDS Research and Technology Protection programs and test activities through oversight and approval of CI Support Plans, Defense Threat Assessments and Multi-Discipline CI Threat Analyses.

3. BMDS Certification. This activity develops a comprehensive picture of the overall Information Assurance/Computer Network Defense (IA/CND) architecture at all levels of the BMDS. To accomplish this, the MDA BMDS Certification and Accreditation team must interface with relevant stakeholders, assess documentation and IA/CND design, gain insight into past/present security related issues, and exploit threat/vulnerability assessments to identify trends, understand threats and manage risks to fulfill certification and accreditation related requirements. This office also provides a recommendation to the Designated Approving Authority relating to system certification for the BMDS and its Elements. Additionally, this certification entails engagement in various activities to assess the security posture by 1) identifying opportunities to implement Defense-in-Depth (DiD) in Block 06 and subsequent versions of the BMDS 2) providing oversight, coordination and management of all processes (e.g., definition and scope of ST&E's, vulnerability assessments, and risk mitigation strategies), and 3) by conducting cyber threat/vulnerability assessments in coordination with the Intelligence Community (IC) in order to influence BMDS risk, vulnerability, and ST&E resolution strategy.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Counterintelligence	0	2,552	2,743	3,105
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments: N/A As noted above, prior to FY 2005, funding was captured under PE 0901598C (MDA Management Headquarters).

FY 2005 Planned Accomplishments:

- Develop a Technical Surveillance and Countermeasures (TSCM) Capability
- Develop an automated Travel Net Program
- Initiate an exhaustive counterintelligence (CI) review of Small Business Innovation Research (SBIR) proposals
- Initiate CI Mapping/Matrix Project for MDA Critical Program Information (CPI)
- Establish on-site LNO at Defense Security Service
- Provide CI Support to PROJECT DOMAIN (FBI) and PROJECT BLUEPRINT (Naval Criminal Investigative Service (NCIS))
- Implement CI support model for MDA/TE
- Publish CI Threat Assessments and MDCITAs
- Expand and update CI Database (Primes, SBIR, FBI, Mapping)
- Field Remote Intelligence Support Capability
- Develop/Implement MDA CI Policy
- Implement CI portal of the MDA classified LAN

FY 2006 Planned Program:

- Field Technical Surveillance and Countermeasures (TSCM) Capability
- Implement automated Travel Net Program
- Develop an MDA Insider Threat Program
- Continue review of SBIR proposals
- Continue to publish CI Threat Assessments and MDCITAs
- Continue to develop, expand and populate CI databases

FY 2007 Planned Program:

- Enhance TSCM capability
- Enhance automated Travel Net Program
- Implement MDA Insider Threat Program
- Continue review of SBIR proposals
- Continue to publish CI Threat Assessments and MDCITAs

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

- Continue to develop, expand and populate CI databases
- Conduct CI Assessments of MDA Test Ranges

	FY 2004	FY 2005	FY 2006	FY 2007
BMDS Certification	0	1,116	1,249	1,421
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments: N/A. As noted above, in FY 2004 and prior, funding was captured under PE 0901598C (MDA Management Headquarters).

FY 2005 Planned Accomplishments:

- Develop a certification recommendation on behalf of the BMDS components and overall system in time to fulfill Block 04 release dates.
- Conduct vulnerability assessments against the block release, to include White Team Assessments (e.g., policy, procedure and process review conducted by an unbiased third party).
- Implement risk management processes across the BMDS elements to prioritize and categorize vulnerabilities. This information helps decision makers understand the risks, select strategies to mitigate threats, and enhance the information systems infrastructure, while improving the security, command and control of essential systems.
- Enhance the confidentiality, integrity and availability of key systems, networks and data through direct participation in information assurance related activities designed to enforce requirements, verify and/or implement essential processes, controls and procedures required by key systems as part of a defensive strategy.
- Characterize existing Information Assurance (IA) related guidance (e.g., DoD 8500.2, Information Assurance Technology Framework (IATF), NSA, and DISA CND requirements) for use by systems engineers and program developers to facilitate incorporation of practices and procedures developed in accordance with emerging IA Technologies.

FY 2006 Planned Program:

- Maintain the current level of C&A support and develop a certification recommendation consistent with the DITSCAP (DIACAP when effective) to support fielded components as well as the Block 06 release, including STSS, upgraded C2BMC “backbone”, SBX radar, ABL, and THAAD.
- Coordinate with the Designated Approval Authority to ensure MDA's spiral development releases fulfill timelines.
- Conduct Blue/Red team assessments against the BMDS.
- Advise and assist elements and the overall BMDS to enhance IA/CND infrastructure.

FY 2007 Planned Program:

- Develop a certification recommendation on behalf of the BMDS components and overall system to support the increases commensurate with the expansion of the BMDS based on the Block 08 release, including STSS, upgraded C2BMC “backbone”, SBX radar, ABL, and THAAD.
- Coordinate with the Designated Approval Authority to ensure MDA's spiral development releases fulfill timelines.
- Maintain the advise and assist role related to enhance the IA/CND infrastructure for deployed block and beyond.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

	FY 2004	FY 2005	FY 2006	FY 2007
Intelligence	16,568	16,991	17,302	18,820
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- Established the National Sensor Integration Rapid Prototype (NSIRP) to use national technical means of the Intelligence Community to assist in Missile Defense engagements.
- Restructured current MASINT reporting to provide real-time (R/T) data streams to BMD node(s).
- Leveraged community algorithm development effort for ballistic missile events and focus on reporting to enhance missile defense.
- Brought on line the Missiles and Rockets Knowledge Base (MARKB) (allowing C2BMC reach back into intelligence databases).
- Initiated development of UMPIRE (a universal tool to allow BMDS planners and warfighters to access disparate Intelligence Community (IC) databases using a single interface).
- Developed intelligence-based plume and signature data for C2BMC and the COCOMs.
- Provided threat support in all MDA sponsored and supported wargames and exercises.
- Provided daily intelligence support to the MDA Director, his Principal Staff Officers, and the Missile Defense Operations Center (MOC).

FY 2005 Planned Accomplishments:

- Expand MASINT reporting data streams to BMD nodes through increasing number of assets used in warning of potential launch events and co-process these data streams with other assets to bring higher confidence of detection and characterization and reduce the potential for false alarms.
- Expand worldwide missile event reporting capability to provide for near real-time (NRT) assessment and fusion of signature and metric performance data sets to evaluate reporting on threat ballistic missiles and to support fusion of national technical means.
- Enhance and expand the Missiles and Rockets Knowledge Base (MARKB).
- Enhance UMPIRE (a universal tool to allow BMDS planners and warfighters to access disparate Intelligence Community (IC) databases using a single interface).
- Develop intelligence-based plume and signature data for C2BMC and the COCOMs.
- Provide threat support in all MDA sponsored and supported wargames and exercises.
- Provide daily intelligence support to the MDA Director, his Principal Staff Officers, and the Missile Defense Operations Center (MOC).

FY 2006 Planned Program:

- Further enhance and expand the Missiles and Rockets Knowledge Base (MARKB).
- Further enhance UMPIRE (a universal tool to allow BMDS planners and warfighters to access disparate Intelligence Community (IC) databases using a single interface).
- Develop intelligence-based plume and signature data for C2BMC and the COCOMs.
- Provide threat support in all MDA sponsored and supported wargames and exercises.
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Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

FY 2007 Planned Program:

- Further enhance and expand the Missiles and Rockets Knowledge Base (MARKB).
- Further enhance UMPIRE (a universal tool to allow BMDS planners and warfighters to access disparate Intelligence Community (IC) databases using a single interface). Develop intelligence-based plume and signature data for C2BMC and the COCOMs.
- Provide threat support in all MDA sponsored and supported wargames and exercises.
- Provide daily intelligence support to the MDA Director, his Principal Staff Officers, and the Missile Defense Operations Center (MOC).

C. Other Program Funding Summary

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PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

D. Acquisition Strategy

In support of acquiring an effective BMDS capability, this project directs various executing agents and leverages expertise in the intelligence community, counterintelligence community, and information assurance community, including the military departments, Federally Funded Research and Development Centers (FFRDCs), University Affiliated Research Centers (UARCs), and industry. The executing agents utilize various contracting strategies in a flexible manner to maximize their contribution to the BMDS.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Counterintelligence										
Analysis and Support	C/FFP	Beta Analytics Int`l, Inc./ Wash, DC	0	2,277	1/2Q	2,443	1/2Q	2,621	1/2Q	7,341
Analysis and Support	Various	Various/ Various	0	275	1/4Q	300	1/4Q	484	1/4Q	1,059
Intelligence										
Leverage Existing/Future Assets	MIPR	USAF/ SMC, Los Angeles, CA	3,000	3,200	1/4Q	1,280	1/4Q	1,470	1/4Q	8,950
Leverage Existing/Future Assets	Various	Various/ JNIC, CO; NSWC, VA; USAF, OH	1,611	1,660	1/4Q	2,525	1/4Q	2,740	1/4Q	8,536
Intelligence Support Center	SS/CPAF	JNIC - Northrop Grumman/ Shriever AFB,CO	1,000	1,000	1/3Q	1,450	1/3Q	1,750	1/3Q	5,200
Scenario Applications	Various	SMDC - TSC/ Huntsville, AL	2,667	2,400	1/3Q	2,500	1/3Q	2,750	1/3Q	10,317

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Characterization	SS/CPAF	JNIC - Northrop Grumman/ Shriever AFB,CO	2,198	2,000	1/3Q	2,230	1/3Q	2,255	1/3Q	8,683
Current Intelligence & Portal	Various	Various/ Various	1,020	1,115	1/3Q	1,289	1/3Q	1,495	1/3Q	4,919
Wargaming	SS/CPAF	JNIC - Northrop Grumman/ Shriever AFB,CO	300	350	1/2Q	380	1/2Q	438	1/2Q	1,468
Studies & Scenario Development	Various	Various/ Various	800	421	N/A	519	2/4Q	670	2/4Q	2,410
Subtotal Support Costs			12,596	14,698		14,916		16,673		58,883

Remarks

Prior to FY05, Counterintelligence funding was contained under PE 0901598C (MDA Management Headquarters).

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation										

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
BMDS Certification										
Certification & Validation Support	FFRDC	Multiple/ Los Angeles, CA; Ft Monmouth, NJ	0	1,116	1/2Q	1,249	1/2Q	1,421	1/2Q	3,786
Intelligence										
Project Management Support	FFRDC	SMC (Aerospace)/ Los Angeles, CA	600	930	1Q	960	1Q	990	1Q	3,480
Project Management	C/FFP	BAH/ McLean, VA	2,549	2,715	1/4Q	2,849	1/4Q	2,862	1/4Q	10,975
Project Management	SS/TM	PRA/ San Diego, CA	823	1,200	1/3Q	1,320	1/3Q	1,400	1/3Q	4,743
Subtotal Management Services			3,972	5,961		6,378		6,673		22,984

Remarks

Prior to FY05, BMDS Certification funding was contained in PE 0901598C (MDA Management Headquarters).

Project Total Cost			16,568	20,659		21,294		23,346		81,867

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Intelligence																																
Studies & Scenario Development																																
Foreign Missile Knowledge Base																																
Update and Maintain Foreign Missile Knowledge Base																																
Intelligence Support Center																																
Signatures																																
Wargaming Support																																
Counterintelligence																																
CI Investigations & Operations Updates																																
Defense Threat Assessments																																
Multi-Discipline CI Threat Assessments																																
BMDS Certification																																
Certification and Accreditation																																
Systems Engineering & Validation																																
CND Threat/Modeling & Simulation																																

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Intelligence								
Studies & Scenario Development	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Foreign Missile Knowledge Base	3Q-4Q							
Update and Maintain Foreign Missile Knowledge Base		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Intelligence Support Center	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Signatures	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Intelligence Briefings	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Intelligence Summaries and Readbooks	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Wargaming Support	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Counterintelligence								
CI Investigations & Operations Updates		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Defense Threat Assessments		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Intelligence Information Reports		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Multi-Discipline CI Threat Assessments		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Summaries and Readbooks		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Travel Briefings & Debriefings		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
BMDS Certification								
Certification and Accreditation		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Systems Engineering & Validation		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
CND Threat/Modeling & Simulation		2Q,4Q	2Q,4Q	2Q,4Q	2Q,4Q	2Q,4Q	2Q,4Q	2Q,4Q

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0103 Producibility & Manufacturing Technology	28,267	36,254	27,313	36,211	38,597	41,564	42,462	43,378
RDT&E Articles Qty	0	0	0	0	0	0	0	0

Note:
FY05 funding includes $3.85M in Congressional Plus-Ups. In FY05 and FY06 $6.5M and $9.0M of Project 0103 core funding respectively was reprogrammed to an industrial investment appropriation on a two year trial basis to better leverage MDA Producibility and Manufacturing Technology efforts. The benefits derived from this initial effort will determine the level of potential reprogrammings in future years.

A. Mission Description and Budget Item Justification

Producibility and Manufacturing Technology (MP) is integral to MDA's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the implementation of two-year capability blocks. An essential component of strong systems engineering practices, MP provides common, integrated programs across the BMDS Elements to ensure mature industrial manufacturing capabilities are available to the Blocks through risk reduction, cost reduction/avoidance, and performance enhancement. MP furthers efforts in commonality and spreads best practices for producibility and manufacturing across the BMDS Elements by cooperatively funding and leveraging efforts.

MP provides crosscutting BMDS manufacturing risk assessments, industrial capability assessments, and near term (1-3 year) producibility enhancements. Manufacturing risk assessments are accomplished through Engineering and Manufacturing Readiness Level (EMRL) Assessments, the MP systems engineering tool that employs widespread industry and BMDS Element interaction to analyze the maturity of manufacturing processes for BMDS and the Elements that insert into the BMDS Risk Management Process. Industrial Capability Assessments (ICAs) are accomplished broadly across the BMDS Industrial Base where trades are performed to assess and analyze the original equipment manufacturers (OEMs), supplier base, and others that produce end items for the BMDS. Near term producibility enhancements are accomplished through efforts in a number of key investment areas: Power Systems, Radiation Hardening (RAD HARD), Manufacturing Process Improvements, Electro-Optics/Infrared (EO/IR), Radar and RF, Propulsion, and Advanced Materials and Structures. All MP investments within these areas are applied towards near term manufacturing improvements/producibility enhancements. These efforts are programmed for BMDS Element integration within a three to five year timeframe. In FY05 there is a significant increase in resources applied to the RAD HARD program. This increase is a result of BMDS near term capability improvements desired for the Block 06 BMDS and is part of the overall funding profile for the RAD HARD electronics program. The MP 06 funding is a result of the reprogramming of funds to the OSD Title III program. This will be reevaluated in the MDA internal POM review.

The Power Systems objective is to establish a long-term, viable, world-class manufacturer of high performance thermal batteries that are responsive to requirements with respect to quality, delivery, and price for various configurations of thermal batteries. To accomplish this, Power Systems projects focus on providing alternative higher energy density power sources for BMDS systems that are more producible, reliable, and predictable. Projects also focus on developing new and improving manufacturing technologies and processes as well as the development of second source vendors with alternate technologies. These projects include advanced but available thermal power sources for interceptors, as well as other advanced primaries for GBI and THAAD Program KVs. Higher density secondary (rechargeable) power sources for missile defense applications and advanced but available solar array technology that can be hardened against natural and enhanced radiation environments are also required.

The Radiation Hardening objective is to provide an integrated strategy to increase the availability of affordable Radiation Hardened (RH) and Radiation Tolerant (RT) devices for BMDS. Efforts include: support of programs at established foundries for critical devices being developed under the Radiation Hardening Oversight Council (RHOC), support programs at specified commercial foundries that utilize special Hardness by Design (HBD) rules to enhance radiation hardness with commercial manufacturing processes and practices, enhanced circuit modeling and simulation capabilities to better predict radiation hardness levels, developing a catalog of RH and RT devices available to MDA system designers, and exploring alternate hardening techniques.

The Manufacturing Process Improvements objective is to identify manufacturing processes and practices that serve both short-term and long-term MDA requirements. Efforts to accomplish this include: reducing unit cost for major subsystems in MDA systems, exploiting commercial practices to reduce capitalization costs, reducing timelines for long lead items through rapid prototyping of items with audit trail to demonstrated manufacturing heritage, eliminating hazardous or difficult to obtain materials that may add to cost and schedule, introducing metrics such as Engineering and

Manufacturing Readiness Levels (EMRLs) to assure technologies are ready for insertion in MDA systems, and providing prime contractors and major subcontractors with support to adopt best practices and lean manufacturing to enhance productivity. Additionally this area addresses overarching industrial base issues such as supply chain management, critical suppliers, parts obsolescence, and technology refresh.

The Electro-Optics/Infrared (EO/IR) objective is to implement producibility and reliability programs to assure availability of RH and RT IR and visible Focal Plane Arrays (FPAs), readouts, cryocoolers and optics to meet the diverse requirements of BMDS systems for missile and satellite environments. Congressional Plus-Ups for Electro-Optical Components and Sensor Electronics LCC Reduction were appropriated to Project 0103 in FY05 and will be executed in the EO/IR area.

The Radar & RF objective is to provide subsystem improvements to enhance BMDS radar performance and sensitivity for emerging threats. Efforts to accomplish this will include: demonstrating producibility and reliability of high-power amplifiers, introducing producible materials and technologies to enhance thermal management, improving manufacturability of Transmit/Receive (T/R) Modules and Transmit/Receive Integrated Microwave Modules (TRIMMs) for cost and schedule, introducing Open System approaches and architecture to prevent parts obsolescence and stimulate competition at the subsystem level, and introducing composite materials to reduce antenna weight and improve transportability.

The Propulsion objective is to provide affordable, reliable propulsion systems/subsystems for the BMDS Elements. Efforts to achieve this objective will include: introducing innovative high-temperature materials to replace refractory metals reducing cost, weight and manufacturing time; implementing lean manufacturing and quality control to recapture cost and schedule for affected BMDS Elements; and executing programs to address scalability in propulsion systems addressing endurance, erosion resistance and improved manufacturing processes.

The Advanced Materials & Structures objective is to replace exotic material such as Beryllium and Lithium Aluminum alloys with polymer matrix composites (PMCs) and metal matrix composites (MMCs) that exhibit equivalent strength and stiffness while being more easily producible at a lower cost. Program also aims to provide manufacturing processes, similar to those in commercial industry, that allow rapid prototyping and limited production without long lead times for: Interceptor and KV structures, Radar and EO Seekers, and missile canisters and launchers.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Power Systems	1,574	4,196	3,585	3,592
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Accomplishments:

- Completion of movement of STANDARD Missile Battery production line in preparation of Lithium Oxyhalide Battery Production Line relocation at Eagle Picher (EP)
- EP assembled modeling team which will develop thermal battery models
- Completion of preliminary design for THAAD Improved Oxyhalide Battery
- Initial requirements defined for Lithium-Ion satellite battery
- Completed design work for PAC-3 cobalt disulfide batteries for aging evaluation

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

FY 2005 Planned Accomplishments:

- Eagle Picher (EP) Projects
  Lithium oxyhalide batteries for Ground Based Interceptor EKV and THAAD KV are mostly handmade, being built from drawings and procedures that are not sufficiently capable of conveying the subtleties of construction. Manufacturing and Producibility improvement projects will improve EP responsiveness with respect to quality, delivery and price. Eagle-Picher will implement six-sigma lean and best manufacturing techniques in order to optimize oxyhalide battery production. Additionally, they will implement a software-based expert system that allows battery assembly workers to automatically access highly detailed build and inspection procedures for lithium oxyhalide and thermal batteries. The MDA funded projects will also include a program to assist Eagle-Picher in developing high fidelity battery design, performance, and process models that will allow optimizing and improving design and manufacturability of MDA batteries.
- Process Improvement for Lithium Oxyhalide Batteries
- Battery-Build Expert System - Mitigate battery build and inspection errors
- Battery Modeling - Improve and optimize MDA batteries produced at EP
- Process Planning - Improve MDA battery manufacturing processes
- Develop an Advanced Lithium-Ion Battery for space applications
- MDA Battery Steering Group - Developing and prioritizing a battery roadmap for MDA

FY 2006 Planned Program:

- Second source battery for GBI EKV
- Full scale demonstration of satellite Lithium-Ion battery
- MDA Battery Steering Group - Maintaining and prioritizing MDA/MP Battery investments
- Continue EP Projects
- Develop an Advanced Lithium-Ion Battery for space applications

FY 2007 Planned Program:

- Completion of EP Projects
- Implementation of THAAD cold operating temperature improvement battery
- MDA Battery Steering Group - Maintaining and prioritizing MDA/MP Battery investments

	FY 2004	FY 2005	FY 2006	FY 2007
Radiation Hardening	6,774	11,098	8,004	14,656
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Program Accomplishments:

- Cataloged THAAD electronic components and radiation testing results
- Device designs and radiation testing completed for Chalcogenide RAM (C-RAM) and Electronically Erasable Programmable ROM (EEPROM) programs
- Radiation testing of commercially available Field Programmable Gate Arrays (FPGA)

- A/D Converter IRAD effort development is complete and suitable for both natural and nuclear environments
- Developed a transparent radiation shielding material capable of significant reduction in radiation damage in a natural environment for both cover glass and lens applications

FY 2005 Planned Accomplishments:

- Inertial Measurement Unit (IMU) Interface Electronics development in support of an MDA core standard for electronics capable of IMU interchangeability
- Virtually Hard FPGA development and assessment involving the use of commercial FPGAs with and without hard wired processor cores
- Rad Hard Common Processor for missile applications involving stacking, shielding and survivability assessment
- Detector Testing - radiation tolerance testing of EKV long wave IR and visible sensors relative to High Altitude Exoatmoshperic Nuclear Survivability (HAENS) standard
- HAENS Standard testing of focal plane arrays (VLWIR, 2-color LW/LW, visible and associated read-out electronics), and other commercial electronic devices to include IMU electronics
- Non-Volatile C-RAM program- continued packaging development and assessment
- EEPROM program - continued packaging development and assessment

FY 2006 Planned Program:

- Continue IMU Interface Electronics development in support of an MDA core standard for electronics capable of IMU interchangeability
- Continue Virtually Hard FPGA development and assessment involving the use of commercial FPGAs with and without hard wired processor cores
- Continue Detector Testing - radiation tolerance testing of EKV long wave IR and visible sensors relative to HAENS standard
- Continue HAENS Standard testing of focal plane arrays (VLWIR, 2-color LW/LW, visible and associated read-out electronics), and other commercial electronic devices to include IMU electronics

FY 2007 Planned Program:

- Complete IMU Interface Electronics development in support of an MDA core standard for electronics capable of IMU interchangeability
- Complete Virtually Hard FPGA development and assessment involving the use of commercial FPGAs with and without hard wired processor cores
- Complete Detector Testing - radiation tolerance testing of EKV long wave IR and visible sensors relative to HAENS standard
- Complete HAENS Standard testing of focal plane arrays (VLWIR, 2-color LW/LW, visible and associated read-out electronics), and other commercial electronic devices to include IMU electronics

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
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	FY 2004	FY 2005	FY 2006	FY 2007
Manufacturing Process Improvements	1,774	1,996	1,585	2,592
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Program Accomplishments:

- Initiated new contract for Lean Pathways at end of FY04
- Co-funded with Navy a new initiative that will improve the readiness, mission capability, and life-cycle affordability of Navy/MDA weapon systems by developing an enterprise-wide capability for integrating technology refresh tools
- Leveraged a DLA investment to focus the Robust Lean Supply Network (RLSN) effort on MDA programs (SM3, KEI, MKV)

FY 2005 Planned Accomplishments:

- Continue Technology Refresh efforts
- Initiate Tin Whisker effort to better understand the physics of failure
- Develop processes for robotic soldier dipping of leads and embedding die on printed circuit cards to mitigate tin whisker risk
- Continue RLSN efforts to develop, demonstrate, and deploy tools to evaluate risks in the supply chain of weapons systems
- Continue inter-service activities in manufacturing technology, EMRLs/MRLs, and batteries
- Conduct Lean Pathways events at several prime/original equipment manufacturers (OEMs) and supplier companies

FY 2006 Planned Program:

- Complete RLSN effort
- Continue efforts to mitigate tin whisker growth risk
- Continue inter-service activities in manufacturing technology
- Begin deploying technology refresh tools
- Continue Lean Pathway events at several prime/OEMs and supplier companies

FY 2007 Planned Program:

- Implement embedded die process in the BMDS
- Host the Defense Manufacturing Conference
- Expand Lean Pathways to other BMDS customers
- Integrate technology refresh and critical supplier results into corporate MDA risk mitigation strategy

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
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	FY 2004	FY 2005	FY 2006	FY 2007
Electro-Optics/Infrared (EO/IR)	8,374	8,096	5,585	5,592
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Program Accomplishments:

- Improved producibility of Advanced RH Very Long Wavelength Infrared (VLWIR) detectors
- Enabled a second source for operational testing of the Two Color Focal Plane Array (FPA)
- Commenced a program to enable a low cost RH Hybrid Visible Sensor
- Established program to enable Silicon Carbide (SiC) as an alternative material for optical mirror and structure
- Advanced Cryocooler thermal unit and conducted cost analysis identifying electronics as two thirds of cryocooler costs

FY 2005 Planned Accomplishments:

- RH Scalable Missile Telescopes - low cost alternative materials and processing development and assessment
- SiC Mirrors polishings and coatings technology development
- Two Color (LW/LW) Detector producibility and radiation tolerant assessment
- Light Detection and Ranging (LIDAR) Detector development to improve detector sensitivity enabling improvement detection range
- Laser RADAR (LADAR) device performance testing
- Space Cryocooler Thermal and Electronics development and assessment
- Two Color (LW/LW) Environmental Testing for missile kill vehicle applications
- Development of improved RH (proton radiation) large 256X256 array VLWIR Detectors for satellite surveillance applications
- RH Visible Sensors development for satellite and surveillance applications
- Stacked Electronics Processing development and assessment to improve density and radiation tolerance of missile kill vehicle electronics

FY 2006 Planned Program:

- RH Scalable Missile Telescopes - optical component alignment technology and development
- SiC Mirrors polishing preprocessing and radiation hardened coatings technology development
- LIDAR Detector development to improve detector sensitivity enabling improvement detection range
- Satellite payload radiation hardened electronics development and assessment
- Development of improved RH (proton radiation) large 256X256 array VLWIR Detectors for missile and satellite surveillance applications
- RH Visible Sensors development for missile and satellite surveillance applications

FY 2007 Planned Program:

- RH Scalable Missile Telescopes - radiation hardening of alternative materials and assessment
- SiC Mirrors polishing and radiation hardened coatings technology development
- LIDAR Detector radiation hardening

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

- Development of improved RH (proton radiation) large 256X256 array VLWIR Detectors for missile and satellite surveillance applications
- RH Visible Sensors development for missile and satellite surveillance applications

	FY 2004	FY 2005	FY 2006	FY 2007
Radar & RF	2,274	3,296	3,585	3,592
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Program Accomplishments:

- Established MDA's High Power Electronics Reliability Test program - initiated reliability testing of High Voltage Gallium Arsenide (GaAs) Microwave Monolithic Integrated Circuits (MMICs) at the Naval Research Laboratory (NRL)
- Continued the Joint Silicon Carbide (SiC) MMIC Producibility Enhancement program - produced 3-inch diameter semi-insulating SiC wafers with MMIC yield
- Continued the Joint High Voltage GaAs MMIC Producibility program - produced first MMIC lots

FY 2005 Planned Accomplishments:

- Continue the High Power Electronics Reliability Test program - continue reliability testing of High Voltage GaAs MMICs at NRL and initiate reliability testing of Gallium Nitride (GaN) MMICs at NRL, NSWC-Crane, PSU-ARL, and AFRL
- Continue the Joint SiC MMIC Producibility Enhancement program - produce 3-inch diameter semi-insulating SiC wafers with greater MMIC yield
- Complete the Joint High Voltage GaAs MMIC Producibility program - produce MMIC lots for independent reliability testing
- Initiate the 4-inch Diameter Semi-Insulating (SI) SiC Wafer Producibility program
- Initiate Moduleless Transmit/Receive Integrated Microwave Modules (TRIMM) program
- Conduct Hardware-in-the-Loop (HWIL) testing of Advanced Optical Processor (AOP) 2 Architecture - field testing to gather target data

FY 2006 Planned Program:

- Continue the High Power Electronics Reliability Test program - complete reliability testing of High Voltage GaAs MMICs at NRL and continue reliability testing of GaN MMICs at NRL, NSWC-Crane, PSU-ARL, and AFRL
- Complete the Joint SiC MMIC Producibility Enhancement program - produce 3-inch diameter semi-insulating SiC wafers with greater MMIC yield
- Continue the 4-inch Diameter SI SiC Wafer Producibility program - introduce second source for 4-inch SI SiC wafers
- Develop and design Moduleless TRIMM architecture

FY 2007 Planned Program:

- Continue the High Power Electronics Reliability Test program - continue reliability testing of GaN MMICs at NRL, NSWC-Crane, PSU-ARL, and AFRL
- Continue the 4-inch Diameter SI SiC Wafer Producibility program - produce 4-inch SI SiC wafers from multiple vendors
- Initiate the 4-inch diameter SI GaN Wafer Producibility program
- Fabricate and test Moduleless TRIMMs

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

	FY 2004	FY 2005	FY 2006	FY 2007
Propulsion	4,399	4,296	2,885	3,092
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Program Accomplishments:

- Successful Throttling Divert and Attitude Control System (TDACS) Component, Subsystem and System Level Testing demonstrating TDACS configuration during flight-type duty cycle
- Populated the Carbon Silicon Carbide (C-SiC) material database for high temperature applications for C-SiC
- Developed a basic design of experiment for the THAAD DACS low temperature combustion instability
- Began the design and initial fabrication of an Exploding Foil Deflagrating Initiator (EFDI) as part of a Mil Std 1901A compliant Initiation Safety Device

FY 2005 Planned Accomplishments:

- Characterize C-SiC material properties from alternate sources to evaluate manufacturing process variation on material strength under high temperature, high pressure operation
- Initiate a producibility improvement for the TDACS divert thruster system, using braided C-SiC, to reduce part count and improve performance for BMDS applications
- Develop concept definition of proportional controlled solid DACS components for application to BMDS interceptors
- Execute efforts to address insensitive munitions for Missile Defense Systems

FY 2006 Planned Program:

- Execute hot gas testing of braided C-SiC thruster assemblies developed in FY05
- Continue material characteristics testing of high temperature materials for propulsion system applications
- Evaluate near term technologies to address insensitive munitions issues within the BMDS
- Hot fire test component demonstrations developed as part of the concept definition for proportional controlled solid DACS systems
- Further mature proportional DACS technologies for application to Midcourse and Boost defense missions

FY 2007 Planned Program:

- Continue efforts from FY05 and FY06 to address materials and subsystem design and development to reduce cycle time, part count, risk and improve performance of axial and divert propulsion systems for the BMDS

