# Department of Defense Fiscal Year (FY) 2007 Budget Estimates
# February 2006
# Research, Development, Test and Evaluation, Defense-Wide
# Volume 2 (Change 1)
# Missile Defense Agency (MDA)

| PROGRAM ELEMENT | PROJ NUMBER | CHANGES | PAGE | |
|---|---|---|---|---|
| | | | ORIG. SUBMIT | |
| | | | PE Page # | Volume II Page # |
| 0603175C | 0502 | **Section C. Other Program Funding Summary**<br>The attached Section C chart replaces the original Section C chart referenced on the R-2A. | 22 of 24 | 0022 |
| | 0602 | | 24 of 24 | 0024 |
| 0603881C | 0907 | The attached Section C chart replaces the original Section C chart referenced on the R-2A. | 22 of 60 | 0046 |
| | 0007 | | 39 of 60 | 0063 |
| | 0401 | | 50 of 60 | 0074 |
| | 0806 | | 57 of 60 | 0081 |
| | 0602 | | 60 of 60 | 0084 |
| 0603882C | 0708 | The attached Section C chart replaces the original Section C chart referenced on the R-2A. | 14 of 114 | 0098 |
| | 0808 | | 36 of 114 | 0120 |
| | 0908 | | 59 of 114 | 0143 |
| | 0008 | | 69 of 114 | 0153 |
| | 0709 | | 85 of 114 | 0169 |
| | 0809 | | 97 of 114 | 0181 |
| | 0402 | | 106 of 114 | 0190 |
| | 0602 | | 114 of 114 | 0198 |
| 0603883C | 0710 | The attached Section C chart replaces the original Section C chart referenced on the R-2A. | 7 of 40 | 0205 |
| | 0810 | | 22 of 40 | 0220 |
| | 0910 | | 30 of 40 | 0228 |
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| | 0602 | | 40 of 40 | 0238 |
| 0603884C | 0811 | The attached Section C chart replaces the original Section C chart referenced on the R-2A. | 14 of 58 | 0252 |
| | 0911 | | 30 of 58 | 0268 |
| | 0011 | | 40 of 58 | 0278 |
| | 0812 | | 49 of 58 | 0287 |
| | 0012 | | 55 of 58 | 0293 |
| | 0602 | | 58 of 58 | 0296 |
| 0603886C | R113 | The attached Section C chart replaces the original Section C chart referenced on the R-2A. | 13 of 44 | 0309 |
| | R213 | | 31 of 44 | 0327 |
| | 0602 | | 44 of 44 | 0340 |
| 0603888C | 0304 | The attached Section C chart replaces the original Section C chart referenced on the R-2A. | 25 of 164 | 0365 |
| | 0704 | | 55 of 164 | 0395 |
| | 0804 | | 70 of 164 | 0410 |
| | 0904 | | 83 of 164 | 0423 |
| | 0004 | | 94 of 164 | 0434 |
| | R104 | | 101 of 164 | 0441 |
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| | 0005 | | 155 of 164 | 0495 |
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| 0603889C | 0701 | The attached Section C chart replaces the original Section C chart referenced on the R-2A. | 21 of 176 | 0525 |
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| | 0001 | | 57 of 176 | 0561 |
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| | 0703 | | 98 of 176 | 0602 |
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| 0603890C | 0101 | The attached Section C chart replaces the original Section C chart referenced on the R-2A. | 28 of 150 | 0708 |
| | 0105 | | 49 of 150 | 0729 |
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| 0603892C | 0709 | The attached Section C chart replaces the original Section C chart referenced on the R-2A. | 11 of 80 | 0841 |
| | 0809 | | 29 of 80 | 0859 |
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| 0603893C | 0812 | The attached Section C chart replaces the original Section C chart referenced on the R-2A. | 10 of 32 | 0920 |
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| 0603894C | 0515 | The attached Section C chart replaces the original Section C chart referenced on the R-2A. | 7 of 16 | 0949 |
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| 0605502C | 0510 | The attached Section C chart replaces the original Section C chart referenced on the R-2A. | 2 of 2 | 0968 |
| 0901585C | 0605 | The attached Section C chart replaces the original Section C chart referenced on the R-2A. | 2 of 2 | 0970 |
| 0901598C | 0601 | The attached Section C chart replaces the original Section C chart referenced on the R-2A. | 6 of 6 | 0976 |

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| 74 | 0603889C | Ballistic Missile Defense Products | 0505 |
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($ Thousands)

| Line Number | Program Element | Budget Project | Program | Budget Activity | FY05 Actual | FY06 | FY07 | FY08 | FY09 | FY10 | FY11 | FY07-11 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | RDT&E | | | | | | | | | | |
| **27** | **0603175C** | | Ballistic Missile Defense Technology | 03 | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,055,333 |
| | | 0502 | Advanced Technology Development | 03 | 221,875 | 144,847 | 199,137 | 177,810 | 205,247 | 214,512 | 221,775 | 1,018,481 |
| | | 0602 | Program-Wide Support | 03 | 2,141 | 4,458 | 7,539 | 5,604 | 8,815 | 8,422 | 6,472 | 36,852 |
| | Budget Activity 03 Total | | | 03 | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,055,333 |
| **66** | **0603879C** | | Advanced Concepts, Evaluations and Systems | 04 | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0501 | Advanced Concepts, Evaluations and Systems (ACES) | 04 | 166,844 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0602 | Program-Wide Support | 04 | 152 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **67** | **0603881C** | | Ballistic Missile Defense Terminal Defense Segment | 04 | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 3,847,303 |
| | | 0907 | Terminal High Altitude Area Defense (THAAD) Block 2008 | 04 | 745,801 | 991,007 | 942,457 | 694,496 | 473,926 | 21,300 | 0 | 2,132,179 |
| | | 0007 | Terminal High Altitude Area Defense (THAAD) Block 2010 | 04 | 0 | 0 | 0 | 114,461 | 119,300 | 642,318 | 385,548 | 1,261,627 |
| | | 0401 | Israeli Arrow Program | 04 | 150,836 | 130,838 | 77,175 | 77,189 | 77,373 | 78,990 | 80,637 | 391,364 |
| | | 0806 | PAC-3 Block 2006 | 04 | 0 | 0 | 1,600 | 1,000 | 0 | 0 | 0 | 2,600 |
| | | 0602 | Program-Wide Support | 04 | 17,426 | 17,912 | 17,078 | 17,052 | 11,434 | 10,954 | 3,015 | 59,533 |
| **68** | **0603882C** | | Ballistic Missile Defense Midcourse Defense Segment | 04 | 4,467,693 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 11,758,075 |
| | | 0708 | Ground-Based Midcourse Defense (GMD) Block 2004 Test Bed/Initial Defensive Capability (IDC) | 04 | 822,729 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0808 | Ground-Based Midcourse Defense (GMD) Block 2004/2006 Development | 04 | 2,430,207 | 2,333,987 | 2,354,003 | 467,800 | 510,300 | 0 | 0 | 3,332,103 |
| | | 0908 | Ground-Based Midcourse Defense (GMD) Block 2008 Development | 04 | 0 | 72,559 | 354,948 | 1,394,803 | 1,186,732 | 500,963 | 340,922 | 3,778,368 |
| | | 0008 | Ground-Based Midcourse Defense (GMD) Block 2010 | 04 | 0 | 0 | 118,900 | 706,000 | 669,800 | 1,575,388 | 1,310,381 | 4,380,469 |
| | | 0709 | AEGIS Ballistic Missile Defense Block 2004 | 04 | 901,299 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0809 | AEGIS Ballistic Missile Defense Block 2006 | 04 | 121,574 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0402 | Japanese Cooperative Program | 04 | 69,489 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0602 | Program-Wide Support | 04 | 122,395 | 35,626 | 49,121 | 81,890 | 30,508 | 72,077 | 33,539 | 267,135 |
| **69** | **0603883C** | | Ballistic Missile Defense Boost Defense Segment | 04 | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 2,808,570 |
| | | 0710 | Airborne Laser (ABL) Block 2004 | 04 | 447,934 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0810 | Airborne Laser (ABL) Block 2006 | 04 | 0 | 454,677 | 595,425 | 0 | 0 | 0 | 0 | 595,425 |
| | | 0910 | Airborne Laser (ABL) Block 2008 | 04 | 0 | 0 | 2,660 | 542,559 | 417,425 | 0 | 0 | 962,644 |
| | | 0010 | Airborne Laser (ABL) Block 2010 | 04 | 0 | 0 | 0 | 0 | 0 | 416,425 | 647,764 | 1,064,189 |
| | | 0602 | Program-Wide Support | 04 | 24,609 | 16,996 | 33,531 | 34,883 | 38,375 | 40,239 | 39,284 | 186,312 |
| **71** | **0603884C** | | Ballistic Missile Defense Sensors | 04 | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 2,298,000 |
| | | 0811 | Ballistic Missile Defense Radars Block 2006 | 04 | 271,464 | 234,703 | 222,511 | 84,993 | 102,545 | 0 | 0 | 410,049 |
| | | 0911 | Ballistic Missile Defense Radars Block 2008 | 04 | 0 | 38,745 | 276,126 | 470,808 | 404,233 | 184,883 | 160,959 | 1,497,009 |
| | | 0011 | Ballistic Missile Defense Radars Block 2010 | 04 | 2,250 | 180 | 7,061 | 18,530 | 123,779 | 129,318 | 47,992 | 326,680 |
| | | 0812 | Space Tracking and Surveillance System (STSS) Block 2006 | 04 | 248,086 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0012 | Space Tracking and Surveillance System (STSS) Block 2010 | 04 | 42,616 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0602 | Program-Wide Support | 04 | 2,777 | 4,540 | 8,812 | 15,064 | 16,825 | 12,163 | 11,398 | 64,262 |
| **72** | **0603886C** | | Ballistic Missile Defense System Interceptors | 04 | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 4,603,200 |
| | | R113 | Ballistic Missile Defense Interceptor Block 2012 | 04 | 256,809 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | R213 | Ballistic Missile Defense Interceptor Block 2014 | 04 | 0 | 201,933 | 386,300 | 400,000 | 851,900 | 1,149,000 | 1,651,018 | 4,438,218 |
| | | 0602 | Program-Wide Support | 04 | 15,255 | 7,409 | 19,208 | 25,417 | 43,191 | 53,485 | 23,681 | 164,982 |

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| Line Number | Program Element | Budget Project | Program | Budget Activity | FY05 Actual | FY06 | FY07 | FY08 | FY09 | FY10 | FY11 | FY07-11 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **73** | **0603888C** | | Ballistic Missile Defense Test and Targets | 04 | 697,801 | 608,663 | 591,911 | 587,064 | 620,222 | 626,693 | 646,936 | 3,072,826 |
| | | 0304 | Test & Evaluation | 04 | 245,581 | 219,167 | 208,213 | 217,805 | 228,081 | 221,261 | 227,105 | 1,102,465 |
| | | 0704 | Test & Evaluation Block 2004 | 04 | 140,456 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0804 | Test & Evaluation Block 2006 | 04 | 9,769 | 133,972 | 128,760 | 0 | 0 | 0 | 0 | 128,760 |
| | | 0904 | Test & Evaluation Block 2008 | 04 | 0 | 0 | 45,184 | 127,791 | 132,309 | 0 | 3,625 | 308,909 |
| | | 0004 | Test & Evaluation Block 2010 | 04 | 0 | 0 | 0 | 35,157 | 39,815 | 119,011 | 110,446 | 304,429 |
| | | R104 | Test & Evaluation Block 2012 | 04 | 0 | 0 | 0 | 0 | 0 | 56,161 | 75,884 | 132,045 |
| | | 0305 | Targets & Countermeasures Core | 04 | 22,697 | 19,868 | 20,209 | 20,719 | 21,075 | 21,609 | 21,979 | 105,591 |
| | | 0705 | Targets & Countermeasures Block 2004 | 04 | 250,077 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0805 | Targets & Countermeasures Block 2006 | 04 | 24,765 | 224,387 | 158,987 | 0 | 0 | 0 | 0 | 158,987 |
| | | 0905 | Targets & Countermeasures Block 2008 | 04 | 0 | 4,226 | 20,533 | 173,533 | 151,327 | 0 | 0 | 345,393 |
| | | 0005 | Targets & Countermeasures Block 2010 | 04 | 0 | 500 | 2,500 | 5,353 | 41,721 | 191,425 | 162,878 | 403,877 |
| | | R105 | Targets & Countermeasures Block 2012 | 04 | 0 | 0 | 0 | 0 | 0 | 6,000 | 39,181 | 45,181 |
| | | 0602 | Program-Wide Support | 04 | 4,456 | 6,543 | 7,525 | 6,706 | 5,894 | 11,226 | 5,838 | 37,189 |
| **74** | **0603889C** | | Ballistic Missile Defense Products | 04 | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 2,542,475 |
| | | 0701 | Command and Control, Battle Management and Communications (C2BMC) Block 2004 | 04 | 152,217 | 65,524 | 53,526 | 292 | 0 | 0 | 0 | 53,818 |
| | | 0801 | Command and Control, Battle Management and Communications (C2BMC) Block 2006 | 04 | 26,791 | 136,282 | 176,735 | 102,687 | 56,703 | 283 | 0 | 336,408 |
| | | 0901 | Command and Control, Battle Management and Communications (C2BMC) Block 2008 | 04 | 6,122 | 5,576 | 33,645 | 158,764 | 179,883 | 106,889 | 64,310 | 543,491 |
| | | 0001 | Command and Control, Battle Management and Communications (C2BMC) Block 2010 | 04 | 0 | 0 | 0 | 1,247 | 35,393 | 161,466 | 206,404 | 404,510 |
| | | 0802 | Hercules Block 2006 | 04 | 22,730 | 19,645 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0902 | Hercules Block 2008 | 04 | 58,798 | 38,179 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0002 | Hercules Block 2010 | 04 | 0 | 6,304 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0505 | Hercules | 04 | 0 | 0 | 50,562 | 50,881 | 50,319 | 50,071 | 50,856 | 252,689 |
| | | 0703 | Joint Warfighter Support Block 2004 | 04 | 37,844 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0803 | Joint Warfighter Support Block 2006 | 04 | 0 | 31,044 | 53,350 | 0 | 0 | 0 | 0 | 53,350 |
| | | 0903 | Joint Warfighter Support Block 2008 | 04 | 0 | 0 | 0 | 49,687 | 50,912 | 0 | 0 | 100,599 |
| | | 0003 | Joint Warfighter Support Block 2010 | 04 | 0 | 0 | 0 | 0 | 0 | 52,322 | 55,519 | 107,841 |
| | | 0204 | Joint National Integration Center (JNIC) | 04 | 71,631 | 75,728 | 99,461 | 106,611 | 107,560 | 109,325 | 110,581 | 533,538 |
| | | 0817 | Concurrent Test & Operations (CTO) - Distributed Multi-Echelon Training System (DMETS) Block 2006 | 04 | 0 | 0 | 22,500 | 0 | 0 | 0 | 0 | 22,500 |
| | | 0917 | Concurrent Test & Operations (CTO) - Distributed Multi-Echelon Training System (DMETS) Block 2008 | 04 | 0 | 0 | 0 | 13,800 | 11,100 | 0 | 0 | 24,900 |
| | | 0017 | Concurrent Test & Operations (CTO) - Distributed Multi-Echelon Training System (DMETS) Block 2010 | 04 | 0 | 0 | 0 | 0 | 0 | 9,300 | 9,600 | 18,900 |
| | | 0602 | Program-Wide Support | 04 | 8,802 | 10,548 | 17,061 | 22,383 | 18,114 | 17,061 | 15,312 | 89,931 |
| **75** | **0603890C** | | Ballistic Missile Defense System Core | 04 | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 2,626,093 |
| | | 0101 | Systems Engineering & Integration | 04 | 226,222 | 100,033 | 112,626 | 116,353 | 115,984 | 127,960 | 141,556 | 614,479 |
| | | 0105 | Countermeasures/Counter-Countermeasures (CM/CCM) | 04 | 27,295 | 21,161 | 25,700 | 26,700 | 27,700 | 23,000 | 23,400 | 126,500 |
| | | 0102 | Intelligence and Security | 04 | 28,152 | 19,015 | 23,922 | 27,437 | 28,980 | 39,142 | 46,600 | 166,081 |
| | | 0103 | Producibility & Manufacturing Technology | 04 | 36,540 | 32,752 | 36,921 | 40,247 | 43,214 | 44,112 | 45,028 | 209,522 |
| | | 0104 | BMD Information Management Systems | 04 | 61,252 | 111,843 | 123,175 | 124,775 | 127,375 | 135,375 | 138,075 | 648,775 |
| | | 0106 | Modeling & Simulation | 04 | 0 | 92,577 | 103,419 | 107,740 | 109,770 | 111,222 | 112,538 | 544,689 |
| | | 0107 | Safety, Quality and Mission Assurance | 04 | 3,206 | 17,833 | 25,900 | 31,800 | 41,100 | 40,100 | 40,500 | 179,400 |
| | | 0602 | Program-Wide Support | 04 | 16,185 | 12,278 | 21,414 | 26,343 | 29,549 | 33,627 | 25,714 | 136,647 |