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

	FY 2004	FY 2005	FY 2006	FY 2007
Advanced Materials & Structures	3,098	3,276	2,084	3,095
RDT&E Articles (Quantity)	0	0	0	0

FY 2004 Program Accomplishments:

- EKV Composite Sunshade - significant reductions in cost from current baseline component
- EKV Composite Electronic Unit Housing Assembly - significant reductions in cost, increased heat dissipating capability and improved compatibility with the upgraded computer processor unit
- Integrated heat shield coupon materials identified and prepared for heat testing at the Air Force Arnold Research Development and Engineering Center

FY 2005 Planned Accomplishments:

- Composite Mirror Structure - develop an assembly more amenable to radiation hardening at a reduced cost
- Liquid Divert and Attitude Control System (LDACS) Structure - develop compatibility with both KEI and EKV at a reduced cost
- KEI Radome - meet schedule milestones and produce better performing products at a reduced cost
- KEI Payload Adapter - produce prototype hardware at a reduced cost in time for preliminary design review and dynamic inert model tests
- KEI Nosecone - develop an improved nosecone at a reduced cost

FY 2006 Planned Program:

- Composite Mirror Structure - continue to develop an assembly more amenable to radiation hardening at a reduced cost
- Liquid Divert and Attitude Control System (LDACS) Structure - continue to develop compatibility with both KEI and EKV at a reduced cost
- KEI Radome - continue to meet schedule milestones and produce better performing products at a reduced cost
- KEI Payload Adapter - continue to produce prototype hardware at a reduced cost in time for preliminary design review and dynamic inert model tests
- KEI Nosecone - continue to develop an improved nosecone at a reduced cost

FY 2007 Planned Program:

- Continue to focus on advanced materials in radiation hardening, structures, mirrors, thermal management and propulsion that could assist modular or scalable efforts on kill vehicles and missile structures that reduce cycle times and enhance BMDS performance

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

D. Acquisition Strategy

Producibility and Manufacturing Technology (MP) adheres to MDA's capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks. Working with the BMDS Elements, MP identifies and executes programs that improve manufacturing and producibility for the BMDS. This is accomplished by leveraging maturing manufacturing technologies with the services and other government agencies. MP also leverages industry investments and uses Element cost share in hardware for component producibility improvements. For efficiency, MP utilizes existing MDA and service contract vehicles when possible to execute the program.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Power Systems										
Battery Efforts	MIPR	NSWC/ Crane, IN	900	3,240	1Q	2,700	1Q	2,700	1Q	9,540
Radiation Hardening										
Rad Hard	Various	AFRL/ Kirtland, NM	2,200	3,634	1Q	2,594	1Q	4,879	1Q	13,307
Rad Hard	Various	SMDC/ Huntsville, AL	1,950	2,644	1Q	1,701	1Q	3,458	1Q	9,753
Rad Hard	MIPR	Various	1,430	3,157	2Q	2,163	2Q	4,194	1/2Q	10,944
Manufacturing Process Improvements										
Tech Refresh/RLSN	CPFF	ATI	600	700	1Q	550	1Q	300	1Q	2,150
Tin Whisker	CPFF	ONR/VA	300	350	1Q	300	1Q	300	1Q	1,250
Manufacturing Processes	MIPR	Various	180	30	1Q	50	1Q	1,200	1/2Q	1,460
Electro-Optics/Infrared (EO/IR)										
EO/IR	Various	AFRL/ Kirtland, NM	3,750	2,880	2Q	1,920	1Q	1,920	1Q	10,470
EO/IR	CPFF	Fibertek/ Hendon, VA	2,000	1,620	1/2Q	1,080	1/2Q	1,080	1Q	5,780
EO/IR	Various	SMDC/ Huntsville, AL	1,270	2,250	1Q	1,500	1Q	1,500	1Q	6,520
Radar & RF										
SiC MMIC	CPFF	CREE/NC/ Triquint/TX	540	360	1Q	400	1Q	400	1Q	1,700
RF Device Test	MIPR	NRL/ Washington, DC	225	693	1Q	770	1Q	770	1Q	2,458
High Voltage GaAs	CPFF	Triquint/TX	450	567	1Q	630	1/2Q	630	1/2Q	2,277
RF	MIPR	Various	315	810	1Q	900	1Q	900	1Q	2,925

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Propulsion										
SMDC	CPFF	Aerojet/ Sacramento, CA	2,430	1,980	1Q	1,231	1Q	1,338	1Q	6,979
Propulsion	MIPR	NSWCCD/MD	350	450	1Q	280	1Q	304	1Q	1,384
Propulsion	MIPR	ATK/Elkton, MD	350	450	1Q	280	1Q	304	1Q	1,384
Propulsion	MIPR	Various	313	450	2Q	280	2Q	304	2Q	1,347
Advanced Materials & Structures										
Advanced Materials	CPFF	San Diego Composites/ San Diego, CA	500	1,535	1Q	853	1Q	1,421	1Q	4,309
Advanced Materials	CPFF	Mentis Sciences, Inc./ Manchester, NH	200	428	1Q	238	1Q	396	1Q	1,262
Advanced Structures	Various	SMDC/ Huntsville, AL	1,572	468	1Q	260	1Q	433	1Q	2,733
Subtotal Product Development			21,825	28,696		20,680		28,731		99,932

Remarks

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Power Systems										
Battery Efforts	MIPR	NSWC/ Crane, IN	100	360	1Q	324	1/2Q	326	1/2Q	1,110
SETA	FFP	DRC, SPARTA/ VA	389	395	1Q	356	1Q	356	1Q	1,496
Radiation Hardening										

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603890C Ballistic Missile Defense System Core

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Rad Hard	Various	AFRL/ Kirtland, NM	300	410	1Q	376	1Q	537	1Q	1,623
Rad Hard	Various	SMDC/ Huntsville, AL	200	300	1Q	275	1Q	393	1Q	1,168
Rad Hard	MIPR	Various	120	357	1Q	327	1Q	468	1Q	1,272
SETA	FFP	DRC, SPARTA/ VA	389	395	1Q	363	1Q	517	1Q	1,664
Manufacturing Process Improvements										
Tech Support	MIPR	REDCOM/AL	60	120	1Q	96	1Q	117	1Q	393
Tech Support	MIPR	NSWC/ Crane, IN	40	120	1Q	77	1Q	94	1Q	331
JDMTP	MIPR	ONR/VA	20	80	2Q	51	2Q	63	2Q	214
SETA	FFP	DRC, SPARTA/ VA	389	395	1Q	256	1Q	308	1Q	1,348
Electro-Optics/Infrared (EO/IR)										
EO/IR	Various	AFRL/ Kirtland, NM	400	320	2Q	246	1/2Q	247	1/2Q	1,213
EO/IR	CPFF	Fibertek/ Herndon, VA	255	180	2Q	138	1/2Q	139	1/2Q	712
EO/IR	Various	SMDC/ Huntsville, AL	125	250	1Q	192	1Q	193	1Q	760
SETA	FFP	DRC, SPARTA/ VA	389	395	1Q	304	1Q	303	1Q	1,391
Radar & RF										
SiC MMIC	CPFF	CREE/NC/ Triquint/TX	60	40	1Q	41	1Q	41	1Q	182

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603890C Ballistic Missile Defense System Core

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
RF Device Test	MIPR	NRL/ Washington, DC	50	63	1Q	64	1Q	65	1Q	242
High Voltage GaAs	CPFF	Triquint/TX	25	77	1Q	79	1/2Q	79	1/2Q	260
RF	Various	Various	35	90	1Q	92	1Q	92	1Q	309
SETA	FFP	DRC, SPARTA/ VA	389	395	1Q	404	1Q	405	1Q	1,593
Propulsion										
SMDC	CPFF	Aerojet/ Sacramento, CA	270	220	1Q	175	1Q	182	1Q	847
Propulsion	MIPR	NSWCCD/MD	45	50	1Q	40	1Q	41	1Q	176
Propulsion	MIPR	ATK/ Elkton, MD	45	50	1Q	40	1Q	41	1Q	176
Propulsion	MIPR	Various	23	50	2Q	40	1/2Q	41	1/2Q	154
SETA	FFP	DRC, SPARTA/ VA	389	395	1Q	314	1Q	327	1Q	1,425
Advanced Materials & Structures										
Advanced Materials	CPFF	San Diego Composites/ San Diego, CA	50	171	1Q	136	1Q	162	1Q	519
Advanced Materials	CPFF	Mentis Sciences, Inc./ Manchester, NH	20	48	1Q	38	1Q	45	1Q	151
Advanced Structures	Various	SMDC/ Huntsville, AL	181	30	1Q	41	1Q	49	1Q	301
SETA	FFP	DRC, SPARTA/ VA	389	395	1Q	313	1Q	379	1Q	1,476
Subtotal Support Costs			5,147	6,151		5,198		6,010		22,506

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation										

Remarks

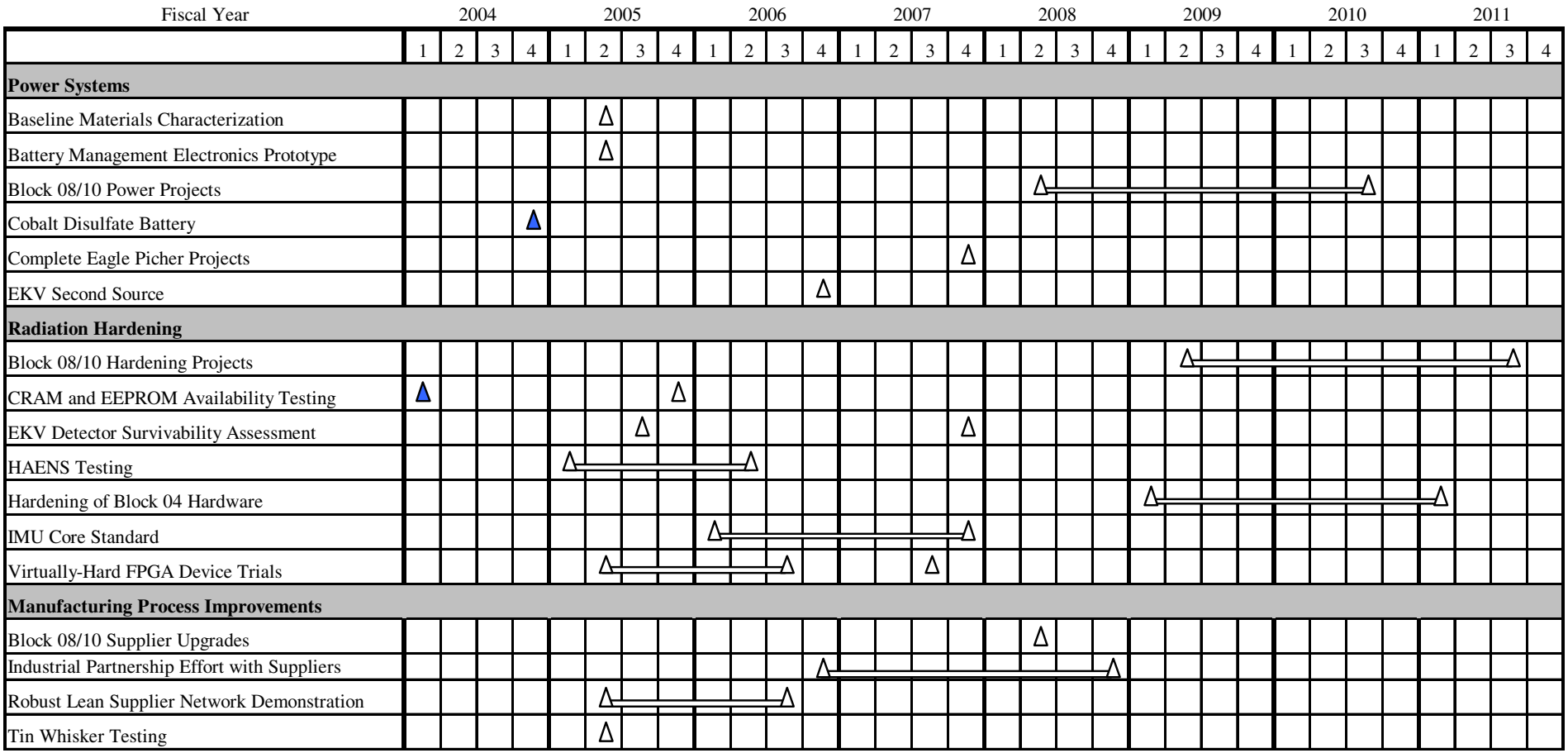
IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Power Systems										
Govt Personnel		MDA/ VA	185	201	1/2Q	205	1/2Q	210	1/2Q	801
Radiation Hardening										
Govt Personnel		MDA/ VA	185	201	1/2Q	205	1/2Q	210	1/2Q	801
Manufacturing Process Improvements										
Govt Personnel		MDA/ VA	185	201	1/2Q	205	1/2Q	210	1/2Q	801
Electro-Optics/Infrared (EO/IR)										
Govt Personnel		MDA/ VA	185	201	1/2Q	205	1/2Q	210	1/2Q	801
Radar & RF										
Govt Personnel		MDA/ VA	185	201	1/2Q	205	1/2Q	210	1/2Q	801
Propulsion										
Govt Personnel		MDA/ VA	185	201	1/2Q	205	1/2Q	210	1/2Q	801

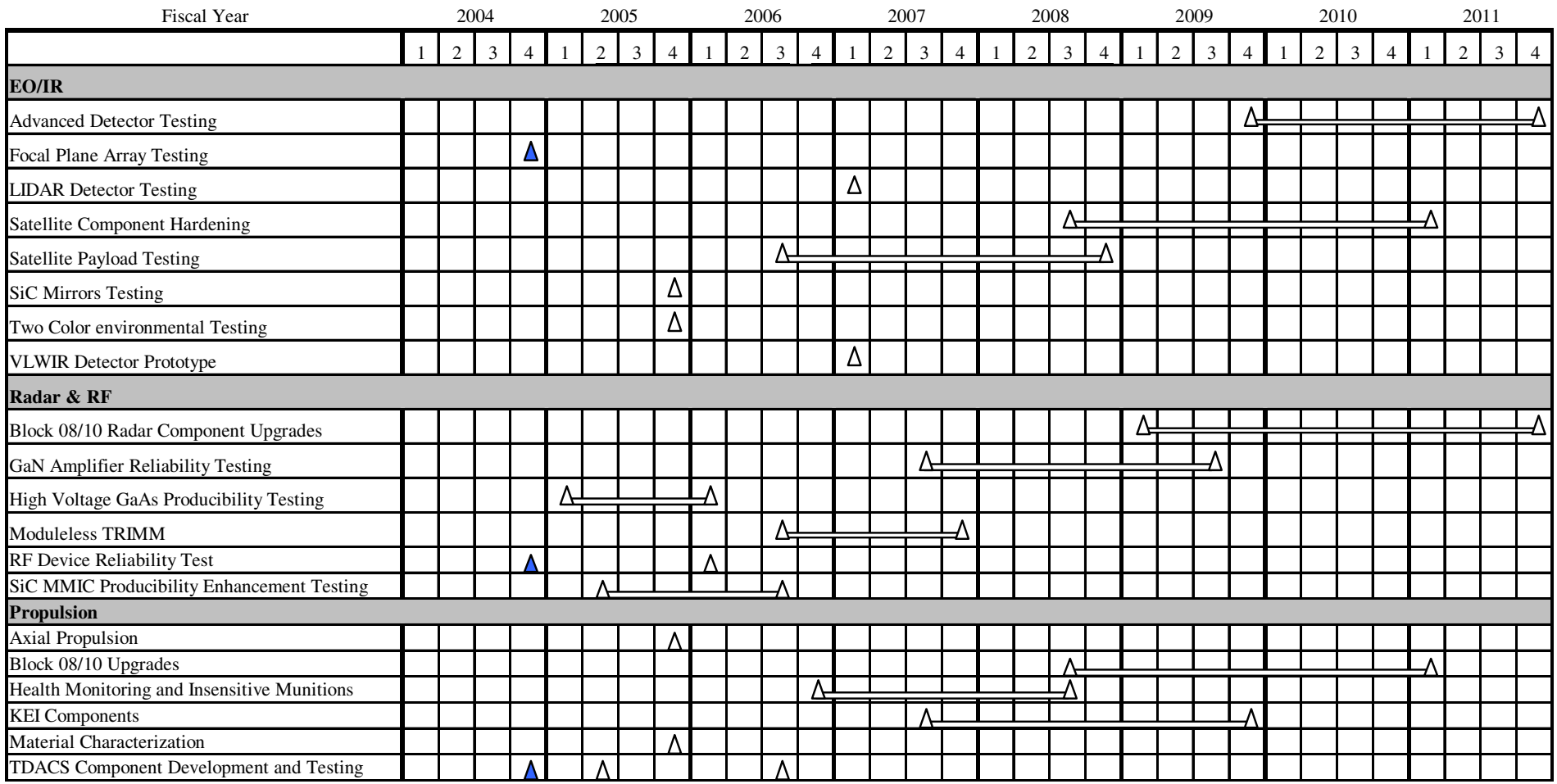
Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Advanced Materials & Structures										
Govt Personnel		MDA/ VA	185	201	1/2Q	205	1/2Q	210	1/2Q	801
Subtotal Management Services			1,295	1,407		1,435		1,470		5,607
Remarks										
Project Total Cost			28,267	36,254		27,313		36,211		128,045
Remarks										

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**



Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**



Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Advanced Materials and Structures																																
Block 08/10 Component Material Upgrades																																
CC Telescope Housing Fabrication Process Testing																																
EKV Composite Manufacturing Cost Reduction																																
KEI Cost/Weight Reduction																																
KEI Nosecone Risk Reduction Testing																																
Lightweight Ballistic Canister Protection Testing																																

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Power Systems								
Baseline Materials Characterization		2Q						
Battery Management Electronics Prototype		2Q						
Battery Manufacturing Improvements		1Q-4Q	1Q-2Q					
Block 08/10 Power Projects					2Q-4Q	1Q-4Q	1Q-3Q	
Cobalt Disulfate Battery	4Q							
Complete Eagle Picher Projects				4Q				
Computer Aided Process/Planning		4Q						
EKV Second Source			4Q					
Relocation of Oxyhalide Production Line		3Q						
Solar & Fuel Cells, High Capacity Storage Devices			4Q					
Technology Roadmap Planning Meeting		2Q						
Radiation Hardening								
Block 08/10 Hardening Projects						2Q-4Q	1Q-4Q	1Q-3Q
COTS FPGA Assessment		2Q						
CRAM and EEPROM Availability Testing	1Q	4Q						
Detector Testing		4Q						
EKV Detector Survivability Assessment		3Q		4Q				
HAENS Testing		1Q-4Q	1Q-2Q					
Hardening of Block 04 Hardware						1Q-4Q	1Q-4Q	1Q
IMU Core Standard			1Q-4Q	1Q-4Q				
Rad Hard Catalog		1Q-4Q	1Q-3Q					
Rad Hard common Processor			1Q					
THAAD Detector/IMU Survivability Assessment			1Q					
Virtually-Hard FPGA Device Trials		2Q-4Q	1Q-3Q	3Q				
Manufacturing Process Improvements								
Block 08/10 Supplier Upgrades					2Q			
Industrial Partnership Effort with Suppliers			4Q	1Q-4Q	1Q-4Q			
Robust Lean Supplier Network Demonstration		2Q-4Q	1Q-3Q					
Technology Refresh		2Q						
Tin Whisker Testing		2Q						
EO/IR								

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Advanced Detector Testing						4Q	1Q-4Q	1Q-4Q
Focal Plane Array Testing	4Q							
Hybrid Stirling/Cryocooler			4Q					
Hybrid/Stirling Cryocooler Electronics			1Q					
LIDAR Detector Testing				1Q				
Satellite Component Hardening					3Q-4Q	1Q-4Q	1Q-4Q	1Q
Satellite Payload Testing			3Q-4Q	1Q-4Q	1Q-4Q			
Scalable SiC Mirror Assembly/Inspection			1Q					
SiC Mirrors Testing		4Q						
Stacked Electronics Processing Prototypes		4Q						
Two Color FPA		3Q						
Two Color environmental Testing		4Q						
VLWIR Detector Prototype				1Q				
Visible Hybrid Detector				1Q				
Radar & RF								
Block 08/10 Radar Component Upgrades						1Q-4Q	1Q-4Q	1Q-4Q
GaN Amplifier Reliability Testing				3Q-4Q	1Q-4Q	1Q-3Q		
High Voltage GaAs Producibility Testing		1Q-4Q	1Q					
Moduleless TRIMM			3Q-4Q	1Q-4Q				
RF Device Reliability Test	4Q		1Q					
SiC MMIC Producibility Enhancement Testing		2Q-4Q	1Q-3Q					
Propulsion								
Axial Propulsion		4Q						
Block 08/10 Upgrades					3Q-4Q	1Q-4Q	1Q-4Q	1Q
Health Monitoring and Insensitive Munitions			4Q	1Q-4Q	1Q-3Q			
KEI Components				3Q-4Q	1Q-4Q	1Q-4Q		
Material Characterization		4Q						
TDACS Component Development and Testing	4Q	2Q	3Q					
Advanced Materials and Structures								
Block 08/10 Component Material Upgrades				4Q	1Q-4Q	1Q-4Q	1Q-3Q	
CC Telescope Housing Fabrication Process Testing			1Q					
EKV Composite Manufacturing Cost Reduction	4Q							

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
KEI Cost/Weight Reduction			3Q	4Q	3Q			
KEI Nosecone Risk Reduction Testing		4Q						
KEI Payload Shock and Vibration Mitigation Testing				1Q				
KEI Radome Development Testing		4Q						
LDACS Structure Development Testing		4Q						
Lightweight Ballistic Canister Protection Testing		4Q						

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0202 Hercules Core	20,955	0	0	0	0	0	0	0
RDT&E Articles Qty	0	0	0	0	0	0	0	0

Note:
In FY 2005, Project 0202, Hercules Core, is moved to PE 0603889C, Ballistic Missile Defense Products, Projects 0802, 0902, and 0002, Project Hercules Blocks 06, 08, and 10 respectively.

A. Mission Description and Budget Item Justification

This Project covers the core elements of Project Hercules. The Hercules products are described in PE 0603889C, Projects 0802 and 0902. Project Hercules is a national effort to develop robust detection, tracking, and discrimination algorithms to counter off nominal and evolving missile threats. Hercules is also developing a physics-based Decision Architecture that applies advanced decision theory to future BMD System Command, Control, and Battle Management (C2BM) concepts. In addition to a general program to develop algorithms useful against targets in all phases of flight, Hercules has specific projects to develop algorithms for forward based sensors, the Decision Architecture, and mitigating countermeasures. Hercules develops algorithms to enhance BMD System element capabilities in Block 06, 08 and beyond and will provide these algorithms to the BMD System elements for insertion into their respective programs. Project Hercules Core activities include the collection and analysis of flight test data, systems engineering, the Hercules test bed infrastructure, and the development of models and simulations generalized for off nominal and evolving threats.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Project Hercules	20,955	0	0	0
RDT&E Articles (Quantity)	0	0	0	0

- Hercules successfully participated in the Red Dog countermeasure flight test campaign in FY03 and began the extensive analysis necessary to incorporate the results of the flight tests into countermeasure models and tracking and discrimination algorithms. Additional flight test support and post-flight data analysis are planned for most major MDA flight tests.
- System engineering is performed by Hercules to ensure algorithms addressing specific enemy missile threats or phases of flight can be integrated into overarching algorithm concepts or C2/BM concepts such as the Decision Architecture.
- Hercules completed successful live time testing of discrimination algorithms and elements of the Decision Architecture, an approach to applying advanced decision theory concepts to C2BMC. Hercules also completed several digital test program studies used to characterize the break points of algorithms developed within Hercules. The live time and digital testing infrastructure funded under the BMD Core PE is necessary to support risk reduction tests associated with transitioning Hercules technology into all BMD elements.
- Models and simulations have been and continue to be developed and upgraded within Hercules to expand the ability of Hercules to address the off-nominal and evolving missile threats. The boost, midcourse, and terminal phase algorithm development teams and the forward based sensor, decision architecture, and clutter mitigation teams all need advanced models and simulations to develop their algorithms.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

D. Acquisition Strategy

Project Hercules follows MDA's capability-based acquisition strategy. This emphasizes assessment, spiral-development testing and evolutionary acquisition through the definition of two-year capability blocks.

Project Hercules activities are performed by subject matter experts composed of Government, Federally Funded Research and Development Centers (FFRDC), University Affiliated Research Centers (UARC), private industry including major defense contractors, Government laboratories, and System Engineering and Technical Assistance (SETA) contractors.
Capabilities can be transitioned into future operational force structure by integrating the Hercules concepts into MDA elements. MDA element managers then coordinate with the Services and their acquisition community so they can plan, budget, and procure necessary hardware and software for operational deployed and sustained forces.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Project Hercules										
MIT/LL	CPFF	Hanscomb AFB	4,067	0	N/A	0	N/A	0	N/A	4,067
SEG		NSWC-Corona, CA	1,093	0	N/A	0	N/A	0	N/A	1,093
Northrop Grumman XonTech	CPFF	Van Nuys, CA	2,758	0	N/A	0	N/A	0	N/A	2,758
SMDC Hercules	Various	Various	1,144	0	N/A	0	N/A	0	N/A	1,144
MDA Hercules	Various	Various	2,752	0	N/A	0	N/A	0	N/A	2,752
AFRL - Eglin AFB	Various	Various	825	0	N/A	0	N/A	0	N/A	825
Subtotal Support Costs			12,639	0		0		0		12,639

Remarks

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Project Hercules										
Northrop Grumman XonTech	CPFF	Van Nuys, CA	1,710	0	N/A	0	N/A	0	N/A	1,710
SMDC Hercules	Various	Various	1,420	0	N/A	0	N/A	0	N/A	1,420
MDA Hercules	Various	Various	710	0	N/A	0	N/A	0	N/A	710

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
AFRL-Eglin AFB	Various	Various	820	0	N/A	0	N/A	0	N/A	820
Subtotal Test and Evaluation			4,660	0		0		0		4,660

Remarks

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Project Hercules										
CSC-SETA	FFP	Fairfax, VA	1,926	0	N/A	0	N/A	0	N/A	1,926
SPARTA-SETA	FFP	Arlington, VA	1,730	0	N/A	0	N/A	0	N/A	1,730
Subtotal Management Services			3,656	0		0		0		3,656

Remarks

Project Total Cost			20,955	0		0		0		20,955

Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Project Hercules																																
Program Review	▲																															

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Project Hercules								
Program Review	1Q							

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0104 BMD Information Management Systems	37,535	61,453	125,257	184,869	166,755	156,754	140,597	145,213
RDT&E Articles Qty	0	0	0	0	0	0	0	0

Note:
In FY 2004, Project 0104 was increased to ensure Information Assurance (IA) and Information Technology (IT) security operations were in place for the BMDS Initial Defensive Operations (IDO). Projects include certification and accreditation of the BMDS and other networks and systems; implementation of the Enterprise Network Operations Security Center (ENOSC) to monitor and ensure network security; implementation of more reliable communications to promote information sharing such as video teleconferencing capabilities which enable MDA senior leadership to communicate in a safe, efficient and cost effective method with the Combatant Commanders during IDO and beyond; and, expansion of classified connectivity to MDA sites around the country.

In FY 2006 through FY 2011, there is an increase in Project 0104 due to the Computing Infrastructure, Computing and Network Management Services, and Information Distribution Services being consolidated from PE 0901598C into this PE and Project.

FY 2006 includes and increase of $18M identified for the communications and computing infrastructure of the MDA facility located at the Von Braun Complex in Huntsville, Alabama. FY 2007 through FY 2011 shows an increase of $9M per year for the recurring operations and sustainment costs for that Complex. The facility will consolidate several MDA locations in the Huntsville area into one campus environment.

FY 2007 includes an increase of $42M to the Computing Infrastructure initiative to fund the engineering, cabling installation and testing, computing hardware and software necessary to lay in the communications and computing infrastructure of the MDA Campus environment to accomplish the consolidation of MDA employees in the National Capital Region (NCR) currently in several locations around the NCR. FY 2007, FY 2008 and FY 2009 includes $13.8M, 11.9M and 12.2M, respectively in the Computing and Network Management Services initiative to operate and maintain continuity of operations of the MDA networks and to facilitate the staging of moves until it is completed in FY 2008.

A. Mission Description and Budget Item Justification

The Ballistic Missile Defense (BMD) Information Management Systems Project 0104 integrates and supports every aspect of the BMD System (BMDS) by providing a secure and reliable Information Technology (IT) infrastructure and the Information Management/Information Technology (IM/IT) services necessary to enable the BMDS System elements and operators to collaborate and share information which is essential to accomplishing the complex integrated BMDS mission and achieving Initial Defensive Operations (IDO). This project is an essential and integral component of the BMDS Core Program Element (PE) because it funds the Agency's communications backbone and infrastructure that enables all the Projects in all the PEs to communicate in a safe, secure and affordable manner. The mission of the CIO is to ensure that MDA IM/IT assets are administered, acquired, managed and operated in compliance with and meet the goals of existing statutes and DoD regulations, in particular the President's Management Agenda, the Clinger-Cohen Act, the E-Government Act of 2002, the Government Paperwork Elimination Act, and the Office of Management and Budget (OMB) requirements to align IT investments with the Federal Enterprise Architecture (FEA).

Project 0104 includes initiatives that are vital to the strategic mission of the Agency such as the MDA Enterprise Communications Infrastructure. This initiative includes costs required to obtain access to the classified Secret Internet Protocol Router Network (SIPRNET), Missile Defense Agency Network (MDANet), classified and unclassified Video Teleconferencing circuits and the Joint Worldwide Intelligence Connectivity System (JWICS). Connectivity to JWICS is essential to the MDA Intelligence project to obtain and provide intelligence data used to feed the Command, Control, Battle Management and Communication (C2BMC) project, the Hercules Project, the Countermeasures/Counter-Countermeasures (CM/CCM) project, and the Modeling and Simulation project. This Project funds initiatives that support the MDA Systems Engineering and Integration (SEI) mission for the BMDS System including: - Information Assurance (IA) and Computer Network Defense (CND) management and Certification and Accreditation (CA) support to the Ballistic Missile Defense System (BMDS) and all elements networks required for BMDS IDO; - Establishing electronic business practices and processes that help achieve more effective, efficient and secure business and mission support activities throughout the MDA enterprise; - Creating an IM/IT Enterprise Architecture to support information needs, solutions and standards for the business and mission support activities of the MDA; - Creating an IM/IT Enterprise Architecture that allows both information sharing, electronic records management, financial management, and decision support using web-based technologies; - Providing policy, guidance, planning, oversight, and monitoring to

enable the MDA enterprise with IM/IT capabilities to comply with statutes, regulations, directives, and policies; - Establishing IM/IT processes and infrastructure throughout the MDA enterprise that allows IM/IT operations to be performed in an efficient, secure, and effective manner.