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($ Thousands)

| Line Number | Program Element | Budget Project | Program | Budget Activity | FY05 Actual | FY06 | FY07 | FY08 | FY09 | FY10 | FY11 | FY07-11 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **76** | **0603891C** | | Special Programs - MDA | 04 | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,140,002 |
| | | 0501 | Special Programs - MDA | 04 | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,140,002 |
| **77** | **0603892C** | | Ballistic Missile Defense Aegis | 04 | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 4,736,305 |
| | | 0709 | AEGIS Block 2004 Test Bed | 04 | 0 | 145,112 | 28,000 | 20,000 | 0 | 0 | 0 | 48,000 |
| | | 0809 | AEGIS BMD Block 2006 | 04 | 0 | 455,635 | 482,500 | 87,600 | 76,100 | 47,800 | 3,500 | 697,500 |
| | | 0909 | AEGIS BMD Block 2008 | 04 | 0 | 266,158 | 418,345 | 680,796 | 557,545 | 91,763 | 50,595 | 1,799,044 |
| | | 0009 | AEGIS BMD Block 2010 | 04 | 0 | 0 | 29,000 | 52,800 | 171,600 | 471,900 | 341,200 | 1,066,500 |
| | | R109 | AEGIS BMD Block 2012 | 04 | 0 | 0 | 16,000 | 21,100 | 39,800 | 158,000 | 167,500 | 402,400 |
| | | 0402 | Japanese Cooperative Program | 04 | 0 | 36,234 | 44,000 | 75,000 | 125,000 | 193,000 | 225,000 | 662,000 |
| | | 0602 | Program-Wide Support | 04 | 0 | 12,525 | 14,029 | 14,264 | 10,453 | 10,690 | 11,425 | 60,861 |
| **78** | **0603893C** | | Space Tracking & Surveillance System | 04 | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,433,394 |
| | | 0812 | Space Tracking and Surveillance System (STSS) Block 2006 | 04 | 0 | 227,848 | 247,519 | 73,700 | 92,000 | 89,200 | 41,200 | 543,619 |
| | | 0912 | Space Tracking and Surveillance System (STSS) Block 2008 | 04 | 0 | 0 | 35,000 | 29,300 | 24,100 | 14,100 | 13,800 | 116,300 |
| | | R112 | Space Tracking and Surveillance System (STSS) Block 2012 | 04 | 0 | 0 | 97,000 | 309,150 | 635,250 | 836,690 | 816,500 | 2,694,590 |
| | | 0602 | Program-Wide Support | 04 | 0 | 3,640 | 11,066 | 15,024 | 20,528 | 18,291 | 13,976 | 78,885 |
| **79** | **0603894C** | | Multiple Kill Vehicle | 04 | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,726,384 |
| | | 0515 | Multiple Kill Vehicles (MKV) | 04 | 0 | 49,324 | 162,250 | 278,900 | 356,500 | 412,157 | 504,500 | 1,714,307 |
| | | 0602 | Program-Wide Support | 04 | 0 | 1,000 | 2,725 | 6,905 | 840 | 690 | 917 | 12,077 |
| **A** | **0603895C** | | BMD System Space Program | 04 | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| | | 0517 | Space Test Bed | 04 | 0 | 0 | 0 | 45,000 | 150,000 | 166,000 | 206,100 | 567,100 |
| | | 0602 | Program-Wide Support | 04 | 0 | 0 | 0 | 300 | 600 | 700 | 1,000 | 2,600 |
| Budget Activity 04 Total | | | | 04 | 8,342,140 | 7,418,450 | 9,000,710 | 9,167,054 | 9,621,826 | 9,811,883 | 9,560,854 | 47,162,327 |
| **135** | **0605502C** | | Small Business Innovative Research - MDA | 06 | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0510 | Statutory & Mandated Programs | 06 | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **150** | **0901585C** | | Pentagon Reservation | 06 | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 37,235 |
| | | 0605 | Pentagon Reservation Maintenance Reserve Fund (PRMRF) | 06 | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 37,235 |
| **151** | **0901598C** | | Management Headquarters - MDA | 06 | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 400,368 |
| | | 0601 | Management Headquarters | 06 | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 400,368 |
| Budget Activity 06 Total | | | | 06 | 260,570 | 114,213 | 102,975 | 92,529 | 92,270 | 74,740 | 75,089 | 437,603 |
| RDT&E Total | | | | 06 | 8,826,726 | 7,681,968 | 9,310,361 | 9,442,997 | 9,928,158 | 10,109,557 | 9,864,190 | 48,655,263 |
| | | MILCON | | | | | | | | | | |
| | **0603882C** | | Ballistic Missile Defense Midcourse Defense Segment | NA | 19,560 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0808 | Ground-Based Midcourse Defense (GMD) Block 2004/2006 Development | NA | 19,560 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **0603888C** | | Ballistic Missile Defense Test and Targets | NA | 2,769 | 4,901 | 7,592 | 7,824 | 8,376 | 8,723 | 8,680 | 41,195 |
| | | 0304 | Ballistic Missile Defense Test & Targets | NA | 2,769 | 4,901 | 7,592 | 7,824 | 8,376 | 8,723 | 8,680 | 41,195 |
| MILCON Total | | | | NA | 22,329 | 4,901 | 7,592 | 7,824 | 8,376 | 8,723 | 8,680 | 41,195 |
| | | BRAC | | | | | | | | | | |
| | **0207998C** | | BRAC | NA | 0 | 8,308 | 0 | 84,819 | 19,100 | 2,850 | 0 | 106,769 |
| | | 0610 | Base Realignment and Closure (BRAC) | NA | 0 | 8,308 | 0 | 84,819 | 19,100 | 2,850 | 0 | 106,769 |
| BRAC Total | | | | NA | 0 | 8,308 | 0 | 84,819 | 19,100 | 2,850 | 0 | 106,769 |
| PROGRAM TOTAL* | | | | | 8,849,055 | 7,695,177 | 9,317,953 | 9,535,640 | 9,955,634 | 10,121,130 | 9,872,870 | 48,803,227 |

* Includes funds in PE 0904903D – Defense-Wide Resources

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PE 0904903D – Defense-Wide Resources | | | | | | | | 1,950,912 | 1,952,703 | 1,993,500 | 1,741,451 | 7,638,566 |

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# PART SUMMARY

**Missile Defense**

The Missile Defense Agency (MDA) mission is to defend the U.S., deployed forces and allies from ballistic missile attack. MDA is researching, developing and fielding a global, integrated and multi-layered Ballistic Missile Defense System (BMDS), comprising multiple sensors, interceptors and battle management capabilities.

## PERFORMING

### Adequate

- **MDA's strategic planning, resource allocation and management oversight activities are properly aligned to accomplish stated mission objectives.** MDA budget requests and human resource management activities are explicitly tied to appropriate performance goals. MDA leaders regularly review and evaluate a wide array of performance data to inform and guide their decision making.
- **MDA accomplished short-term goals by fielding the first phase of the defensive system.** The Agency continues to develop capabilities to defend the U.S. and deployed forces against broader ballistic missile threats. MDA instituted corrective measures to address flight testing, quality, and mission assurance issues in pursuit of subsequent developmental program goals.
- **The DoD maintains a flexible investment planning approach for the missile defense portfolio to manage efficiently the high degree of program uncertainty and complexity.** The DoD and the MDA have initiated several activities to improve financial planning and coordination among key stakeholders for future force structure development and operational support needs.

**We are taking the following actions to improve the performance of the program:**

- MDA is improving program management discipline, accountability, and inter-department coordination by developing and applying a Strategic Management Framework and Integrated Program Policy documents.
- MDA is conducting an increasingly complex flight tests in FY06 to verify system performance, quality and mission assurance provisions, and to increase overall confidence in the fielded system.
- The DoD, MDA, and the services are assigning specific organizational responsibilities to support financial and program plans for the FY 2008 budget submission.

# PART ASSESSMENT

## Missile Defense 2005 Assessment

| | |
|---|---|
| Program Code | 10000070 |
| Program Title | Missile Defense |
| Program Type(s) | Capital Assets and Service Acquisition Program |
| Program Notes | |
| Assessment Year | 2005 |
| Assessment Status | Final<br>Ready to publish/published. No changes will be made from this point on. |
| Assessment Notes | |
| **Assessment Rating** | **Adequate** |

**Assessment Section Scores**

| Section | Score |
|---|---|
| Program Purpose & Design | 80% |
| Strategic Planning | 78% |
| Program Management | 86% |
| Program Results/Accountability | 56% |

**Program funding Level (in millions)**

| | |
|---|---|
| Prior Year | $8849 |
| Current Year | $7695 |
| Budget Year | $9318 |
| Explanation of Composition of Funding | |

# PART ASSESSMENT

## Funding

| | Budget Resources (millions) | | | Obligations (millions) | | | |
|---|---|---|---|---|---|---|---|
| Treasury Account | Prior Year | Current Year | Budget Year | Prior Year | Current Year | Budget Year | Explanation |
| 970400 | $8827 | $7682 | $9310 | $8694 | $7802 | $9139 | Research, Development, Test and Evaluation, Defense Wide |
| 970510 | Not provided. | $8 | Not provided. | Not provided. | $4 | Not provided. | Base Realignment and Closure, Defense Wide |
| 970500 | $22 | $5 | $8 | $12 | $8 | $8 | Military Construction, Defense Wide |

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# PROGRAM ASSESSMENT

**PROGRAM**
View Similar Programs

## Defense Small Business Innovation Research/Technology Transfer

This program uses funding set aside specifically for small businesses to investigate the potential for new technologies to help meet the Department's mission and funds the early stage of development of such technologies by small businesses.

**RATING**
What This Rating Means

**NOT PERFORMING**

**Results Not Demonstrated**

- **Provides funds to small businesses, but has poor controls on unproductive spending.**
- **Continues to provide funding to companies with track records of poor performance.**
- **Overestimates commercial successes resulting from Federal support by counting additional investment on par with product sales as measures of success.** Product sales are the ultimate measure of success in the marketplace.

**IMPROVEMENT PLAN**
About Improvement Plans

**We are taking the following actions to improve the performance of the program:**

- Tightening eligibility requirements for accepting proposals from companies and individuals that repeatedly fail to sell resulting products in the marketplace.
- Changing the way companies' past performance is assessed to ensure that it more closely matches the intent of the law (Section 638 of Title 15, USC) that the program support product commercialization.
- Seeking to get highly successful awardees to enter the mainstream of Defense contracting.

**LEARN MORE**

- **Details and Current Status of this program assessment.**
- How all Federal programs are assessed.
- Learn more about Defense Small Business Innovation Research/Technology Transfer.

# Missile Defense Agency

## Fiscal Year 2007 (FY07)

## Budget Estimate

# Overview

# Missile Defense Agency

## Fiscal Year 2007 (FY 07) Budget Estimate

## Overview

### Outline

This budget overview summarizes our FY07 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 FY06 Budget Submission**

**IV. Block Highlights**

**V. BMD Management**

**VI. President's Budget Submission and Organization**

**VII. Summary**

**VIII. Acronym List**

**MISSILE DEFENSE AGENCY**
**FY 2007 BUDGET ESTIMATE OVERVIEW**

## I. INTRODUCTION

The Missile Defense Agency (MDA) is developing a Ballistic Missile Defense System (BMDS) to defend the United States, its deployed forces, friends and allies against ballistic missiles of all ranges and in all phases of flight. In 2005, we made significant progress with a series of successful tests unparalleled in our development efforts to date, and we recovered from the difficulties we experienced in 2004 and early in 2005. We also moved forward with fielding the first increment of the BMDS. In 2006 and beyond, we will build on our success with continued emphasis on mission assurance and quality, increasingly robust and realistic testing, fielding additional components as they are completed and developing new capability for integration into the system of the future. Our Fiscal Year (FY) 2007 program of work and our proposed Future Years Defense Program (FYDP) will focus on achieving five objectives which seek to:

- Complete development, fielding and verification of the initial capability;
- Provide the U.S. Combatant Commanders with support and sustainment for the Ballistic Missile Defense System;
- Develop a totally integrated capability during 2007 and beyond based on a strong core research and spiral development program;
- Execute an increasingly complex test program concurrent with operations; and
- Establish a robust international foundation for missile defense.

Each of these objectives is tied to one or more of the agency's strategic goals:

**Competence** – The Missile Defense Agency will demonstrate an evolving capability to defeat any adversary's ballistic missiles. We will build on our early successes to perfect our missile defense systems, structures and processes. We will create a "core competency" in missile defense to protect our nation, military services, combatant commands, and our international partners.

**Dominance** – The Missile Defense Agency will enable a Department of Defense capacity – both in equipment and proficiency – to dominate the missile defense battlespace and be able to defend the United States and its allies from ballistic missile attacks. Through our efforts, we also seek to contain and counter the proliferation of military technology by hostile forces, and render all adversary missiles ineffective through our highly effective defense systems.

**Partnership** – Recognizing that fielding effective ballistic missile defenses must be a global effort that welcomes and accommodates allied participation, we will expand ballistic missile defense systems and proficiencies among our allies and friends. In doing this, we will work closely with other nations to develop and field missile defense capabilities that perform to the highest standards of mission assurance, reliability and cost effectiveness.

**Efficiency** – Recognizing that effective planning and efficient resource management are the keys to providing the portfolio of capabilities required to defeat today's missile threats and overcome tomorrow's challenges, we will sustain continuous improvement within the Missile Defense Agency, and optimize mission area management and business practices to achieve peak performance in a resource-constrained, evolutionary acquisition environment.

**The Evolving Security Environment.** Proliferating and evolving ballistic missile systems and associated technologies and expertise continue to pose dangers to our national security. In 2005 there were more than seventy-five foreign ballistic missile launches around the world. Nearly sixty launches last year involved short-range ballistic missiles, approximately ten involved medium- and intermediate-range missiles, and about ten involved land- and sea-based long-range ballistic missiles.

Iran, which continues to show interest in developing nuclear capabilities, and nuclear-capable North Korea have not relented in their pursuit of longer-range ballistic missiles. North Korea has the indigenously-developed 1,300 km No Dong Medium-Range Ballistic Missile (MRBM), which can threaten Japan, South Korea, and U.S. bases in the region. North Korea could test at any time the Taepo Dong-2 (TD-2) ICBM, which the Central Intelligence Agency (CIA) assesses to be capable of reaching the U.S. with a nuclear weapon. These missiles can threaten European population centers and U.S. deployed forces as well. Iran continues to develop an improved version of its 1,300 km Shahab-3 MRBM and has publicly claimed a variant that has a range of 2,000 km. Iran may have the technical capability to develop an ICBM by 2015. We also face a threat from short-range ballistic missiles. Without major technical hurdles, an adversary could choose to launch a missile at the United States from a forward-based sea platform within a few hundred kilometers of U.S. territory. Our fielding activity is intended to respond directly to all of these dangers.

Ballistic missiles remain the weapon of choice among our potential adversaries. The Gulf Wars in 1991 and 2003 demonstrated that hostile countries are willing to use ballistic missiles against coalition forces and our allies and friends. We can expect in the future our adversaries will use ballistic missiles to thwart our foreign policy objectives by holding hostage our cities and other high value assets. They will use them to deny our forces access to theaters of conflict or to coerce us. Ballistic missiles could provide strategic leverage to our enemies and we must continue our efforts to counter them.

## 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 FY06 budget submission, we provide highlights of planned capability improvements by Block, and we address our Budget Structure and Organization.

**Initial Capability and Recent Successes**. The BMDS program, as represented by the FY07 MDA budget submission, is focused on the continued development and fielding of ballistic missile defense capability. We will build on the successes we had in 2005 and our anticipated progress in 2006. In the latter part of 2005, we made major progress in developing and

deploying both sensors and weapons. In November, we had a successful Aegis Ballistic Missile Defense (BMD) intercept test and a successful Terminal High Altitude Area Defense (THAAD) flight test. On December 13, we had a successful flight test of the Ground-Based Interceptor (GBI) in its operational configuration. We added a second Aegis BMD engagement cruiser to our force and emplaced two more Ground-Based Interceptors at Fort Greely, Alaska, bringing our total number of interceptors in Alaska to eight. Two additional interceptors are at Vandenberg Air Force Base in California.