The BMD Information Management Systems project, executed by the Missile Defense Agency (MDA) Chief Information Office (CIO), includes the following Task areas: 1) Enterprise Architecture and Engineering, 2) Service IM/IT , 3) MDA Communications Infrastructure, 4) Enterprise Information Assurance 5) Enterprise Applications, 6) Virtual Data Centers, 7) Enterprise Plans and Policies, 8) Video Teleconferencing Centers, 9) ITO South Computing Infrastructure, 10) Computing Infrastructure, 11) Computing and Network Management Services and 12) Information Distribution Services.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Enterprise Architecture and Engineering	4,050	3,814	3,535	2,668
RDT&E Articles (Quantity)	0	0	0	0

Task Description: Enterprise Architecture and Engineering initiatives support the MDA and especially the Ballistic Missile Defense System (BMDS) Core projects by funding the design, development and implementation of an MDA Enterprise Architecture (EA) in accordance with the global information grid and DoD architecture framework guidelines. The MDA EA will improve the management of, and access to, data, information and knowledge throughout the MDA. Benefits of an MDA EA will be to facilitate the information sharing needs for interoperability among the MDA elements and systems. It will improve the Information Management and Information Technology (IM/IT) infrastructure that facilitates and supports design, development, modeling and simulations, testing of BMDS components and the management and sharing of the critical BMD-related data.

FY 2004 Accomplishments:

- Documented the MDA Baseline As-Is Architecture
- Developed the MDA Target Architecture
- Developed a Strategic Plan for the MDA Enterprise Architecture
- Completed the MDANet Enterprise deployment to 13 MDA locations around the country
- Developed an integrated MDA Enterprise Network with a single corporate identity
- Implemented reliable information storage that can support disaster recovery and maintain continuity of classified operations between 2 MDA regional sites

FY 2005 Planned Accomplishments:

- Develop a Sequencing Plan to transition to the MDA Enterprise Architecture
- Complete transition of MDA primary regional sites to the MDA Enterprise Architecture
- Develop a plan to implement JWICS/SIPRNET to BMDS operational sites as required
- Continue engineering support for classified computing across the MDA Enterprise

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

FY 2006 Planned Program:

- Develop engineering plans for implementation of ATM to Version IPV6 protocol conversion
- Continue engineering support for classified network computing across the MDA Enterprise
- Develop engineering plans to increase server capacity to meet operational demands of the BMDS
- Design Metropolitan-Area-Networks (MANs) to provide network redundancy at primary regional sites
- Complete engineering planning for reliable information storage that can support disaster recovery and maintain continuity of operations between all sites

FY 2007 Planned Program:

- Provide engineering support for implementation of disaster recovery systems
- Continue engineering support for classified network computing across the MDA Enterprise
- Provide engineering support for enterprise server installations at primary regional sites
- Continue engineering support for integration of Metropolitan-Area-Networks (MANs) to provide network redundancy at primary regional sites

	FY 2004	FY 2005	FY 2006	FY 2007
Service IM/IT	6,116	7,657	4,751	4,872
RDT&E Articles (Quantity)	0	0	0	0

This initiative provides funds to three MDA Executing Agents for IM/IT costs incurred to support MDA BMDS-related efforts. The Executing Agents include 1) U.S. Army Space and Missile Defense Command (SMDC), 2) the U.S. Army Program Executive Office, Air, Space and Missile Defense (PEO ASMD), and 3) U.S. Air Force BMD Program Executive Office (USAF PEO). Funds provided to SMDC supports continuing operations and maintenance of their communications and computing infrastructure. This includes costs for operation and maintenance of a Corporate Information Management System (CIMS). CIMS is a system that has several modules that support a variety of business and administrative functions including: procurement, personnel, logistics, financial and contractual. This initiative supports the communications costs for LAN's/WAN's, and database management activities that support MDA IM/IT initiatives as well as network services including help desk, user support and software maintenance. SMDC also receives MDA funds to update and maintain the Program Resource Internet Database Environment (PRIDE), a database management tool used by MDA and the executing agents that supports mission operations. The PRIDE application provides MDA users access to planning, budgeting and administrative data. Funds provided to PEO ASMD support computing infrastructure costs for providing automated services for gathering, storing, sharing and retrieving technical and management information to provide oversight of multiple research contracts and business activities in support of MDA-related projects. Funds provided to the USAF PEO are used to fund support costs for logistics and database management efforts and communications costs for LANs/WAN's that are MDA related.

FY 2004 Accomplishments:

- Support recurring O&M and helpdesk services

FY 2005 Planned Accomplishments:

- Support recurring O&M and helpdesk services

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

FY 2006 Planned Program:

- Support recurring O&M and helpdesk services

FY 2007 Planned Program:

- Support recurring O&M and helpdesk services

	FY 2004	FY 2005	FY 2006	FY 2007
MDA Communications Infrastructure	6,101	9,396	12,018	12,787
RDT&E Articles (Quantity)	0	0	0	0

The MDA Enterprise Communications Infrastructure initiative consists of leased communications costs for classified and unclassified voice and data circuits including T1, fractional T1, OC3, and video teleconferencing capabilities and circuit access to the Joint Worldwide Intelligence Communications System (JWICS). Circuits and associated services are provided by the Defense Information Systems Agency (DISA) as well as the Defense Research and Engineering Network (DREN). Circuit access includes government and industry locations to enable and support information processing and information sharing of BMD-related data, globally, throughout the MDA Enterprise. This initiative funds expansion of bandwidth to the MDA's Video Teleconferencing Centers (VTCs) and Virtual Data Centers to meet increased demands of systems currently in place, and establish additional VTC sites to efficiently and effectively increase the information sharing capability to support the BMDS Initial Defensive Operations (IDO) schedule.

FY 2004 Accomplishments:

- Began phased installation of Service Delivery Points (SDPs) to provide Wide Area Network (WAN) connectivity to MDA regional locations in accordance with the Enterprise Architecture design
- Supported recurring maintenance agreements on MDA Enterprise network equipment
- Funded MDA Enterprise leased communications and services for existing circuits provided by DISA and DREN
- Upgraded obsolete networking equipment to improve system reliability and standardize equipment across the MDA Enterprise
- Established classified connectivity at the Joint National Integration Center (JNIC) in Colorado, at the Ground-based Midcourse Defense (GMD) in Huntsville, AL, at Space Tracking Surveillance System (SSTS) in Los Angeles, CA at Airborne Laser (ABL), Albuquerque, NM and in the National Capital Region (NCR)
- Delivered classified enterprise services to the NCR
- Established MDA Enterprise services at ABL Edwards AFB

FY 2005 Planned Accomplishments:

- Continue phased installation of Service Delivery Points (SDPs) to provide Wide Area Network (WAN) connectivity to MDA regional locations in accordance with the Enterprise Architecture design
- Support recurring maintenance agreements on MDA Enterprise network equipment
- Begin expansion of networking equipment to meet the demands of the BMDS operational environment
- Fund MDA Enterprise leased communications for existing circuits provided by DISA and DREN.

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FY 2006 Planned Program:

- Continue phased installation of Service Delivery Points (SDPs) to provide Wide Area Network (WAN) connectivity to MDA regional locations in accordance with the Enterprise Architecture design
- Support recurring maintenance agreements on MDA Enterprise network equipment.
- Fund MDA Enterprise leased communications for existing circuits provided by DISA and DREN.
- Continue expansion of networking equipment to meet the demands of the BMDS operational environment
- Migrate the MDA Enterprise Network layer from Asynchronous Transfer Mode (ATM) to Internet Protocol (IP) in support of the DoD Global Information Grid (GIG) architecture plan.

FY 2007 Planned Program:

- Continue phased installation of Service Delivery Points (SDPs) to provide Wide Area Network (WAN) connectivity to MDA regional locations in accordance with the Enterprise Architecture design
- Support recurring maintenance agreements on MDA Enterprise network equipment.
- Fund MDA Enterprise leased communications for existing circuits provided by DISA and DREN
- Continue expansion of networking equipment to meet the demands of the BMDS operational environment

	FY 2004	FY 2005	FY 2006	FY 2007
Enterprise Information Assurance	8,391	11,723	16,059	18,484
RDT&E Articles (Quantity)	0	0	0	0

The Enterprise Information Assurance (IA) Program was established to track IT security costs separately in accordance with the DoD FMR Volume 2B Chapter 18. The IA Program is a vital aspect of the Ballistic Missile Defense System (BMDS) and the MDA Enterprise. MDA IA activities will ensure that intended protection, detection and reaction processes are outlined and implemented to protect and defend information and information systems by providing for availability, integrity, authentication, confidentiality and non-repudiation for the mission, test and administrative environments across MDA. The IA Program provides system security engineering, integration of available Information Security (INFOSEC) products, development, and testing to ensure that command, control, communications, computing and intelligence (C4I) systems are protected against malicious or accidental attacks.

The MDA IA Program consists of the following IA special interest items: Protect Information - Public Key Infrastructure (Goal 1); Defend Systems and Networks (Goal 2); IA Situational Awareness/Command and Control (C2) (Goal 3); Transform and Enable IA Capabilities (Goal 4); and Create an IA Empowered Workforce (Goal 5).

FY 2004 Accomplishments:

- Completed an IA Network Assessment to verify robustness of network tools
- Developed initial capability to enhance training of Information Assurance Officer (IAO) and Information Assurance Manager (IAM) to recognize and respond to IA attacks
- Briefed Strategic Command (STRATCOM) on IA/CND for the BMDS
- In support of BMDS IDO, issued appropriate IATOs, SSAAs, and Memoranda of Understanding
- Completed CA efforts and issued an IATO for the BMDS IDO
- Implemented PKI/Common Access Card (CAC) at 7 MDA locations for a total of 2,900 users

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

FY 2005 Planned Accomplishments:

- Continue IA engineering and planning guidance for all IT enclaves and acquisition programs
- Continue to support CA efforts and implementation and testing of IA controls to ensure that mission, test and administrative networks, systems and applications are implemented with appropriate IT security measures and procedures
- Prepare and coordinate Memoranda of Understanding for Computer Network Defense (CND) providers on mission, test and administrative systems as required
- Continue IA and CND management oversight and support for BMDS and MDA Enterprise systems
- Support IAVA compliance initiatives
- Develop an IA Master Plan
- Develop an IA Architecture
- Begin CND planning for the BMDS Block 6
- Continue support for recurring IA assessments on BMDS and Enterprise Architectures
- Continue engineering planning and documentation support for IA architecture modifications
- Provide recurring IA training to the IA workforce
- Support 24/7 Enterprise Network Operations Security Center (ENOSC) operations.

FY 2006 Planned Program:

- Provide IA engineering and planning guidance for all IT enclaves and acquisition programs
- Support IAVA compliance initiatives
- Continue IA and CND management oversight and support for BMDS and MDA Enterprise systems
- Provide support to integration of enterprise applications using CAC and public key enabled (PKE) applications and digital signature capability
- Continue engineering planning and documentation support for IA architecture modifications.
- Provide recurring IA training to the IA workforce
- Support 24/7 Enterprise Network Operations Security Center (ENOSC) operations

FY 2007 Planned Program:

- Provide IA engineering and planning guidance for all IT enclaves and acquisition programs
- Continue IA and CND management oversight and support for BMDS and MDA Enterprise systems
- Support IAVA compliance initiatives
- Continue implementation of enterprise applications using CAC and public key enabled (PKE) applications and digital signature capability
- Provide recurring IA training to the IA workforce
- Continue engineering planning and documentation support for IA architecture modifications.
- Support 24/7 Enterprise Network Operations Security Center (ENOSC) operations.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

	FY 2004	FY 2005	FY 2006	FY 2007
Enterprise Applications	2,385	9,352	15,238	19,260
RDT&E Articles (Quantity)	0	0	0	0

In accordance with the Clinger Cohen Act, DoD Directive 5000.15 DoD Records Management Program and OMB Circular A130, the Enterprise Applications initiative provides for the implementation of enterprise information applications which are used to collect, analyze, display and share data. Examples include PKE enterprise applications such as MDA Enterprise Portal, E-Management System (EMS), collaborative tools, web-enabled scheduling, personnel tracking system, standard procurement system, and on-line BMDS University.

FY 2004 Accomplishments:

- Fund recurring enterprise application license fees
- Began deployment of the MDA Classified and Unclassified Enterprise Portals for authorized information sharing and collaboration
- Began implementation of a web-enabled System Development Scheduling capability
- Implemented initial phase of the on-line MDA Ballistic Missile Defense System University (BMDSU)
- Completed an E-Management System (EMS) Pilot project for electronics records management and published a Records Management Guideline
- Designed and implemented an Initial Defensive Operations (IDO) Task Force Knowledge Site on the MDA Classified Portal
- Completed identification of software applications to OSD Software Asset Management (SAM)

FY 2005 Planned Accomplishments:

- Fund recurring enterprise application license fees
- Continue EMS project implementation and training program
- Continue expansion and spiral development of the MDA unclassified and classified web-based Enterprise Portals.
- Support implementation of DoD standardized financial management applications
- Implement an MDA Personnel Tracking System
- Implement an Agency action tracking system
- Continue implementation of the BMD System Asset Management capability
- Support implementation of a Standard Procurement System

FY 2006 Planned Program:

- Fund recurring enterprise application license fees
- Begin implementation of PKE-enabled Enterprise applications
- Expand MDA Enterprise Portals to non-MDA resident users
- Begin phased implementation of information sharing and collaboration applications
- Integrate on-line BMDS University training program to MDA Enterprise Portals

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

FY 2007 Planned Program:

- Fund recurring enterprise application license fees
- Continue implementation of PKE information sharing and collaboration applications
- Continue phased implementation of information sharing and collaboration applications
- Continue integration of BMDS University training program to MDA Enterprise Portals

	FY 2004	FY 2005	FY 2006	FY 2007
Virtual Data Centers	2,903	3,534	3,968	3,643
RDT&E Articles (Quantity)	0	0	0	0

In accordance with OMB 9602 Consolidation of Agency Data Centers, the Virtual Data Center (VDC) task includes the operations, maintenance and support costs to provide a classified portal access capability to Ballistic Missile Defense-related test, experiment, modeling and simulation data that is processed, cataloged and made available to the MDA community by the Data Centers. The VDC initiative consolidates information sharing across the MDA into an integrated virtual capability. The VDCs include the Missile Defense Data Center (MDDC), a component of the US Army Space and Missile Defense Command (USASMDC), the Advanced Missile Signature Center (AMSC), a component of the US Air Force, Naval Warfare Assessment Station, and the Joint National Integration Center Ballistic Missile Defense System Integration Data Center (BMDS IDC). The BMD Information Resource Center (BIRC), a resource and research service library, will begin conversion to a virtual library in FY04.

FY 2004 Accomplishments:

- Support recurring VDC Program operations and maintenance.
- Began conversion of the VDC into the MDA classified knowledge repository (MDA Classified Portal).
- Began phased implementation of Disaster Recovery Capability at the BMDS IDC.
- Began the conversion of the BMD Information Resource Center (BIRC) to Virtual Data Center capability

FY 2005 Planned Accomplishments:

- Support recurring VDC Program operations and maintenance
- Complete planning of disaster recovery capability
- Complete the conversion of the BIRC to a Virtual Data Center capability

FY 2006 Planned Program:

- Support recurring VDC Program operations and maintenance
- Begin integration of VDCs to the MDA Enterprise Portals
- Begin expansion of server and on-line storage capacity to support increased mission for IDO
- Begin phased implementation of Disaster Recovery capability

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FY 2007 Planned Program:

- Support recurring VDC Program operations and maintenance
- Being integration of VDCs to the MDA Enterprise Portals
- Continue expansion of server and on-line storage capacity to support increased mission for IDO
- Continue implementation of Disaster Recovery capability

	FY 2004	FY 2005	FY 2006	FY 2007
Enterprise Plans & Policies	4,478	7,218	5,750	6,994
RDT&E Articles (Quantity)	0	0	0	0

This initiative funds efforts that support development and implementation of Agency-wide IM/IT policies, guidelines and management processes to ensure efficient and effective oversight of information resources in accordance with various Federal and statutory policies including the Clinger-Cohen Act, the Federal Information Security Management Act (FISMA), the Government Paperwork Elimination Act (GPEA), and the Office of Management and Budget (OMB) IT budget reporting in accordance with the DoD Financial Management Regulations. Specific efforts include implementation of the CIO vision, mission and goals, development of the agency Strategic IM/IT Plan, IM/IT budget formulation and execution in accordance with the Planning, Programming, Budgeting and Execution System (PPBES) process, development of IM/IT policies and procedures, Capital Planning and Investment Control (CPIC) process development and implementation, business case development, review and approval, CIO participation on IT-related boards and working groups, and Section 508 and Enterprise Software Initiative (ESI) compliance reporting within and outside the Agency.

FY 2004 Accomplishments:

- Submitted Agency Special Budget Exhibits 53 IT Resources and Exhibit 300 Selected Capital Investment Report (SCIR)
- Submitted the Federal Information Security Management Act (FISMA) Report for FY04
- Published CIO Guideline on the CPIC process for IT Investments
- Managed FY04 Planning, Programming, Budgeting and Execution System (PPBES)
- Drafted, coordinated and published policies, guidelines and processes in accordance with applicable legislation, OMB, OSD and DoD guidance.
- Provide quarterly updates to the MDA IT Registry of IT systems
- Provide updates to the President's Management Agency (PMA) E-Government initiative
- Prepared status reports and report metrics/progress of the MDA IM/IT Enterprise to OMB, OSD, and DoD.

FY 2005 Planned Accomplishments:

- Prepare and submit Agency Special Budget Exhibit 53, IT Resources and Exhibit 300, Selected Capital Investment Report (SCIR)
- Submit the Federal Information Security Management Act (FISMA) Report for FY04
- Manage FY05 Planning, Programming, Budgeting and Execution System (PPBES)
- Draft, coordinate and publish policies, guidelines and processes in accordance with applicable legislation, OMB, OSD and DoD guidance.
- Provide quarterly updates to the MDA IT Registry of IT systems

- Provide updates to the President's Management Agency (PMA) E-Government initiative
- Prepared status reports and report metrics/progress of the MDA IM/IT Enterprise to OMB, OSD, and DoD.

FY 2006 Planned Program:

- Prepare and submit Agency Special Budget Exhibit 53, IT Resources and Exhibit 300, Selected Capital Investment Report (SCIR) to support the FY 2008-2013 Program and Budget Review
- Submit the Federal Information Security Management Act (FISMA) Report for FY05
- Manage FY06 Planning, Programming, Budgeting and Execution System (PPBES)
- Draft, coordinate and publish policies, guidelines and processes in accordance with applicable legislation, OMB, OSD and DoD guidance.
- Provide quarterly updates to the MDA IT Registry of IT systems
- Provide updates to the President's Management Agency (PMA) E-Government initiative
- Prepared status reports and report metrics/progress of the MDA IM/IT Enterprise to OMB, OSD, and DoD.

FY 2007 Planned Program:

- Prepare and submit Agency Special Budget Exhibit 53, IT Resources and Exhibit 300, Selected Capital Investment Report (SCIR)
- Submit the Federal Information Security Management Act (FISMA) Report for FY06
- Manage FY07 Planning, Programming, Budgeting and Execution System (PPBES)
- Draft, coordinate and publish policies, guidelines and processes in accordance with applicable legislation, OMB, OSD and DoD guidance.
- Provide quarterly updates to the MDA IT Registry of IT systems
- Provide updates to the President's Management Agency (PMA) E-Government initiative
- Prepared status reports and report metrics/progress of the MDA IM/IT Enterprise to OMB, OSD, and DoD.

	FY 2004	FY 2005	FY 2006	FY 2007
MDA Video Teleconferencing	3,011	4,795	5,250	5,106
RDT&E Articles (Quantity)	0	0	0	0

The MDA Video Teleconferencing (VTC) initiative consists of costs required for the management, engineering, systems integration, operation, maintenance and technical support services for the teleconferencing network within the Missile Defense Agency's National Capital Region and the Joint National Integration Center (JNIC) community of interest (COI). The COI consists of a combination of .com, .mil, .gov, and .edu locations at various geographic locations throughout the contiguous United States and the Pacific. Defense Information System Agency, through its Defense Information Systems Network (DISN) Video Services-Global-Global (DVS-G) contracts, is responsible for video teleconferencing throughout the Department of Defense. The MDA COI is but one community in the greater DVS-G. Core MDA VTC COI sites include the NCR, JNIC, Airborne Laser (ABL) at Kirtland Air Force Base (AFB), Space Tracking and Surveillance Systems (STSS) at Los Angeles AFB, and numerous offices in Huntsville, AL including Terminal High Altitude Area Defense (THAAD), Targets and Countermeasures, and Ground Missile Defense.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

FY 2004 Accomplishments:

- Initiated VTC Configuration Management throughout the MDA Enterprise
- Began upgrade and standardization of VTC equipment and software
- Collaborated with VTC sites across the Enterprise to establish VTC best business practices
- Expanded the VTC Integrated Project Team (IPT) into an Enterprise-wide Tiger Team
- Awarded a VTC Operations and Maintenance contract to provide services for arrangement, engineering, systems integration, and maintenance
- Published VTC room standards, baselined rooms and system software and instituted a self-paced distance learning program

FY 2005 Planned Accomplishments:

- Support recurring O&M support to VTC Centers
- Implement Video-Over-Internet Protocol (VOIP) capability for Executive Offices
- Implement MDA VOIP Operations Center

FY 2006 Planned Program:

- Continue implementation of VOIP for all MDA users
- Provide recurring O&M support to VTC Centers
- Integrate VTC capability to new MDA facilities
- Continue standardization of VTC equipment and software

FY 2007 Planned Program:

- Continue implementation of VOIP for all MDA users
- Continue to provide recurring O&M support to VTC Centers
- Continue to integrate VTC capability to new MDA facilities
- Continue standardization of VTC equipment and software

	FY 2004	FY 2005	FY 2006	FY 2007
ITO South Computing Infrastructure	100	175	18,000	8,752
RDT&E Articles (Quantity)	0	0	0	0

This task provides funding for the engineering, design, procurement, installation, operations and maintenance costs for the information technology (IT) infrastructure, and the communications and computing infrastructure for the Von Braun Complex (VBC) being built in Huntsville, Alabama. The VBC will consolidate personnel at MDA-sponsored organizations in the Huntsville area to include: Information Technology Office - South, Ground-based Midcourse (GM), Missile Defense Data Center (MDDC), Applied Data Analysis Center (ADAC), the Targets and Countermeasures project office, and the Hercules project office. The funds in the initiative will provide for the acquisition and continuing operations, maintenance and support costs to support the information technology/information management (IT/IM) infrastructure including the local area network (LAN) electronics, classified and unclassified desktop computers, servers, printers, and an array of

applicable software and the associated help desk and LAN operations services. The communications and computing infrastructure costs consist of long haul circuits, local circuits, telephone systems and equipment, video teleconferencing equipment, cell phones and associated support services.

FY 2006 Planned Program:

- Complete planning and design of the IM/IT infrastructure of the new MDA facility located at the Von Braun Complex in Huntsville, Alabama
- Begin implementation of the IM/IT infrastructure at the MDA facility at the Von Braun Complex

FY 2007 Planned Program:

- Support recurring IM/IT infrastructure operations and maintenance

	FY 2004	FY 2005	FY 2006	FY 2007
Computing Infrastructure	0	0	12,530	53,091
RDT&E Articles (Quantity)	0	0	0	0

The Computing Infrastructure initiative provides funds to support the operations and sustainment of the Enterprise systems supporting the National Capital Region (NCR). This initiative provides funding for infrastructure costs such as the cable plant, network routing and switching gear, and storage devices as well as desktop computers and servers and the associated user, server and information assurance applications. This initiative also supports the planning, analysis and acquisition of IT resources and office automation equipment. In FY 2006, $5.9M has been budgeted to support the planning for the MDA Campus consolidation. In FY 2007, $42M is identified for the installation of the communications and computing infrastructure build out, purchase of IM/IT hardware and software and the parallel operations that will be required during the transition to a consolidated campus environment in the National Capital Region (NCR).

FY 2006 Planned Program:

- Fund recurring software licenses for the NCR
- Fund recurring Maintenance Agreements for the NCR
- Fund recurring support for the NCR classified and unclassified LAN
- Begin IT infrastructure design and planning for MDA Campus consolidation

FY 2007 Planned Program:

- Fund recurring software licenses for the NCR
- Fund recurring Maintenance Agreements for the NCR
- Fund recurring support for the NCR classified and unclassified LAN
- Begin cable plant installation and build-out of IT infrastructure of MDA Campus
- Fund surge support during the MDA Campus build-out
- Implement parallel communications and computing capabilities to ensure continuity of operations during the Campus build-out

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

	FY 2004	FY 2005	FY 2006	FY 2007
Computing & Network Management Services	0	0	20,365	37,608
RDT&E Articles (Quantity)	0	0	0	0

The Computing and Network Management Services initiative consists of support services required to operate and maintain the National Capital Region classified and unclassified local area network. This includes help desk services and trouble ticket identification and resolution, hardware, software and peripherals installation services, cabling, desktop PCs, printers, and other peripherals to accommodate agency expansion. Costs include IT equipment such as projectors, video teleconferencing equipment and other IT equipment needed to equip conference rooms with the capability to conduct meetings and accommodate information sharing across the MDA enterprise at many geographical locations.

FY 2006 Planned Program:

- Support recurring O&M and helpdesk services
- Support IT planning efforts during the MDA Campus build-out

FY 2007 Planned Program:

- Support recurring O&M and helpdesk services
- Support the increase in O&M and helpdesk services due to parallel operations during the MDA Campus build-out

	FY 2004	FY 2005	FY 2006	FY 2007
Information Distribution Services	0	3,789	7,793	11,604
RDT&E Articles (Quantity)	0	0	0	0

Information Distribution Services includes costs to develop, manage content, and operate and maintain the MDA Portal. The MDA Portals are a vital asset used to share information and knowledge throughout the Missile Defense community. Also included are costs to operate and maintain the Visual Information Production Center, a state-of-the-art, high capacity graphic and video production environment which provides services to senior leadership and agency employees.

FY 2005 Planned Accomplishments:

- Support recurring O&M and helpdesk services

FY 2006 Planned Program:

- Continue Portal content management and collaboration efforts
- Continue to fund the Video Information Production Center (VIPC) to provide graphic and video production capabilities to Agency senior leadership and MDA-wide personnel

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

FY 2007 Planned Program:

- Continue Portal content management and collaboration efforts
- Continue to fund the VIPC to provide graphic and video production capabilities to Agency senior leaderships and MDA-wide personnel

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

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D. Acquisition Strategy

MDA employs a federated acquisition strategy for the procurement and sustainment of the MDA Enterprise. This strategy utilizes a FEDSIM Millennia contractor for Engineering and Architectural Planning support. Approved engineering designs and plans are then implemented, sustained, and operated by local contractors in each regional area (National Capital Region, Huntsville Alabama, Colorado Springs, CO, Albuquerque, NM, and Los Angeles, CA).

In FY 2006 a contract will be awarded for planning and engineering of the MDA Campus computing infrastructure in the National Capital Region (NCR). In FY 2007, another contract will be awarded in the NCR to lay in the communications and computing infrastructure of the MDA Campus. A contract will be awarded for the operations and maintenance of the computing infrastructure at the MDA Campus in FY 2007.

In late FY 2006, a contract will be awarded for the build out of the communications and computing infrastructure of the Von Braun Complex in Huntsville, Alabama. Another contract will be awarded in FY 2007 to operate and maintain the IM/IT infrastructure at the Complex.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Enterprise Architecture and Engineering										
Ent Architecture & Engineering	MIPR	FEDSIM/SRA/ VA	4,050	3,814	2Q	3,535	2Q	2,668	2Q	14,067
Service IM/IT										
Service IM/IT	C/CPAF	SMDC/SAIC/ AL	4,480	6,116	1/2Q	4,480	1/2Q	4,480	1/2Q	19,556
Service IM/IT	C/CPAF	PEO ASMD/SAIC/ AL	1,345	1,345	1/2Q	0		0		2,690
Service IM/IT	C/CPFF	USAF/SAIC/ CA	291	196	1/2Q	271	1/2Q	392	1/2Q	1,150
MDA Communications Infrastructure										
Leased Comms	MIPR	DISA/ IL	3,558	2,822	1Q	3,951	1Q	4,764	1Q	15,095
Leased Comms	MIPR	Army Rsch Lab/ MD	600	790	1Q	1,106	2Q	1,383	1Q	3,879
WAN Tansport	C/CPAF	Northrop Grumman/ CO	1,104	2,344	2Q	4,075	2Q	3,727	2Q	11,250

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Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Hub Services	MIPR	AFRL Hanscom/ MA	10	10	1Q	10	1Q	10	1Q	40
Hub Services	MIPR	AFRL Redstone/ AL	23	23	1Q	23	1Q	23	1Q	92
Leased Comms	MIPR	USAF Wake Island/ CA	29	0	N/A	0	N/A	0	N/A	29
Comms Support	MIPR	GMD/ AL	32	0	N/A	0	N/A	0	N/A	32
Leased Comms	MIPR	DTSW/ VA	176	826	1Q	353	1Q	380	1Q	1,735
WAN Sustainment Services	C/CPAF	Northrop/ CA	840	2,581	2Q	2,500	2Q	2,500	2Q	8,421
Enterprise Information Assurance										
C&A Support	MIPR	FEDSIM/ VA	1,149	1,338	2Q	1,965	2Q	2,128	2Q	6,580
C&A Support	MIPR	GovWorks/ VA	696	899	3Q	935	1/3Q	972	1/3Q	3,502
NCR Info Assurance	C/CPAF	ZEN Tech/ VA	0	5,069	1/3Q	4,069	1/3Q	4,482	1/3Q	13,620
Enterprise Network Op Security Center	C/CPAF	Northrop Grumman/ CO	4,010	3,772	2Q	7,000	2Q	5,500	2Q	20,282
Disaster Recovery	C/CPAF	Northrop Grumman/ CO	0	0	N/A	1,218	2Q	3,902	2Q	5,120
PKI Support	C/CPAF	FEDSIM/ VA	1,456	345	2Q	572	2Q	1,200	2Q	3,573
Info Assurance Training	C/CPAF	FEDSIM/ VA	300	300	2Q	300	2Q	300	2Q	1,200

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Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
PKI Support	C/CPAF	ZEN/ VA	596	0	N/A	0	N/A	0	N/A	596
Enterprise Applications										
Enterprise Application	C/CPAF	FEDSIM/ VA	897	4,967	2Q	8,544	2Q	13,696	1/2Q	28,104
PRIDE Maintenance and Support	MIPR	SMDC/ AL	895	999	1/2Q	999	1Q	999	1Q	3,892
Database Support	MIPR	GSA/ VA	0	100	2Q	0	N/A	0	N/A	100
BMDS University support	MIPR	NTIS/ VA	0	433	1Q	0	N/A	0	N/A	433
App Integration Support	C/CPAF	Northrop/ CO	568	2,853	2Q	5,695	2Q	4,565	2Q	13,681
Document Scanning	MIPR	DTIC/ VA	25	0	N/A	0	N/A	0	N/A	25
Virtual Data Centers										
VDC Support	C/CPAF	AMSC/ AL	290	300	1/2Q	307	2Q	290	2Q	1,187
VDC Support	C/CPAF	MDDC/ AL	348	348	1/2Q	369	1/2Q	348	1/2Q	1,413
VDC Support	MIPR	NSWC/ CA	131	131	1/2Q	131	1/2Q	131	1/2Q	524
VDC Support	C/CPAF	Northrop Grumman/ CO	1,956	1,953	2Q	1,953	2Q	1,912	2Q	7,774
BMDS Library Support	C/CPFF	DRC/ VA	178	0	2Q	0	N/A	0	N/A	178
Publications	Various	Various/ VA	0	802	1/2Q	1,208	1/2Q	962	1/2Q	2,972
Enterprise Plans & Policies										

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
SETA Support	C/CPFF	GovWorks (Milestone Group)/ VA	2,850	6,212	2/3Q	4,892	2/3Q	5,088	2/3Q	19,042
CIO Support	Various	Various/ CO	262	556	1/2Q	858	1/2Q	1,906	1/2Q	3,582
CIO Support	C/CPFF	Decisive Analytics/ VA	0	300	2Q	0	N/A	0	N/A	300
SETA Support	SS/MIPR	NAWC Pt Mugu/ CA	1,366	0	N/A	0	N/A	0	N/A	1,366
CIO Support	MIPR	STRATCOM	0	150	2Q	0	N/A	0	N/A	150
MDA Video Teleconferencing										
VTC Support and Maintenance	SS/CPAF	SGICOM/ VA	1,411	3,786	1/3Q	3,708	1/3Q	3,819	1/3Q	12,724
VTC Enterprise Engineering	C/CPAF	FEDSIM/ VA	1,600	831	2Q	1,542	2Q	1,287		5,260
Integration Support	C/CPAF	Northrop/ CO	0	178	2Q	0	N/A	0	N/A	178
ITO South Computing Infrastructure										
Von Braun Complex IT Support		TBD	0	0	N/A	18,000		0	N/A	18,000
Von Braun IT Support and Sustainment		TBD	0	0	N/A	0	N/A	8,752		8,752
ITO South IT Equipment/Lease		GSA	100	125	2Q	0	N/A	0	N/A	225
ITO West IT Support & Equipment		GSA	0	50	2Q	0	N/A	0	N/A	50
Computing Infrastructure										
Cabling	C/TM	Crawford/ MD	0	0	N/A	2,652	1/2Q	2,800	1/2Q	5,452
MDA Campus IT Infrastructure	C/CPAF	TBD	0	0	N/A	3,900		42,091		45,991

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
IT HW/SW Equipment	MIPR	GSA	0	0	N/A	5,978	1/2Q	8,200		14,178
Computing & Network Management Services										
Computing & Network Services	C/CPFF	ZEN Tech/ MD	0	0	N/A	14,304	2/3Q	17,426	2/3Q	31,730
MDA Campus Parallel O&M	Various	TBD	0	0	N/A	0	N/A	13,881	1Q	13,881
IM/IT Support	MIPR	GovWorks/ VA	0	0	N/A	4,800	2/3Q	4,920	2/3Q	9,720
Cabling	SS/CPFF	Crawford/ MD	0	0	N/A	960	1Q	1,080	1Q	2,040
MSS Database Support	CPFF	ZEN Tech/ MD	0	0	N/A	301	2/3Q	301	2/3Q	602
Information Distribution Services										
Portal and VIPC support	SS/CPFF	CSC/ VA	0	3,789	N/A	7,793	2/3Q	11,604	1/2Q	23,186
Subtotal Support Costs			37,622	61,453		125,257		184,869		409,201

Remarks

A contract will be awarded for the Planning and Engineering for the MDA Campus in FY 2006.

A contract will be awarded for the MDA Campus build-out of the communications and computing infrastructure in FY 2007. Another contract will be awarded in FY 2006 for the build out of the IM/IT infrastructure of the Von Braun Complex in Huntsville, Alabama.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation										

Remarks

IV. Management Services Cost ($ in Thousands)

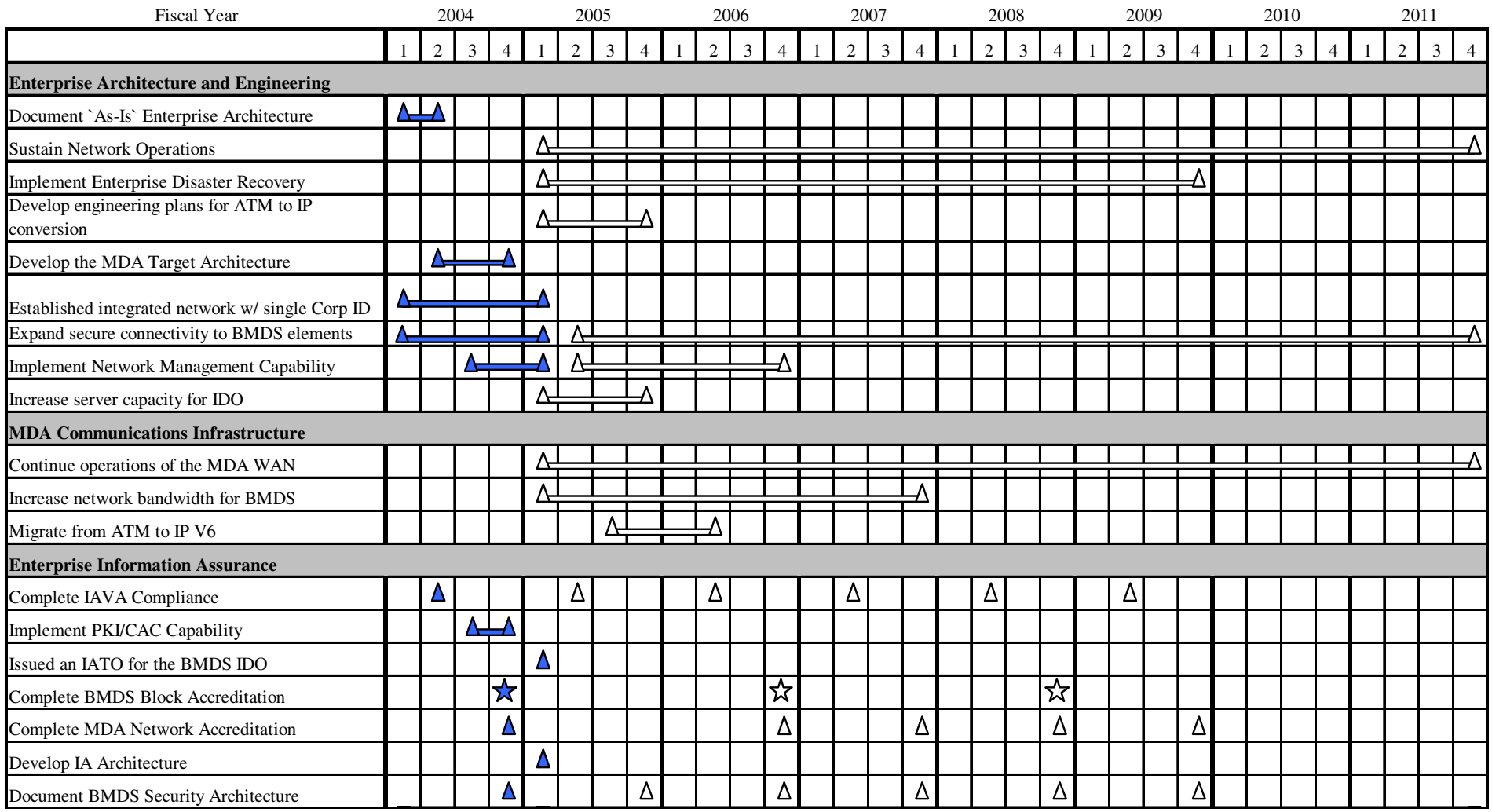
Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services										

Remarks

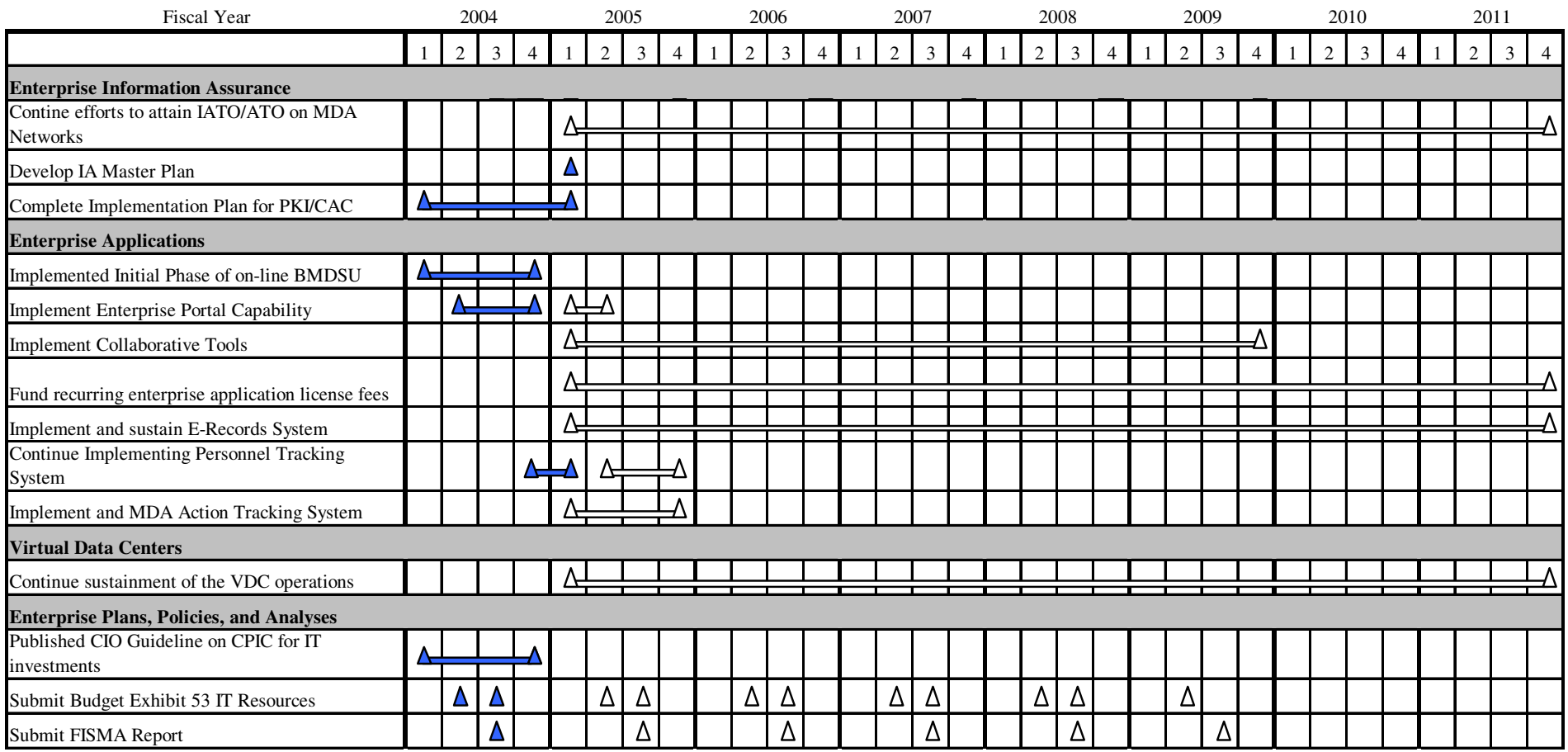
Project Total Cost			37,622	61,453		125,257		184,869		409,201

Remarks

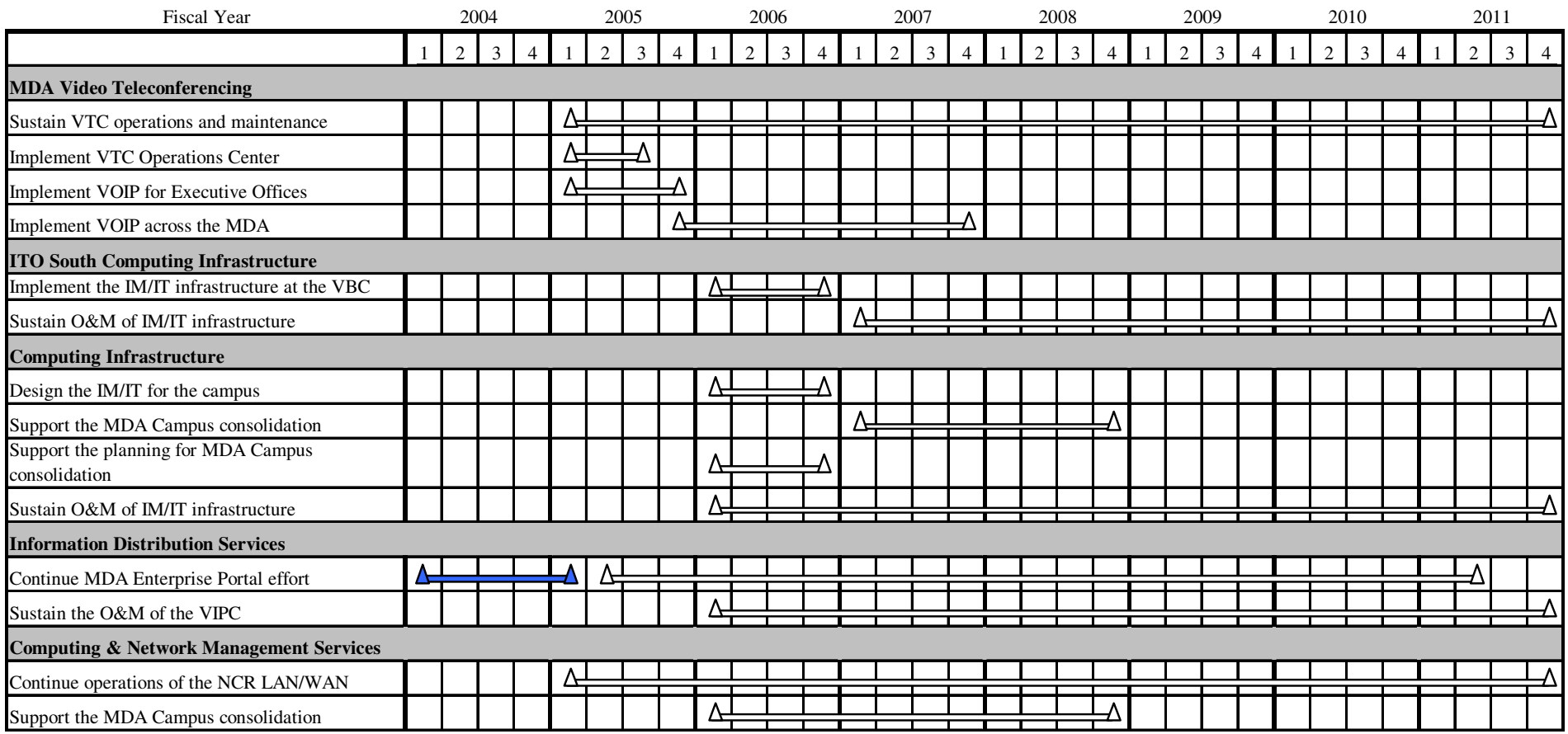
Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**



Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**



Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**



Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Enterprise Architecture and Engineering								
Document `As-Is` Enterprise Architecture	1Q-2Q							
Sustain Network Operations		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Initiate Disaster Recovery between NCR and JNIC	1Q-4Q							
Develop Network Op Security Ctr (NOSC)	3Q-4Q	1Q-4Q	1Q-4Q					
Implement Enterprise Disaster Recovery		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q		
Complete planning of disaster recovery capability	1Q-4Q	1Q-2Q						
Develop engineering plans for ATM to IP conversion		1Q-4Q						
Develop the MDA Target Architecture	2Q-4Q							
Established integrated network w/ single Corp ID	1Q-4Q	1Q						
Expand secure connectivity to BMDS elements	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Implement Network Management Capability	3Q-4Q	1Q-4Q	1Q-4Q					
Increase server capacity for IDO		1Q-4Q						
MDA Communications Infrastructure								
Fund DISA/DREN for comms and services	1Q	1Q	1Q	1Q	1Q	1Q		
Continue operations of the MDA WAN		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Continue migration of circuits to DISA	4Q		1Q,2Q					
Execute Service Level Agreements for hub services	1Q	1Q	1Q	1Q	1Q	1Q		
Support recurring maintenance agreements		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q
Increase network bandwidth for BMDS		1Q-4Q	1Q-4Q	1Q-4Q				
Migrate from ATM to IP V6		3Q-4Q	1Q-2Q					
Enterprise Information Assurance								
Complete IAVA Compliance	2Q	2Q	2Q	2Q	2Q	2Q		
Implement PKI/CAC Capability	3Q-4Q							
Issued an IATO for the BMDS IDO		1Q						
Complete BMDS Block Accreditation	4Q		4Q		4Q			
Complete MDA Network Accreditation	4Q		4Q	4Q	4Q	4Q		
Develop IA Architecture		1Q						
Document BMDS Security Architecture	4Q	4Q	4Q	4Q	4Q	4Q		
Continue efforts to attain IATO/ATO on MDA Networks		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Develop IA Master Plan		1Q						

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Complete Implementation Plan for PKI/CAC	1Q-4Q	1Q						
Enterprise Applications								
Implemented Initial Phase of on-line BMDSU	1Q-4Q							
Implement Enterprise Portal Capability	2Q-4Q	1Q-2Q						
Implement the BMDS University applications	1Q-4Q	1Q						
Implement a Personnel Tracking System	1Q-4Q	1Q						
Implement an E-Management System at GMD	1Q-4Q	1Q						
Implement a System Development Schedule	1Q-4Q	1Q						
Implement Collaborative Tools		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q		
Fund recurring enterprise application license fees		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Implement and sustain E-Records System		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Continue Implementing Personnel Tracking System	4Q	1Q-4Q						
Implement and MDA Action Tracking System		1Q-4Q						
Virtual Data Centers								
Convert the BIRC to a Virtual Library	3Q-4Q	1Q-2Q						
Complete planning of disaster recovery capability		1Q-4Q						
Continue sustainment of the VDC operations		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Enterprise Plans, Policies, and Analyses								
Update MD Enterprise IM/IT Program Plan	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q		
Update Info Security Approach w/evolving DoD Stnds	1Q-4Q	1Q-4Q						
Complete DOJ Section 58 Survey	1Q	1Q	1Q	1Q	1Q	1Q		
Published CIO Guideline on CPIC for IT investments	1Q-4Q,4Q							
Manage the SW Asset Management Program	1Q					4Q		
Complete Qtrly update of MDA IT Registry	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q		
Submit Budget Exhibit 53 IT Resources	2Q,3Q	2Q,3Q	2Q,3Q	2Q,3Q	2Q,3Q	2Q		
Submit FISMA Report	3Q	3Q	3Q	3Q	3Q	3Q		
Submit GPEA Report	3Q	3Q	3Q	3Q	3Q	3Q		
Coordinate FISMA review, inspection, audit	2Q	2Q	2Q	2Q	2Q	2Q		
MDA Video Teleconferencing								
Sustain VTC operations and maintenance		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Implement VTC Operations Center		1Q-3Q						

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Implemented Configuration Mgmt	1Q-3Q,3Q							
Implement VOIP for Executive Offices		1Q-4Q						
Implement VOIP across the MDA		4Q	1Q-4Q	1Q-4Q				
ITO South Computing Infrastructure								
Implement the IM/IT infrastructure at the VBC			1Q-4Q					
Sustain O&M of IM/IT infrastructure				1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Computing Infrastructure								
Design the IM/IT for the campus			1Q-4Q					
Maintain software licenses for the NCR		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Support the MDA Campus consolidation				1Q-4Q	1Q-4Q			
Support the planning for MDA Campus consolidation			1Q-4Q					
Sustain O&M of IM/IT infrastructure			1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Information Distribution Services								
Continue MDA Enterprise Portal effort	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-2Q
Sustain the O&M of the VIPC			1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Computing & Network Management Services								
Continue operations of the NCR LAN/WAN		1Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Support the MDA Campus consolidation			1Q-4Q	1Q-4Q	1Q-4Q			
Computing and Network Management Services								
Continue operations of the NCR LAN/WAN								4Q

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0106 Modeling & Simulation	0	0	103,680	106,497	108,090	110,120	111,397	112,713
RDT&E Articles Qty	0	0	0	0	0	0	0	0

Note: FY04 and FY05 funding for this effort was under the Ballistic Missile Defense System (BMDS), Program Element 0603890C, Project 0101

A. Mission Description and Budget Item Justification

The mission of the Missile Defense Agency (MDA) is to develop an integrated layered Ballistic Missile Defense System (BMDS) to defend the United States, its deployed forces, friends and allies from ballistic missiles of all ranges and in all phases of flight. Modeling and Simulation (M&S) plays a key role in both developing the BMDS and assessing its likely effectiveness. M&S is responsible for providing credible system-level models and simulations to model the elements of an integrated BMDS.

In order to strengthen the Agency's M&S program, a significant modeling and simulation effort, leveraging existing element models, linked and integrated at the system-level and oriented for future development of the BMDS is essential. Under this Project, legacy modeling and simulation (M&S) tools and simulations will address near-term IDO and Block 04 objectives and provide warfighter support and sustainment for BMDS. We will establish a modeling and simulation framework to assess overall BMDS interoperability and performance. It will provide development, training and operations at the system-level, and improve the BMDS through incremental improvements and Block upgrades over time.

Model Development:

MDA employs a comprehensive, collaborative system engineering process that defines required system-wide performance, validates element designs, and assesses and verifies integrated system capability. M&S includes the development, verification, validation, and accreditation of system-level models and simulations required for the development, testing, assessment, deployment, and operation of the BMDS. A comprehensive M&S plan based on needs and expectations for IDO and Block 04 and beyond includes sustaining the legacy M&S tools, establishing and aligning enterprise M&S processes, developing an integrated BMDS M&S open architecture, defining a Common Environment and Threat Model (CETM), and building an M&S foundation for international missile defense initiatives.

The sustainment of legacy M&S tools focuses on the maintenance and operation of existing models and simulations to meet the short-term needs of the Agency. The legacy M&S tools will address IDO and Block 04 initiatives. These M&S tools will undergo a detailed M&S requirements engineering assessment prior to verification, validation and accreditation for the IDO and Block 04 events. We will update these system-level models and simulations as necessary providing accredited representations of the deployed Block 2004 BMDS.

The M&S program will establish and align enterprise processes for cross-agency synchronization and develop a standardized work breakdown structure for M&S activities agency wide. The enterprise processes include development and maintenance, requirements engineering, configuration management, verification and validation (V&V), accreditation, information assurance, and program protection responsibilities required to provide credible M&S tools.

The M&S framework will mirror the capabilities of the BMDS open architecture. M&S priorities for Block 06 and beyond include developing and delivering a fully integrated M&S framework that evolves over time through spiral development. The M&S framework consists of three types of capabilities:

- Type 1:Mission Effects - Planning and Integration of BMDS With Other War fighting Mission Areas
- Type 2: Engagement Effects- Capability Assessment, C2BMC CONOPS Development and Training
- Type 3: Engineering Effects- Engineering Design, Integration, Testing and Verification of Element and Component Specifications

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

In order to respond to a rapidly changing threat and take advantage of advances in technology, M&S will define a Common Environment and Threat Model (CETM). The CETM will provide a framework and rule set for the standardized representation of the battlespace environment and adversary capabilities. M&S will assess existing threat and environment models, then define, develop and integrate these tools into the CETM. The CETM domain will include active and passive signatures of threat objects and their kinematics and operational behaviors, the relevant natural and perturbed battlespace environment, the effects of this environment on threats and defensive systems, and a common way of dealing with the effectiveness and consequences of missile defense engagements. The M&S framework will define the criteria for the required CETM characteristics for all simulation types.

In line with the MDA international goals, M&S will build a foundation for International Missile Defense Initiatives by partnering on defining requirements and interfaces for an open system modeling framework.

Test and Operations:

The M&S program coordinates initiatives with the MDA Test and Operations directorates.

To effectively organize and execute the BMDS Test Bed Engineering effort, two collaborative structures manage the entire engineering process from concept through development to operational integration. The division of labor for these structures is the Responsible Engineering Organization (REO), led by MDA System Engineering and Integration; and the Responsible Test Organization (RTO), led by MDA Test and Evaluation. The REO leads Test Bed Planning, BMDS Design, Development and Integration. The RTO leads Test and Verification. REO supports Force Structure Integration and Deployment and the User in the procurement and fielding of as militarily useful BMD capability.

MDA employs an integrated system-level approach to testing, bringing together the contributions of various BMDS elements into combined test events where practical. These system test events are comprised of two or more elements interacting to verify the capability of the larger system in one or more engagement sequences. The Integrated Master Test Plan synchronizes test events.

The M&S program will configure credible and accredited system-level tools to meet the needs of the war fighters, the developers, the testers, and the system engineers. M&S will accredit selected system-level models and simulations to support BMDS verification and assessments for the following venues: war games, ground tests, flight tests, constructive analysis, and training. M&S will develop, sustain, and modernize the M&S infrastructure to include laboratories and other computational facilities.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Model Development	0	0	69,387	71,166
RDT&E Articles (Quantity)	0	0	0	0

*Note: FY04 and FY05 funding for this effort was under the Ballistic Missile Defense System (BMDS), Program Element 0603890C, Project 0101

FY 2004 Accomplishments:

- Released Parametric Endo-Exo Lethality Simulation (PEELS): Version 10.1
- Released Post Engagement Ground Effects Model (PEGEM): Version 5.1
- Released Kinetic Impact Debris Distribution (KIDD): Version 5.1
- Released CT-Analyst: Version 2
- Released Extended Air Defense Simulation (EADSIM) v11, Theater High Altitude Area Defense System (THAAD) Representation Benchmark for JPOW8 Wargame (WG)

- Released Battle space Environment Satellite Toolkit (BEST) R1.1, accepted by Government and currently in Beta-Test by selected participants from the BMD user community
- Released Commanders Analysis and Planning Simulation (CAPS) v 8.0, International Version
- Released Missile Defense Wargame (MDWAR) v 4.3 , 5.0, 5.1
- Developed Monthly Technical, Cost and Schedule Reports

FY 2005 Planned Accomplishments:

- Initiate and complete Model Assessments
- Assess Existing Threat and Environment Tools
- Define M&S Framework
- Define Common Environment and Threat Model (CETM)
- Demonstrate CETM v 0.5
- Define all M&S Sim Type Capabilities
- Plan, Build and Integrate CETM Version 1.0
- Define Criteria for Accuracy/Detail per Sim Type Capabilities
- Define and Develop SIM Type 1 use (Mission Effects) for Planning and Integration of BMDS With Other War fighting Mission Areas
- Define M&S Enterprise processes Release Version 1.0
- Release Parametric Endo-Exo Lethality Simulation (PEELS): Version 10.2, 11.0
- Release Post Engagement Ground Effects Model (PEGEM): Version 5.2, 6.0
- Release Kinetic Impact Debris Distribution (KIDD): Version 5.6, 6.0
- Release Performance Assessment Workbench Software (PAWS): Version 2.0, 3.0
- Release CT-Analyst: Version 3
- Release EADSIM v12, THAAD Representation Accreditation to support Wargames
- Release BEST R1.2
- Release Next Generation Flowfield Solver
- Release FLITES
- Release Strategic Scene Generation Model (SSGM) 99.4
- Release Optical Signature Code (OSC) v 20.2
- Release Missile Defense Wargame (MDWAR) v 5.2, 6.0, 6.1
- Develop Monthly Technical, Cost and Schedule Reports
- Develop Reference Manuals, User Manuals, Methodology Manuals, Configuration Manuals, Assessment Reports and Vision Documents

FY 2006 Planned Program:

- Release Type 1 Capabilities
- Define and Develop M&S Framework
- Release Common Environment and Threat Model (CETM) v 1.0, define and begin development on CETM v 2.0 functionality
- Define and Develop SIM Type 2 and 3 Capabilities
- Type 2 Capabilities (Engagement Effects) for Capability Assessment, C2BMC CONOPS Development and Training

- Type 3 Capabilities (Engineering Effects) for Engineering Design, Integration, Testing and Verification of Element and Component Specifications
- Develop foundation for International M&S
- Begin Collaboration with International partners on defining requirements and interfaces for an open system modeling framework
- Complete M&S Enterprise processes Release Version 1.0
- Release Parametric Endo-Exo Lethality Simulation (PEELS): Version 11.2, 11.4
- Release Post Engagement Ground Effects Model (PEGEM): Version 6.2, 6.4
- Release Kinetic Impact Debris Distribution (KIDD): Version 6.2, 6.4
- Release CT-Analyst: Version 4
- Release EADSIM, v13, THAAD Representation Accreditation to support Wargames
- Release BEST R2
- Release SOCRATES-P
- Release Optical Signature Code (OSC) 21
- Release Commanders Analysis and Planning Simulation (CAPS) v 9.0 and 9.1
- Release Missile Defense Wargame (MDWAR) v 6.2, 7.0
- Develop Monthly Technical, Cost and Schedule Reports
- Develop Reference Manuals, User Manuals, Methodology Manuals, Configuration Manuals, Assessment Reports and Vision Documents

FY 2007 Planned Program:

- Release Type 2 Capabilities
- Continue to Develop M&S Framework
- Continue to Update Common Environment and Threat Model (CETM)
- Continue to Develop SIM Type 1,2,3 Capabilities
- Continue Collaboration with International partners on defining requirements and interfaces for an open system modeling framework
- Continuous process improvement of M&S Enterprise processes
- Release Parametric Endo-Exo Lethality Simulation (PEELS): Version 12.0
- Release Post Engagement Ground Effects Model (PEGEM): Version 7.0
- Release Kinetic Impact Debris Distribution (KIDD): Version 7.0
- Release CT-Analyst: Version 5
- Release EADSIM, v14, THAAD Representation Accreditation to support Wargames
- Release BEST R3
- Release Optical Signature Code (OSC) 22
- Release Commanders Analysis and Planning Simulation (CAPS) v 10.0 and 10.1
- Release Missile Defense Wargame (MDWAR) v 7.1
- Develop Monthly Technical, Cost and Schedule Reports
- Develop Reference Manuals, User Manuals, Methodology Manuals, Configuration Manuals, Assessment Reports and Vision Documents

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

	FY 2004	FY 2005	FY 2006	FY 2007
Product Test and Operations	0	0	23,148	23,741
RDT&E Articles (Quantity)	0	0	0	0

Note: FY04 and FY05 funding for this effort was under the Ballistic Missile Defense System (BMDS), Program Element 0603890C, Project 0101