Our Command, Control, Battle Management, and Communications (C2BMC) element also took the first step in integrating the BMDS which is necessary to establish an affordable and effective global, layered defense. Both hardware and software were installed at the United States Northern Command (USNORTHCOM), United States Strategic Command (USSTRATCOM), and United States Pacific Command (USPACOM), with C2BMC capability and support also initiated at USPACOM. C2BMC capabilities include basic deliberative crisis action planning and common situational awareness at these Combatant Commands (COCOMs). In addition, we now provide common situational awareness directly to the Secretary of Defense and the President of the United States to aid in decision-making via our C2BMC system.

We successfully acquired and tracked Intercontinental Ballistic Missiles (ICBMs) with our Forward-Based X-Band-Transportable (FBX-T) radar, completed the upgrade to the Beale Air Force Base early warning radar and tested the Cobra Dane radar against an air-launched target. Our fire control system processed the information from Cobra Dane to generate an intercept solution for the target. We achieved high-power radiation with the successful tests in the Gulf of Mexico of our Sea-Based X-Band radar, which is now in Hawaii, and we added four Aegis BMD Long-Range Surveillance and Tracking destroyers to our force, bringing the total to ten.

Our Airborne Laser achieved operational power for the full duration of a test and completed the initial flight tests while operating its beam control, fire control system on the heavily modified 747 aircraft. Finally, our Kinetic Energy Interceptor (KEI) team successfully built a mobile fire control prototype with direct downlink capability. The fire control prototype validates engagement sequence groups and timelines for KEI through real time processing of global target of opportunity data. Six tests using the prototype demonstrated our ability to close the fire control solution for the boost phase intercept mission. The program also successfully demonstrated overhead non-imaging infrared data fusion processing, and concurrently demonstrated the use of national sensor data for intercept operations in the field and characterized the value of timely receipt of national sensor data in the Kinetic Energy Interceptor fire control solution. The KEI program completed an in-flight communications system waveform study and antenna design, which identified a feasible waveform to optimize for anti-jamming and operations in a nuclear environment to meet core standards in these areas.

These successes were challenging, particularly in light of the difficulties we faced in the early part of 2005 and in 2004, but our rededication to mission assurance and quality proved effective and demonstrated the soundness of our technical approach to developing ballistic missile defenses.

During 2006, we will build on this progress by continuing to emplace Ground-Based Interceptors (GBIs) in Alaska, adding Standard Missile-3 sea-based interceptors, adding Aegis BMD Long-Range Surveillance and Tracking destroyers and upgrading Aegis BMD Long-Range Surveillance and Tracking destroyers to Engagement destroyers. The Sea-Based X-Band radar will arrive on station in Alaska, the first Forward Based X-Band-Transportable (FBX-T) radar will be deployed to Japan and an upgraded early warning radar will begin operation in Fylingdales, England in 2006.

The proposed FY 2007 budget submission will continue to expand our fielded capability. Figure 1 lists the capability that was fielded at the end of 2005.

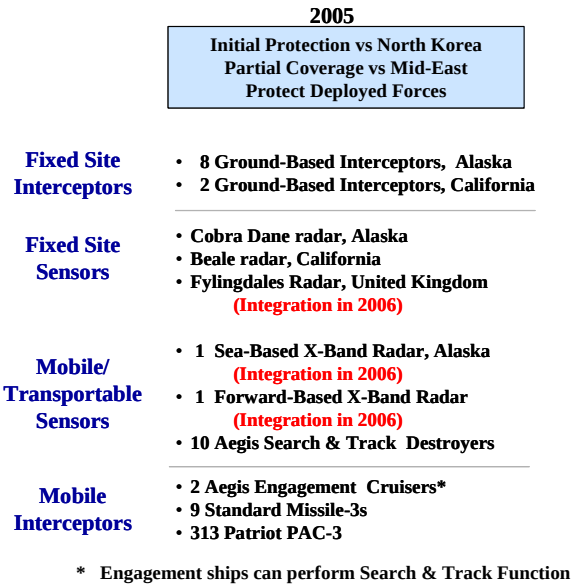


**Figure 1.**

**Warfighter Support.** The Missile Defense Agency is developing and delivering a ballistic missile defense capability to the warfighters at USPACOM, USSTRATCOM, and USNORTHCOM. 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. MDA is fully funding Contractor Logistics Support in this budget submission to ensure system developers have financial resources to fully support fielded components after delivery.

MDA works collaboratively with the Combatant Commanders and the Military Services through a Warfighter Involvement Process (WIP), and various other venues such as exercises, war games, seminars, and other events. The WIP is structured to generate opportunities to collaborate with the warfighters in defining, advocating and prioritizing requirements for additional Ballistic Missile Defense System capabilities.

An effective training program is critical to the operational readiness, combat effectiveness, and overall performance of the BMDS. Using Joint Chiefs of Staff Training Guidance, we developed doctrine to allow for integrated, effective, and timely training in coordination with the U.S. Strategic Command. Our Joint Warfighter Directorate and C2BMC element are, therefore, working hand-in-hand with warfighters in the development of the Concurrent Test and Operations – Distributed Multi-Echelon Training System (CTO-DMETS). This jointly-created training program is crucial to prepare everyone assigned to the BMDS elements, supporting headquarters, and command authorities for the challenges they will face as they operate the System.

**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; we will continue to field C2BMC capabilities at our COCOMs, enhancing situational awareness and command and control, adding sensor management, and completing the initial fielding of a Global Integrated Fire Control (GIFC) capability; and we will add the Terminal High Altitude Area Defense (THAAD) capability beginning in 2009 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. Finally, we are also beginning to field the Space Tracking and Surveillance System (STSS), which will improve our capability against all threats.

A truly global and integrated BMDS relies on a network-centric capability to share information and rapidly react to ballistic missile defense threats in any theater throughout the world. Global C2BMC is the linchpin for an integrated layered BMDS. MDA's C2BMC program focuses on five major products critical to BMDS operation: Global Integrated Fire Control (GIFC), Situational Awareness, BMD Planner, BMDS Network, and Cyber-Warfare Command and Control. Each of these products is described below:

- **Global Integrated Fire Control (GIFC).** We are developing a global, distributed, real-time, integrated fire control system – it will receive sensor information from land, sea, air, and space, and commits land-, sea-, air-, and potentially space-based weapons to fire at identified targets. The GIFC will be flexible, supporting any command structure

desired by the warfighters and providing: trusted, system-level track for interceptor engagements; automated and manual management of BMDS radars for sensor optimization; automated and manual weapon-target pairing for magazine optimization; kill assessment on interceptor engagements; and cyber-warfare command and control of the BMDS Network.

In Block 2006, we will field the initial GIFC to the USPACOM Air Operations Center (AOC) at Hickam AFB in Hawaii to provide optimized, layered, integrated BMD to the USPACOM theaters and region to include the defense of Hawaii. The initial GIFC will provide a system-level track to all elements and C2 centers after the correlation and discrimination of observed tracks in the BMDS battlespace. The GIFC develops a coordinated sensor task plan after calculating the amount of energy and time needed to devote to each target. Additionally, the GIFC will provide automated and manual weapon-system assignment to optimize the weapon-target pairing based on engaging the highest priority targets, balancing the depletion of inventory, and minimizing inventory wastage. In Block 2008 and Block 2010, we will increase the GIFC capabilities, incorporating refined discrimination and correlation, superior weapon-target pairing, and target-object map production. The C2BMC program is developing the GIFC to accept algorithm enhancements and upgrades rapidly and readily as we anticipate many future enhancements to the BMDS. In Block 2008 and Block 2010, we will expand the fielding of GIFC, completing the USPACOM theater activities, and adding EUCOM and USCENTCOM regional and theater activities.

- **BMD Situational Awareness.** Situational Awareness is the ability to identify, process, and comprehend the critical elements of information about what is happening in the battlespace with regards to the BMD mission. Effective situational awareness depends on effective tactics, techniques, and procedures and a common, dependable, and accurate situational awareness knowledge-base. The loss of Situational Awareness increases chances for human error and decreases system performance. This usually occurs over a period of time and from a variety of sources: system failure to detect changes in the battlespace; confusing human-machine interface; failure to address unbounded conditions in the battlespace; unresolved discrepancies in sensor information; and ambiguity about displayed information. Our situational awareness tools will help to mitigate these occurrences.

- **BMD Planner.** To achieve effective and efficient Global Integrated Fire Control, the joint warfighters must develop rules that guide the operations of the BMDS. To develop these rules, the joint warfighters require a planning and analysis tool that incorporates metrics based on feasibility, suitability, acceptability, and uniqueness. The C2BMC program considers the fundamental elements of battle plan analysis as it applies to BMD, and in Block 2006 we will develop tools to evaluate courses of action (COA) rapidly. In Block 2008 and 2010, we will develop algorithms designed to provide the commander an expanded selection of alternatives when planning a battle. The objective is to enable a commander to evaluate mission objectives and battlefield intelligence, to improve the association of computer-generated COAs with reality and to allow the retention of battlefield initiative through a reduction in planning time requirements.

- **BMDS Network**. The C2BMC program is initiating, in Block 2006, the development of a service-oriented architecture (SOA) for the BMDS network. SOA is an architectural style for building software applications that use services available in a network such as the web. It promotes loose coupling between software components so that they can be reused. In the case of the BMDS, elements and components are the services and the SOA allows the introduction of new services while maintaining legacy services without the need to rebuild the network from the bottom up. This will replace the current point-to-point network used for the Initial Defense Capability. By the end of Block 2010, the BMDS Network will feature a completely functional SOA that features application-independence among the BMDS elements. That is, any element can modify its software at any time and remain a fully-functional element of the BMDS. Finally, we will work with Defense Information System Agency (DISA) and industry to develop and implement high-speed, high-bandwidth communications that can transport the BMDS data throughout the globe. The data transport mechanisms must provide rapid, secure, and accurate data transport throughout the BMDS Network.

- **Cyber-Warfare Command and Control.** Information processing—whether by computers or by humans— is becoming a "center of gravity" in future warfare. Nation-states reconnoiter and probe to identify exploitable digital network weaknesses among potential adversaries. In Block 2006, the C2BMC program is developing a cyber-warfare command and control (C2) prototype capability that will allow warfighters to monitor the BMD cyber-space to detect and isolate potential adversary intrusions into the BMDS Network. The prototype will depend on firewall technology and other current mechanisms to provide information security, and will operate during peacetime and during BMD execution activities. In Block 2008 and 2010, we will continue our collaboration with other agencies to prevent unauthorized intrusions into the BMDS Network.

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 (ESG) 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 this missile – 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.

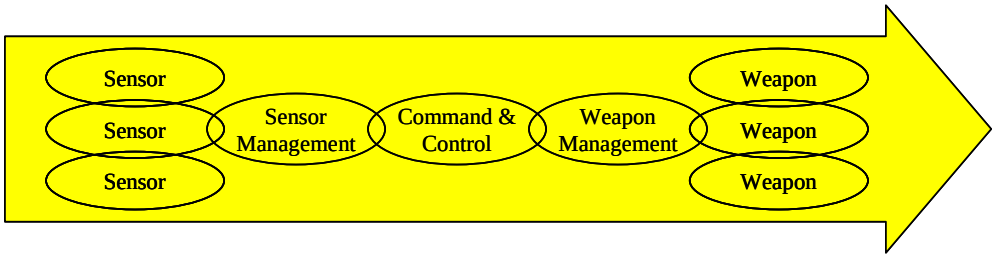


**Figure 2. Components of an Engagement Sequence**

"Ground-Based Interceptor Engage on Cobra Dane Radar" ("GBI Engage on Cobra Dane") describes a GBI launched and targeted based on track data from the Cobra Dane upgraded early warning radar and "Ground-Based Interceptor Engage on Aegis BMD (AN/SPY-1) Long-Range 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. Both of these are engagement sequence capabilities included in the initially fielded BMDS. "GBI Engage on Cobra Dane" occurs entirely within the Ground-Based Midcourse element. "GBI Engage on Aegis" crosses element boundaries from the Aegis BMD element to the Ground-Based Midcourse element. As the BMDS evolves, engagement sequences will increase both in number and in complexity. A fully integrated system allows for multiple kill chains via our global C2BMC 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*.

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 (ABL) and the Kinetic Energy Interceptor. 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. The Kinetic Energy Interceptor is a strategically deployable, multi-use, mobile interceptor being designed to intercept threat missiles in the boost/ascent and midcourse phases of flight. The most stressing scenario requires 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. The interceptor has long range and transportability – attributes that are beneficial for engaging longer range ballistic missiles in all phases of the flight trajectory. The Kinetic Energy Interceptor 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 (MKV) development effort focused on using miniaturization technology to develop an interceptor capable of engaging more than one potential target with multiple kill vehicles. MKV will help 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.

**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 developmental and operational test objectives. This incremental approach

enables MDA, Operational Test Authorities (OTA), 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.

To continue the implementation of this approach, MDA, in coordination with the OTAs and DOT&E, is revising the Integrated Master Test Plan (IMTP). 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 within a given Block. The IMTP also defines the characterization objectives 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. The criteria for OTA characterization are system performance, supportability, survivability, interoperability, and capability to perform alert transition.

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. Colocated within the CTF at multiple MDA locations is 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. Although the Liaison Group is located at MDA, OLG members report directly to their respective OTAs. This relationship within the RTO maintains the representatives' independence, yet provides the environment for continuous two-way communication channels to facilitate interaction and cooperation. The OLG 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) provides Warfighter input to test planning and execution. MDA's concurrent testing and operation approach 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.

We continue to develop and refine 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 functionality and capability defined in the

form of 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. MDA continues to place an increased emphasis on testing in anticipated operational conditions to the maximum extent practical, along with the emphasis on ensuring quality control and discipline by establishing and following proper procedures.

The MDA strategy for test, verification, and assessment focuses on functionality and capability. 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 simulation and exercise of the communications infrastructure and messaging functions within 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 (M&S) 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 Hardware-in-the-Loop test 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.

**FY06 Flight Test Plan**. The highlights of the FY06 test plan include four more GMD flight tests. The first will be a radar characterization test of the Beale Upgraded Early Warning Radar. The second test is a radar and target synchronization test. The third is a radar characterization test of the SBX Radar using only a target. The fourth test will be a kill vehicle endgame certification test with a planned intercept as a secondary objective. The Aegis BMD program will conduct two additional flights tests. The first will be a joint flight test with Japan, and the second will be an intercept against a medium range target with the tactical Aegis BMD configuration. MDA will also conduct four additional flight tests of the THAAD weapon system. The first will be against a simulated target. The second and third will be intercept tests, one of which will be against a separating target. The last will be an interceptor control test without a target. Testing C2BMC functions will be a major objective of all flight tests and

operators will be involved in each test. Finally, we will conduct a flight test involving C2BMC and the PATRIOT weapon system.

MDA has planned one critical measurements and countermeasures (CMCM) flight test to collect phenomenology data. MDA will participate in at least two Air Force Glory Trip (GT) flight tests, a Japanese Cooperative Target test, and three Israeli Arrow System Tests (AST). To support this flight test program, we also plan to conduct ground tests and participate in COCOM sponsored events to demonstrate interoperability, evaluate performance, and develop doctrine, tactics, techniques and procedures (TTP).

**FY07 Flight Test Plan**. The highlights of the FY07 test plan include three GMD flight tests, one of which will include an intercept as the primary objective. MDA will conduct two system flight tests employing Aegis BMD to demonstrate Aegis BMD's ability to successfully engage a target under operational conditions. MDA will conduct one system level flight test of the THAAD weapon system while THAAD completes four developmental tests. This system test will be an actual intercept mission that will assess THAAD's ability to communicate and exchange data with the AEGIS BMD weapon system and THAAD's ability to provide hit assessment reporting to C2BMC. Lastly, we will conduct a flight test to demonstrate PATRIOT's ability to receive engagement coordination direction from C2BMC.

We will participate in at least two Air Force Glory Trip (GT) flight tests and one Israeli Arrow System Tests. To support this flight test program, we also plan to conduct ground tests and participate in COCOM sponsored events to demonstrate interoperability, evaluate performance, and develop doctrine and TTPs.

**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, if necessary, defend our collective interests from ballistic missile attack.

International participation remains an essential part of our program. The Government of Japan is a major international partner and has announced plans to deploy a multi-layered missile defense capability. Their plans include upgrading their Patriot battalions to a PAC-3 capability and four Aegis destroyers to a BMD capability, including the purchase of Standard Missile-3 interceptors. Additionally, we will field a Forward Based X-Band Radar and associated C2BMC network and communications in Japan to contribute both to the defense of the U.S. as well as Japan. This effort will foster opportunities for data sharing among our governments and is a model for our way ahead with other nations. 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. Efforts to explore participation of Japanese industry in ABL development also continue.