FY 2004 Accomplishments:

- Developed Accreditation Reports of Selected Models, Simulations, and Federations
- Developed Benchmark Reports for Wargames, Ground Tests, Flight Tests, Constructive Analysis, and Training
- Developed Test Assessment Reports for Wargames, Ground Tests, Flight Tests, Constructive Analysis, and Training
- Developed, Sustained and Modernized M&S Laboratories and Computational Facilities

FY 2005 Planned Accomplishments:

- Accredit Selected Models, Simulations, and Federations for Wargames, Ground Tests, Flight Tests, Constructive Analysis, and Training
- Develop Accreditation Reports:
  - Parametric Endo-Exo Lethality Simulation (PEELS): THAAD Live Fire Test and Evaluation (LFT&E)
  - Post Engagement Ground Effects Model (PEGEM), Kinetic Impact Debris Distribution (KIDD): Operational, JC05
  - CT-Analyst: Operational
- Develop Benchmark Reports for Wargames, Ground Tests, Flight Tests, Constructive Analysis, and Training
- Develop Test Assessment Reports for Wargames, Ground Tests, Flight Tests, Constructive Analysis, and Training
- Develop, Sustain and Modernize M&S Laboratories and Computational Facilities

FY 2006 Planned Program:

- Accredit Selected Models, Simulations, and Federations for Wargames, Ground Tests, Flight Tests, Constructive Analysis, and Training
- Develop Accreditation Reports:
  - Parametric Endo-Exo Lethality Simulation (PEELS): KI, THAAD, Aegis, Ground-based Midcourse Defense (GMD)
  - Post Engagement Ground Effects Model (PEGEM), Kinetic Impact Debris Distribution (KIDD): Kinetic Interceptors (KI), Operational, Joint Project Optic Windmill (JPOW) IX
  - CT-Analyst: Operational
- Develop Benchmark Reports for Wargames, Ground Tests, Flight Tests, Constructive Analysis, and Training
- Develop Test Assessment Reports for Wargames, Ground Tests, Flight Tests, Constructive Analysis, and Training
- Develop, Sustain and Modernize M&S Laboratories and Computational Facilities

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

FY 2007 Planned Program:

- Accredit Selected Models, Simulations, and Federations for Wargames, Ground Tests, Flight Tests, Constructive Analysis, and Training
- Develop Accreditation Reports:
  - Parametric Endo-Exo Lethality Simulation (PEELS): THAAD, Aegis, GMD
  - Post Engagement Ground Effects Model (PEGEM), Kinetic Impact Debris Distribution (KIDD): Operational, JC07
  - CT-Analyst: Operational
- Integrate and Test SIM Type 1,2,3 use
- Develop Benchmark Reports for Wargames, Ground Tests, Flight Tests, Constructive Analysis, and Training
- Develop Test Assessment Reports for Wargames, Ground Tests, Flight Tests, Constructive Analysis, and Training
- Develop, Sustain and Modernize M&S Laboratories and Computational Facilities

	FY 2004	FY 2005	FY 2006	FY 2007
Systems Engineering and Integration (SE&I)	0	0	11,145	11,590
RDT&E Articles (Quantity)	0	0	0	0

Note: FY04 and FY05 funding for this effort was under the Ballistic Missile Defense System (BMDS), Program Element 0603890C, Project 0101

M&S Program Management is leading an integrated MDA team approach using skills from government, industry, and academia. M&S Program Management is responsible for managing a team of government, FFRDCs/UARCs and SETA to provide a comprehensive plan for M&S based on needs and expectations for IDO and Block 04. These needs and expectations include sustaining the legacy M&S tools, establishing and aligning enterprise M&S processes, defining a Common Environment and Threat Model (CETM), developing an integrated BMDS M&S open framework, and building an M&S foundation for international missile defense initiatives

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

D. Acquisition Strategy

The M&S acquisition strategy is to build an integrated open system framework for Block 06 and beyond. The initial phase of the strategy will involve detailed M&S requirements engineering and legacy M&S tools. The results of the requirements engineering and legacy M&S tool assessment will drive the use, modify, make, or buy decisions that roll selected M&S Tools into the developing Integrated BMDS M&S Framework that supports the spiral development of the BMDS.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Model Development										
M&S Tools	CPAF	Northrop Grumman/ JNIC/CO	0	0	N/A	10,549	1Q	10,820	1Q	21,369
M&S Tools	TM	DSI, GSA/ AL	0	0	N/A	2,693	1Q	2,762	1Q	5,455
M&S Tools	CPAF	TBE/ PEO ASMD/AL	0	0	N/A	4,711	1Q	4,831	1Q	9,542
M&S Tools	CPAF	PEO ASMD/ AL	0	0	N/A	837	1Q	859	1Q	1,696
M&S Tools	CPAF	JTAGS/ PEO ASMD/AL	0	0	N/A	591	1Q	607	1Q	1,198
M&S Tools	Various	SBIRS/MCS/ Air Force	0	0	N/A	419	1Q	429	1Q	848
M&S Tools	Various	JNIC/ CO	0	0	N/A	628	1Q	644	1Q	1,272
M&S Tools	MIPR	GMD/ AL	0	0	N/A	837	1Q	859	1Q	1,696
M&S Tools	MIPR	SPAWAR/ CA	0	0	N/A	1,832	1Q	1,879	1Q	3,711

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
M&S Tools	Various	USA Net Design Facility/ PEO ASMD/AL	0	0	N/A	523	1Q	537	1Q	1,060
M&S Tools	MIPR	THAAD/ AL	0	0	N/A	1,884	1Q	1,933	1Q	3,817
M&S Tools	CPAF	Lockheed Martin/ PA	0	0	N/A	2,094	1Q	2,147	1Q	4,241
M&S Tools	Various	Patriot	0	0	N/A	471	1Q	483	1Q	954
M&S Tools	MIPR	Photon Research Associates/ VA	0	0	N/A	6,176	1Q	6,335	1Q	12,511
M&S Tools	CPFF	NRL/ Washington, DC	0	0	N/A	2,408	1Q	2,469	1Q	4,877
M&S Tools	CPFF	AFRL-PR/ CA	0	0	N/A	837	1Q	859	1Q	1,696
M&S Tools	CPFF	AFRL-VS/ MA	0	0	N/A	209	1Q	215	1Q	424
M&S Tools	CPFF	AFRL-MN/ FL	0	0	N/A	105	1Q	107	1Q	212
M&S Tools	CPFF	AFRL-SN/ OH	0	0	N/A	105	1Q	107	1Q	212
M&S Tools	CPFF	SMDC/ AL	0	0	N/A	628	1Q	644	1Q	1,272
M&S Tools	MIPR	NASIC/ OH	0	0	N/A	209	1Q	215	1Q	424
M&S Tools	MIPR	MISIC/ AL	0	0	N/A	209	1Q	215	1Q	424
M&S Tools	FFP	SPARTA/ CA	0	0	N/A	53	1Q	55	1Q	108

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603890C Ballistic Missile Defense System Core

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
M&S Tools	CPIF	TBE/ SMDC/AL	0	0	N/A	1,926	1Q	1,976	1Q	3,902
M&S Tools	MIPR	ITT, GSA/ AL	0	0	N/A	2,319	1Q	2,378	1Q	4,697
M&S Tools	FFP	CSC/ SMDC/GA	0	0	N/A	900	1Q	923	1Q	1,823
M&S Tools	FFP	Dynetics/ SMDC/GA	0	0	N/A	262	1Q	268	1Q	530
M&S Tools	MIPR	Miltec, GSA/ GA	0	0	N/A	916	1Q	939	1Q	1,855
M&S Tools	MIPR	BAE, GSA/ GA	0	0	N/A	1,612	1Q	1,653	1Q	3,265
M&S Tools	FFP	NRL/ VA	0	0	N/A	497	1Q	510	1Q	1,007
M&S Tools	MIPR	FBX-T/ VA	0	0	N/A	837	1Q	859	1Q	1,696
*M&S Framework	CPAF	TBD	0	0	N/A	21,110	1Q	21,649	1Q	42,759
Product Test and Operations										
M&S Tools	TM	DSI, GSA/ SMDC/AL	0	0	N/A	309	1Q	317	1Q	626
M&S Tools	CPIF	TBE/ SMDC/AL	0	0	N/A	314	1Q	322	1Q	636
M&S Tools	MIPR	SPARTA/ VA	0	0	N/A	398	1Q	408	1Q	806
Computational Facilities	Various	VARIOUS	0	0	N/A	22,127	1Q	22,694	1Q	44,821
Subtotal Support Costs			0	0		92,535		94,907		187,442

Remarks

Previous Year funding for this effort was under the Ballistic Missile Defense System (BMDS), Program Element 0603890C, Project 0101.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

*The M&S Framework represents funding for the Block 06 common M&S framework for all system level models. The M&S framework will model the entire BMDS for all venues. We have defined the requirements for the architecture, implementation framework and simulation uses. The acquisition strategy to transition to an open architecture approach will include legacy M&S tools, FFRDCs/UARCs, SETA and laboratories and other computational facilities.

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 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 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Systems Engineering and Integration (SE&I)										
SETA	FFP	MDA/ VA	0	0	N/A	2,234	1Q	2,323	1Q	4,557
FFRDCs/UARCs and other government labs	FFRDC	JHU/APL/ MD	0	0	N/A	4,352	1Q	4,526	1Q	8,878
FFRDCs/UARCs and other government labs	FFRDC	Aerospace/ CA	0	0	N/A	441	1Q	458	1Q	899
FFRDCs/UARCs and other government labs	FFRDC	MIT/LL/ MA	0	0	N/A	743	1Q	773	1Q	1,516
FFRDCs/UARCs and other government labs	FFRDC	MITRE/ VA	0	0	N/A	1,267	1Q	1,318	1Q	2,585
FFRDCs/UARCs and other government labs	FFRDC	Torch Industries/ VA	0	0	N/A	80	1Q	83	1Q	163
Gov`t Personnel		MDA/ VA	0	0	N/A	1,872	1Q	1,947	1Q	3,819
Travel			0	0	N/A	156	1Q	162	1Q	318

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603890C Ballistic Missile Defense System Core

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Management Services			0	0		11,145		11,590		22,735

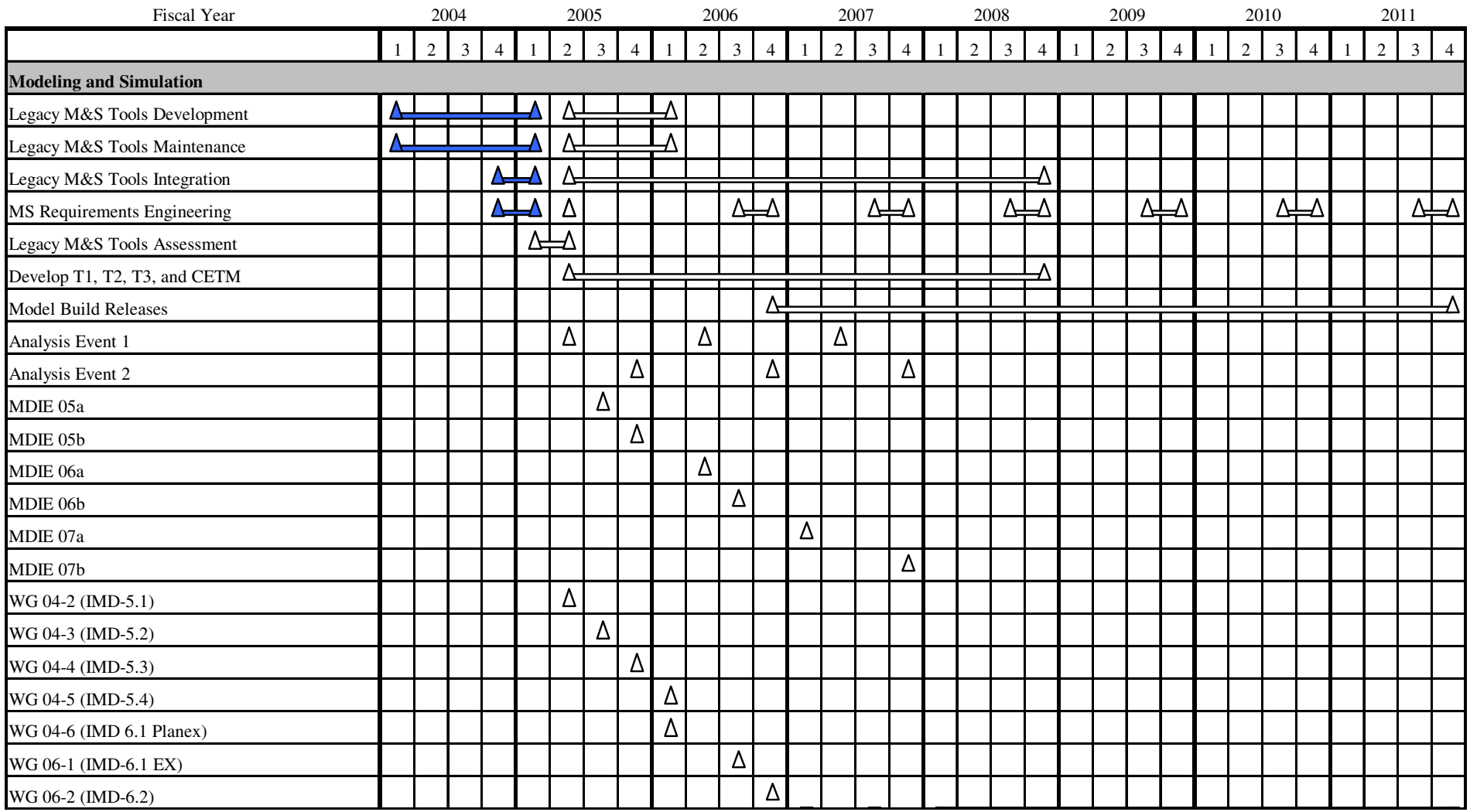
Remarks

Previous Year funding for this effort was under the Ballistic Missile Defense System (BMDS), Program Element 0603890C, Project 0101

Project Total Cost			0	0		103,680		106,497		210,177

Remarks
Previous Year funding for this effort was under the Ballistic Missile Defense System (BMDS), Program Element 0603890C, Project 0101

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**



Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Modeling and Simulation																																
WG 06-3 (IMD-7.1)													Δ																			
WG 06-4 (IMD-7.2)															Δ																	
Constructive Analysis																	Δ															Δ
MDIE Events																	Δ															Δ
War game Events																	Δ															Δ

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Modeling and Simulation								
Legacy M&S Tools Development	1Q-4Q	1Q-4Q	1Q					
Legacy M&S Tools Maintenance	1Q-4Q	1Q-4Q	1Q					
Legacy M&S Tools Integration	4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q			
MS Requirements Engineering	4Q	1Q-2Q	3Q-4Q	3Q-4Q	3Q-4Q	3Q-4Q	3Q-4Q	3Q-4Q
Legacy M&S Tools Assessment		1Q-2Q						
Develop T1, T2, T3, and CETM		2Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q			
Model Build Releases			4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Analysis Event 1		2Q	2Q	2Q				
Analysis Event 2		4Q	4Q	4Q				
PEELS: Version 10.1 Release	2Q							
MDIE 05a		3Q						
MDIE 05b		4Q						
MDIE 06a			2Q					
MDIE 06b			3Q					
MDIE 07a				1Q				
MDIE 07b				4Q				
WG 04-2 (IMD-5.1)		2Q						
WG 04-3 (IMD-5.2)		3Q						
WG 04-4 (IMD-5.3)		4Q						
WG 04-5 (IMD-5.4)			1Q					
WG 04-6 (IMD 6.1 Planex)			1Q					
WG 06-1 (IMD-6.1 EX)			3Q					
WG 06-2 (IMD-6.2)			4Q					
WG 06-3 (IMD-7.1)				1Q				
WG 06-4 (IMD-7.2)				3Q				
Constructive Analysis					1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
MDIE Events					1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q
Wargame Events					1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q

Common Environment and Threat Model, CETM; Missile Defense Integration Exercise, MDIE; War Game (WG)

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0107 Safety, Quality and Mission Assurance	0	0	19,694	20,800	21,123	21,890	20,654	21,143
RDT&E Articles Qty	0	0	0	0	0	0	0	0

Note:
The prior year (PY) and the FY05 funding for Software Acquisition Improvement Program in the amount of $4,362M is captured in Project 0101, and for Safety, Quality, and Mission Assurance the amount of $12,000M is captured in PE 0603882C Project 0602.

A. Mission Description and Budget Item Justification

The Missile Defense Agency Safety, Quality and Mission Assurance Directorate (MDA/QS) is an essential element in ensuring the successful implementation of MDA Programs throughout the Ballistic Missile Defense System (BMDS). This Directorate is the BMDS change agent responsible for establishing a safety, quality and mission assurance centric culture, through disciplines and philosophy to bear upon the development and fielding of the BMDS. As a critical activity in MDA BMDS efforts, The Safety, Quality and Mission Assurance Directorate's mission is to develop and implement policies, perform engineering and technical studies and to foster and ensure MDA system-wide safety, quality and mission assurance (SQMA). This Directorate is also responsible for implementing the 2003 Defense Authorization Act, Section 804, which requires MDA/BMDS to establish and implement a program to improve the software acquisition process. The MDA/BMDS SQMA and software acquisition improvement activities performed by this Directorate encompass the development, engineering, testing, production, and fielding of ballistic missile defense elements under the cognizance of MDA. The efforts of this Directorate enables the development, testing and fielding of an effective, reliable, and safe missile defense capability. Within the Safety, Quality and Mission Assurance Directorate, responsibilities are functionally allocated to four groups; Assurance Integration, Mission Assurance, Quality Assurance and Safety.

To ensure the BMDS can meet its performance, schedule, quality, safety, and mission assurance requirements, MDA SQMA principles have been applied throughout each individual element and the BMDS as a whole. These functions include establishment of MDA BMDS safety plans, development and maintenance of the MDA/BMDS Mission Assurance Provisions (MAP), BMDS development and maintenance of Mission Assurance Provision Implementation Plans (MAIP), independent technical assessments of BMDS element SQMA efforts, establishing relationships with DOD and Military Service SQMA organizations, instituting SQMA in MDA/BMDS acquisitions and establishing a Quality-centric culture and implementation to ensure mission success. SQMA is key to providing the effective war-fighting capability and ensuring all phases including life-cycle support are addressed within the confines on the BMDS.

Personnel: Provides funding for government salaries and benefits at the Missile Defense Agency that are associated with safety, quality, and mission assurance.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Safety, Quality and Mission Assurance	0	0	19,694	20,800
RDT&E Articles (Quantity)	0	0	0	0

The prior year (PY) and the FY05 funding for Software Acquisition Improvement Program in the amount of $4,362M is captured in Project 0101, and for Safety, Quality, and Mission Assurance the amount of $12,000M is captured in PE 0603882C Project 0602.

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

FY 2005 Planned Accomplishments:

- Develop Mission Assurance Provisions (MAP) for all BMDS elements
- Coordinate implementation of Mission Assurance Implementation Plans (MAIP)
- Implement Safety, Quality, and Mission Assurance forums
- Embed QS personnel in MDA organizations to provide BMDS Quality and Mission Assurance expertise
- Provide technical support to MDA Programs and the BMDS to develop and implement required safety, quality, and mission assurance requirements
- Establish a BMDS integrated MDA Metrics Program
- Participant in the BMDS Joint Reliability, Availability, Maintainability Evaluation Team (JRMET)
- Implement and maintain MDA's Safety and Quality Concerns Hotline
- Establish MDA safety policies and requirements for MDA and the BMDS
- Develop Capability Verification and Assessment addendum detailing the capability of the BMDS to operate safely for Block 04
- Establish a MDA Safety Review Board
- Establish MDA Safety Council and BMDS Safety Working Groups
- Develop MDA Mishap Investigation Program
- Develop Range Safety mediation, augmentation, and commonality program
- Establish MDA BMDS Safety Officer Program
- Perform Occupational Safety and Health Inspections of MDA facilities
- Develop a Software Acquisition Program Improvement Program Plan (SAIPP)
- Pilot MDA Software Readiness Levels (SWRLs)
- Revise and implement MDA Software Acquisition Process Framework (MSAPF)
- Develop Software Acquisition Training/Education Program (SAT/EP)

FY 2006 Planned Program:

- Implement MDA Assurance Provisions
- Assess implementation of BMDS MAIPs through assessments to ensure mission success
- Conduct MDA BMDS Safety, Quality, and Mission Assurance forums
- Embed QS personnel in MDA BMDS organizations to provide Quality and Mission Assurance expertise
- Provide technical support to MDA Programs and BMDS to develop and implement required safety, quality, and mission assurance requirements
- Implement an integrated BMDS MDA Metrics Program
- Participant in the BMDS Joint Reliability, Availability, Maintainability Evaluation Team (JRMET)
- Implement and maintain MDA's Safety and Quality Concerns Hotline
- Revise MDA safety policies and requirements for MDA and the BMDS
- Develop Capability Verification and Assessment addendum detailing the capability of the BMDS to operate safely for Block 06
- Implement a MDA Safety Review Board
- Implement MDA Safety Council and BMDS Safety Working Groups
- Implement MDA Mishap Investigation Program
- Conduct Independent Safety Assessments/Reviews of MDA Programs and BMDS

- Implement Range Safety mediation, augmentation, and commonality program
- Establish MDA BMDS Safety Officer Program
- Perform Occupational Safety and Health Inspections of MDA facilities
- Implement Software Acquisition Program Improvement Program Plan (SAIPP)
- Implement MDA Software Readiness Levels (SWRLs)
- Implement MDA Software Acquisition Process Framework (MSAPF)
- Develop Software Acquisition Training/Education Program (SAT/EP)
- Develop MDA Software Verification and Validation Program (MSVVP)

FY 2007 Planned Program:

- Implement MDA Assurance Provisions
- Assess implementation of BMDS MAIPs through assessments to ensure mission success
- Conduct MDA BMDS Safety, Quality, and Mission Assurance forums
- Embed QS personnel in MDA BMDS organizations to provide Quality and Mission Assurance expertise
- Provide technical support to MDA Programs and BMDS to develop and implement required safety, quality, and mission assurance requirements
- Revise/update the integrated BMDS MDA Metrics Program
- Participant in the BMDS Joint Reliability, Availability, Maintainability Evaluation Team (JRMET)
- Implement and maintain MDA's Safety and Quality Concerns Hotline
- Implement MDA safety policies and requirements for MDA and the BMDS
- Revise Capability Verification and Assessment addendum detailing the capability of the BMDS to operate safely
- Implement a MDA Safety Review Board
- Implement MDA Safety Council and BMDS Safety Working Groups
- Conduct MDA Mishap Investigation Program
- Conduct Independent Safety Assessments/Reviews of MDA Programs and BMDS
- Conduct Range Safety mediation, augmentation, and commonality program
- Implement MDA BMDS Safety Officer Program
- Perform Occupational Safety and Health Inspections of MDA facilities
- Continued update and implementation of the Software Acquisition Program Improvement Program Plan (SAIPP)
- Conduct MDA Software Readiness Levels (SWRLs)
- Conduct MDA Software Acquisition Process Framework (MSAPF)
- Implement Software Acquisition Training/Education Program (SAT/EP)
- Develop MDA Software Verification and Validation Program (MSVVP)

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

D. Acquisition Strategy

The execution of program activities is a collaborative effort involving subject matter experts composed of Government, Federally Funded Research and Development Centers (FFRDC), University Affiliated Research Centers (UARC), Science and Engineering and Technical Assistance (SETA), and Industry. In addition extensive involvement by the major defense contractors responsible for implementation of the MAP requirements is required. Safety, Quality, and Mission Assurance and Software Acquisition Improvement initiates will be executed by MDA directorates and industry contractors.

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

I. Product Development Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Safety, Quality and Mission Assurance										
S/W Acq	SS/TM	STSC/ Hill AFB, UTAH	0	0	N/A	400	1/2Q	400	1/2Q	800
S/W Acq	C/FFP	Sparta/ AL, MD, VA	0	0	N/A	500	1/2Q	500	1/2Q	1,000
Subtotal Product Development			0	0		900		900		1,800

Remarks

The prior year (PY) and the FY05 funding for Software Acquisition Improvement Program in the amount of $4,362M is captured in Project 0101, and for Safety, Quality, and Mission Assurance the amount of $12,000M is captured in PE 0603882C Project 0602.

II. Support Costs Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Safety, Quality and Mission Assurance										
OGA Spt	SS/MIPR	NSWC Corona/ CA, VA	0	0	N/A	2,700	1/2Q	2,800	1/2Q	5,500
Safety & Quality	C/FFP	SRS Tech/ VA, MD	0	0	N/A	3,800	1/2Q	4,000	1/2Q	7,800
Mission Assurance	C/FFP	Swales/ VA, MD, NM, CA	0	0	N/A	2,800	1/2Q	3,526	1/2Q	6,326
Metrics	C/FFP	BAE/SMDC/ AL, VA, MD	0	0	N/A	1,844	1/2Q	1,844	1/2Q	3,688
Safety, Quality, and Mission Assurance	C/MIPR	ONR-BMPCOE/ VA, MD	0	0	N/A	600	1/2Q	600	1/2Q	1,200

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
OGA Spt	SS/MIPR	NSWC Crane/ IN, VA	0	0	N/A	700	1/2Q	700	1/2Q	1,400
Govt Spt	SS/MIPR	NSWC VA Beach/ VA	0	0	N/A	200	1Q	200	1Q	400
S/W Acq OGA Spt	SS/TM	SMDC/ AL	0	0	N/A	400	1Q	400	1Q	800
S/W Acquisition	C/FFRDC	SEI/ PA, VA	0	0	N/A	510	1Q	510	1Q	1,020
Subtotal Support Costs			0	0		13,554		14,580		28,134

Remarks

The prior year (PY) and the FY05 funding for Software Acquisition Improvement Program in the amount of $4,362M is captured in Project 0101, and for Safety, Quality, and Mission Assurance the amount of $12,000M is captured in PE 0603882C Project 0602.

III. Test and Evaluation Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Subtotal Test and Evaluation										

Remarks

Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

IV. Management Services Cost ($ in Thousands)

Cost Categories:	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award/ Oblg Date	FY 2006 Cost	FY 2006 Award/ Oblg Date	FY 2007 Cost	FY 2007 Award/ Oblg Date	Total Cost
Safety, Quality and Mission Assurance										
QS Civilian Salaries	TM	MDA/ VA, MD, AL, CA, AZ, HI, AK, MA, NJ, FL, AR, UT, MH	0	0	N/A	5,240		5,320		10,560
Subtotal Management Services			0	0		5,240		5,320		10,560

Remarks

The prior year (PY) and the FY05 funding for Software Acquisition Improvement Program in the amount of $4,362M is captured in Project 0101, and for Safety, Quality, and Mission Assurance the amount of $12,000M is captured in PE 0603882C Project 0602.