Of course, we continue to work closely with the United Kingdom (UK). In 2005, we provided C2BMC situational awareness capability and displays to the UK. In 2006, we will

finish work on the Fylingdales Upgraded Early Warning Radar in the UK. We will begin work, after having reached an accord with the Kingdom of Denmark, on upgrading the Early Warning Radar in Thule, Greenland. These radars are key components for defeating long-range ballistic missile threats emerging from the Middle East and Northeast Asia.

We are also 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) 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. In FY06, we will provide hardware and operational C2BMC capabilities in an international exercise – Joint Project Optic Windmill. Israel remains a strong partner in missile defense. 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.

Finally, the FY07 budget submission includes funding to begin exploring potential locations for both a GBI and a radar/C2BMC site overseas. 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 FY06 BUDGET SUBMISSION.

The following is a summary of the significant program changes reflected in this year's budget compared to the FY06 submission.

**Fielding.** The fielding program described in this submission has been revised compared to the one shown in our FY06 submission. The Agency worked within its fiscal controls across the FYDP to weigh alternatives and balance the approaches to a layered defense. Adjustments were made to the fielding program outlined in PB06. We adjusted the number of Ground Based Interceptors based on recommendations from our Mission Readiness Task Force (MRTF). We reduced the number of SM-3 Sea Based Interceptors to invest in development upgrades that pace the near-term threat. This change resulted in the overall decrease in the number of fielded interceptors in the FYDP. Additionally, we have decided not to upgrade a radar at Eglin Air Force Base in Florida. Figure 3 highlights our fielding program at the end of the 2007.

**Development.** We have made several key adjustments to our development efforts while also attempting to realize efficiencies through overhead and infrastructure reductions.

- **Airborne Laser.** We have chosen to defer the trade studies and initial engineering efforts associated with the second Airborne Laser aircraft until after the lethal shootdown in 2008 to allow for a design turn on the aircraft. During the period leading up to lethal shootdown, the program manager will capture additional knowledge that will assist in future design alternatives for the second ABL; in addition, this realignment has added flexibility to the overall BMD program by making resources available for other efforts and allowing us to avoid premature termination of promising technologies. Deferral of

these trade studies will result in a two-year delay in the purchase of the second aircraft. Despite this change, the ABL program remains our primary boost phase intercept effort and made significant progress during CY2005.

**Figure 3.**

- **Kinetic Energy Interceptor**. We have chosen to adjust further the development of the Kinetic Energy Interceptor program in order to focus resources on current Ground Based Midcourse and Aegis BMD efforts, particularly as they relate to mission assurance and quality. We have maintained the schedule for the key knowledge points in the program, including the first booster flight test in 2008, but the overall result of rebalancing these resources is to delay the fielding of the first KEI fire unit from Block 2012 to Block 2014. We also moved two efforts from the BMDS Interceptors (KEI) PE: the Near Field Infrared Experiment now resides in the Ballistic Missile Defense Technology Program Element, and the Space Test Bed now resides in the BMD System Space Program PE. Both efforts will be managed by the MDA Space Center of Excellence.

- **Multiple Kill Vehicles.** We have restructured the Multiple Kill Vehicles program to introduce an improved Liquid Divert and Attitude Control System and integrate a 2-Color Seeker into the effort. We will also introduce knowledge points to ensure the program is on the same knowledge-based acquisition process as our other development efforts.

- **Nuclear Survivability**. We have initiated nuclear survivability efforts throughout the BMDS to enhance the ability of the system to operate in this environment.

## 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.

**Block 2004.** This funding is detailed in Table 1.

| Block 2004 Funding FY05-11 ($M Then-Year) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Project** | **FY05** | **FY06** | **FY07** | **FY08** | **FY09** | **FY10** | **FY11** | **FYDP FY 07-11** |
| C2BMC Block 2004 | 152 | 66 | 54 | | | | | **54** |
| Hercules Block 2004 | | | | | | | | |
| Joint Warfighter Support Block 2004 | 34 | | | | | | | |
| Test & Evaluation Block 2004 | 144 | | | | | | | |
| Targets & CM Block 2004 | 248 | | | | | | | |
| THAAD Block 2004 | 584 | | | | | | | |
| GMD Block 2004 Test Bed / IDC | 823 | | | | | | | |
| Aegis BMD Block 2004 | 901 | 145 | 28 | 20 | | | | **48** |
| ABL Block 2004 | 448 | | | | | | | |
| **Total** | **3,334** | **211** | **82** | **20** | **-** | **-** | **-** | **102** |

**Numbers may not add exactly due to rounding.**

**Table 1. Funding for Block 2004**

**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 2. Major initiatives in Block 2006 are:

**Fielding**: 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 Fylingdales, UK;
- A Forward Based X-Band Radar in Japan;
- A Sea-Based X-Band Radar in Alaska;
- Initial Global Integrated Fire Control at the Pacific Air Operations Center integrating Aegis BMD, FBX-T and GMD assets;
- Additional C2BMC planning and situation awareness capabilities at COCOM Headquarters to improve/streamline executive decision-making.

**Development**

- Completion of the Space Tracking and Surveillance System ground segment, and the launch of two satellites. Demonstrate capability to acquire, track, discriminate and report ballistic missile and intercept events; to perform acquisition-to-track handover and track handover within a satellite constellation; and to transfer command, mission and health and status data from ground segment to satellites and between satellites. Explore approaches for closing fire control loop for the BMDS.

- Continue integration, ground and flight test activities supporting ABL's low-power beam control/fire control and Ballistic Missile Command, Control, Communications, Computers and Intelligence (BMC4I) systems. By the end of Block 2006, low power system integration will be complete and the installation of the high-energy laser (HEL) will have begun.

| Block 2006 Funding FY05-11 ($M Then-Year) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Project** | **FY05** | **FY06** | **FY07** | **FY08** | **FY09** | **FY10** | **FY11** | **FYDP FY 07-11** |
| C2BMC Block 2006 | 27 | 136 | 177 | 103 | 57 | | | **336** |
| Hercules Block 2006 | 23 | 20 | | | | | | |
| Joint Warfighter Support Block 2006 | | 27 | 77 | 1 | | | | **78** |
| Test & Evaluation Block 2006 | 9 | 134 | 129 | | | | | **129** |
| Targets & CM Block 2006 | 25 | 224 | 159 | | | | | **159** |
| THAAD Block 2006 | 162 | | | | | | | |
| GMD Block 2004 / 2006 | 2,450 | 2,334 | 2,354 | 468 | 510 | | | **3,332** |
| Aegis BMD Block 2006 | 122 | 456 | 483 | 88 | 76 | 48 | 4 | **698** |
| ABL Block 2006 | | 455 | 595 | | | | | **595** |
| BMDS Radars Block 2006 | 276 | 235 | 223 | 85 | 103 | | | **410** |
| STSS Block 2006 | 248 | 228 | 248 | 74 | 92 | 89 | 41 | **544** |
| **Total** | **3,340** | **4,248** | **4,444** | **818** | **838** | **137** | **45** | **6,281** |
| Defense-Wide Resources | | | | (430) | (204) | | | (634) |
| **MDA Total Less Defense-Wide Resources** | **3,340** | **4,248** | **4,444** | **388** | **633** | **137** | **45** | **5,647** |

**Numbers may not add exactly due to rounding.**

**Table 2. Funding for Block 2006**

The following table provides an estimate of the current facilitized production rate capacity for capabilities being fielded in Block 2006.

| | **Facilitized Capacity** |
|---|---|
| **Ground Based Interceptors (GBI)** | **One per month** |
| **Standard Missile 3 (SM-3)** | **Two per month** |
| **THAAD Radar** | **Two per year** |
| **FBX-T Radar** | **Two per year** |

**Table 3. Block 2006 Production Rate Capacity**

**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 4. The most significant Block 2008 efforts include:

**Fielding**: 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;
- Upgraded Early Warning Radar at Thule, Greenland;
- Two FBX-T Radars and one Adjunct X-Band Dish Radars;
- C2BMC capability in European Command (EUCOM);

- Fully deployed Global Integrated Fire Control and COCOM planning and situational awareness incorporating newly fielded sensors and weapons systems.

**Development**

- Upgrades and improvements to GMD including enhanced SBX capabilities, additional GFC capabilities, countermeasures mitigation and multi-sensor fusion. Additionally, we will upgrade EKV software to enhance performance and the EKV processor and avionics to improve reliability, memory and throughput capabilities.

- For Aegis BMD, we will develop a new signal processor for the Aegis BMD Weapon System, and upgrade the seeker and divert and attitude control system (DACS) on the Standard Missile.

- Continued ground and flight testing of the first ABL aircraft, to include the first in-flight lethal demonstration of the weapon system against a boosting ballistic missile (currently scheduled for late CY2008). In addition, the program will conduct trade studies and establish the capabilities baseline for a second ABL aircraft.

- Upgrades to STSS ground segment hardware and software and upgrades to the STSS spacecraft software. Upgrades will be based on data gathered from satellites launched in Block 2006.

**Block 2008 Funding FY05-11 ($M Then-Year)**

| Project | FY05 | FY06 | FY07 | FY08 | FY09 | FY10 | FY11 | FYDP FY 07-11 |
|---|---|---|---|---|---|---|---|---|
| C2BMC Block 2008 | 6 | 6 | 34 | 159 | 180 | 107 | 64 | **543** |
| Hercules Block 2008 | 59 | 38 | | | | | | |
| Joint Warfighter Support Block 2008 | | | | 63 | 62 | | | **125** |
| Test & Evaluation Block 2008 | | | 45 | 128 | 132 | | 4 | **309** |
| Targets & CM Block 2008 | | 4 | 21 | 174 | 151 | | | **345** |
| THAAD Block 2008 | 0 | 991 | 942 | 694 | 474 | 21 | | **2,132** |
| GMD Block 2008 | | 73 | 355 | 1,395 | 1,187 | 501 | 341 | **3,778** |
| Aegis BMD Block 2008 | | 266 | 418 | 681 | 558 | 92 | 51 | **1,799** |
| ABL Block 2008 | | | 3 | 543 | 417 | | | **963** |
| BMDS Radars Block 2008 | | 39 | 276 | 471 | 404 | 185 | 161 | **1,497** |
| STSS Block 2008 | | | 35 | 29 | 24 | 14 | 14 | **116** |
| **Total** | **65** | **1,416** | **2,129** | **4,336** | **3,589** | **920** | **634** | **11,609** |
| Defense-Wide Resources | | | | (803) | (702) | (719) | (209) | (2,432) |
| **MDA Total Less Defense-Wide Resources** | **65** | **1,416** | **2,129** | **3,533** | **2,888** | **201** | **425** | **9,177** |

**Numbers may not add exactly due to rounding.**

**Table 4. Funding for Block 2008**

The following table provides an estimate of the current facilitized production rate capacity for capabilities being fielded in Block 2008.

| | Facilitized 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** |
| **FBX-T Radar** | **Two per year** |

**Table 5. Block 2008 Production Rate Capacity**

**Block 2010.** Fielding and development efforts will continue in Block 2010. Funding for Block 2010 is detailed in Table 6. Significant Block 2010 efforts include:

**Fielding**

- Expanded capability with additional sea-based interceptors and an additional THAAD fire unit, additional Ground-Based Interceptors, a potential third site for fielding of these GBIs, a second Adjunct X-Band Dish radar as well as network and user C2BMC enhancements to integrate these new assets. Funding for the Block 2010 GBIs and the potential third site starts in FY07.

**Development**

- GMD efforts in Block 2010 include the development of advanced payloads that can address increasingly sophisticated threats.

- The Aegis BMD Block 2010 program will integrate Aegis BMD with the Navy-developed Open Architecture system. This effort will transition Aegis BMD from older, mil-standard computers to newer, commercial-off-the-shelf (COTS) computing plants.

- The ABL Block 2010 effort continues the spiral development of the ABL for future integration of its capabilities into the BMDS. The two key components of this spiral activity are the 1st ABL Weapon System test bed and the 2nd ABL Weapon System. The block effort provides a flying asset for advancing capability of future ABL aircraft through technology and operations improvement. The ABL Block 2010 effort includes evaluations of the 1st ABL against a broader spectrum of threats as an integrated part of the overall BMDS, and also provides for enhancement of BMDS integration. In addition, during ABL Block 2010, the purchase of the 2nd ABL green aircraft will be initiated. The 2nd ABL effort focuses on developing and producing an ABL that will demonstrate a capability that is operationally significant with a baseline that is robust, reliable, and reproducible in order to support an eventual production decision.

| Block 2010 Funding FY05-11 ($M Then-Year) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Project** | **FY05** | **FY06** | **FY07** | **FY08** | **FY09** | **FY10** | **FY11** | **FYDP FY 07-11** |
| C2BMC Block 2010 | | | | 1 | 35 | 161 | 206 | **405** |
| Hercules Block 2010 | | 6 | | | | | | |
| Joint Warfighter Support Block 2010 | | | | | | 62 | 65 | **127** |
| Test & Evaluation Block 2010 | | | | 35 | 40 | 119 | 110 | **304** |
| Targets & CM Block 2010 | | 1 | 3 | 5 | 42 | 191 | 163 | **404** |
| THAAD Block 2010 | | | | 114 | 119 | 642 | 386 | **1,262** |
| GMD Block 2010 | | | 119 | 706 | 670 | 1,575 | 1,310 | **4,380** |
| Aegis BMD Block 2010 | | | 29 | 53 | 172 | 472 | 341 | **1,067** |
| ABL Block 2010 | | | | | | 416 | 648 | **1,064** |
| BMDS Radars Block 2010 | | | 7 | 19 | 124 | 129 | 48 | **327** |
| STSS Block 2010 | 43 | | | | | | | |
| BMDS Interceptor Block 2010 | | | | | | | | |
| EO/IR Block 2010 | 2 | | | | | | | |
| **Total** | **45** | **7** | **157** | **934** | **1,201** | **3,769** | **3,278** | **9,339** |
| | | | | | | | | |
| Defense-Wide Resources | | | | (685) | (762) | (975) | (1,343) | (3,765) |
| **MDA Total Less Defense-Wide Resources** | **45** | **7** | **157** | **248** | **439** | **2,794** | **1,935** | **5,574** |

**Numbers may not add exactly due to rounding.**

**Table 6. Funding for Block 2010**

**Block 2012.** We have a considerable investment in Block 2012 capability in this budget submission comprised primarily of our Space Tracking and Surveillance System (STSS) program. Funding for Block 2012 is in Table 7. The STSS launch schedule will depend on the final satellite configuration which will await the test results from the initial Block 2006 two-satellite constellation; however, the first satellite of the final configuration is projected to be launched early in Block 2012. We are planning to initiate the acquisition of the Block 2012 STSS constellation after the delivery of the Block 2006 payloads. The Aegis BMD Block 2012 program will integrate the Aegis BMD Weapon System improvements and the SM-3 Block IIA missile, i.e., the 21-inch Full Caliber Round (FCR) missile, which will provide the capability to engage longer-range threats, including ICBMs.

| Block 2012 Funding FY05-11 ($M Then-Year) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Project** | **FY05** | **FY06** | **FY07** | **FY08** | **FY09** | **FY10** | **FY11** | **FYDP FY 07-11** |
| Test & Evaluation Block 2012 | | | | | | 56 | 76 | **132** |
| Targets & CM 2012 | | | | | | 6 | 39 | **45** |
| Aegis Block 2012 | | | 16 | 21 | 40 | 158 | 168 | **402** |
| STSS Block 2012 | | | 97 | 309 | 635 | 837 | 817 | **2,695** |
| BMDS Interceptor Block 2012 | 257 | | | | | | | |
| **Total** | **257** | **-** | **113** | **330** | **675** | **1,057** | **1,099** | **3,274** |
| | | | | | | | | |
| Defense-Wide Resources | | | | (33) | (285) | (300) | (190) | (807) |
| **MDA Total Less Defense-Wide Resources** | **257** | **-** | **113** | **298** | **390** | **757** | **909** | **2,467** |

**Numbers may not add exactly due to rounding.**

**Table 7. Funding for Block 2012**

**Block 2014**. Block 2014 consists of the Kinetic Energy Interceptor program, delayed from Block 2012. The Kinetic Energy Interceptor program will continue to focus on critical technology demonstrations and the development of an initial land-based capability. During FY07, the program will continue to focus on static booster firings in preparation for a booster flight test in FY08. A sea-based capability could follow sometime thereafter depending on funding levels in the program. Funding for Block 2014 is detailed in Table 8.

| Block 2014 Funding FY05-11 ($M Then-Year) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Project** | **FY05** | **FY06** | **FY07** | **FY08** | **FY09** | **FY10** | **FY11** | **FYDP FY 07-11** |
| BMDS Interceptor Block 2014 | | 202 | 386 | 400 | 852 | 1,149 | 1,651 | **4,438** |
| **Total** | **-** | **202** | **386** | **400** | **852** | **1,149** | **1,651** | **4,438** |
| Defense-Wide Resources | | | | | | | | |
| **MDA Total Less Defense-Wide Resources** | **-** | **202** | **386** | **400** | **852** | **1,149** | **1,651** | **4,438** |

**Numbers may not add exactly due to rounding.**

**Table 8. 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 in Table 9 below.

| Mission Area Investments Funding FY05-11 ($M Then-Year) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Project** | **FY05** | **FY06** | **FY07** | **FY08** | **FY09** | **FY10** | **FY11** | **FYDP FY 07-11** |
| System Engineering | 159 | 121 | 138 | 143 | 144 | 151 | 165 | **741** |
| C2BMC | | | | | | | | |
| BMD Test & Targets | 442 | 417 | 439 | 461 | 475 | 472 | 481 | **2,327** |
| International Programs | 220 | 167 | 121 | 152 | 202 | 272 | 306 | **1,053** |
| Multiple Kill Vehicle | | 49 | 162 | 279 | 357 | 412 | 505 | **1,714** |
| Special Programs | 167 | 275 | 375 | 715 | 630 | 725 | 695 | **3,140** |
| Advanced Systems | 222 | 145 | 250 | 274 | 406 | 431 | 479 | **1,838** |
| SBIR/STTR | 139 | | | | | | | |
| Producibility & Manufacturing Technology | 37 | 33 | 37 | 40 | 43 | 44 | 45 | **210** |
| Safety, Quality & Mission Assurance | 15 | 18 | 26 | 32 | 41 | 40 | 41 | **179** |
| BMD Information Management Systems | 61 | 112 | 123 | 125 | 127 | 135 | 138 | **649** |
| Intelligence & Security | 28 | 19 | 24 | 27 | 29 | 39 | 47 | **166** |
| Program-Wide Support | 197 | 133 | 209 | 272 | 235 | 290 | 192 | **1,197** |
| Headquarters Management | 122 | 114 | 103 | 93 | 92 | 75 | 75 | **438** |
| BRAC | | 8 | | 85 | 19 | 3 | | **107** |
| **Total** | **1,809** | **1,611** | **2,007** | **2,697** | **2,800** | **3,089** | **3,166** | **13,760** |

**Numbers may not add exactly due to rounding.**

**Table 9. Funding for Mission Area Investments**

## V. BALLISTIC MISSILE DEFENSE MANAGEMENT

A key aspect to supporting MDA re-engineering efforts will be to develop the necessary management disciplines and techniques to strengthen our ability to manage, account for and invest in resources across the entire spectrum of the BMDS. This will entail a multi-disciplinary approach across several functional areas and disciplines summarized below to include: re-engineering, financial management and accounting, knowledge-based decision-making, business case analysis, and insight.

**MDA Re-engineering**. We are chartered to develop and field a single, layered, integrated BMDS as a single acquisition effort. When the Agency was formed, the Department provided the necessary authorities to bring together separate missile defense efforts into a single effort. The transition to managing all these efforts as a single effort has been deliberate – primarily to avoid perturbing on-going activity any more than necessary. We placed our emphasis on integrating various aspects of the program to achieve better performance while

maintaining our schedule. We also made decisions based on benefits to the entire system. Our organization, however, remained element-centric as opposed to system-centric. Over the past year we have developed a "re-engineered" organization to fully implement the transition to a single system. A key part of this approach is recognition of the Director, MDA as the BMDS Program Manager and his need to balance capability across components of the BMDS, not only within each element. To facilitate this, we will focus on commonality and efficiencies in everything from interceptor and sensor components to flight testing and modeling and simulation efforts. This will drive us toward a system that maximizes performance across the battlespace while minimizing cost and unwanted redundancy.

**Financial Management and Accounting**. We support and are participating in several Department-level financial management initiatives and programs: the Financial Improvement and Audit Readiness (FIAR) Plan; the Business Management Modernization Program (BMMP); and the Defense Agencies Initiative (DAI). The FIAR is the overarching plan to improve financial management in the Department. We have a Financial Improvement Plan (FIP) that we use to manage internal Agency financial improvements and provide information to the Department for inclusion in the FIAR. Additionally, the new internal control reporting requirements over financial management contained in Office of Management and Budget Circular A-123, Management's Responsibility for Internal Control, are being addressed and incorporated into the Financial Improvement Plan and the FIAR as part of the FIAR initiative. At the same time, we are developing timely, reliable, and comprehensive financial information to assist in making key resource and investment decisions. Under our re-engineering concept we will ensure that one person who is part of top management has overall responsibility for establishing and implementing effective financial management policies, financial management internal controls, and financial management systems. Also, financial management is one of five BMMP Core Business Missions (CBMs) and we are working actively to execute the goals and objectives of the CBM.

**Knowledge-based Decision Making**. We are executing a capability-based acquisition strategy to develop and field this BMD Program in accordance with Secretary of Defense direction. We cannot predict with certainty what nation(s) or non-state actor will pose threats to U.S. interests or those of our allies and friends. Capability-based acquisition allows us to exploit capability opportunities sooner, focusing on adding capabilities with demonstrated military utility rather than delaying to achieve a military requirement that may have been defined years earlier. The spiral development of our Block construct allows us to plan for these incremental improvements in capability and focus on integration activities. We use knowledge-based decision making as an implementation mechanism for capability-based acquisition. Knowledge-based decision making allows for incremental financial commitment to a development effort based on achieving planned knowledge points. Pre-planned knowledge points allow us to manage risk by making sure we are getting what we wanted out of our development efforts. Each added commitment of funding hinges on knowledge gained from a demonstrated event and we maintain flexibility to make adjustments when planned knowledge points are not achieved.

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.

Knowledge-based funding allows us to use our budgetary resources in the most efficient and responsible manner.

**Business Case Analysis**. In order to achieve more effective resource decision making we are establishing a delineated link between resource allocation, performance management and strategic planning as part of our overall business case analysis (BCA). This will be simple enough to be implemented quickly and to identify potential trade-offs necessary to provide incentives for cost reduction and capability comparisons. Our objective is to achieve the best approach to field integrated defense capabilities in support of joint objectives and to facilitate the delivery of capabilities to the warfighter in a timely, efficient, and cost effective manner. This will bring a comprehensive approach to strategic planning based on programmatic choice, and an efficient allocation of resources to develop, acquire, and field missile defense capability. Our business case management concept is evolutionary, exploring new ways to move forward and implement meaningful programmatic change. And at the same time we are working with several other government agencies, major combatant commands, the military departments, and industry to ensure DOD-wide investment decisions support our Nation's missile defense objectives.

**Department Oversight**. The Department is establishing the Ballistic Missile Defense Executive Board (referred to hereafter as the Board) to recommend and oversee implementation of strategic policies and plans, program priorities, and investment options to protect our Nation and our allies from any form of ballistic missile attack. The Board will incorporate evolving requirements into a comprehensive acquisition strategy to develop and field operational missile defense capability. The Board will replace the Senior Executive Council (SEC) as the senior oversight body for missile defense activity, but it will not have the decision authority of the SEC – such authority will reside with the Under Secretary of Defense for Acquisition, Technology and Logistics (USD/AT&L), and with the Director of the Missile Defense Agency as designated by USD/AT&L.

This Board will enhance the decision-making environment by improving information flow among key stakeholders: the Missile Defense Agency (MDA), Office of the Secretary of Defense, Combatant Commanders, DoD components, the Joint Staff, and the national security and intelligence community. The Board will establish a viable means to achieve our goals within the context of technical capability and established resource levels.

This approach will be based on a continuous evaluation of successes, failures and risks throughout a programmatic timeline beginning in the current budget year and extending through the FYDP, and beyond. The Board will guide new ideas and technologies as they develop into initial capabilities, and subsequently into fully mature solutions ready for fielding and inclusion into the missile defense system. The Board will also consider the evolving priorities and requirements of the warfighting community as it formulates recommendations on the way forward.

## VI. PRESIDENT'S BUDGET SUBMISSION AND ORGANIZATION

Table 10 below provides a breakdown of Program Element funding by fiscal year across the FYDP.

| PE Title | PE Number | FY07 | FY08 | FY09 | FY10 | FY11 | FY07-11 Totals |
|---|---|---|---|---|---|---|---|
| Ballistic Missile Defense Technology | 0603175C | 207 | 183 | 214 | 223 | 228 | 1,055 |
| Ballistic Missile Defense Terminal Defense Segment | 0603881C | 1,038 | 904 | 682 | 754 | 469 | 3,847 |
| Ballistic Missile Defense Midcourse Defense Segment | 0603882C | 2,877 | 2,650 | 2,397 | 2,148 | 1,685 | 11,758 |
| Ballistic Missile Defense Boost Defense Segment | 0603883C | 632 | 577 | 456 | 457 | 687 | 2,809 |
| Ballistic Missile Defense Sensors | 0603884C | 515 | 589 | 647 | 326 | 220 | 2,298 |
| Ballistic Missile Defense System Interceptors | 0603886C | 406 | 425 | 895 | 1,202 | 1,675 | 4,603 |
| Ballistic Missile Defense Test and Targets (includes MILCON) | 0603888C | 600 | 595 | 629 | 635 | 656 | 3,114 |
| Ballistic Missile Defense Products | 0603889C | 507 | 506 | 510 | 507 | 513 | 2,542 |
| Ballistic Missile Defense System Core | 0603890C | 473 | 501 | 524 | 555 | 573 | 2,626 |
| Special Programs - MDA | 0603891C | 375 | 715 | 630 | 725 | 695 | 3,140 |
| Ballistic Missile Defense Aegis | 0603892C | 1,032 | 952 | 980 | 973 | 799 | 4,736 |
| Space Tracking & Surveillance System | 0603893C | 391 | 427 | 772 | 958 | 885 | 3,433 |
| Multiple Kill Vehicle | 0603894C | 165 | 286 | 357 | 413 | 505 | 1,726 |
| BMD System Space Program | 0603895C | | 45 | 151 | 167 | 207 | 570 |
| Management Headquarters / PRMRF | 0901598C/ 0901585C | 103 | 93 | 92 | 75 | 75 | 438 |
| Base Realignment and Closure (BRAC) | 0207998C | | 85 | 19 | 3 | | 107 |
| | **PE Total** | **9,318** | **9,536** | **9,956** | **10,121** | **9,873** | **48,803** |
| Defense-Wide Resources | 0904903D | | (1,951) | (1,953) | (1,994) | (1,741) | (7,639) |
| **MDA Total Less Defense-Wide Resources** | | | | | | | **41,165** |

**Numbers may not add exactly due to rounding.**

**Table 10. Funding By Program Element**

Table 11 provides a breakdown of Program Element funding by Block for funds included in this budget submission.

| PE Title | PE Number | BMDS Funding for FYDP 07-11 ($M Then-Year) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Capability Blocks | | | | | | Mission Area Invest | PE Totals |
| | | Block 2004 | Block 2006 | Block 2008 | Block 2010 | Block 2012 | Block 2014 | | |
| Technology | 0603175C | | | | | | | 1,055 | 1,055 |
| Terminal | 0603881C | | 3 | 2,132 | 1,262 | | | 451 | 3,847 |
| Midcourse | 0603882C | | 3,332 | 3,778 | 4,380 | | | 267 | 11,758 |
| Boost | 0603883C | | 595 | 963 | 1,064 | | | 186 | 2,809 |
| Sensors | 0603884C | | 410 | 1,497 | 327 | | | 64 | 2,298 |
| BMDS Interceptor | 0603886C | | | | | | 4,438 | 165 | 4,603 |
| BMD Test & Targets (includes MILCON) | 0603888C | | 288 | 654 | 708 | 177 | | 1,286 | 3,114 |
| BMD Products | 0603889C | 54 | 412 | 669 | 531 | | | 876 | 2,542 |
| BMD Core | 0603890C | | | | | | | 2,626 | 2,626 |
| Special Programs | 0603891C | | | | | | | 3,140 | 3,140 |
| BMD Aegis | 0603892C | 48 | 698 | 1,799 | 1,067 | 402 | | 723 | 4,736 |
| Space Tracking & Surveillance System | 0603893C | | 544 | 116 | | 2,695 | | 79 | 3,433 |
| Multiple Kill Vehicle | 0603894C | | | | | | | 1,726 | 1,726 |
| BMD System Space | 0603895C | | | | | | | 570 | 570 |
| Mgmt Hq/PRMRF | 0901598C/ 0901585C | | | | | | | 438 | 438 |
| BRAC | 0207998C | | | | | | | 107 | 107 |
| | **Block Total** | **102** | **6,281** | **11,609** | **9,339** | **3,274** | **4,438** | **13,760** | **48,803** |
| Defense-Wide Resources | 0904930D | | (634) | (2,432) | (3,765) | (807) | | | (7,639) |
| **MDA Total Less Defense-Wide Resources** | | **102** | **5,647** | **9,177** | **5,574** | **2,467** | **4,438** | **13,760** | **41,165** |

**Numbers may not add exactly due to rounding.**

**Table 11. Mapping Program Elements to Blocks**

## VII. 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.

## VIII. 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 |

# Missile Defense Agency
# Fiscal Year (FY) 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

| Reporting Requirement Reference | Reporting Requirement Language | Budget Documentation and Page |
|---|---|---|
| *Sec 223(a). Ballistic Missile Defense Programs: Procurement;* National Defense Authorization Act for Fiscal Year 2004 (H.R. 1588, H. Rpt. 108-354, pp. 30-31) | *BUDGET JUSTIFICATION MATERIALS- In the budget justification materials submitted to Congress in support of the Department of Defense budget for any fiscal year (as submitted with the budget of the President under section 1105(a) of title 31), the Secretary of Defense shall specify, for each ballistic missile defense system element for which the Missile Defense Agency is engaged in planning for production and initial fielding, the following information:*<br>*(1) The production rate capabilities of the production facilities planned to be used for production of that element.*<br>*(2) The potential date of availability of that element for initial fielding.*<br>*(3) The estimated date on which the administration of the acquisition of that element is to be transferred from the Director of the Missile Defense Agency to the Secretary of a military department.* | **Fiscal Year 2007 Budget Estimate Overview**<br>Block 2006 Production Rates, Page 17<br>Block 2008 Production Rates, Page 19<br><br>**Fiscal Year 2007 Budget Estimate Overview**<br>Fielding, Page 14<br>Block Highlights, Block 2006 Page 16<br>Block Highlights, Block 2008 Page 17<br>Block Highlights, Block 2010 Page 19<br>Block Highlights, Block 2012 Page 20<br>Block Highlights, Block 2014 Page 20<br><br>MDA and the services continue detailed planning for potential transfer of program management responsibilities. As of this budget submission, no specific transfer dates are available to report. |
| *Sec 223(a). Ballistic Missile Defense Programs: Procurement;* National Defense Authorization Act for Fiscal Year 2004 (H.R. 1588, H. Rpt. 108-354, pp. 30-31) | *FUTURE-YEARS DEFENSE PROGRAM- The Secretary of Defense shall include in the future-years defense program submitted to Congress each year under section 221 of this title an estimate of the amount necessary for procurement for each ballistic missile defense system element, together with a discussion of the underlying factors and reasoning justifying the estimate.* | **0603881C**, Terminal Defense, Page 25<br>**0603882C**, BMD Midcourse Defense, Page 85<br>**0603884C**, BMDS Sensors, Page 239<br>**0603889C**, BMD Products, Page 505<br>**0603892C**, BMD Aegis, Page 831<br>**0603893C**, STSS, Page 911<br><br>***** Additionally, MDA to provide BMDS Statements of Goals & Baselines to Congressional staffs on or about March 2006. This report fully satisfies this requirement. |