Project Total Cost			0	0		19,694		20,800		40,494

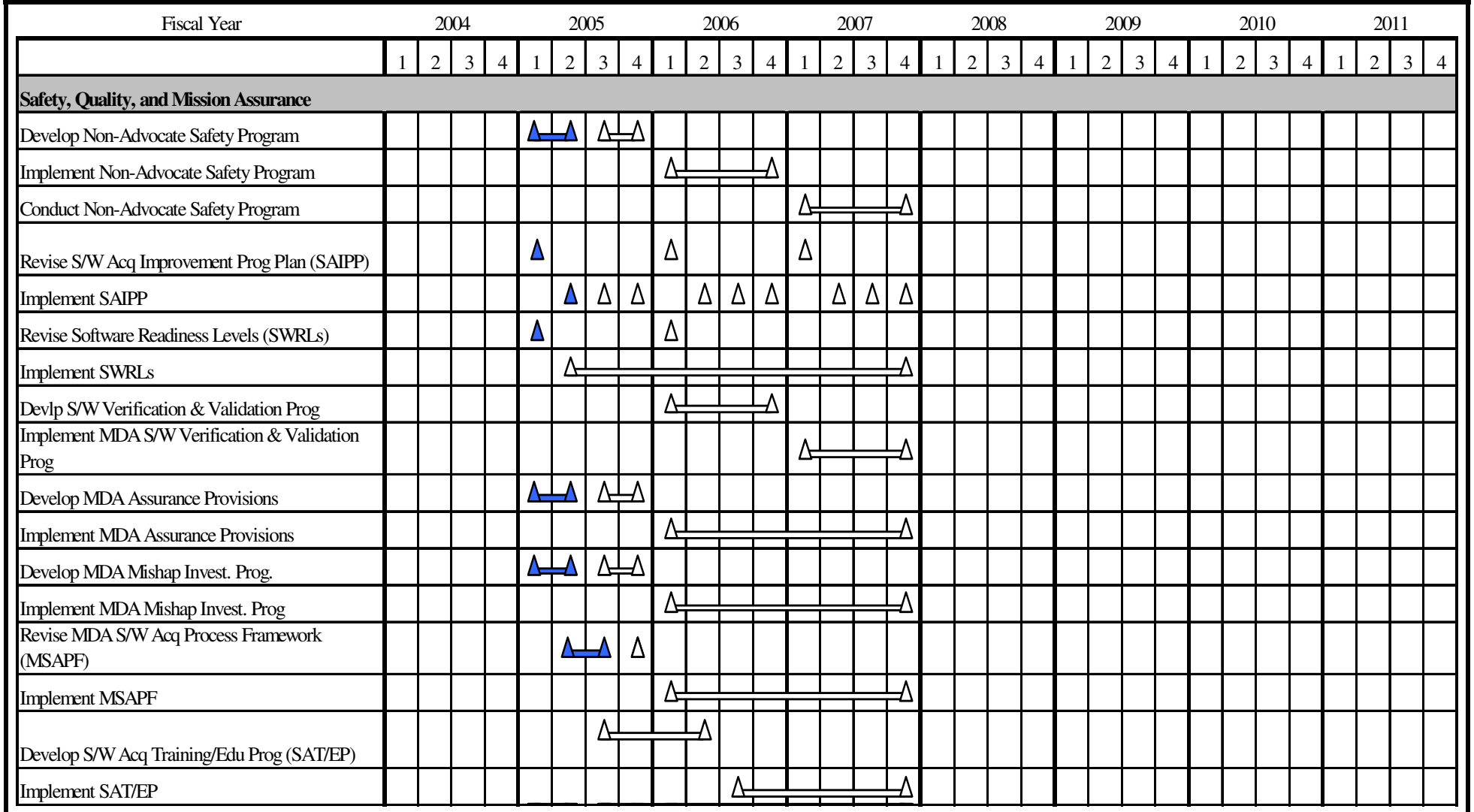
Remarks

Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile

Date
February 2005

APPROPRIATION/BUDGET ACTIVITY
RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)

R-1 NOMENCLATURE
0603890C Ballistic Missile Defense System Core



Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Fiscal Year	2004				2005				2006				2007				2008				2009				2010				2011			
	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
Safety, Quality, and Mission Assurance																																
Range Safety mediation, augment, & commonality Prg																																
Coord MDA Mission Assurance Implement Pln																																
Assess MDA Mission Assurance Implement Pln																																
Maintain MDA/BMDS Safety and Quality Hotline																																
Develop Integrated Metrics Program																																
Implement Integrated MDA Metrics Prog																																
Revise/Update Integrated Metrics Program																																
Independent Safety Assessments/Reviews																																
Perform Occupational Safety & Health Inspections																																
Establish MDA/BMDS Safety Review Board & Council																																
Implement MDA/BMDS Safety Review Board & Council																																
Revise MDA/BMDS Safety Policy & reqmts																																
Implement MDA/BMDS Safety Policy & reqmts																																
Implement SQMA Forums																																
Conduct SQMA Forums																																
Establish MDA/BMDS Safety Officer Program																																
Implement MDA/BMDS Safety Officer Program																																

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Safety, Quality, and Mission Assurance								
Develop Non-Advocate Safety Program		1Q-4Q						
Implement Non-Advocate Safety Program			1Q-4Q					
Conduct Non-Advocate Safety Program				1Q-4Q				
Revise S/W Acq Improvement Prog Plan (SAIPP)		1Q	1Q	1Q				
Implement SAIPP		2Q,3Q,4Q	2Q,3Q,4Q	2Q,3Q,4Q				
Revise Software Readiness Levels (SWRLs)		1Q	1Q					
Implement SWRLs		2Q-4Q	1Q-4Q	1Q-4Q				
Devlp S/W Verification & Validation Prog			1Q-4Q					
Implement MDA S/W Verification & Validation Prog				1Q-4Q				
Develop MDA Assurance Provisions		1Q-4Q						
Implement MDA Assurance Provisions			1Q-4Q	1Q-4Q				
Develop MDA Mishap Invest. Prog.		1Q-4Q						
Implement MDA Mishap Invest. Prog			1Q-4Q	1Q-4Q				
Revise MDA S/W Acq Process Framework (MSAPF)		2Q-4Q						
Implement MSAPF			1Q-4Q	1Q-4Q				
Develop S/W Acq Training/Edu Prog (SAT/EP)		3Q-4Q	1Q-2Q					
Implement SAT/EP			3Q-4Q	1Q-4Q				
Range Safety mediation, augment, & commonality Prg		1Q-4Q	1Q-4Q	1Q-4Q				
Coord MDA Mission Assurance Implement Pln		1Q-4Q						
Assess MDA Mission Assurance Implement Pln			1Q-4Q	1Q-4Q				
Maintain MDA/BMDS Safety and Quality Hotline		1Q-4Q	1Q-4Q	1Q-4Q				
Develop Integrated Metrics Program		1Q-4Q						
Implement Integrated MDA Metrics Prog			1Q-4Q	1Q-4Q				
Revise/Update Integrated Metrics Program				3Q-4Q	1Q			
Independent Safety Assessments/Reviews			1Q-4Q	1Q-4Q				
Perform Occupational Safety & Health Inspections		2Q-4Q	1Q-4Q	1Q-4Q				
Establish MDA/BMDS Safety Review Board & Council		1Q-4Q						
Implement MDA/BMDS Safety Review Board & Council			1Q-4Q	1Q-4Q				

Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Revise MDA/BMDS Safety Policy & reqmts		1Q-4Q						
Implement MDA/BMDS Safety Policy & reqmts			1Q-4Q	1Q-4Q				
Implement SQMA Forums		1Q-4Q						
Conduct SQMA Forums			1Q-4Q	1Q-4Q				
Establish MDA/BMDS Safety Officer Program		1Q-4Q						
Implement MDA/BMDS Safety Officer Program			1Q-4Q	1Q-4Q				

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
0602 Program-Wide Support	36,684	8,946	12,278	24,318	29,067	29,636	26,717	23,153
RDT&E Articles Qty	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

Program-Wide Support provides funding for common support functions across the entire program such as strategic planning, program integration, cost estimating, contracting, financial management to include preparation of financial statements, reimbursement of financial services provided by DFAS, internal review and audit, earned-value management, and program assessment. Includes costs for both government civilians performing these functions as well as support contractors providing government staff augmentation in these areas. Applies to costs at the MDA HQ as well as its Executing Agents in the Services: Army Space and Missile Defense Command, Army PEO Space and Missile Defense, Office of Naval Research, and various Air Force laboratory and acquisition activities. Other costs include physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses at the various MDA Executing Agent locations, which at the MDA HQ are generally funded from the Management Headquarters Program Element (0901598C). Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

B. Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Civilian Salaries and Support	36,684	8,946	12,278	24,318
RDT&E Articles (Quantity)	0	0	0	0

See Section A: Mission Description and Budget Item Justification

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
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PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
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PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)**	R-1 NOMENCLATURE **0603890C Ballistic Missile Defense System Core**

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Missile Defense Agency (MDA) Exhibit R-2 RDT&E Item Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/06 RDT&E Management Support**	R-1 NOMENCLATURE **0605502C Small Business Innovative Research - MDA**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total Program Element (PE) Cost	146,030	0	0	0	0	0	0	0
0510 Statutory & Mandated Programs	146,030	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification

This project explores innovative concepts pursuant to Public Law 102-564 (Small Business Research and Development Enhancement Act of 1992) which mandates a two-phase competition for small businesses with innovative technologies that can also be commercialized. The Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs will develop a variety of new dual-use technologies for possible future MDA BMDS needs. Dual-use means that the technologies will also be judged on their potential for future private sector investment both as a vehicle for reducing development time and cost, unit costs of new MDA BMDS technologies, and as a route to national economic growth through new commercial products. MDA will conduct the competition and the executing agents will award and manage the contracts.

Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
SBIR/STTR Awards	146,030	0	0	0

B. Program Change Summary Table	FY 2004	FY 2005	FY 2006	FY 2007
Previous President's Budget (FY 2005 PB)	0	0	0	0
Current President's Budget (FY 2006 PB)	146,030	0	0	0
Total Adjustments	146,030	0	0	0
Congressional Specific Program Adjustments	0	0	0	0
Congressional Undistributed Adjustments	0	0	0	0
Reprogrammings	0	0	0	0
SBIR/STTR Transfer	146,030	0	0	0
Adjustments to Budget Years	0	0	0	0

Missile Defense Agency (MDA) Exhibit R-2 RDT&E Item Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/06 RDT&E Management Support**	R-1 NOMENCLATURE **0605502C Small Business Innovative Research - MDA**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
PE 0603881C Ballistic Missile Defense Terminal Defense Segment	860,794	928,388	1,143,610	1,034,676	879,674	617,319	731,282	485,512	6,681,255
PE 0603882C Ballistic Missile Defense Midcourse Defense Segment	3,731,708	4,521,019	3,266,196	3,945,991	3,650,848	3,315,513	3,183,622	2,545,882	28,160,779
PE 0603883C Ballistic Missile Defense Boost Defense Segment	475,911	476,179	483,863	648,728	620,793	690,807	811,430	1,183,182	5,390,893
PE 0603884C Ballistic Missile Defense Sensors	417,814	577,297	529,829	995,711	1,214,008	1,186,134	1,069,208	1,018,614	7,008,615
PE 0603886C Ballistic Missile Defense System Interceptors	114,669	279,815	229,658	444,900	677,243	1,137,337	1,468,827	1,717,507	6,069,956
PE 0603888C Ballistic Missile Defense Test and Targets	616,773	720,818	622,357	684,170	608,282	643,119	661,362	670,092	5,226,973
PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
Air Force – Other Procurement	0	0	2,400	1,453	11,279	386	17,710	25,709	58,937
Air Force – Operations and Maintenance	0	17,600	7,964	11,712	33,830	33,080	34,119	35,398	173,703
Air Force – Military Personnel	0	0	3,628	7,640	8,332	8,535	8,826	9,129	46,090
Army – Operations and Maintenance	37,600	49,597	66,974	68,246	69,809	71,472	73,325	75,230	512,253
Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Missile Defense Agency (MDA) Exhibit R-2 RDT&E Item Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/06 RDT&E Management Support**	R-1 NOMENCLATURE **0901585C Pentagon Reservation**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total Program Element (PE) Cost	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725
0605 Pentagon Reservation Maintenance Reserve Fund (PRMRF)	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725

A. Mission Description and Budget Item Justification

The Administration and the Congress have committed to deploying a ballistic missile defense system as soon as technologically possible. In response to Presidential direction, MDA fielded an initial defensive capability in 2004 to address known threats. We began with the most mature components - a small number of sensors and interceptors and a fire control system - forming the foundation of an integrated and layered ballistic missile defense system (BMDS). The fielded system is limited, intended to support comprehensive development and testing while providing defense of the United States against attack by a limited number of ballistic missiles. Our objective remains a single integrated layered system with diverse basing options.

We have balanced fielding decisions with a comprehensive development program to deliver the maximum operational capability within the resources provided. The FY 2006 biennial budget submission, to include the FYDP years, emphasizes full integration of BMDS elements and components - that is, making the system work better as a single system - as well as continued development of capabilities that will close performance gaps in our current configuration. This program is balanced and funded to meet a broad spectrum of potential threats: 1) the size of the rogue nation threat; 2) the complexity of the rogue nation threat; 3) aggressive tactics to circumvent our current posture; and 4) the emergence of new threats. The Administration is committed to defending the American people against new threats of the 21st century and has called out deployment of effective missile defenses as an essential element of that effort.

This DoD directed Program Element started in FY 2001 to separately identify costs for the Pentagon Reservation Maintenance Reserve Fund (PRMRF). The PRMRF finances the following: real property operation and maintenance costs of the Pentagon and Federal Office Building Two and associated parking areas, the renovation of the Pentagon, the Remote Delivery Facility, and the Metro Entrance Facility Projects.

Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
PRMRF	16,251	13,761	17,386	15,586

This effort provides funding for real property operation costs to include maintenance and facility support costs associated with the Missile Defense Agency occupying Federal Office Building Two.

B. Program Change Summary Table	FY 2004	FY 2005	FY 2006	FY 2007
Previous President's Budget (FY 2005 PB)	14,327	13,884	12,958	12,850
Current President's Budget (FY 2006 PB)	16,251	13,761	17,386	15,586
Total Adjustments	1,924	-123	4,428	2,736
Congressional Specific Program Adjustments	0	0	0	0
Congressional Undistributed Adjustments	0	-123	0	0
Reprogrammings	1,924	0	0	0
SBIR/STTR Transfer	0	0	0	0
Adjustments to Budget Years	0	0	4,428	2,736

Missile Defense Agency (MDA) Exhibit R-2 RDT&E Item Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/06 RDT&E Management Support**	R-1 NOMENCLATURE **0901585C Pentagon Reservation**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
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PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
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Army National Guard – Operations and Maintenance	0	0	155	151	150	154	164	167	941
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Missile Defense Agency (MDA) Exhibit R-2 RDT&E Item Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/06 RDT&E Management Support**	R-1 NOMENCLATURE **0901598C Management Headquarters - MDA**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total Program Element (PE) Cost	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760
0601 Management Headquarters	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760

Note:
As addressed under PE 0603890C (BMDS Core), the Counterintelligence and Information Assurance efforts, each approximately $1M per year, were transferred beginning in FY 2005 to Project 0102 in the BMDS Core PE. Otherwise, the FY05 amount reflects a $25M Congressional reduction to FY05 budget request. The FY06 request reflects further reductions as a result of MDA's ongoing efforts to reduce Agency infrastructure, which will carry through into FY07. The increasing amounts in FY08 and FY09 are based on MDA moving to a consolidated location as part of the planned expansion of Arlington National Cemetery, with FY10 and FY11 costs again decreasing to reflect anticipated savings as a result of the consolidation.

A. Mission Description and Budget Item Justification

The Administration and the Congress have committed to deploying a ballistic missile defense system as soon as technologically possible. In response to Presidential direction, MDA fielded an initial defensive capability in 2004 to address known threats. We began with the most mature components - a small number of sensors and interceptors and a fire control system - forming the foundation of an integrated and layered ballistic missile defense system (BMDS). The fielded system is limited, intended to support comprehensive development and testing while providing defense of the United States against attack by a limited number of ballistic missiles. Our objective remains a single integrated layered system with diverse basing options. We have balanced fielding decisions with a comprehensive development program to deliver the maximum operational capability within the resources provided.

The FY 2006 biennial budget submission, to include the FYDP years, emphasizes full integration of BMDS elements and components - that is, making the system work better as a single system - as well as continued development of capabilities that will close performance gaps in our current configuration. This program is balanced and funded to meet a broad spectrum of potential threats: 1) the size of the rogue nation threat; 2) the complexity of the rogue nation threat; 3) aggressive tactics to circumvent our current posture; and 4) the emergence of new threats. The Administration is committed to defending the American people against new threats of the 21st century and has called out deployment of effective missile defenses as an essential element of that effort.

As prescribed by DoD Directive 5100.73, Major Headquarters Activities, signed by the Deputy Secretary of Defense on 13 May 1999, this Program Element funds costs associated with the operation of the headquarters and headquarters activities of the Missile Defense Agency. This project funds the following basic areas:

- Salaries and benefits for government civilian personnel assigned to the Agency headquarters, as well as training and professional development required to maintain mandatory Acquisition Certifications for the MDA workforce. Staff functions funded from this project include the Command Group and Chief of Staff, the Small and Disadvantage Business Utilization Office (SADBU), Workforce Management, General Counsel, Legislative Affairs, Financial Management to include a priority effort to improve Agency-wide financial statements, International Program Support with particular emphasis of Israeli and Japanese cooperative efforts, centralized oversight of classified programs, and management of all MDA facility, maintenance, and housekeeping activities.
- Related operational costs include leases for commercial office space, utilities and communications at both the leased facilities and Federal Office Building 2 (Navy Annex), shuttle bus service between the five major offices occupied by MDA personnel throughout the National Capitol Region (NCR), janitorial and maintenance contracts to ensure a healthy and productive work place, and leases for office equipment other than computers. This project also funds mission travel and relocation costs for new government civilian employees hired from outside the NCR.
- In addition to the direct costs for government civilian salaries and the MDA headquarters plant, this project also funds contractual support for Management Headquarters related efforts covering a broad spectrum of activities: from janitorial and maintenance services, travel office staffing, mail room operations, and contract secretarial support, to highly specialized skills such as certified accountants and auditors to help improve MDA's financial statements, attorney advisors to augment the General Counsel's office, international program specialists, employee benefit and training specialists, program analysts with specific skill sets to assist in tracking classified programs, and logistics/facility managers.

Missile Defense Agency (MDA) Exhibit R-2 RDT&E Item Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/06 RDT&E Management Support**	R-1 NOMENCLATURE **0901598C Management Headquarters - MDA**

Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Civilian Salaries & Support	40,388	54,245	54,958	51,973

This effort funds the basic costs for government civilian salaries and the operation of the MDA plant.

Civilian Salaries & Benefits: Funds MDA's civilian payroll.

Supplies: This effort provides for the materials and supplies to stock the Missile Defense Agency supply rooms.

Rents & Utilities: The rents and utilities for MDA leased offices.

Travel & Transportation: Provides funding mission travel, Permanent Change of Station, and any other transportations costs.

Service Contracts: Costs for service contracts such as office machines (copies, facsimile and printers), telephone service, leased vehicles, and various other service contracts.

Training: Provides funding for Missile Defense Agency civilian and military career development training.

	FY 2004	FY 2005	FY 2006	FY 2007
Support Contracts	51,712	59,532	44,369	43,470

This effort provides contractual services required to maintain and operate the MDA plant as well as augment the government civilian staff performing Agency-wide Management Headquarters functions:

Logistics and Administrative Support - janitorial and maintenance services, travel office staffing, mail room operations, and contract secretarial support.

Workforce Management - responsible for providing organization development consultation on corporate workforce management systems and issues. In addition, provides support for directing and managing the development, coordination, and execution of workforce management goals, objectives, policies, plans and programs for the Missile Defense Agency.

Financial Management - provides Ballistic Missile Defense Program accounting and fiscal policy for the Missile Defense Agency and Missile Defense Agency Executing Agents. In coordination with the Defense Finance and Accounting Service, the DoD Comptroller, and the DoD Inspector General, improve and enhance the MDA financial process leading to a clean opinion on the audited MDA financial statement.

Strategic Relations - provides support to the principal advisor for developing the strategy, analysis, planning and implementation for all strategic (international and interagency) programs.

Other Specialized Support - provides augmentation for management of classified programs, legal, logistics management, and support to the Director's office.

Missile Defense Agency (MDA) Exhibit R-2 RDT&E Item Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/06 RDT&E Management Support**	R-1 NOMENCLATURE **0901598C Management Headquarters - MDA**

B. Program Change Summary Table	FY 2004	FY 2005	FY 2006	FY 2007
Previous President's Budget (FY 2005 PB)	92,449	141,923	146,099	145,112
Current President's Budget (FY 2006 PB)	92,100	113,777	99,327	95,443
Total Adjustments	-349	-28,146	-46,772	-49,669
Congressional Specific Program Adjustments	0	-25,000	0	0
Congressional Undistributed Adjustments	0	-3,146	0	0
Reprogrammings	-349	0	0	0
SBIR/STTR Transfer	0	0	0	0
Adjustments to Budget Years	0	0	-46,772	-49,669

Missile Defense Agency (MDA) Exhibit R-2 RDT&E Item Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/06 RDT&E Management Support**	R-1 NOMENCLATURE **0901598C Management Headquarters - MDA**

C. Other Program Funding Summary

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	Total Cost
PE 0603175C Ballistic Missile Defense Technology	226,765	231,145	136,241	184,877	197,229	205,191	212,435	218,763	1,612,646
PE 0603879C Advanced Concepts, Evaluations and Systems	132,701	159,878	0	0	0	0	0	0	292,579
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PE 0603889C Ballistic Missile Defense Products	309,949	383,830	455,152	509,982	509,161	516,599	516,017	515,729	3,716,419
PE 0603890C Ballistic Missile Defense System Core	449,747	399,829	447,006	538,442	532,412	530,934	520,679	531,832	3,950,881
PE 0603891C Special Programs - MDA	0	0	349,522	482,903	826,173	1,097,252	1,015,198	1,244,072	5,015,120
PE 0605502C Small Business Innovative Research - MDA	146,030	0	0	0	0	0	0	0	146,030
PE 0901585C Pentagon Reservation	16,251	13,761	17,386	15,586	6,058	6,376	4,490	4,725	84,633
PE 0901598C Management Headquarters - MDA	92,100	113,777	99,327	95,443	98,984	98,728	81,492	81,760	761,611
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Army National Guard – Military Personnel	21,000	21,000	17,648	24,432	24,952	25,591	25,591	25,591	185,805
Navy – Operations and Maintenance	0	11,300	12,900	24,100	24,400	24,600	23,300	23,700	144,300
PAC-3/MEADS – RDT&E	433,728	344,978	304,973	336,959	465,395	521,791	522,418	502,961	3,433,203
PAC-3/MEADS – Missile Procurement	841,964	574,972	581,924	578,579	660,584	616,020	509,032	738,679	5,101,754

Department of Defense Exhibit R-2 RDT&E Budget Item Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/20**	R-1 NOMENCLATURE **0904903D Defense-Wide Resources**

COST ($ in Thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total PE Cost	0	0	0	0	1,950,912	1,952,703	1,993,500	1,741,451

The Missile Defense Agency program includes the use of these funds to support the program outlined in the Missile Defense narrative justification. For the purpose of this budget submission, these funds are reflected in, and associated content described in the following MDA Program Elements: Ballistic Missile Defense Terminal Defense Segment (PE 0603881C), Ballistic Missile Defense Midcourse Defense Segment (PE 0603882C), Ballistic Missile Defense Sensors (PE 0603884C), Ballistic Missile Defense System Interceptors (PE 0603886C), and Ballistic Missile Defense Products (PE 0603889C).

Department of Defense Exhibit R-2 RDT&E Budget Item Justification	Date **February 2005**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, DW/20**	R-1 NOMENCLATURE **0904903D Defense-Wide Resources**

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Missile Defense Agency

Fiscal Year 2006

RDT&E Construction Exhibit

February 2005

MISSILE DEFENSE AGENCY
FY 2006 RDT&E CONSTRUCTION PROGRAM

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MISSILE DEFENSE AGENCY
FY 2006 RDT&E CONSTRUCTION PROJECT SUMMARY
BY LOCATION

($ in Thousands)

State/Country/Installation/Project	Auth. Request	Approp. Request	New/Current Mission	Page No.
Major Construction				
Various Worldwide Locations				
Ballistic Missile Defense System (BMDS) Missile Defense Plan II (MDP II) – Phase II	0	31,200	New	4
Ballistic Missile Defense System (BMDS) Missile Defense Plan II Follow-On Part A	44,000	3,000	New	7
TOTAL RDT&E CONSTRUCTION	44,000	34,200		

1. COMPONENT	FY 2006 RDT&E CONSTRUCTION PROJECT DATA	2. DATE
MDA		February 2005

3. INSTALLATION AND LOCATION	4. PROJECT TITLE
Various Worldwide Locations	Ballistic Missile Defense System (BMDS) Missile Defense Plan II (MDP II) Phase II

5. PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJECT NUMBER	8. PROJECT COST ($000)
0603882C	312	MDA-538	Auth 0 Approp 31,200

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
PRIMARY FACILITIES				85,400
FGA Missile Launch Silos	LS	-	-	(34,800)
FGA GBMFC2 IFICS Data Terminal	LS	-	-	(6,900)
FGA Relocate Comm Lines/Road	LS	-	-	(1,900)
FGA Mechanical-Electrical Bldg	LS	-	-	(26,500)
FGA Upgrade Security System	LS	-	-	(1,100)
Thule Upgrade Early Warning Radar	LS	-	-	(14,200)
SUPPORTING FACILITIES				48,500
Electric Service	LS	-	-	(9,700)
Water, Sewer, Gas	LS	-	-	(9,900)
Paving, Walks, Curbs and Gutters	LS	-	-	(7,500)
Site Imp (6,000) /Demo (1,200)	LS	-	-	(7,200)
Other (Mob/Demob)	LS	-	-	(14,200)
SUBTOTAL				133,900
CONTINGENCY (5.0%)				6,695
TOTAL CONTRACT COST				140,595
SUPERVISION, INSPECTION/OH (7.5%)				10,545
TOTAL REQUEST				151,140
TOTAL REQUEST ROUNDED				151,200
INSTALLED EQPT-OTHER APPROPRIATIONS (NON-ADD)				(250,300)

10. DESCRIPTION OF PROPOSED CONSTRUCTION: This project extends and enhances the Ballistic Missile Defense System (BMDS) Ground-based Mid-course Defense (GMD) Test Bed and Initial Defensive Operations Capabilities program at various worldwide locations. In FY2005 the project was authorized $157.0 million and appropriated $40.3 million for Phase I. The FY 2006 request is $31.2 million of appropriations for Phase II. The FY2007 request of $85.5 million will complete the project. At Fort Greely, Alaska (FGA), MDP II provides 14 missile launch silos, a GMD Battle Management Fire Control and Communication (GBMFC2) an In-flight Interceptor Communications System (IFICS) Data Terminal, a Mechanical-Electrical Building, and an upgrade to associated physical and electrical security systems. Upgrade will also be done to the Early Warning Radar facility at Thule, Greenland (Denmark). Supporting facilities include: water, sewer, gas and electric service; paving, walks, curbs and gutters; storm drainage; fire protection and alarm systems; site improvements; and telecommunications systems. Access for the handicapped will be provided.

11. REQUIRED: 1 EA ADEQUATE: NONE SUBSTANDARD: NONE

PROJECT: Construct Missile Defense Plan II Phase II at various locations worldwide to provide an additional layer of defense with increased capabilities consistent with MDA's missile defense mission.

1. COMPONENT	FY 2006 RDT&E CONSTRUCTION PROJECT DATA	2. DATE
MDA		February 2005

3. INSTALLATION AND LOCATION
Various Worldwide Locations

4. PROJECT TITLE	5. PROJECT NUMBER
Ballistic Missile Defense System (BMDS) Missile Defense Plan II (MDP II) Phase II	MDA-538

11. REQUIREMENT (CONTINUED):

REQUIREMENT: This project is required to provide Missile Defense Plan II Phase II capability enhancements designed to incrementally improve MDA's ability to conduct and support enhanced Initial Defensive Operations. (New Mission)

CURRENT SITUATION: Missile Defense Agency is developing a Ballistic Missile Defense System to ensure operational equipment and missiles adequately meet technological and threat assessments. This project continues GMD execution of systematic spiral development and evolution acquisition through incremental capabilities enhancements. Missile Defense Plan II Phase II supplements the GMD Test Bed Program and Initial Defensive Operations Capability project for the BMDS and will enhance capabilities at Fort Greely.

IMPACT IF NOT PROVIDED: Planned enhancements of the GMD elements in support of MDA's BMDS will not be available for defensive operations. Ultimately, the full potential to defend the United States against limited ballistic missile attack under Initial Defensive Operations may not be achieved.

ADDITIONAL: Cost estimates are based upon parametric estimates and similar experience gained during the construction of Test Bed and Initial Defensive Operations facilities at Fort Greely, Alaska. This project is being coordinated with the appropriate physical security plans, and includes required physical security and/or combating terrorism measures. All required NEPA and/or EO 12114 analyses will be completed prior to the start of construction.

12. SUPPLEMENTAL DATA:

A. Design Data (Estimates)	
(1) Status	
(a) Date Design Started	OCT 2004
(b) Date 35% Design	JAN 2005
(c) Date Design Complete	MAR 2005
(d) Parametric Cost Estimating Used to Develop Costs	Yes
(e) Type of Design Contract	Design-Bid-Build and Design-Build
(2) Basis	
(a) Standard or Definitive Design	Yes
(b) Where Design was most recently used	Fort Greely, AK
(3) Total Design Cost	($000)
(a) Production of Plans and Specifications	3,093
(b) All other Design Costs	2,767
(c) Total Costs (c) = (a)+(b) or (d)+(e)	5,860
(d) Contract	4,160
(e) In-house	1,700
(4) Construction Contract Award Date	MAY 2005
(5) Construction Start Date	JUN 2005
(6) Construction Complete Date	SEP 2007

1. COMPONENT	FY 2006 RDT&E CONSTRUCTION PROJECT DATA	2. DATE
MDA		February 2005

3. INSTALLATION AND LOCATION
Various Worldwide Locations

4. PROJECT TITLE	5. PROJECT NUMBER
Ballistic Missile Defense System (BMDS) Missile Defense Plan II (MDP II) Phase II	MDA-538

12. SUPPLEMENTAL DATA (CONTINUED):

B. Equipment associated with this project provided from other appropriations:

Equipment Nomenclature	Procuring Appropriation	Fiscal Year Appropriated Or Requested	Cost ($000)
GBI Launch Equipment	RDT&E	2005	64,200
CN Comm Equipment	RDT&E	2006	74,300
GBI Launch Equipment	RDT&E	2006	51,400
IDT Tracking Equipment	RDT&E	2006	9,900
CN Comm Equipment	RDT&E	2007	43,600
IDT Tracking Equipment	RDT&E	2007	6,900

1. COMPONENT	FY 2006 RDT&E CONSTRUCTION PROJECT DATA	2. DATE
MDA		February 2005

3. INSTALLATION AND LOCATION6	4. PROJECT TITLE
Various Locations	Ballistic Missile Defense System (BMDS)_Missile Defense Plan II Follow-On Part A

5. PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJECT NUMBER	8. PROJECT COST ($000)
0603882C	312	MDA 549	Auth 44,000 Approp 3,000

9. COST ESTIMATES

ITEM	U/M (M/E)	QUANTITY	UNIT COST	COST ($000)
PRIMARY FACILITIES				28,551
Fort Greely-Missile Silos (10)	EA	10	2,328	(23,281)
Upgrade Early Warning Radar-Cape Cod Air Force Station	LS	-	-	(2,300)
Upgrade Early Warning Radar-Clear Air Force Station	LS	-	-	(3,000)
SUPPORTING FACILITIES				10,400
Electric Service	LS	-	-	(3,700)
Water, Sewer, Gas	LS	-	-	(2,900)
Paving, Walks, Curbs and Gutters	LS	-	-	(1,700)
Site Imp (0)/Demo ()	LS	-	-	(0)
Other (Mob/Demob)	LS	-	-	(2,100)
SUBTOTAL				38,951
CONTINGENCY (5.0%)				1,948
TOTAL CONTRACT COST				40,899
SUPERVISION, INSPECTION/OH (7.5%)				3,067
TOTAL REQUEST				43,966
TOTAL REQUEST ROUNDED				44,000
INSTALLED EQPT - OTHER APPROPRIATIONS (NON-ADD)				(366,000)

10. DESCRIPTION OF PROPOSED CONSTRUCTION: This project extends and enhances the Ballistic Missile Defense System Ground-Based Mid-Course Defense (GMD) Test Bed and Limited Defensive Operations (LDO) Capabilities program at various locations in the United States. This is a single year authorization request with multi-year appropriations. The FY 2006 request is for a total authorization of $44.0 million and an appropriation of $3.0 million. Additional appropriation requests will follow in the amount of $29.0 million, $8.0 million, $1.0 million and $3.0 million, in FY 2007, FY 2008, FY 2009 and FY 2010, respectively. Missile Defense Plan (MDP) II Follow-On provides 10 additional missile launch silos at Fort Greely, Alaska, and upgrades radars at Cape Cod Air Force Station and Clear Air Force Station via the Interim - Upgraded Early Warning Radar (I-UEWR) Program. Supporting facilities include: water, sewer and electric service; paving, walks, curbs and gutters; storm drainage; fire protection and alarm systems; and telecommunications systems.

11. REQUIRED:

Silos:	40 EA	ADEQUATE: 30 EA	SUBSTANDARD: NONE
UEWR:	7 EA	4 EA	3

PROJECT: Constructs 10 missile silos and upgrades two radars at various locations to provide increased capabilities consistent with Missile Defense Agency's (MDA's) mission.

REQUIREMENT: This project is required to provide capability enhancements designed to incrementally improve MDA's ability to conduct and support enhanced Initial Defensive Operations.

1. COMPONENT	FY 2006 RDT&E CONSTRUCTION PROJECT DATA	2. DATE
MDA		February 2005

3. INSTALLATION AND LOCATION
Various Locations

4. PROJECT TITLE	5. PROJECT NUMBER
Ballistic Missile Defense System (BMDS) Missile Defense Plan II Follow-On Part A	MDA 549

11. REQUIREMENT (CONTINUED)

CURRENT SITUATION: The MDA is developing a BMDS to ensure operational equipment and missiles adequately meet technological and threat assessments. This project continues GMD execution of systematic spiral development and evolutionary acquisition through incremental capability enhancements. MDP II Follow-On enhances the Initial Defensive Operational capability and will improve capabilities world wide.