# Missile Defense Agency
# Congressional Reporting Requirements

| Reporting Requirement Reference | Reporting Requirement Language | Budget Documentation and Page |
|---|---|---|
| BMDO BUDGET JUSTIFICATION MATERIAL; H.Rept.107-298, the House Appropriations Committee Report, to accompany H.R.3338, the Department of Defense Appropriations Bill, 2002 Pg 252 | The Committee is concerned about the level of information provided in this year's budget justification material. In addition to the material currently provided, the Committee directs the Department to submit the following information as part of its future budget requests.<br>For each program element and project: the funding appropriated in the previous year and the expected requirement for the next six years, by year.<br>For special interest projects and new starts: a detailed schedule (including contract awards, decision points, test events and hardware/software deliveries) at least through the stage of testing the prototype whose performance will form the basis for deciding whether or not to begin developing the system as a major defense acquisition program.<br>For those programs that are already major defense acquisition programs: a detailed schedule (including contract awards, decision points, test events and hardware/software deliveries), the number of systems to be acquired, the expected performance, the unit cost, and the cost to completion for the program.<br>In addition, the Department should present an overall timeline for its future architecture highlighting when each system in that architecture will go into production as well as a comparable threat timeline indicating which threat systems are expected to be deployed and in what quantities. | **R-1 Exhibit,** Page V<br><br>**0603881C**, Terminal Defense, Page 25<br>**0603882C**, BMD Midcourse Defense, Page 85<br>**0603884C**, BMDS Sensors, Page 239<br>**0603889C**, BMD Products, Page 505<br>**0603892C**, BMD Aegis, Page 831<br>**0603893C**, STSS, Page 911<br><br>**Fiscal Year 2007 Budget Estimate Overview**<br>Fielding, Page 14<br>Block Highlights, Block 2006 Page 16<br>Block Highlights, Block 2008 Page 17<br>Block Highlights, Block 2010 Page 19<br>Block Highlights, Block 2012 Page 20<br>Block Highlights, Block 2014 Page 20<br><br>***** Additionally, MDA to provide BMDS Statements of Goals & Baselines to Congressional staffs on or about March 2006. This report fully satisfies this requirement. |

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/03 Advanced Technology Development (ATD)** | R-1 NOMENCLATURE: **0603175C Ballistic Missile Defense Technology** |

| COST ($ in Thousands) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| Total PE Cost | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 |
| 0502 Advanced Technology Development | 221,875 | 144,847 | 199,137 | 177,810 | 205,247 | 214,512 | 221,775 |
| 0602 Program-Wide Support | 2,141 | 4,458 | 7,539 | 5,604 | 8,815 | 8,422 | 6,472 |

*Note: In FY06, the Multiple Kill Vehicles program funding moved from Project 0502 (Engagement Systems area) to a new Program Element (0603894C) in Project 0515, Multiple Kill Vehicles.*

*Beginning in FY06, funding for the Near Field Infrared Experiment (NFIRE) was moved to Advanced Technology from PE 0306886C per Congressional direction.*

## A. Mission Description and Budget Item Justification

The Advanced Technology Program Element develops the next generation technology capabilities for the Ballistic Missile Defense System (BMDS) to counter the current and evolving BMD threat. The technology investment priorities balance the pursuit of next generation technology with promising high payoff near-term technology solutions to increase the current BMDS capability. The technology development activities include six focused areas that develop and mature promising concepts and technologies. The six areas are Innovation and Analysis, Sensing Systems Technology, Engagement Systems Technology, the High Altitude Airship (HAA), Advanced Command and Control and Battle Management and Communications (C2BMC) Technology, and the Near Field Infrared Experiment (NFIRE).

## A.1 System Element Description

The Advanced Technology development program develops technology and future capabilities to counter current and evolving threat ballistic missiles. The technology initiatives are transitioned to current BMDS weapons, sensors, and command and control, battle management, and communications (C2BMC) components to improve the capability of the BMDS.

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

This Program Element supports the development of technologies for the entire BMDS. This PE considers BMDS technology needs associated with individual elements as well as unique requirements to realize the next generation BMDS. The technology efforts selected for development may lead to enhanced performance of a specific BMDS component/subsystem, may benefit a common component that can be used by multiple elements, or develop a new technology that adds a new capability to the BMDS. As technologies are matured in this PE, opportunities to integrate them into BMDS components/subsystems are structured to support two-year block upgrades. Examples of planned transitions into the BMDS include the Photonic Time Delay Unit (PTDU) for the THAAD radar; the Strategic Illuminator Laser (SILL) for the Airborne Laser (ABL); the Multiple Kill

Vehicles (MKV) for the Ground Based Interceptor (GBI), Kinetic Energy Interceptor (KI) and future interceptor programs; and quantum well infrared photo detector cameras (QWIPs) for ABL.

## A.3 Major System Element Goals

The three major goals for Advanced Technology are:

- Identify new system concepts and next generation technology for the BMDS
- Select and invest in high pay-off technology with a risk level commensurate with the pay-off, and seek large returns on investment to complement the BMDS
- Mature key promising technologies to support two-year BMDS block upgrades and long-term BMDS evolution

| B. Program Change Summary | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Previous President's Budget (FY 2006 PB) | 231,145 | 136,241 | 184,877 |
| Current President's Budget (FY 2007 PB) | 224,016 | 149,305 | 206,676 |
| Total Adjustments | -7,129 | 13,064 | 21,799 |
| Congressional Specific Program Adjustments | 0 | 26,056 | 0 |
| Congressional Undistributed Adjustments | 0 | -12,992 | 0 |
| Reprogrammings | -3,326 | 0 | 0 |
| SBIR/STTR Transfer | -3,803 | 0 | 0 |
| Adjustments to Budget Years | 0 | 0 | 21,799 |

FY05 reduction of $7.129 million includes MDA reprogrammings and the SBIR/STTR transfer.

FY06 increase of $13.064 million includes Congressional specific program adjustments (most notably transfer in of the Near Field Infrared Experiment (NFIRE) and NetCentric Airborne Defense Element (NCADE); and transfer out of the High Altitude Airship (HAA)) and a portion of the MDA Congressional undistributed adjustment.

FY07 increase of $21.799 million follows through with the Congressionally directed transfers and includes overhead/infrastructure reductions.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/03 Advanced Technology Development (ATD)** | R-1 NOMENCLATURE: **0603175C Ballistic Missile Defense Technology** |

| COST ($ in Thousands) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0502 Advanced Technology Development | 221,875 | 144,847 | 199,137 | 177,810 | 205,247 | 214,512 | 221,775 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: In FY06, the Multiple Kill Vehicles program funding moved from Project 0502 (Engagement Systems area) to a new Program Element (0603894C) in Project 0515, Multiple Kill Vehicles.*

*Beginning in FY06, funding for the Near Field Infrared Experiment (NFIRE) was moved to Advanced Technology from PE 0306886C per Congressional direction.*

## A. Mission Description and Budget Item Justification

The Advanced Technology Program Element develops the next generation technology for the Ballistic Missile Defense System (BMDS) to counter the current and evolving BMD threat. The technology investment priorities balance the pursuit of the next generation technology with promising high payoff near-term technology solutions that may increase the current BMDS capability. The technology development activities include six focused areas that develop and mature promising concepts and technologies. The six areas are Innovation and Analysis, Sensing Systems Technology, Engagement Systems Technology, the High Altitude Airship (HAA), Advanced Command and Control and Battle Management and Communications (C2BMC) Technology, and the Near Field Infrared Experiment (NFIRE).

The Innovation and Analysis (I&A) area seeks out new concepts and technology solutions through a series of programs enabling proposals from domestic and foreign industry, universities/colleges, researchers, and other agencies. The I & A activity matures this new and innovative technology to a level where it can be transitioned directly to the BMDS or selected as a promising technology for future maturation in one of the six technology areas. This area includes the technical direction and programmatic oversight focusing congressionally mandated technology activities towards providing technology improvements for the BMDS. The series of programs conducted in the Innovation and Analysis area include:

- The Advanced Technology Small Business Innovative Research (SBIR) and Small Business Technology Transfer (STTR) program oversees topic development, evaluates and selects the best proposals from small businesses, and manages the resulting contracts. Advanced Technology SBIR managers conduct the MDA SBIR Research, Evaluation and Debriefing process for all MDA Phase I & II proposals.
- One I & A activity researches topics and selects BMDS relevant proposals from Historically Black Colleges and Universities/Minority Institutions (HBCU/MI). I & A provides technical and management oversight for the selected proposals.
- International Science and Technology collaboration proposals are managed by the I&A team. This team ensures that proposals from allied governments, individuals, businesses or universities are processed through full objective evaluation, recommendation and selection processes.

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- Advanced Technology ensures MDA compliance with Technology Transfer mandates through conducting the MDA Technology Applications (TA) program. This program assists qualified participants by helping them to commercialize products developed from MDA funded technology. The TA program seeks to offset some of the cost and time of technology development by accelerating the maturation of technologies from MDA Contract recipients (BAA, SBIR, STTR, etc.) through the marketplace where private investment and broad application of the products accelerate technology reliability and reduce cost through rate production.
- The I & A activity provides technical and management oversight for congressional interest technology programs.
- The Advanced Technology Innovation Cell (ATIC) identifies, assesses, evaluates and recommends investment for new and innovative technologies among proposals from all sources, both domestic and international. The primary tool used by the ATIC to draw candidates is the Advanced Technology Broad Area Announcement (BAA) which invites proposals from foreign and domestic businesses, universities, researchers and agencies. Additionally, Advanced Technology manages the MDA Science Technology and Research (MSTAR) program which is a BAA open to domestic accredited universities.

The Sensing Systems Technology area focuses on developing new technologies to enable threat detection, launch-to-destruction threat tracking, and discrimination in all phases of flight. Promising technologies in this area include 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 for distributed sensing and other BMDS applications.

The EO/IR Active Sensors task, under the Discriminating Sensor Technology (DST) program, is developing advanced laser radar (LADAR) technology. LADAR technology, coupled with passive sensors, can provide improved system discrimination performance by providing target features currently unavailable.

The EO/IR Passive Sensors task develops basic technology in components and materials focused on enhancing the capabilities of the BMDS. Examples include:

- Multi-color, low noise, focal plane arrays and multi-band IR/UV/Visual spectrum cameras
- Silicon substrates for Mercury-Cadmium-Telluride (HgCdTe) infrared sensors
- Very long wave infrared (VLWIR) sensors
- Advanced Infrared Search and Track technologies
- Deployable Large-Aperture Optical Collectors

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These technology initiatives benefit the BMDS by increasing the maximum range for detection of a threat, reducing uncertainty associated with a threat or threat cluster, by enabling a more accurate assessment of threat characteristics (to deduce the type warhead, trajectory, and predicted impact point), and by accelerating the command and control process required to commence missile defense

The Radar Systems Technology (RST) program integrates and tests next-generation transmitters, receivers, antennas, amplifiers, signal processors, and algorithms/software to demonstrate technologies to insert in BMDS radars in future blocks, as well as to enable and exploit new concepts in radar. RST focuses on technologies to improve traditional, high-power density radar systems such as existing Sea-Based X-Band (SBX) Radar and Forward Based X-Band (FBX-T) Radar systems. RST also focuses on revolutionary technology associated with low-power density radar systems with associated benefits of high performance and lower cost, compared to existing systems.

The Early Launch Detection and Tracking (ELDT) effort is developing and demonstrating early detection, all-weather surveillance and fire control technologies for transition to Boost Defense Segment systems. For a forward-based or theater-class missile defense system the time line is a critical component. This technology effort is expected to reduce the time required to detect a boosting missile compared to current baseline overhead and land/sea based assets. For ascent phase intercepts, the increase will be greater.

The Micro Satellite task is investigating small satellite concepts, payloads, and applications for future Ballistic Missile Defense System applications. The micro satellite concept is developing lighter, lower cost satellites that allow for tailoring of payloads and coverage for specific missions including persistent surveillance and on-demand operations against a specific threat region. The following three Micro Satellite experiments will demonstrate detection and tracking, communication, and propulsion concepts to enable future space-related BMD capabilities:

- The Distributed Sensing Experiment will demonstrate the ability of a network of two or three micro satellites to track targets in space and provide three-dimensional tracking information to ground stations.
- The Propulsion Experiment will demonstrate the ability of axial and divert propulsion systems to guide micro satellites, constrained by mass and volume, to fixed points in space. One micro satellite will be tested approximately 30 days after launch and a second micro satellite will be tested after one year in orbit to determine the survivability of the system propellant after it has been dormant for a year.
- Target Risk Reduction Experiment will demonstrate the ability of micro satellites to serve as cooperative targets for the ballistic missile defense system.

The Engagement Systems Technology area focuses on developing technologies enabling engagement of multiple threats in all phases of flight via hit-to-kill interceptors or directed energy. The activities in this area include technologies that increase the likelihood of successfully destroying an incoming ballistic missile by improving the kill vehicle or laser, as well as improving the target tracking and aim point selection using advanced laser

technologies. Promising new laser technologies are developed under the Laser Technology Program (LTP) and multiple promising technologies for hit-to-kill interceptors are being developed under the Multiple Kill Vehicle (MKV) program.

Note: In FY06, the Multiple Kill Vehicles program funding moved from Project 0502 (Engagement Systems area) to a new Program Element (0603894C) in Project 0515, Multiple Kill Vehicles. Additional technologies (beyond MKV) enabling the next generation hit-to-kill interceptors will be developed in this area.

The Laser Technology Program is developing next generation state-of-the art laser technologies. This program will develop higher power, lower weight and more reliable lasers; more sensitive detectors for laser radar (LADAR) target acquisition, discrimination, and precision aim point selection; and advanced optical beam stabilization and pointing technology. The promising technologies under development include:

- Strategic Illuminator Laser- A multi-kilowatt brassboard illuminator system which significantly advances the state-of-the-art in power, beam quality, reliability, and packaging for the Airborne Laser and other long-range laser platforms. The program validates both the physical architecture of the laser head and the achievement of difficult weight and packaging goals for the power, structural, and cooling systems.
- Small Laser Amplifier for Ladar (SLAL) - A powerful small laser transmitter (hundreds of watts) suitable for insertion on a missile defense platform with strict weight and volume constraints. Two contacts were awarded in May 2003 to Northrop Grumman and Coherent Technologies Inc. to develop competing/alternative prototype.
- Advanced Inertial Reference Unit - A device for highly accurate laser pointing and tracking. The increased accuracy provided by this technology will enhance performance of laser tracking, discrimination and engagement systems such as ABL. Contract was awarded in April 2003 to Applied Technology Associates to develop a breadboard prototype device used for telescope pointing and local-loop jitter suppression.
- Advanced Detectors - Improved detectors for laser radars, with increased sensitivity and bandwidth. Two contractors - SAIC and Sensors Unlimited, will fabricate camera systems for 3-D target tracking and wave front sensing (adaptive optics) for delivery to government facilities and subsequent checkout.
- Angle-Angle Range Doppler Imager (AARDI) - Combine the capabilities angle-angle range and coherent Doppler ladar to achieve both direct detection and coherent detection to enhance discrimination and aim point selection. MIT/LL began work on this project in January 2004.
- Advanced Chemical Oxygen-Iodine Laser (COIL) Technology - Development and experimental characterization of a high performance singlet delta oxygen generator based on a flat jet hydrogen peroxide ejectors that improve chemical yield and device manufacturability COIL technology may provide enhanced engagement performance while reducing the production risks. Contract awarded to Directed Energy Solutions in May 2004.
- Air (Oxygen) Laser - Develop and demonstrate a diode pumped liquid oxygen laser that reduces the weight and complexity of high energy laser weapons sources. The Phase I activity conducted using DARPA funding will develop and demonstrate a single KW device and design a scale-up

laser. Phase II, under joint MDA-DARPA funding, will demonstrate the scale-up, tens-of-kW, device. The goal of this effort is to produce high output power laser in a small, lightweight package for a future tactical directed energy weapon, the ABL Strategic Illuminator, or a discriminating LADAR.

- COIL Improvements - Four technology areas are being explored to improve efficiency while reducing weight and volume. These areas are: Deuterated Fuels; Advanced Generators; Supersonic Iodine Ejectors; and Advanced Diagnostics. Air Force Research Laboratory is pursuing the first three areas, while Los Gatos Research was competitively contracted for Advanced Diagnostics (February 2005). As these mature, they are anticipated to enable future performance enhancements through line upgrades to ABL.
- Ultra-Sensitive Detectors - Follow-on to Advanced Detectors, further increasing sensitivity to the single photon level by reducing background noise. Contracts were awarded in April 2005 to Raytheon Vision Systems and VOXTEL, for eventual down-select to one team.
- Advanced Track Illuminator Laser (ATILL) - FY06 new start for a cryogenically cooled, high efficiency (Yb:YAG) laser capable of improving beam quality and output power, while reducing weight, to support implementation on multiple platforms as a next-generation illuminator.

The High Altitude Airship (HAA) area focuses on developing a stable, geostationary platform to support communications, sensor, or weapons requirements. The HAA concept demonstrates the technical feasibility and military utility of an unmanned, un-tethered, gas filled, solar powered airship that can fly for up to a month at 60,000 feet while carrying a 500 pound payload. The prototype is intended as a developmental step, and functions as a test bed for testing other MDA technologies, toward building an operational High Altitude Airship that can self-deploy from the continental United States to worldwide locations and operate autonomously for long-endurance operations (1 year or more). An operational HAA will be an autonomous, high-altitude, long-endurance platform that will enable continuous over-the-horizon communications, wide-area surveillance, and protection to support theater operations without interruption, or the cost / risk of employing a manned aircraft.

The Advanced Command and Control and Battle Management and Communications (C2BMC) and Network Technology effort focuses on developing the next generation command and control and battle management concepts and the enabling technologies required to implement them among the BMDS. These activities will develop, integrate, and demonstrate advanced C2BMC concepts and enabling technologies for improving BMDS performance across all mission areas to include defense of friends and allies. This activity will include participation in missile flight event and technology demonstrations to evaluate and assess these advanced concepts and technologies. The key concepts under development include:

- Early BMDS subsystem integration. This activity uses simulation, mock-ups, and testing activities to identify and resolve issues associated with integrating advanced capabilities and new subsystems into the BMDS in support of transition to operations.
- Advanced battle management and global integrated fire control concepts.
- Advanced command & control concepts and enabling network technology.
- Advanced mobile command & control concepts and enabling technology.

- BMDS coalition and allied partner integration (Situational Awareness, Post-Intercept Debris and Consequence Mitigation/Management, and Defense Planning) concepts and enabling technology primarily with UK, NATO and Japan.

The Near Field Infrared Experiment (NFIRE) technology effort will collect high and low resolution images of a boosting rocket to improve our understanding of exhaust plume phenomenology and plume-to-rocket body discrimination. We will use this data to validate the models and simulations that are fundamental to developing the guidance and endgame homing algorithms for boost phase interceptors. A secondary objective of the experiment is to collect hyper-temporal short wave infrared and visible data for assessing early launch detection and tracking capability.

The experiment will include three mission types: targets of opportunity, dedicated fly-bys, and ground observations. Targets of opportunity may include aircraft flights, space launches and missile tests at a viewing distance of 100 to 1000 kilometers. Dedicated fly-bys are high resolution observations of a dedicated target vehicle at a range of less than 10 kilometers. Ground observations may include bright burning events such as forest fires, volcanoes, and static tests of rocket engines.

The Missile Defense Agency was approached by the German government to add a Laser Communications Terminal (LCT) to the satellite for performing communications experiments. These experiments will test satellite-ground and satellite-satellite capabilities of the terminal for potential incorporation into the Ballistic Missile Defense System. The laser communication experiments will be conducted on a non-interference basis with the other MDA missions.

MDA will benefit significantly from the large amounts of data transmitted directly from a sensor satellite via the LCT. Likewise, the BMDS will benefit as the NFIRE program will provide sensor data to the Missile Defense Space Experimentation Center (MDSEC), the ground operations for NFIRE, STSS and the Space Test Bed, under the auspices of the MDA Space Applications Center of Excellence, where the data will be utilized by multiple programs to improve missile engagement performance. In FY07, the NFIRE program will join the MDSEC in the new program element established in FY06 for the Space Test Bed (PE 0306895C) as one of two core program elements within the MDA Space Applications Center of Excellence.

NFIRE Goals:

- Launch the Near Field Infrared Experiment satellite in the 4th quarter of FY06
- Conduct multiple missions in FY07 to collect data
- Use the data to validate the models and simulations that are fundamental to developing the navigation, guidance and control and endgame homing algorithms

- If feasible, initiate planning for a second NFIRE mission in response to Congressional encouragement in the FY06 Appropriations Bill to complete development of the Kill Vehicle.

**B. Accomplishments/Planned Program**

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Statutory and Mandated | 3,400 | 1,800 | 1,305 |
| RDT&E Articles (Quantity) | 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 05 Accomplishments:

- Continued to fund the HBCU/MI programs through contracts for innovative technologies such as advanced electro-optics, MEMS technology, and advanced signal processing.
- Continued 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.
- Continued program support for the administration of the SBIR/STTR Program.
- Established investment strategy for continued advanced research in innovative technologies that can feed into identified technology shortfalls, such as advanced power supplies and lightweight cooling systems.

FY 06 Planned Program:

- Continue to fund HBCU/MI programs to capitalize on successes from past year work.
- Continue to accelerate technology maturation through techniques such as commercialization assistance by expert reviews and advice, out reach publications and web site, consultation and training of technology developers, and application of standard metrics to validate technology maturation claims.
- Continue program support for SBIR/STTR through development of topics that will attract innovative technology development proposals that can help achieve BMDS evolution and push the creativity of university and private technologists to help MDA meet technology goals.

FY07 Planned Program:

- Continue to fund HBCU/MI to support BMDS technology needs as they arise.

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- Continue to accelerate technology maturation techniques such as commercialization assistance by expert reviews and advice, out reach publications and web site, consultation and training of technology developers, and application of standard metrics to validate technology maturation claims.
- Continue program support for SBIR and STTR through development of topics that will attract innovative technology development proposals that can help achieve BMDS evolution and push the creativity of university and private technologists to help MDA meet technology goals.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Congressional Action | 39,543 | 29,850 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

FY05 Accomplishments:

- Provided Congressionally-mandated funding for research into these areas with an emphasis for the program to fill BMDS gaps and explore technology solutions for the net generation BMDS.
  - Advanced Processing Architecture
  - Next-Again-Generation Radiation Hard CMOS (Complementary Metal Oxide Silicon)
  - Ultra-Thin Integrated Electronics Miniaturization Trusted Foundry
  - Massively Parallel Optical Interconnects for Micro satellites
  - 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

FY06 Planned Program:

- Provide Congressionally-mandated funding for these identified research focus areas, as a minimum, to explore technology solutions for the next generation BMDS.
  - Center for Optical Logic Devices
  - Massively Parallel Optical Interconnects for Micro Satellite Applications
  - Advanced RF Technology Development

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- Multiple Target Tracking Optical Sensor Array Technology (MOST)
- Porous Silicon
- SiC Thick Film Mirror Coatings
- Advanced Processing Architecture
- Aluminum Nitride Substrates for Wide Bandgap Devices
- High Density Power Supplies using Silicon Carbide
- Day and Night Vision Sensor
- NetCentric Airborne Defense Element (NCADE)

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Innovative Technology and Analysis | 7,467 | 10,118 | 13,519 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Note: The Advanced Technology Innovative Cell (ATIC) is the focal point 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 improvement in boost, midcourse, and terminal phases of missile defense.

The Missile Defense Science, Technology and Research (MSTAR) program 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.

FY05 Accomplishments:

- Solicited, received, and reviewed innovative ideas from industry, private individual and international sources. Selected promising ideas for further research through contracting actions.
- Funded proposals in electro-optics, lasers, advanced power systems, miniaturization of electronics, and other innovative technology.
- Released the MSTAR BAA to solicit proposals from academic institution.
- Awarded contracts under the MSTAR program to a number of institutions focusing on new technology areas evolving from university research. Areas included electro-optical systems, advanced signal processing, laser systems, and microelectronics.

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FY06 Planned Program:

- Continue to seek innovative and Breakthrough technologies and international sources.

FY07 Planned Program:

- Continue to seek innovative and breakthrough technologies from domestic and international sources.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Sensing Systems | 69,701 | 57,203 | 79,720 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

FY05 Accomplishments:

- Discriminating Sensor Technology:
  - Tested upgraded range-resolved Doppler imaging LADAR breadboard at full power.
  - Integrated LADAR with passive sensors and beam pointing system.
  - Tested fully functional active/passive discriminating sensor with breadboard-level fidelity (Technology Readiness Level (TRL) 4) at the AMOR range.
  - Commenced design of a flyable brassboard discriminating sensor based on this technology.
- Passive EO/IR Technology:
  - Established executing agents and initiated efforts for Mercury-Cadmium-Telluride on Silicon, type II strained layer superlattice, high quantum efficiency quantum well infrared photo detectors, and Lead salt materials for focal plane arrays. These advanced IR detector materials improve the sensitivity and cost effectiveness of EO/IR sensors.
  - Developed figures of Merit that quantified goals for each effort.
  - Began growing materials and devices to build focal plan arrays. Material and devices met or exceeded planned quantified milestones.
  - Delivered two prototype quantum well infrared photo detector cameras to Boeing for joint field testing with the Airborne Laser System Program Office. These will support significant performance improvement in EO/IR sensors.
  - Continued development of 10K cryocooler and characterization and qualification of previously developed cryocoolers.
  - Conducted independent testing of previously developed focal plane arrays at the Air Force Infrared Radiation Effects Laboratory.
  - Upgraded focal plane array and cameral field test equipment at the Army Research Laboratory.
- Radar System Technology:
  - Continued development of next-generation transmitters, receivers, antennas, signal processors, and software for improvements in Ballistic Missile Defense System radars.

- Continued design and technical analysis of advanced antenna technologies; further demonstrate distributed aperture coherence; completed development of high voltage X-Band power amplifier chips based on GaAs technology.
- Commenced development of transmit/receive modules based on packaging of wide-bandgap materials in conjunction with DARPA.
- Conducted Preliminary Design Reviews for two competitive approaches to the low-power antenna tiles that will comprise the building blocks for the panels and antennae for the Scalable Panels for Efficient, Affordable Radar system development program.

- Early Launch Detection and Tracking Technology:
  - 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.
- Spectral Sensing for Kill Assessment:
  - Began Phenomenology studies to better understand the spectral environment resulting from a hyper-velocity impact between a kill vehicle and an RV with a nuclear warhead. Began preliminary sensor designs to test and study hyper-velocity impact phenomenology.
- Micro Satellites
  - Completed Distributed Sensing Experiment System Functional Review and initiated Phase 2 Design and Fabrication.
  - Completed Distributed Sensing Experiment preliminary design review.
  - Completed Micro Satellite Propulsion Experiment System Functional Review and initiated Phase 2 Design and Development.
  - Initiated Micro Satellite Propulsion Experiment source selection for the prime integrator. Established Micro Satellite Target System - Risk Reduction Experiment using Small Business Innovative Research approach.

FY06 Planned Program:

- Discriminating Sensor Technology:
  - Continue full-power testing currently underway at the Maui Space Sensor System test complex
- Passive EO/IR Technology:
  - Continue efforts for Mercury-Cadmium-Telluride on Silicon, type II strained layer superlattice, high quantum efficiency quantum well infrared photo detectors, and Lead salt materials for focal plane arrays.
  - Build initial focal plane arrays and conduct independent testing to evaluate performance.
  - Conduct hardware-in-the-loop testing in relevant Exoatmospheric Kill Vehicle and Terminal High Altitude Area Defense system environments at the Massachusetts Institute of Technology Lincoln Laboratory.
  - Conduct Airborne Laser System Program office field test of quantum well infrared photo detector and Mercury-Cadmium-Telluride cameras.
  - Continue 10K cryocooler development.

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- Radar Systems Technology:
  - Continue development of next-generation transmitters, receivers, antennae, signal processors, and software for improvements in BMDS radars.
  - Continue design and technical analysis of advanced antenna technologies; begin the integration of tiles to comprise the low-power density antenna arrays.
  - Continue development of transmit/receive modules based on packaging of wide-bandgap materials in conjunction with DARPA.
- Early Launch Detection and Tracking Technology:
  - 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.
  - Participate in cooperative R&D with Australia to accomplish testing of advanced Over the Horizon radar concepts and algorithms.
  - Complete design and commence fabrication of prototypical ELDT sensors.
- Spectral Sensing for Kill Assessment:
  - Begin development of a high speed spectrometer instrument package for intercept flight tests.
  - Continue modeling effort of hyper-velocity impact and subsequent fireball development and spectral output. Perform ground based experiments to verify modeling efforts and test potential sensor prototypes
- Micro Satellites
  - Continue development of Micro Satellite technologies to enable future BMDS space components and systems. Planned activities will include at a minimum:
    - Complete Distributed Sensing Experiment Critical Design Review and initiate Phase 3 Fabrication, Integration and Test.
    - Select Prime Integrator for Micro Satellite Propulsion Experiment and prepare for Preliminary Design Review.
    - Select and award small business company to begin the Micro Satellite Target System - Risk Reduction Experiment.

FY07 Planned Program:

- Passive EO/IR Technology:
  - Continue efforts for Mercury-Cadmium-Telluride on Silicone, type II strained layer superlattice, high quantum efficiency quantum well infrared photo detectors, and Lead salt materials for focal plane arrays.
  - Build interim focal plane arrays and cameras and conduct independent testing to evaluate performance.

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- Radar System Technology:
  - Continue development of next-generation transmitters, receivers, antennae, signal processors, and software for improvements in BMDS radars' detection, acquisition, tracking and discrimination. This effort includes possible development of large aperture passive RF antennae.
  - 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.
- Early Launch Detection and Tracking Technology:
  - Complete fabrication of prototypical ELDT sensors in both electro-optical and radar frequency bands.
  - Utilize prototypes in all available flight tests.
- Spectral Sensing for Kill Assessment:
  - Complete development of high speed spectrometer instrument package for support of data collection during intercept flight tests.
  - Continue with BMDS hyper/multi-spectral sensor prototype design, development, and testing.
  - Perform ground based experiments to verify exploitable impact features derived from modeling and small scale tests.
  - Initiate development of advanced, high accuracy Infrared Search and Track (IRST) system.
- Micro Satellites
  - Continue development of Micro Satellite technologies to enable future BMDS space components and systems. Planned activities will include at a minimum:
    - Complete the build of three Distributed Sensing Experiment micro satellites and conduct the Pre-environmental Test Review and Launch Readiness Review.
    - Conduct Micro Satellite Propulsion Experiment Preliminary Design Review.
    - Conduct Micro Satellite Target System - Risk Reduction Experiment Analysis, Design and Development.

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| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Engagement Systems Technology | 81,928 | 28,345 | 41,093 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Note: In FY06, the Multiple Kill Vehicles program funding moved from Project 0502 (Engagement Systems area) to a new Program Element (0603894C) in Project 0515, Multiple Kill Vehicles. Following resources were moved: FY06 - $82 million, FY07 - $220 million, FY08 - $273 million, FY09 - $306 million, FY10 - $308 million, FY11 - $113 million.

FY05 Accomplishments:

- Laser Technology Program
  - Continued execution of Strategic Illuminator, Compact Laser Radar Amplifier, Advanced Inertial Reference Unit, Advanced Detectors, and Angle-Angle-Range Doppler Imaging LADAR efforts, from prototype demonstration to termination.
  - Selected one to three technology base projects in FY05 for execution in FY06.
  - Conducted a Concept Design Review for ADI, Block 2008/2010 capability in BMDS.
  - Completed disposition of Capistrano Test Site equipment from the former Spaced Based Laser program in FY05.
  - Strategic Illuminator Laser- Achieved first light using a single gain medium (Nov 2004)and first light at full power (June 2005). A Preliminary Design Review was conducted in May 2005 and the breadboard demonstration was completed in July 2005 leading to the final brassboard design.
  - Small Laser Amplifier for Ladar - Following successful Program Review in November 2004, both contractors entered Phase IIb, breadboard fabrication. Both contractors completed their breadboards and successfully demonstrated more than the required half power in September 2005.
  - Advanced Inertial Reference Unit - Exercised Option 2a following a successful Critical Design Review in December 2004. The program plan was followed and a prototype device was fabricated.
  - Advanced Detectors - Completed Phase 2 of detector batch production and camera integration (detector and read-out) and began Phase III final design documentation, fabrication, testing and delivery. Modeling & simulation of the system conducted.
  - Angle-Angle-Range Resolved Doppler Imager - Completed waveform generator and range-Doppler resolution demonstration. Integrated Northrop-Grumman SLAL amplifier into breadboard for Angle-Angle Doppler capability and demonstrated system operation on indoor, full-scale test range.
  - Advanced Chemical Oxygen-Iodine Laser Technology - Completed preliminary testing of nozzle and scaled-up the design. Built facility to handle more complex testing, conducted successful hot flow test, and produced test report to conclude the project.

- Air (Oxygen) Laser - Following contract award in early FY05, developed device architecture based on requirements analysis, conducted trade-off studies and acquired/fabricated components leading to initial design verification testing.
- COIL Improvements - Deuterated Fuels: Constructed test apparatus and obtained specially formulated fuels to begin testing in October 2005; Subscale Supersonic Iodine Injection: subscale testing completed and design and fabrication for full scale Iodine nozzles underway; Advanced Generators: Centrifugal Spray undergoing testing; Rotating Sparge demo completed, microclimates underway; Advanced Diagnostics: contractor designed, fabricated and installed instrumentation to measure chemical species concentrations being generated for COIL.
- Ultra-Sensitive Detectors - Awarded two contracts and completed detector and multiplexer design.

- Hit-to-Kill Interceptors
  - Identified additional areas (beyond MKV) where new technology development is required to enable the next generation hit-to-kill interceptors.
- Multiple Kill Vehicles
  - Conducted MKV hover test kill vehicle critical design review.
  - Conducted MKV system engineering studies and analyses.
  - Conducted kill vehicle seeker, divert propulsion, and avionics breadboard and brassboard demonstrations.
  - Conducted kill vehicle mission and seeker processor algorithm and software development.