IMPACT IF NOT PROVIDED If this project is not provided, planned enhancements of the GMD elements in support of MDA's BMDS will not be available for defensive operations. Ultimately, the full potential to defend the United States against limited ballistic missile attack under IDO will not be achieved.

ADDITIONAL INFORMATION: Cost estimates are based on parametric estimates and similar experience gained during the construction of Test Bed and Capability Enhancement / Initial Defensive Operations facilities at Fort Greely, Alaska. This project is being coordinated with the appropriate physical security plans, and required physical security and/or combating terrorism measures are included.

12. SUPPLEMENTAL DATA:

A. Design Data (Estimates)

(1) Status	
(a) Date Design Started	FEB 2005
(b) Date 35% Design	AUG 2005
(c) Date Design Complete	NOV 2005
(d) Parametric Cost Estimating Used to Develop Costs	Yes
(e) Type of Design Contract: Design-Bid-Build and Design Build	
(2) Basis of Design	
(a) Standard or Definitive Design	Yes
(b) Where Design was most recently used:	Fort Greely, AK
(3) Total Cost (000) (c)= (a)+(b) or (d)+(e)	($000)
(a) Production of Plans and Specifications:	$ 2,475
(b) All other Design Costs:	$ 2,025
(c) Total Design Costs:	$ 4,500
(d) Contract:	$ 3,500
(e) In-house:	$ 1,000
(4) Construction Contract Award	NOV 2005
(5) Construction Start	DEC 2005
(6) Construction Complete	SEP 2010

B. Equipment associated with this project provided from other appropriations:

Equipment Nomenclature	Procuring Appropriation	Fiscal Year Appropriated Or Requested	Cost ($000)
GBI Launch Equipment	RDT&E	2006 - 2009	266,000
I-UEWR Equipment	RDT&E	2006 - 2011	100,000
			366,000

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Missile Defense Agency

Fiscal Year 2007

RDT&E Construction Exhibit

February 2005

MISSILE DEFENSE AGENCY
FY 2007 RDT&E CONSTRUCTION PROGRAM

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MISSILE DEFENSE AGENCY
FY 2007 RDT&E CONSTRUCTION PROJECT SUMMARY
BY LOCATION

($ in Thousands)

State/Country/Installation/Project	Auth. Request	Approp. Request	New/Current Mission	Page No.
Major Construction				
Various Worldwide Locations				
Ballistic Missile Defense System (BMDS) Missile Defense Plan II – Phase III	0	85,500	New	4
Ballistic Missile Defense System (BMDS) Missile Defense Plan II Follow-On Part B	0	29,000	New	7
TOTAL RDT&E CONSTRUCTION	0	114,500		

1. COMPONENT	FY 2007 RDT&E CONSTRUCTION PROJECT DATA	2. DATE
MDA		February 2005

3. INSTALLATION AND LOCATION	4. PROJECT TITLE
Various Worldwide Locations	Ballistic Missile Defense System (BMDS) Missile Defense Plan II (MDP II) Phase III

5. PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJECT NUMBER	8. PROJECT COST ($000)
0603882C	312	MDA 539	Auth 0 Approp 85,500

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
PRIMARY FACILITIES				85,400
FGA Missile Launch Silos	LS	-	-	(34,800)
FGA GBMFC2 IFICS Data Terminal	LS	-	-	(6,900)
FGA Relocate Comm Lines/Road	LS	-	-	(1,900)
FGA Mechanical-Electrical Bldg	LS	-	-	(26,500)
FGA Upgrade Security System	LS	-	-	(1,100)
Thule Upgrade Early Warning Radar	LS	-	-	(14,200)
SUPPORTING FACILITIES				48,500
Electric Service	LS	-	-	(9,700)
Water, Sewer, Gas	LS	-	-	(9,900)
Paving, Walks, Curbs and Gutters	LS	-	-	(7,500)
Site Imp (6,000) /Demo (1,200)	LS	-	-	(7,200)
Other (Mob/Demob)	LS	-	-	(14,200)
SUBTOTAL				133,900
CONTINGENCY (5.0%)				6,695
ESTIMATED CONTRACT COST				140,595
SUPERVISION, INSPECTION/OH (7.5%)				10,545
TOTAL CONTRACT COST				151,140
TOTAL REQUEST ROUNDED				151,200
INSTALLED EQPT-OTHER APPROPRIATIONS				250,300

10. DESCRIPTION OF PROPOSED CONSTRUCTION: This project extends and enhances the Ballistic Missile Defense System (BMDS) Ground-Based Mid-Course Defense (GMD) Test Bed and Initial Defensive Operations (IDO) Capabilities program at various world-wide locations. This is a single year authorization request with multi-year appropriations. The FY 2005 request was for a total authorization of $157 million and an appropriation of $40.3 million. The FY 2006 appropriation request was for $31.2 million. The FY 2007 appropriation request is for $85.5 million. At Fort Greely, Alaska (FGA), MDP II provides 14 missile launch silos, GMD Battle Management Fire Control and Communications (GBMFC2) / In-flight Interceptor Communications System (IFICS) Data Terminal, a Mechanical-Electrical Building, and an upgrade to associated physical and electrical security systems. Upgrade will also be done to the Early Warning Radar facility at Thule, Greenland (Denmark). Supporting facilities include: water, sewer, gas and electric service; paving, walks, curbs and gutters; storm drainage; fire protection and alarm systems; site improvements; and telecommunications systems. Access for the handicapped will be provided.

11. REQUIREMENT: 1 EA ADEQUATE: NONE SUBSTANDARD: NONE

PROJECT: Construct Missile Defense Plan II (MDP II) Phase III at various locations world wide to provide an additional layer of defense with increased capabilities consistent with MDA's missile defense mission.

1. COMPONENT	FY 2007 RDT&E CONSTRUCTION PROJECT DATA	2. DATE
MDA		February 2005

3. INSTALLATION AND LOCATION
Various Worldwide Locations

4. PROJECT TITLE	5. PROJECT NUMBER
Ballistic Missile Defense System (BMDS) Missile Defense Plan II (MDP II) Phase III	MDA 539

11. REQUIREMENT (CONTINUED):

REQUIREMENT: This project is required to provide Missile Defense Plan II Phase III capability enhancements designed to incrementally improve MDA's ability to conduct and support enhanced Initial Defensive Operations. (New Mission)

CURRENT SITUATION: Missile Defense Agency is developing a Ballistic Missile Defense System to ensure operational equipment and missiles adequately meet technological and threat assessments. This project continues execution of systematic spiral development and evolution acquisition through incremental capabilities enhancements. Missile Defense Plan II, Phase III supplements the Test Bed Program and Initial Defensive Operations Capability project for the BMDS and will enhance capabilities at Fort Greely, AK.

IMPACT IF NOT PROVIDED: Planned enhancements of elements in support of MDA's BMDS will not be available for defensive operations. Ultimately, the full potential to defend the United States against limited ballistic missile attack under Initial Defensive Operations may not be achieved.

ADDITIONAL: Cost estimates are based upon parametric estimates and similar experience gained during the construction of Test Bed and Initial Defensive Operations facilities at Fort Greely, Alaska. This project is being coordinated with the appropriate physical security plans, and includes required physical security and/or combating terrorism measures. All required NEPA and/or EO 12114 analyses will be completed prior to the start of construction.

12. SUPPLEMENTAL DATA:

A. Design Data (Estimates)

(1) Status	
(a) Date Design Started	OCT 2004
(b) Date 35% Design	JAN 2005
(c) Date Design Complete	MAR 2005
(d) Parametric Cost Estimating Used to Develop Costs	Yes
(e) Type of Design Contract	Design-Bid-Build and Design-Build
(2) Basis	
(a) Standard or Definitive Design	Yes
(b) Where Design was most recently used	Fort Greely, AK
(3) Total Design Cost	($000)
(a) Production of Plans and Specifications	3,093
(b) All other Design Costs	2,767
(c) Total Cost (c) = (a)+(b) or (d)+(e)	5,860
(d) Contract	4,160
(e) In-house	1,700
(4) Construction Contract Award Date	MAY 2005
(5) Construction Start Date	JUN 2005
(6) Construction Complete Date	SEP 2007

1. COMPONENT	FY 2007 RDT&E CONSTRUCTION PROJECT DATA	2. DATE
MDA		February 2005

3. INSTALLATION AND LOCATION
Various Worldwide Locations

4. PROJECT TITLE	5. PROJECT NUMBER
Ballistic Missile Defense System (BMDS) Missile Defense Plan II (MDP II) Phase III	MDA 539

12. SUPPLEMENTAL DATA (CONTINUED):

B. Equipment associated with this project which will be provided from other appropriations:

Equipment Nomenclature	Procuring Appropriation	Fiscal Year Appropriated Or Requested	Cost ($000)
GBI Launch Equipment	RDT&E	2005	64,200
CN Comm Equipment	RDT&E	2006	74,300
GBI Launch Equipment	RDT&E	2006	51,400
IDT Tracking Equipment	RDT&E	2006	9,900
CN Comm Equipment	RDT&E	2007	43,600
IDT Tracking Equipment	RDT&E	2007	6,900

1. COMPONENT	FY 2007 RDT&E CONSTRUCTION PROJECT DATA	2. DATE
MDA		February 2005

3. INSTALLATION AND LOCATION6	4. PROJECT TITLE
Various Locations	Ballistic Missile Defense System (BMDS) Missile Defense Plan II Follow-On Part B

5. PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJECT NUMBER	8. PROJECT COST ($000)
0603882C	312	MDA 550	Auth 0 Approp 29,000

9. COST ESTIMATES

ITEM	U/M (M/E)	QUANTITY	UNIT COST	COST ($000)
PRIMARY FACILITIES				28,551
Fort Greely-Missile Silos (10)	EA	10	2,328	(23,281)
Upgrade Early Warning Radar-Cape Cod Air Force Station	LS	-	-	(2,300)
Upgrade Early Warning Radar-Clear Air Force Station	LS	-	-	(3,000)
SUPPORTING FACILITIES				10,400
Electric Service	LS	-	-	(3,700)
Water, Sewer, Gas	LS	-	-	(2,900)
Paving, Walks, Curbs and Gutters	LS	-	-	(1,700)
Site Imp (0)/Demo ()	LS	-	-	(0)
Other (Mob/Demob)	LS	-	-	(2,100)
ESTIMATED CONTRACT COST				38,951
CONTINGENCY (5%)				1,948
SUBTOTAL				40,899
SUPERVISION, INSPECTION/OH (7.5%)				3,067
TOTAL CONTRACT COST				43,966
TOTAL REQUEST ROUNDED				44,000
INSTALLED EQUIPMENT - OTHER APPROPRIATIONS				366,000

10. DESCRIPTION OF PROPOSED CONSTRUCTION: This project extends and enhances the Ballistic Missile Defense System Ground-Based Mid-Course Defense (GMD) Test Bed and Initial Defensive Operations (IDO) Capabilities program at various locations in the United States. In FY 2006 the project was authorized $44.0 million and appropriated $3.0 million. The FY 2007 request is $29.0 million of appropriations for Part B. Additional appropriation requests will follow in the amount of $8.0 million, $1.0 million, and $3.0 million in FY 2008, FY 2009 and FY 2010 respectively. Missile Defense Plan (MDP) II Follow-On provides 10 additional missile launch silos at Fort Greely, Alaska, and upgrades radars at Cape Cod Air Force Station and Clear Air Force Station via the Interim - Upgraded Early Warning Radar (I-UEWR) Program. Supporting facilities include: water, sewer and electric service; paving, walks, curbs and gutters; storm drainage; fire protection and alarm systems; and telecommunications systems.

11. REQUIRED:		ADEQUATE:	SUBSTANDARD:
(Silos):	40 EA	30 EA	NONE
(UEWR):	7 EA	4 EA	3

PROJECT: Constructs 10 missile silos and upgrades two radars at various locations to provide increased capabilities consistent with Missile Defense Agency's (MDA's) mission.

REQUIREMENT: This project is required to provide capability enhancements designed to incrementally improve MDA's ability to conduct and support enhanced Initial Defensive Operations.

1. COMPONENT MDA	FY 2007 RDT&E CONSTRUCTION PROJECT DATA	2. DATE February 2005

3. INSTALLATION AND LOCATION
Various Locations

4. PROJECT TITLE : Ballistic Missile Defense System (BMDS) Missile Defense Plan II Follow-On Part B	5. PROJECT NUMBER MDA 550

11. REQUIREMENT (CONTINUED):

CURRENT SITUATION: The MDA is developing a BMDS to ensure operational equipment and missiles adequately meet technological and threat assessments. This project continues GMD execution of systematic spiral development and evolutionary acquisition through incremental capability enhancements. MDP II Follow-On enhances the Limited Defensive Operational capability and will improve capabilities world wide.

IMPACT IF NOT PROVIDED: If this project is not provided, planned enhancements of the GMD elements in support of MDA's BMDS will not be available for defensive operations. Ultimately, the full potential to defend the United States against limited ballistic missile attack under IDO will not be achieved.

ADDITIONAL INFORMATION: Cost estimates are based on parametric estimates and similar experience gained during the construction of Test Bed and Capability Enhancement/Initial Defensive Operations facilities at Fort Greely, Alaska. This project is being coordinated with the appropriate physical security plans, and required physical security and/or combating terrorism measures are included.

12. SUPPLEMENTAL DATA:

A. Estimated Design Date

(1) Status	
(a) Date Design Started:	FEB 2005
(b) Date 35% Designed	AUG 2005
(c) Date Design Complete	NOV 2005
(d) Parametric Cost Estimating Used to Develop Costs	Yes
(e) Type of Design Contract:	Design-Bid-Build and Design Build
(2) Basis	
(a) Standard or Definitive Design	Yes
(b) Where Design Was Most Recently Used	Fort Greely, AK
(3) Total Design Cost (000)	
(a) Production of Plans and Specifications:	$ 2,475
(b) All Other Design Costs:	$ 2,025
(c) Total Costs (c) = (a)+(b) or (d)+(e)	$ 4,500
(d) Contract	$ 3,500
(e) In-house	$ 1,000
(4) Construction Contract Award	NOV 2005
(5) Construction Start	DEC 2005
(6) Construction Complete	SEP 2010

B. Equipment associated with this project which will be provided from other appropriations:

Equipment Nomenclature	Procuring Appropriation	Fiscal Year Appropriated Or Requested	Cost ($000)
GBI Launch Equipment	RDT&E	2006 - 2009	266,000
I-UEWR Equipment	RDT&E	2006 - 2011	100,000
		TOTAL EQUIPMENT COST	366,000

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Missile Defense Agency

Fiscal Year 2006

Military Construction Exhibit

February 2005

MISSILE DEFENSE AGENCY
FY 2006 MILITARY CONSTRUCTION PROGRAM

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MISSILE DEFENSE AGENCY
FY 2006 MILITARY CONSTRUCTION PROJECT SUMMARY
BY LOCATION

($ in Thousands)

State/Country/Installation/Project	Auth. Request	Approp. Request	New/Current Mission	Page No.
Major Construction				
Kwajalein Atoll, Kwajalein				
Emergency Services Facility, Meck Island	4,901	4,901	Current	4
Unspecified Minor Construction	0	0		
Planning and Design	0	0		
TOTAL MILITARY CONSTRUCTION	4,901	4,901		

1. COMPONENT	FY 2006 MILITARY CONSTRUCTION PROGRAM	2. DATE
MDA		February 2005

3. INSTALLATION AND LOCATION	4. COMMAND	5. AREA CONSTR. COST INDEX
Kwajalein Atoll, Kwajalein	Missile Defense Agency	2.29

6. PERSONNEL	PERMANENT			STUDENTS			SUPPORTED			
STRENGTH: N/A	OFFICER	ENLISTED	CIVILIAN	OFFICER	ENLISTED	CIVILIAN	OFFICER	ENLISTED	CIVILIAN	TOTAL
Tenant of U.S. Army										

7. INVENTORY DATA ($000)

A. TOTAL ACERAGE	.....	N/A
B. INVENTORY TOTAL AS OF	.....	N/A
C. AUTHORIZATION NOT YET IN INVENTORY	.....	0
D. AUTHORIZATION REQUESTED IN THE FY2006	.....	4,901
E. AUTHORIZATION REQUESTED IN THE FY2007	.....	0
F. PLANNED IN NEXT THREE PROGRAM YEARS	.....	0
G. REMAINING DEFICIENCY	.....	0
H. GRAND TOTAL	.....	4,901

8. PROJECTS REQUESTED IN THE FY2005 PROGRAM:

CATEGORY CODE	PROJECT TITLE	SCOPE	COST ($000)	DESIGN STATUS START	DESIGN STATUS COMPLETE
730-10	Emergency Services Facility	731 SM	4,901	Oct 04	Dec 05

9. FUTURE PROJECTS:

CATEGORY CODE	PROJECT TITLE	SCOPE	COST ($000)
	NONE		

10. MISSION OR MAJOR FUNCTIONS: The mission of the Missile Defense Agency is to develop and field an integrated Ballistic Missile Defense System capable of providing a layered defense for the homeland, deployed forces, friends and allies against ballistic missiles of all ranges in all phases of flight.

11. OUTSTANDING POLLUTION AND SAFETY DEFICIENCIES:

A. Air Pollution: N/A

B. Water Pollution: N/A

C. Occupational Safety and Health (OSH): N/A

1. COMPONENT	FY 2006 MILITARY CONSTRUCTION PROJECT DATA	2. DATE
MDA		February 05

3. INSTALLATION AND LOCATION	4. PROJECT TITLE
Kwajalein Atoll, Kwajalein	Emergency Services Facility

5. PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJECT NUMBER	8. PROJECT COST ($000)
0603888C	730-10	MDA-528	4,901

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
PRIMARY FACILITY				
Emergency Services Facility	SM (SF)	731 (7,866)	5421 (504)	3,963
SUPPORTING FACILITIES				420
Utilities	LS	-	-	(220)
Pavements (Roads, Parking, etc.)	LS	-	-	(85)
Site Improvements	LS	-	-	(95)
Antiterrorism Force Protection, Physical Security	LS	-	-	(20)
SUBTOTAL				4,383
CONTINGENCY (5.0%)				219
TOTAL CONTRACT COST				4,602
SUPERVISION, INSPECTION/OH (6.5%)				299
TOTAL REQUEST				4,901
TOTAL REQUEST (ROUNDED)				4,901
EQUIPMENT FROM OTHER APPROPRIATIONS (NON-ADD)				(50)

10. DESCRIPTION OF PROPOSED CONSTRUCTION: Construct an emergency services facility housing a single company fire department and the medical services operations on Meck Island. Facility will consist of reinforced concrete foundation and industrial floor slab, masonry exterior walls with rigid insulation and a standing seam metal roof system. Supporting facilities will include utilities (electric, water, sewer & communications), landscaping, roads, sidewalks, and site improvements.

Air Conditioning: 20 tons.

11. REQUIREMENT: 731 SM ADEQUATE: 0 SM SUBSTANDARD: 411 SM

PROJECT: Construct an Emergency Services Facility at Meck Island, Kwajalein Atoll (Current Mission).

REQUIREMENT: An adequate facility is required to house fire protection and medical emergency treatment services on Meck Island. This facility will house a medical treatment area, three large apparatus/equipment bays for two fire engines and one emergency medical vehicle, a combination dayroom and training area, sleeping areas, cooking/ dining room area, latrines, administration area, crew preparation working and storage areas and mechanical/electrical/communications rooms. Meck Island is the launch complex for test and evaluation of the test interceptor missiles and target missiles of the Ballistic Missile Defense System (BMDS). Due to the hazards associated with BMDS testing activities, emergency fire, medical and security services must be on-island during missile test activities.

1. COMPONENT	FY 2006 MILITARY CONSTRUCTION PROJECT DATA	2. DATE
MDA		February 05

3. INSTALLATION AND LOCATION
Kwajalein Atoll, Kwajalein

4. PROJECT TITLE	7. PROJECT NUMBER
Emergency Services Facility	MDA-528

11. REQUIREMENT (CONTINUED):

CURRENT SITUATION: The current emergency services facility has major structural deterioration in all its supporting walls and roof, is uneconomically repairable and is undersized to meet the functional requirements of the emergency services operations required for BMDS tests. Exterior doors and windows are in need of replacement and interior rooms such as restrooms and kitchen areas need improvement. The general condition of internal finishes, mechanical and electrical systems have deteriorated and are beyond their useful lives. These conditions create a degraded working environment and impair emergency services ability to support missile test requirements. Major electrical upgrades are needed for the main power service to the building and throughout the entire facility. Meck Island is approximately 40 km from the main support base facilities located on Kwajalein Island and this facility provides the only emergency service capability on Meck Island. The U.S. Army Corps of Engineers Fire Protection Risk Assessment has validated the need for a new facility.

IMPACT IF NOT PROVIDED: The current facility will continue to deteriorate and within a short period could be condemned as structurally unsound. Emergency fire protection and medical vehicles will have to be parked outside in a highly corrosive salt spray and fog environment and make-shift arrangements will have to be established for emergency personnel. Fire and medical personnel will be constrained in their ability to respond to emergencies that may result in increased mission risk and result in loss of life and government property. Failures within the BMDS test program can ultimately result in a deterioration of missile defense and the inability and delays to the United States to shield itself and its friends from foreign threats.

ADDITIONAL: All required Anti-Terrorist/Force Protection requirements will be designed into a new facility. The appropriate environmental analysis will be completed before construction.

12. SUPPLEMENTAL DATA:

A. Design Data (Estimates)

(1) Status	
(a) Estimated Start Date	OCT 2004
*(b) % complete as of 1 Jan 05	15%
*(c) 35% Complete as of	MAR 2005
(d) Date Design Complete	SEP 2005
(e) Parametric Cost Estimating Used to Develop Costs	Yes
(f) Type of Contract	Design-Bid-Build
(2) Basis	
(a) Standard or Definitive Design	Yes
(b) Where Design was most recently used	Military Ocean Terminal Sunny Point, NC

1. COMPONENT	FY 2006 MILITARY CONSTRUCTION PROJECT DATA	2. DATE
MDA		February 05

3. INSTALLATION AND LOCATION
Kwajalein Atoll, Kwajalein

4. PROJECT TITLE	7. PROJECT NUMBER
Emergency Services Facility	MDA-528

12. SUPPLEMENTAL DATA (CONTINUED):

(3) Total Design Cost	($000)
(a) Production of Plans and Specifications	285
(b) All other Design Costs	193
(c) Total Cost (c) = (a)+(b) or (d)+(e)	478
(d) Contract	315
(e) In-house	163
(4) Construction Contract Award Date	MAR 2006
(5) Construction Start Date	APR 2006
(6) Construction Complete Date	FEB 2008

* Indicates completion of Project Definition with Parametric Cost Estimate which is comparable to traditional 35% design to ensure valid scope, cost and executability.

B. Equipment associated with this project which will be provided from other appropriations:

Equipment Nomenclature	Funding Appropriation	Fiscal Year Appropriated	COST ($000)
Furnishings	RDT&E	2006	50

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Missile Defense Agency

Fiscal Year 2007

Military Construction Exhibit

February 2005

MISSILE DEFENSE AGENCY
FY 2007 MILITARY CONSTRUCTION PROGRAM

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MISSILE DEFENSE AGENCY
FY 2007 MILITARY CONSTRUCTION PROJECT SUMMARY
BY LOCATION

($ in Thousands)

State/Country/Installation/Project	Auth. Request	Approp. Request	New/Current Mission	Page No.
Major Construction	0	0		
Unspecified Minor Construction	3,084	3,084	N/A	4
Planning and Design	4,698	4,698	N/A	5
TOTAL MILITARY CONSTRUCTION	7,782	7,782		

1. COMPONENT	FY 2007 MILITARY CONSTRUCTION PROJECT DATA	2. DATE
MDA		February 05

3. INSTALLATION AND LOCATION	4. PROJECT TITLE
Various Worldwide Locations	Unspecified Minor Construction

5. PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJECT NUMBER	8. PROJECT COST ($000)
N/A	N/A	N/A	3,084

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
Unspecified Minor Construction	LS	-	-	3,084
SUBTOTAL				3,084
CONTINGENCY PERCENT (0.0%)				
TOTAL CONTRACT COST				3,084
SUPERVISION, INSPECTION & OVERHEAD (0.0%)				
TOTAL REQUEST				3,084
INSTALLED EQPT-OTHER APPROPRIATIONS				(0)

10. DESCRIPTION OF PROPOSED CONSTRUCTION: Provide a lump sum amount for unspecified construction projects, not otherwise authorized by law, having a funded cost of $1,500,000 or less, including normal construction, alteration or conversion of permanent or temporary facilities and projects having a funded cost of $3,000,000 or less that are intended solely to correct a deficiency that is life-threatening, health-threatening, or safety-threatening, in accordance with 10 USC Section 2805.

11. REQUIREMENT: As required

REQUIREMENT: These funds provide the means of accomplishing urgent unforeseen construction projects, which could occur during FY 2007. Included would be projects to support mission critical research and development requirements of the Ballistic Missile Defense System.

1. COMPONENT	FY 2007 MILITARY CONSTRUCTION PROJECT DATA	2. DATE
MDA		February 05

3. INSTALLATION AND LOCATION	4. PROJECT TITLE
Various Worldwide Locations	Planning and Design

5. PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJECT NUMBER	8. PROJECT COST ($000)
N/A	N/A	N/A	4,698

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
Planning and Design	LS	-	-	4,698
SUBTOTAL				4,698
CONTINGENCY PERCENT (0.0%)				
TOTAL CONTACT COST				4,698
SUPERVISION, INSPECTION & OVERHEAD (0.0%)				
TOTAL REQUEST				4,698
INSTALLED EQPT-OTHER APPROPRIATIONS				(0)

10. DESCRIPTION OF PROPOSED CONSTRUCTION: The funds requested will be used to provide financing for architectural and engineering services and construction design of Missile Defense Agency (MDA) Military Construction projects.

11. REQUIREMENT: As Required

REQUIREMENT: These planning and design funds are required to complete design for the FY 2008 MDA Military Construction program, initiate design of facilities in the FY 2009 MDA Military Construction program, complete design of unspecified minor military construction projects, not otherwise authorized by law, but which are anticipated to arise during FY 2007, and accomplish planning and design for major and complex technical projects with a long lead time to be included in subsequent MDA Military Construction programs. Included would be projects to support mission critical research and development requirements of the Ballistic Missile Defense System.

Missile Defense Agency
Fiscal Year (FY) 2006/2007 Budget Estimates

ACRONYMS AND ABBREVIATIONS

A	
A/D	Analog/Digital
AADC	Area Air Defense Commander
AAR	Angle-Angle Range
AARI	Angle-Angle Range Intensity
AAW	Anti-Air Warfare
Ao	Probability of Availability
ABL	Airborne Laser
ABM	Anti-Ballistic Missile
ABT	Air Breathing Targets
ACA	Attitude Control Assembly; Associate Contractor Agreements
ACCS	Air Command and Control System
ACD	Adversary Capability Document
ACD&P	Advanced Component Development and Prototypes
ACES	Advanced Concepts, Evaluations and Systems
ACFT	Advanced Concepts Flight Test
ACIC	Advanced Concepts Innovation Cell
ACN	Advance Change Notice
ACS	Attitude Control System
ACTD	Advanced Concept Technology Demonstration
ADAC	Applied Data Analysis Center
ADE	Aerial Dispersion Experiment
ADI	Advance Discrimination Initiative
ADLT	Advanced Discriminating LADAR Technology
ADM	Acquisition Decision Memorandum; Advanced Developmental Model; Adversary Data Packages
ADP	Arrow Deployability Program; Automated Data Processing
ADSAM	Air-Directed Surface-to-Air Missile
AdvDet	Advanced Detector
AECPP	Arrow Enhanced Component Production Program
AEOS	Advanced Electro-Optical System
AEU	Antenna Equipment Unit
AF	Air Force
AFB	Air Force Base
AFFTC	Air Force Flight Test Center, Edwards AFB, CA
AFOTEC	Air Force Operational Test & Evaluation Center
AIRS	Airborne Infrared Surveillance
AIRU	Advanced Inertial Reference Unit
AIS	Automated Information System
A/J	Anti-Jam

ACRONYMS AND ABBREVIATIONS

ALCOM	Alaskan Command
ALCOR	Advanced Research Project Agency Lincoln C-Band Observable Radar
ALI	AEGIS LEAP Intercept; Alpha/LAMP Integration
ALSS	Active Leak Sensor System
AMCOM	Aviation and Missile Command (Army)
AMD	Air and Missile Defense
AMDCCS	Air and Missile Defense Command and Control System
AMDWS	Army Missile Defense Warning System
AMPP	Arrow Manufacturing Production Program
AMOR	Army Missile Optical Range, Redstone Arsenal, AL
AMOS	Air Force Maui Optical Station
AMSC	Advanced Missile Signature Center
AoA	Analysis of Alternatives
AOP	Airborne Optics Platform; Advanced Optical Processor
AOR	Area of Responsibility
APL	Applied Physics Laboratory
APL/JHU	Applied Physics Laboratory, John Hopkins University, Baltimore, MD
APS	Airborne Pointing System
AR	All Reflective
ARC	Advanced Research Center, US Army, Huntsville, AL
ARC/SC	Advanced Research Center/Simulation Center
ARL	Army Research Laboratory
AS	Advanced Systems
ASIC	Advanced Systems Innovation Cell
ASIP	Arrow System Improvement Program; Application Specific Integrated Circuit
ASMD	Air, Space and Missile Defense
ASN	Advance Study Notice
AST	Airborne Surveillance Test Bed
ATEC	Army Test and Evaluation Command
ATO	Authority To Operate
AVD	Adversary Vignette Database
AVIT	Air Vehicle Integration and Test
AWS	Arrow Weapon System; AEGIS Weapon System
B	
BAA	Broad Agency Announcement
BCA	Business Case Analysis
BCFC	Beam Control Fire Control
BEC	BMC2 Element Capability
BEST	Battlespace Environments and Signatures Toolkit
BIC	Brigade Intelligence Cell (MDA)
BIRC	BMD Information Resources Center
BITC	Battle Management Integration Center
BM	Battle Management; Ballistic Missile

ACRONYMS AND ABBREVIATIONS

BM/C2	Battle Management, Command and Control
BM/C3	Battle Management, Command, Control, and Communications
BM/C4I	Battle Management, Command, Control, Communications, Computers, and Intelligence
BMD	Ballistic Missile Defense
BMDI	Ballistic Missile Defense Interoperability
BMDO	Ballistic Missile Defense Organization
BMDS	Ballistic Missile Defense System
BMDSU	Ballistic Missile Defense System University
BMOC	Backup MDA Operations Center
BMs	Ballistic Missiles
BOC	BMDS Operations Center
BOCA	BMDS On-Alert Capability Assessment
BOD	Board of Directors
BOIP	Basis of Issue Plan
BPA	Blanket Purchase Agreement
BPEx	Battle Planning Exercise
BPI	Boost-Phase Intercept
BPRRA	Baseline Production Readiness Risk Assessments
BSC	Battery Support Center
BSG	Beam Steering Generator
BSP	BMD Signal Processor
BTA	Beam Transfer Assembly
BTB	BMD Test Bed
BTEP	BMDS Training and Education Program
BV	Booster Verification
C	
C&A	Certification and Accreditation
C2	Command and Control
C2/BM	Command and Control/Battle Management
C2BMC	Command and Control, Battle Management, and Communications
C2BMC-X	C2BMC Experimental
C4I	Command, Control, Communications, Computers and Intelligence
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance
CAC	Common Access Card
CAIV	Cost As an Independent Variable
CAPS	Commanders Analysis and Planning System
CARD	Cost Analysis Requirements Document
CCB	Configuration Control Board
CCM	Counter-Countermeasures
CCMWG	Common Cost Methodology Working Group
CCTV	Closed-Circuit Television

ACRONYMS AND ABBREVIATIONS

CDA	Core Depot Assessment
CDI	Classification Discrimination Identification
CDR	Critical Design Review
CDTE	Configuration Development Test and Evaluation
CENTCOM	U.S. Central Command
CEKV	Complementary Exoatmospheric Kill Vehicle (EKV)
CETM	Common Environment and Threat Model
CEU	Cooling Equipment Unit
CIL	Component Integration Laboratory
CIMS	Corporate Information Management System
CIO	Chief Information Officer
CKEI	CONUS KEI (Classified Data Interface)
CLE	Command and Launch Equipment
CLIN	Contract Line Item Number
CLP	Corporate Lethality Program
CM	Cruise Missile; Countermeasures
CM/CCM	Countermeasures/Counter-Countermeasures
CMCM	Critical Measurements/Countermeasures
CMOC	Cheyenne Mountain Operations Center
CMP	Critical Measurements Program; Configuration Management Plan
CNA	Center for Naval Analyses
CNE	Communications Node Equipment
CNIP	C2BMC Network Interface Processor
COCOMS	Combatant Commanders
CODR	Concept Design Review
COI	Community of Interest
COIL	Chemical Oxygen-Iodine Laser
CONOPS	Concept of Operations
CONUS	Continental United States
COP	Common Operational Picture
COR	Contracting Officer's Representative
COTF	Commander Operational Test and Evaluation Force
COTS	Commercial Off-The-Shelf
CPAF	Cost-Plus-Award Fee
CPFF	Cost-Plus-Fixed Fee
CPG	Change Process Guide
CPIC	Capital Planning and Investment Control
CPIF	Cost-Plus-Incentive-Fee
CRA	Continuing Resolution Authority
CSC	Computer Science Corporation
CSEDS	Combat Systems Engineering Development Site, Moorestown, NJ
C-SiC	Carbon Silicon Carbide
CSO	Closely Space Object
CSOP	Combined Standard Operating Procedures

ACRONYMS AND ABBREVIATIONS

CTF	Controlled Test Flight
CTV	Control Test Vehicle
CV	Concept Validation
CVAP	Capabilities Verification and Assessment Plan
CVAR	Capabilities Verification and Assessment Report
CY	Calendar Year
D	
D&D	Design and Development
D&T	Development and Testing
DACS	Divert and Attitude Control System
DAE	Defense Acquisition Executive
DARPA	Defense Advanced Research Projects Agency
DCI	Director of Central Intelligence
DDL	Direct Downlink
DDR	Design Disclosure Review
DE	Directed Energy
DEBI	Dual Mode Experiment on Bowshock Interactions
DEM/VAL	Demonstration/Validation
DFAS	Defense Finance and Accounting Service
DFMA	Design for Manufacturing and Assembly
DGT	Distributed Ground Test
DIGISIM	Digital Simulation
DISA	Defense Information Systems Agency
DISN	Defense Information System Network
DLA	Defense Logistics Agency
DMC	Demonstration Model Canister
DMETS	Distributed, Multi-Echelon Training System
DML	Demonstration Model Launcher
DMPE	Depot Maintenance Plant Equipment
DMTP	Development Master Test Plan
DOD	Department of Defense
DoF	Degree of Freedom
DOJ	Department of Justice
DOTMLPF	Doctrine, Organization, Training, Material, Leadership, Personnel and Facilities
DOT&E	Director, Operational Test & Evaluation
DRB	Design Review Board
DREN	Defense Research and Engineering Network
DSB	Defense Science Board
DSCS	Defense Satellite Communication System
DSP	Defense Support Program
DST	Discriminating Sensor Technology
DT	Developmental Testing
DTRA	Defense Threat Reduction Agency

ACRONYMS AND ABBREVIATIONS

DT&E	Developmental Test and Evaluation
DT/OT	Development Test/Operational Test
DU	Developmental Unit
DVS-G	Defense Information System Network Video Services - Global
DVT	Development Verification Test
DWCF	Defense Working Capital Fund
E	
E/CCA	Element/Component Characterization Analysis
EA	Executing Agent
EADSIM	Extended Air Defense Simulation
EADTB	Extended Air Defense Test Bed
EASTCS	Eastern Asia Strategic and Theater Conflict Scenarios
EBCCD	Electron Bombarded Charge Couple Device
ECB	Engineering Capability Baseline; Engineering Change Board
ECF	Element Characterization Flight
ECM	Electronic Countermeasures
ECP	Engineering Change Proposal
ECS	Element Capability Specification
EDO	Emergency Defense Operations
EDU	Engineering Development Unit
EEPROM	Electronically Erasable Programmable Read-Only Memory
EEU	Electronic Equipment Unit
EFDI	Exploding Foil Deflagrating Initiator
EID	Element Interface Description
EIF	Element Integration Facility
EKV	Exoatmospheric Kill Vehicle
ELDT	Early Launch Detection and Tracking
EMD	Engineering and Manufacturing Development
EMRL	Engineering & Manufacturing Readiness Levels
ENOSC	Enterprise Network Operation Security Center
EO	Electro-optical
EOD	Explosive Ordnance Disposal
EO/IR	Electro-Optical/Infrared
EP	Enhancement Plan; Eagle Picher
ER	Engineering Release
ERB	Engineering Review Board
ESG	Engagement Sequence Group
ESGWG	Engineering Sequence Group Working Group
ESH	Environmental, Safety, and Health
ESI	External System Interface; Enterprise Software Initiative
ESOH	Environmental Safety and Occupational Health
ETDS	Enhanced Target Delivery System
ETEDDS	End-to-End Distributed Development System

ACRONYMS AND ABBREVIATIONS

ETM	Electronic Technical Manual
ETWG	Engineering Sequence Group Tabletop Working Group
EUCOM/IA	European Command Israeli Air Force
EWR	Early Warning Radar
F	
FAC	First Alert and Cueing
FAR	Federal Acquisition Regulations
FASP	Fly Alone Sensor Package
FBR	Forward-Based Radar
FBX	Forward Based Radar
FC&C	Fire Control & Communications
FDR	Forward Deployable Radar
FDS	Flight Demonstration System
FDTE	Force Development Test Experimentation
FEA	Federal Enterprise Architecture
FFP	Firm Fixed Price
FFRDC	Federally Funded Research and Development Center
FISMA	Federal Information Security Management Act
FISS	Foreign Intelligence and Security Services
FM	Fleet Missile
FMA	Foreign Material Acquisition
FMR	Federal Management Regulation
FOB2	Federal Office Building 2
FOR	Family of Radars
FORCE	Family of Radars Configuration Element
FOT	Follow On Technologies
FOV	Field of View
FP	Fixed Price
FPA	Focal Plane Array
FPGA	Field Programmable Gate Arrays
FS&E	Facilities, Siting & Environment
FTE	Full-Time Equivalents
FTS	Flight Termination System
FWG	Functional Working Group
FY	Fiscal Year
FYDP	Future Years Defense Program
G	
GaAs	Gallium Arsenide
GaN	Gallium Nitride
GBI	Ground Based Interceptor
GBMC3	Ground-based Battle Management Command, Control, and Communications
GBMFC2	GMD Battle Management Fire Control and Communications

ACRONYMS AND ABBREVIATIONS

GBR-P	Ground Based Radar Prototype
GCCS	Global Command and Control System
GCCS-MD	Global Command & Control System-Missile Defense
GCN	Global Command Network; GMD Communications Network
GE(EAD)	German (Extended Air Defense)
GEM	Guidance Enhancement Missiles (PATRIOT)
GFC / C	GMD Fire Control and Communications
GFE	Government Furnished Equipment
GFF	Government Furnished Facilities
GFI	Government Furnished Information
GFS	Government Furnished Services
GFX	GFE, GFI, GFF and GFS
GIG	Global Information GRID
GM	Ground-based Midcourse
GMD	Ground-based Midcourse Defense
GMDS	Ground Missile Defense System
GMOC	GBMC3 Mission Operations Center
GN&C / Propulsion	Guidance Navigation and Control
GOI	Government of Israel
GPEA	Government Paperwork Elimination Act
GRADEX	Graduation Exercise
GTOM	Generalized Target Object Map
GTU	Ground Test Unit
GVMP	Government Verification Management Plan
H	
HAA	High Altitude Airship
HAENS	High Altitude Exoatmospheric Nuclear Survivability
HALO	High Altitude Observatory
HARDFAC	Hardware Facility
HBCU/MI	Historically Black Colleges and Universities/Minority Institutions
HBD	Hardness by Design
HCS	Host Center Service
HDTV	High Definition Television
HEL	High Energy Laser
HF	High Frequency
HF/HFOT/F	Hydrogen Fluoride/Hydrogen Fluoride Overtone/Deuterium Fluoride
HIC	Human in Control
HIL	Human-in-the-Loop; Hardware-in-the-Loop
HMI	Human Machine Interface
HQ	Headquarters
HRR	High Range Resolution
HSV	Huntsville, AL
HTI	Hyper temporal Infrared Sensor

ACRONYMS AND ABBREVIATIONS

HTK	Hit to Kill
HW/SW	Hardware/Software
HWIL	Hardware-in-the-Loop
I	
I&T	Integration and Testing
IA/CND	Information Assurance/Computer Network Defense
IAF	Israeli Air Force
IAI	Israel Aircraft Industries
IAM	Information Assurance Manager
IAO	Information Assurance Operation
IAOC	Information Assurance Operations Center
IAR	Integrated Assessment Review
IBR	Initial Baseline Review
ICAs	Industrial Capability Assessments
ICBM	Intercontinental Ballistic Missile
ICD	Interface Control Document
ICS	Interface Control Specifications
ICSS	Interim Contractor Support System
ICWG	Interface Control Working Group
IDC	Initial Defensive Capability
IDO	Initial Defensive Operations
IDR	Integrated Design Review
IDT	In-Flight Interceptor Communications System Data Terminal
IETM	Integrated Electronic Technical Manual
IFICS	In-Flight Interceptor Communications System
IFT	Integrated Flight Test
IFX	Integrated Flight Experiment
IGT	Integrated Ground Test
ILS	Integrated Logistics Support
ILSMT	Integrated Logistics Support Management Team
IM/IT	Information Management/Information Technology
IM/KM	Information Management/Knowledge Management
IMD	Integrated Missile Defense
IMDA	Integrated Missile Defense Analysis
IMDS	Israeli Missile Defense System
IMDWG	Integrated Missile Defense Wargame
IMOD	Israeli Ministry of Defense
IMP	Integrated Master Plan
IMS	Integrated Master Schedule: Information Management System
IMTP	Integrated Master Test Plan
IMU	Inertial Measurement Unit
INFOSEC	Information Security
INT'L	International

ACRONYMS AND ABBREVIATIONS

IOC	Initial Operational Capability
IOT&E	Initial Operational Test and Evaluation
IP	Integration Phase
IPP	Impact Point Prediction
IPR	In-Process Review
IPT	Integrated Product Team
IR	Infrared
IRBM	Intermediate Range Ballistic Missile
IRFPA	Infrared Focal Plane Array
IRT	Independent Review Team
IRU	Inertial Reference Unit
IS&T	Innovative Science and Technology
ISA&I	Israeli System Architecture and Integration
ISC	Intelligence Support Cell (MDA)
ISC2	Integrated Space Command and Control
ISEG	Independent Scientific and Engineering Group
ISSA	Inter-Service Support Agreement
ISTC	Integrated System Test Capability
ISTEF	Innovative Science and Technology Experimentation Facility
IT	Integrated Test; Information Technology
ITA	Innovative Technology & Analysis
ITAR	International Traffic in Arms Regulations
ITB	Israeli Test Bed
ITE	Integration, Test, and Experimentation
ITR	Integrated Technical Review
ITWAA	Initial Threat Warning Attack Assessment
IUEWR	Interim Upgraded Early Warning Radar
IV	Interceptor Vehicles
IV&V	Independent Verification and Validation
IWG	Integration Working Group
J	
JCR	Japan Cooperative Research
JCS EMI	Joint Spectrum Center Electro-Magnetic Interference
JCTV	Joint Control Test Vehicle
JDA	Japan Defense Agency
JDP	Joint Defensive Planning; Joint Data Planner
JEDA	Joint Engine for Defense Analysis
JFM	Joint Flight Mission
JHU	John Hopkins University
JHU/APL	John Hopkins University, Applied Physics Laboratory, Baltimore, MD
JITC	Joint Interoperability Test Command
JMOC	JNIC Mission Operations Center
JNIC	Joint National Integration Center, Falcon AFB, CO

ACRONYMS AND ABBREVIATIONS

JNICRDC	JNIC Research & Development Contract
JNTF	Joint National Test Facility, Falcon AFB, CO
JPO	Joint Project Office
JPOW	Joint Project Optic Windmill (Exercise)
JRE	Joint Range Extension
JREAP	Joint Range Extension Application Protocol
JROC	Joint Requirements Oversight Council
JSC	Joint Spectrum Center
JSCF	JNIC Satellite Control Facility
JTA	Joint Technical Architecture
JTAAS	JNIC Technical Advisory & Assistance Services
JTAMDO	Joint Theater Air and Missile Defense Organization
JTIDS	Joint Tactical Information Data System
JTO	Joint Technology Office
JWICS	Joint Worldwide Intelligence Communications System
JWSP	Joint Warfighter Support Program
K	
K	Kelvin
KA	Kill Assessment
KE	Kinetic Energy
KEI	Kinetic Energy Interceptor
KEISIM	Kinetic Energy Interceptor Simulation
Kft	Kilo Feet (1,000 feet)
KHILS	Kill Vehicle Hardware-in-the-Loop Simulation
KI	Kinetic Interceptor
KIA	Key Investment Area
KICS	KEI In-flight Communications System
KIDD	Kinetic Impact Debris
KLC	Kodiak Launch Complex
KMR	Kwajalein Missile Range, Marshall Islands
KPP	Key Performance Parameters
KTF	Kauai Test Facility, Kauai, HI
KV	Kill Vehicle
KV DACS	Kill Vehicle - Divert Attitude Control System
KW	Kinetic Warhead
L	
LADAR	Laser Detection and Ranging; Laser Radar
LANTCOM	Atlantic Command
LCC	Life Cycle Cost
LDACS	Liquid Divert and Attitude Control System
LDO	Limited Defensive Operations
LEAD	Library of Environmental Analysis Documents

ACRONYMS AND ABBREVIATIONS

LEAP	Lightweight Exoatmospheric Projectile
LFB	Liquid Fuel Booster
LFT&E	Live Fire Test and Evaluation
LFTB	Liquid Fuel Target Booster
LFTS	Liquid Fuel Target System
LIDAR	Light Detection and Ranging
LLNL	Lawrence Livermore National Laboratory, Livermore, CA
LMMFC	Lockheed Martin Missiles and Fire Control
LMMS	Lockheed Martin Missile Systems
LMSSC	Lockheed Martin Space Systems Company
LPE	Launch Point Estimate
LPP	Launch Point Prediction
LRALT	Long Range Air Launched Target
LRBM	Long Range Ballistic Missile
LRS&T	Long Range Surveillance and Tracking
LRIP	Low Rate Initial Production
LTP	Laser Technology Program
LUT	Limited User Testing
LWIR	Long Wave Infrared
M	
M&S	Modeling and Simulation; Materials and Structure
MAIP	Mission Assurance Implementation Plan
MANTECH	Manufacturing Technology
MARC	Missile Analysis and Warning Cell
MASINT	Measurement and Signature Intelligence
MCC	Mission Control Center
MCT	Mercury Cadmium Telluride
MD	Missile Defense
MDA	Missile Defense Agency
MDANET	Missile Defense Agency Network
MDCITA	Missile Defense CI Threat Assessment
MDDC	Missile Defense Data Center
MDE	Missile Defense Element
MDEx	Missile Defense Exercise
MDIE	Missile Defense Integrated Exercises
MDNT	Missile Defense National Team
MDNTB	Missile Defense National Team for BM/C2/COMM
MDNTB(I)	Missile Defense National Team for C2BMC
MDNTS	Missile Defense National Team/System Engineering & Integration
MDNTS(I)	Missile Defense National Team System (Industry)
MDS	Midcourse Defense Segment
MDSE	Missile Defense System Exerciser
MDSG	Missile Defense Support Group

ACRONYMS AND ABBREVIATIONS

MDTA	Missile Defense Threat Assessment
MDTJPO	Missile Defense Targets Joint Program Office
MDU	Monolithic Developmental Unit
MDWAR	Missile Defense Wargame Analysis Resource
MDWG	Missile Defense Working Group
MEADS	Medium Extended Air Defense System
MI	Minority Institutions
MIDS	Management Initiative Decisions
MILCON	Military Construction
MIP	Master Integration Plan
MIPR	Military Interdepartmental Purchase Request
MIT	Miniature Interceptor Technology
MIT/LL	Massachusetts Institute of Technology, Lincoln Laboratory, Lexington, MA
MITS	MHZ Intensity and Tilt Sensor
MKV	Multiple (Miniature) Kill Vehicle
MLP	Mobile Launch Platform
MMC	Metal Matrix Composites
MMIC	Multi-Mission Integration Cell; Microwave Monolithic Integrated Circuits
MMW	Millimeter Wave
MOC	Missile Defense Agency Operations Center
MOS	Military Occupational Specialty
MOST	Multiple Target Tracking Optical Sensor Array Technology
MOU	Memorandum of Understanding
MPAT	Measurements Program Assessment Team
MRBM	Medium Range Ballistic Missile
MRFDL	Multi-Spectral Radio Frequency Datalink
MRL	Multiple Rocket Launcher; Mission Requirements Letter
MRP	Missile Round Pallet
MRT	Medium Range Target
MSAPF	MDA Software Acquisition Process Framework
MSE	Multiple Simultaneous Engagement
MSTAR	Missile Defense Science, Technology & Research
MSTP	Micro Satellite Technology Program
MSWG	Modeling and Simulation Working Group
MSX	Midcourse Space Experiment
MTA	Main Thrust Assembly
MTSC	MDA Technical Support Center
MUA	Military Utility Assessment
MWIR	Medium Wave Infrared
N	
N/UWSS	North American Air Defense/US Commander-in-Chief Space Command Warfighter Support System
NAMEADSM	NATO Medium Extended Air Defense System Management Agency

ACRONYMS AND ABBREVIATIONS

NATO	North Atlantic Treaty Organization
NAWC	Naval Air Warfare Center
NBC/HE	Nuclear Biological Chemical/High Explosive
NCIS	Naval Criminal Investigative Service
NCR	National Capital Region
NEA STCS	Northeast Asia Strategic and Theater Conflict Scenarios
NEPA	National Environmental Policy Act
NFIRE	Near Field Infrared Experiment
NFR	Near Field Range
NGI	Next Generation Internet
NGST	Northrop Grumman Space Technology
NHTF	National Hover Test Facility, Edwards AFB, CA
NLT	No Later Than
NMD	National Missile Defense
NORAD	North American Air Defense Command
NORTHCOM	US Northern Command
NOSC	Network Operation Security Center
NPO	National Product Office
NRL	Naval Research Laboratory, Washington, DC
NRT	Near Real-time
NSIRP	National Sensors Integration and Rapid Prototyping
NSPD	National Security Presidential Directive
NSWC	Naval Surface Warfare Center
NTE	Not to Exceed
O	
OBV	Objective Boost Vehicle
ODA	Optical Data Analysis
ODC	Other Direct Cost
OGA	Other Government Agencies
OLG	OTA Liaison Group
OMB	Office of Management and Budget
ONIR	Overhead Non-imaging Infrared
OPLAN	Operations Plan
OPTEVFOR	Navy's Operational Test & Evaluation Force
ORD	Operational Requirements Document
O&M	Operations and Maintenance
O&S	Operations and Support
OSD	Office of the Secretary of Defense
OT	Operational Test
OTA	Operational Test Authority
OT&E	Operational Test and Evaluation
OTHR	Over The Horizon Radar
OUSD (ATL)	Office of Under Secretary of Defense (Acquisition, Technology & Logistics)

ACRONYMS AND ABBREVIATIONS

P	
PAC	Patriot Advanced Capability
PACOM	U.S. Pacific Command
PAC-3	Patriot Advanced Capability-3
PAM	Planning and Allocation Matrix
PART	Program Assessment Rating Tool
PB	President's Budget
PBL	Performance Based Logistics
PCIL	Prime Consolidated Integration Laboratory
PDM	Program Decision Memorandum
PD/V	Program Definition/Validation
PDR	Preliminary Design Review
PDRR	Program Definition and Risk Reduction
PE	Program Element
PEELS	Parametric Exo/Endoatmospheric Lethality Simulation
PEGEM	Post-Engagement Ground Effects Model
PEGEM,KID	Post-Engagement Ground Effects Model; Kinetic Impact Debris Distribution Model
PEO	Program Executive Officer
PEOAMD	PEO Army Missile Defense
PES	Probability of Engagement Success
PFS	Partial Full Scale
PHB	Plume-to-hard-body
PIA	Proprietary Information Agreements
PIDS	Prime Item Development
PLV	Payload Launch Vehicle
PMA	President's Management Agency
PMC	Polymer Matrix Composites
PMD	Program Management Directives
PMS	Program Management Support Office
PMRF	Pacific Missile Range Facility, Barking Sands, Kauai, HI
POAP	Photoconduction On Active Pixels
POET	Phase One Engineering Team
POM	Program Objective Memorandum
POP	Period of Performance; Proof of Principle
PPBES	Programming, Planning, Budgeting and Execution System
PQT	Production Qualification Test
PRC	People's Republic of China
PRMRF	Pentagon Reservation Maintenance Reserve Fund
PROJ	Project
PY	Prior Year
Q	

ACRONYMS AND ABBREVIATIONS

QoS	Quality of Service
QQPR	Qualitative Quantitative Personnel Requirements
QRLV	Quick Reaction Launch Vehicle
QWIP	Quantum Well Infrared Photo detector
R	
RAD	Radiation
RAMOS	Russian-American Observation Satellite
RCF	Radar Certification Flight
RCS	Radar Cross Section
R&D	Research and Development
RDA	Radar Data Analysis
RDE	Radar Data Exploitation
RDEC	Research and Development Engineering Center, Huntsville, AL
RDT&E	Research, Development, Test and Evaluation
RDWG	Response to MDA Directive Working Group
REO	Responsible Engineering Organization
RESURS-01	Resource-01 Satellite
REX	Receiver Exciter
RF	Radio Frequency
RFI	Radio Frequency Interference; Request for Information
RFP	Request for Proposal
RFTM	RF Transceiver Modem
RH	Radiation Hardened
RHE	Radiation Hardened Electronics
RHOC	Radiation Hardened Oversight Council
RISC	Reduced Instruction Set Computer
RLCEU	Remote Launch/Communication Enhancement Upgrade
RLSN	Robust Lean Supply Network
RMP	Risk Management Plan
ROE	Rules of Engagement
RRDI	Range Resolved Doppler Imaging
RRE	Risk Reduction Effort
RRF	Risk Reduction Flight
RSC	Raytheon Systems Company
RSOI	Reception, Staging, Onward movement and Integration (Exercise)
RT	Radio Telephone; Radiation Tolerant
RT-1 STCS	Regional Threat #1 Strategic and Theater Conflict Scenarios
RTO	Responsible Test Organization
RTS	Ronald Reagan Test Site, Kwajalein, Marshall Islands
RV	Reentry Vehicle
S	
SAASM	Selective Availability Anti-Spoofing Module

ACRONYMS AND ABBREVIATIONS

SAC	Site Activation Command (Alaska)
SAIPP	Software Acquisition Improvement Program Plan
SAM	Subarray Module
SATCOM	Satellite Communications
SBI	Space-Based Interceptor
SBIR	Small Business Innovative Research
SBIRS	Space Based Infrared System
SBIRS-LOW	Space Based Infrared System-Low
SBL	Space Based Laser
SBM	Sea-Based Midcourse
SBX	Sea Based Test XBR
SCIR	Selected Capital Investment Report
SCR	System Capability Review
SCS	System Capabilities Specifications
SDACS	Solid Divert Attitude Control System
SDD	System Development and Demonstration; Scenario Description Document
SDP	Service Delivery Points
SDR	System Design Review; Software Design Review
SE	System Engineering
SE&A	System Engineering & Architecture
SE&I	System Engineering and Integration
SEC	DoD Senior Executive Council
SECDEF	Secretary of Defense
SEIC	Systems Engineering Integration Council
SEP	System Evolutionary Plan
SEPM	System Engineering Project Management
SETA	Scientific Engineering and Technical Assistance
SHORAD	Short-Range Air Defense System
SHotL	Short Hot Launch
SIA	Subarray Interface Assembly
SIC	Silicone Carbide
SICO	System Integration and Checkout
SIF	Systems Integration Facility
SIFT	System Integrated Flight Test
SIL	Systems Integration Laboratory
SIPRNET	Secret Internet Protocol Router Network
SIS	System Integration Strategy
SIT	System Integration Test
SLBD	Sea Lite Beam Director
SLO	Small Low Observable
SLS	Shoot Look Shoot; Strained Layer Superlative
SLV	Space Launch Vehicles
SM	Standard Missile
SM-2	Standard Missile II

ACRONYMS AND ABBREVIATIONS

SM-3	Standard Missile III
SMD	Sea-based Midcourse Defense
SMDC	Space and Missile Defense Command, U.S. Army
SNL	Sandia National Laboratory, Albuquerque, NM
SOG	Statement of Goals
SOLD	Simulation-Over-Line-Driver
SOO	Statement of Objectives
SPACECOM	United States Space Command
SPAWAR	Space and Naval Warfare Systems Command
SPO	System Project Office
SRALT	Short Range Air Launched Targets
SRBM	Short Range Ballistic Missile
SRR	System Requirements Review; Software Readiness Review
SRS	Software Requirements Specification
SS	Sole Source
SSAA	System Security Authorization Agreement
SSC	Space Surveillance Center; Simulation Support Center
SSCO	Sub-System Checkout
SSGM	Strategic Scene Generation Model
SSTB	STSS Surrogate Test Bed
STAR	Strategic Threat Assessment Report
STARS	Strategic Target System
STCS	Strategic and Theater Conflict Scenarios
STE	Staff Technical Equivalent
STRATCOM	US Strategic Command
STRR	Systems Test Readiness Review
STRV	Space Technology Research Vehicle
STSS	Satellite Tracking and Surveillance System
STTR	Small Business Technology Transfer
STV	System Technical View; Smart Test Vehicle
SV	Space Vehicle
SW	Software
SWARF	Senior Warfighter Forum
SWA-S STS	Southwest Asia-South Strategic and Theater Conflict Scenarios
SWIR	Short Wave Infrared
SWRL	Software Readiness Levels
T	
T&E	Test and Evaluation
TAA	Technical Assistance Agreement
TAMD	Theater Air and Missile Defense
TBD	To Be Determined
TBDD	Test Bed Description Document
TBI	Test Bed Infrastructure

ACRONYMS AND ABBREVIATIONS

TBM	Theater Ballistic Missile
TBMCS	Theater Battle Management Core Systems
TBMD	Theater Ballistic Missile Defense
TBSS	Test Bed System Specification
TCGTS	Target Complex Generator Test System
TCP	Transformation Campaign Plan
TDACS	Throttling Divert and Attitude Control Systems
TDD	Threat Description Document
TDS	Terminal Defense Segment
THAAD	Terminal High Altitude Area Defense
TIM	Technical Interchange Meeting
TMD	Theater Missile Defense
TMDSE	Theater Missile Defense System Exerciser
TMSS	Threat Modeling & Simulation System
TOC	Tactical Operations Center
TOG	Technical Objectives and Goals
TOO	Test of Opportunity; Target of Opportunity
TPM	Technical Performance Measures
TR	Deputy for Force Structure Integration and Development; Transmit Receive
TRIMM	Transmit/Receive Integrated Microwave Modules
TRL	Technology Readiness Level
TSC	Theater Surface Combatants
TSCM	Technical Surveillance and Countermeasures
TSCR	Test Bed Systems Capability Review
TSE	Threat System Engineering
TSG	Tactical Support Groups
TSRD	Target System Requirements Document
TSRM	Third Stage Rocket Motor
TTD	True Time Delay
TTP	Tactics, Techniques, and Procedures
TPS-X	Test Bed Radar
TVC	Thrust Vector Control
U	
UARC	University Affiliated Research Centers
UAV	Unmanned Aerial Vehicle
UCAV	Unmanned Combat Aerial Vehicles
UCP	Unified Command Plan
UEWR	Upgraded Early Warning Radar
UK	United Kingdom
UKMOD	UK Ministry of Defense
US	United States
USACE	United States Army Corps of Engineers
USAF	United States Air Force

ACRONYMS AND ABBREVIATIONS

USAFESC	United States Air Force Electronics Systems Center
USAFSMC	United States Air Force Space and Missile Systems Center
USARSPACE	United States Army Space Command
USASMDC	United States Army Space and Missile Defense Command
USNORTHCOM	United States Northern Command
USC	United States Code
USFT	U.S. Flight Tests
USN	United States Navy
USSPACECOM	United States Space Command
USSTRATCOM	United States Strategic Command
USU/SDL	Utah State University Space Dynamics Laboratory, Logan, UT
V	
V&V	Verification and Validation
VAFB	Vandenberg Air Force Base, CA
VBC	Von Braun Complex
VCRM	Verification Cross Reference Matrix
VDC	Virtual Data Center
VECP	Value Engineering Change Proposal
VLS	Vertical Launching System
VLWIR	Very Long Wave Infrared
VOIP	Voice-Over-Internet-Protocol
VPN	Virtual Private Network
VTC	Video Teleconferencing Centers
VV&A	Verification, Validation and Accreditation
VWG	Verification Working Group
W	
WAN	Wide Area Network
WASP	Wide-body Airborne Sensor Platform
WBS	Work Breakdown Structure
WG	Wargame
WHS	Washington Headquarters Service, Washington, D.C.
WMD	Weapons of Mass Destruction
WSERB	Weapons System Explosive Safety Review Board
WSMR	White Sands Missile Range, White Sands, NM
X	
XBR	X-Band Radar
X-Lab	Experimental Laboratory
Y	
Yb:YAG	Ytterbium-Doped Yttrium Aluminum Garnet