FY06 Planned Program:

- Laser Technology Program
  - Strategic Illuminator Laser - Fabrication of the brassboard version will continue until delivery in the first quarter of FY07.
  - Small Laser Amplifier for Ladar - Conduct Critical Design review and down-select to one contractor for Phase III, breadboard production and delivery.
  - Advanced Inertial Reference Unit - Following assemble and integration, will exercise Option 2b to conduct system performance testing and complete the effort.
  - Advanced Detectors - Complete Phase III testing at a Government facility and submit final report.
  - Angle-Angle-Range Resolved Doppler Imager - Integrate an improved amplifier into the brassboard for Angle-Angle-Doppler capability and package the unit for outdoor range testing to demonstrate system performance with full scale targets.
  - Air (Oxygen) Laser - Achieve first light and continue design verification testing on 4kW device. Success with low power device will lead to scale-up design and fabrication in Phase II.

- COIL Improvements - Deuterated Fuels: continue testing various proportions of deuterated material; Injectors - finish fabricating full scale Iodine nozzles and testing; Iodine Advanced Generators -complete testing various alternatives and select one technique for scale-up; Advanced Diagnostic - conclude contract and receive documentation.
- Ultra-Sensitive Detectors Down-select to one contractor for fabrication of breadboard based on approved design.
- AARDI ladar - Complete program. Test integrated AARDI breadboard at MIT/Lincoln Laboratory.
- Advanced Track Illuminator Laser (ATILL) - Complete fabrication of breadboard laser and verification testing leading to scale-up of design and production by single contractor.
- Identify and select promising technologies for lightweight, high efficiency, high power, and high intensity lasers for boost, ascent and midcourse applications for execution starting in FY07.
- Identify and select promising technologies for stable and long-life laser fuel technologies for chemical lasers and long life power source technologies for execution starting in FY07.
- Identify and select one to three other technology base projects in FY06 for execution in FY07.

• Hit-to-Kill Interceptors
- Identify and select promising technologies to enable the next generation of hit-to-kill interceptors for execution starting in FY07.
- Initiate development of technologies to counter the evolving threat.

FY07 Planned Program:

• Laser Technology Program
- Strategic Illuminator Laser - Finish brassboard fabrication, conduct verification testing, and deliver product.
- Angle-Angle-Range Resolved Doppler Imager - Complete outdoor testing with full-scale targets and targets of opportunity. Conclude with delivery of device and documentation.
- Air (Oxygen) Laser - Proceed with Phase II effort of fabrication of scaled-up (10kW) breadboard
- COIL Improvements - Deuterated Fuels: Mature fuels and work toward full-scale demonstration; Injectors - finish full-scale injector testing; Iodine Advanced Generators: Scale-up selected alternative and complete performance verification; Pursue additional improvement projects.
- Ultra-Sensitive Detectors - Deliver prototype camera system for testing at Government location.
- Advanced Track Illuminator Laser (ATILL) - Complete fabrication of breadboard laser and verification testing leading to scale-up of design and production by single contractor.
- Initiate development of technologies for lightweight, high efficiency, high power, and high intensity lasers for boost, ascent and midcourse applications.
- Initiate development of stable and long-life laser fuel technologies for chemical lasers and long life power source technologies.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/03 Advanced Technology Development (ATD)** | R-1 NOMENCLATURE: **0603175C Ballistic Missile Defense Technology** |

- Select three technology base projects in FY07 for execution in FY08.
- Hit to Kill Interceptors
  - Initiate development of the next generation hit-to-kill interceptors.
  - Continue development of technologies to counter the evolving threat.
  -

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| High Altitude Airship | 19,836 | 4,036 | 40,651 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The High Altitude Airship program will demonstrate the technical feasibility and military utility of an unmanned, untethered, gas filled, solar powered airship prototype that can fly for up to a month at 60,000 feet while carrying a 500 pound payload. A Technical Improvement Program is to be executed simultaneously to mature critical technologies as key risk reduction activities for the future operational airship. The flight demonstration of the prototype High Altitude Airship is planned for the FY08/09 timeframe.

FY05 Accomplishments:
- Conducted the prototype airship design and risk reduction phase culminated with a Critical Design Review.
- Prime contractor submitted proposal for the next phase of the program, which included the design and build of a prototype HAA, risk reduction activities, and a Technology Improvement Plan for the operational Airship vehicle.
- Reviewed contractor proposals and conducted Alpha contracting in preparation for contract award in 2006.

FY06 Planned Program:
- Conduct Decision Point One to evaluate and assess the program progress in order to determine the ability of the program to meet the Airship objectives to proceed with Airdock Remediation activities.

FY07 Planned Program:
- Continue the design and initiate build of the High Altitude Airship Prototype Vehicle with work in solar-regenerative power, propulsion and hull design.
- Continue Technology Improvement Plan for the High Altitude Airship operational vehicle with work in power generation, energy storage, and hull mass reduction.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/03 Advanced Technology Development (ATD)** | R-1 NOMENCLATURE: **0603175C Ballistic Missile Defense Technology** |

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Advanced Communications Technology | 0 | 0 | 12,049 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

FY07 Planned Program:

- Commence/continue the activities to enable the integration of the following subsystems into the BMDS:
  - Kinetic Energy Interceptors (KEI)
  - Surveillance and Tracking Space System (STSS)
  - Airborne Laser (ABL)
  - Sea-Based X-Band (SBX) Radar
  - Micro Satellite
  - Overhead Non-Imaging Infrared (ONIR) feature data (moving sensors to space)
  - Other Special/Highly classified program integration activities
- Develop and demonstrate advanced Battle Management and Fire Control technologies to include:
  - Global Integrated Fire Control system
  - Initial Hit, Kill, and Weapons Typing
  - Target Discrimination, decision logic
  - Sensor Netting, Tracking and Fusion
  - Target Object Mapping
  - Sensor Registration Health and Status monitoring
  - Operator C2BMC mockups addressing iterative crew positions, Concepts of Operations, and user interface improvements for advanced BMDS conops development and refinement
- Develop and demonstrate advanced Command & Control and Network Technology to include:
  - Consequence Mitigation, post-intercept debris fallout prediction and warning (both Domestic and International)
  - Support to Lethality Model computational speed improvements to support larger raid size debris predictions in real time
  - Consequence Mitigation coalition concepts of operations with varying tactics/techniques/procedures
  - Network Service Levels for Improved Communications
  - Dynamic Network Performance for B/W efficiency and robustness
  - Improvements in Information Assurance
  - Distributed Track Correlation, Fusion, and Management

- Reduced Network Bandwidth Architectures and Technologies
- Experiment with Advanced Mobile Command and Control for BMDS as mobility adapted
- Experiment with BMDS coalition and Allied Partner integration for cross-domain solutions from a technology standpoint
- Bring integrated experiments into live flight, real time participation in 4 - 6 BMDS live flight missiles events and demonstrations
- Perform Technology Readiness Level Assessments of experiment portfolio quarterly

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| NFIRE | 0 | 13,495 | 10,800 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

FY06 Planned Program:

- Complete spacecraft bus assembly, integration, and test to prepare for payload integration
- Complete and deliver the Tracking Sensor Payload (TSP) for payload integration
- Receive Laser Communications Terminal (LCT) payload for payload integration
- Perform Space Vehicle integration and acceptance testing to ensure the spacecraft and its payloads are functioning
- Perform Space Vehicle environmental testing to ensure the spacecraft and its payloads can survive launch and space environments
- Complete and certify Ground Segment Mission Operations Center to ensure the system is ready to support mission operations
- Conduct Mission Training to ensure the mission operators are prepared to execute
- Conduct Mission Rehearsals to test the interactions between the ground system, space system, and personnel prior to a mission
- Complete delivery and acceptance of Launch Vehicle to support launch of the spacecraft
- Launch the NFIRE Satellite to insert the spacecraft into orbit

FY07 Planned Program:

- Conduct Initial On-Orbit Operations to ensure the functionality and performance of the TSP prior to executing a mission
- Accept delivery of two Multi-stage Boost Targets
- Conduct Target of Opportunity Missions to collect low resolution plume data and validate the tracking performance of the TSP
- Conduct Near Field Boosting Target Fly-by mission to collect high resolution plume data
- Conduct Hyper-Temporal Experiment to assess early launch detect and tracking capability
- Conduct laser communications experiments to assess the viability of the technology for use by the BMDS and STSS Block 2012 (O)

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/03 Advanced Technology Development (ATD)** | R-1 NOMENCLATURE: **0603175C Ballistic Missile Defense Technology** |

| COST ($ in Thousands) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0602 Program-Wide Support | 2,141 | 4,458 | 7,539 | 5,604 | 8,815 | 8,422 | 6,472 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## A. Mission Description and Budget Item Justification

Program-Wide Support provides funding for common non-headquarters support functions across the entire program such as strategic planning, program integration, business management, 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 outside services and support contractors that augment government staff in these areas. Many of these costs reside within the Missile Defense Agency 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, although some functions and costs within this program element are performed by MDA employees assigned within the National Capital Region (NCR). Other costs included herein provide facility capabilities for MDA Executing Agent locations, such as physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses. Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Civilian Salaries and Support | 2,141 | 4,458 | 7,539 |
| RDT&E Articles (Quantity) | 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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| Total PE Cost | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 |
| 0907 Terminal High Altitude Area Defense (THAAD) Block 2008 | 745,801 | 991,007 | 942,457 | 694,496 | 473,926 | 21,300 | 0 |
| 0007 Terminal High Altitude Area Defense (THAAD) Block 2010 | 0 | 0 | 0 | 114,461 | 119,300 | 642,318 | 385,548 |
| 0401 Israeli Arrow Program | 150,836 | 130,838 | 77,175 | 77,189 | 77,373 | 78,990 | 80,637 |
| 0806 PAC-3 Block 2006 | 0 | 0 | 1,600 | 1,000 | 0 | 0 | 0 |
| 0602 Program-Wide Support | 17,426 | 17,912 | 17,078 | 17,052 | 11,434 | 10,954 | 3,015 |
| | | | | | | | |
| Amount Included in PE 0904903D | | | | -301,310 | -124,697 | -211,306 | -22,000 |
| Total PE Cost Reflected in R-1 | 914,063 | 1,139,757 | 1,038,310 | 602,888 | 557,336 | 542,256 | 447,200 |

*These efforts include test interceptor hardware for flight and ground testing, targets and range operations to conduct 5 flight tests, Radar fabrication/assembly/integration/test and component qualification testing.*

## A. Mission Description and Budget Item Justification

As part of the total Ballistic Missile Defense System (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 BMDS elements in terminal defense pursue development and selective upgrades of interceptor defense capabilities that engage short to medium-range ballistic missiles in the late mid-course and terminal phase of their trajectory.

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

Block 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 inside and outside the atmosphere. Development through FY06 will lay a foundation for THAAD Interceptor Engage on THAAD Radar Engagement Sequence Groups (ESG) capability. This initial phase also provides the capability for other BMDS Elements (AEGIS BMD, PATRIOT) to conduct engagement sequences with THAAD communications data. The initial series of flight tests for the THAAD Interceptor Engage on THAAD Radar ESG begins in FY06 and continues into FY07 with a total of 8 flight tests. Development evolves to achieve a more robust THAAD Radar discrimination, advanced interceptor, fire control and launcher capabilities to facilitate communications to the BMDS and forward base engagement coordination with other BMDS elements. THAAD development efforts will provide

future capability for other BMDS elements such as Standard Missile 3 (SM-3) Launch on THAAD Radar. THAAD Radar development continues a collaborative effort with MDA's Sensors Deputate to ensure commonality of the THAAD Radar. The second series of flight tests begins in FY07 and continues into FY09 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. Continued development will include improved survivability, crew operator training capability and remotely placed launcher for an improved defended area and defense against Intermediate Range Ballistic Missiles (IRBMs), capability to launch THAAD interceptors from other BMDS sensor elements and expanding the system's capability to provide THAAD sensor data to the BMDS. This adds the THAAD Interceptor Engage on THAAD Radar using a cue from other BMDS sensors. The Block 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 delivery of Fire Unit #1 consists of 24 interceptors, 3 launchers, 1 THAAD radar, and 1 THAAD fire control and communication (TFCC).

Block 2010:
This block continues the concept of a rapidly deployable configuration through enhanced sensor and interceptor capability as well as supporting strategic surveillance missions. Continued development enables a new ESG, SM-3 Launch on THAAD Radar and includes kill vehicle and booster improvements that significantly increase interceptor performance 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. Block 2010 continues the development of the THAAD System. This program has the flexibility to retrofit development assets, test the hardware capability to launch the THAAD Interceptor using data from a remote sensor before the threat enters the field of view of the THAAD radar; or provide for continuous manufacturing of Fire Unit hardware. In Block 2010, the THAAD Fire Unit #2 consisting of 24 interceptors, 3 launchers, 1 THAAD radar, and 1 TFCC will be delivered.

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, coproduction of the interceptor and the enhancement of Arrow's interoperability with U.S. ballistic missile defense systems (BMDS) via a 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.

**A.1 System Element Description**

The five major components (Interceptors, Launchers, THAAD Radars, THAAD Fire Control and Communication (TFCC), and THAAD-specific support equipment) will be integrated into the THAAD element and the Ballistic Missile Defense System (BMDS). The THAAD interceptor is a certified round that is propelled by a single-stage, solid-propellant rocket booster. Its kill vehicle possesses a divert and attitude control system and an infrared seeker used in destroying its target through hit-to-kill technology. The THAAD Launcher consists of a U.S. Army M1120 Heavy Expanded Mobility Tactical Truck-Load Handling System variant that transports an integrated interceptor round pallet and supports and secures eight ready-to-launch interceptors. The THAAD Radar is an X-Band, solid state, phased array radar capable of tracking multiple threats and multiple interceptors during engagements. The THAAD Radar uses fence, volume, and cued search modes, and provides surveillance, acquisition, track, discrimination, interceptor communications, and hit assessment data collection for the fire control. The THAAD Radar hardware is a transportable system composed of the antenna equipment unit, electronics equipment unit, cooling equipment unit, and the prime power unit. The TFCC is composed of the Tactical Operations Station, the Launch Control Station, and the Station Support Group. These three components together are called the Tactical Station Group (TSG). A TFCC includes two TSGs. The TFCC provides the planning, control, coordination, execution, and communications necessary to fulfill the THAAD mission in a coherent and fully integrated fashion. It is interoperable with external air and interceptor defense and intelligence systems and agencies integrated into the BMDS.

THAAD provides rapidly deployable ground-based interceptor defense components that deepen, extend and complement the BMDS to any Combatant Commander to defeat ballistic missiles of all types and ranges while in all phases of flight. THAAD intercepts inside and outside the atmosphere making countermeasures difficult and significantly mitigates Weapons of Mass Destruction (WMD).

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

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 Terminal Defense System (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 (outside the atmosphere) and terminal phase (inside the atmosphere) of their trajectory. This adds significant capability to the BMDS as the threat missiles transition from the mid-course to terminal phase.

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| 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 THAAD element contributes to the BMDS by providing two engagement sequences, THAAD interceptor engage on THAAD Radar and THAAD interceptor engage on THAAD Radar with a cue from Cobra Dane/Upgraded Early Warning Radars/Sea-Based X-Band Radar. When integrated into the BMDS with the BMDS Command Control/Battle Management Communications (C2BMC), AEGIS BMD and PATRIOT Systems, the rapidly deployable THAAD element improves the BMDS overall effectiveness by engaging interceptors as they transition from inside and outside the atmospheric flight.

## A.3 Major System Element Goals

THAAD has goals that are synchronized with the overall MDA goals to meet the BMDS objectives in Blocks 2008/2010.

- Develop, test, and verify THAAD capability.
- Provide field and sustain THAAD capability for operational testing and BMDS defense operations.
- Continue component development to enhance integrated BMDS capability and efficiency.
- Test and verify enhanced integrated BMDS component capability in an increasingly complex BMDS test program.
- Provide field and sustain enhanced BMDS capabilities.
- Integrate THAAD into the BMDS International Strategy.
- Maintain a culture within THAAD that excels in a complex and uncertain environment.
- Achieve world class business processes and battle rhythm using lean, six sigma improvement techniques.

## A.4 Major Events Schedule and Description

| Major Event | Project | Timeframe | Description |
|---|---|---|---|
| **Flight Test** | | | |
| **Testing Milestones** | | | |
| Conduct FTT-1 | 0907 | 1Q FY 2006 | • FTT-1 was successfully conducted on 22 Nov 06 |
| Conduct FTT-2 | 0907 | 2Q FY 2006 - 3Q FY 2006 | • 1st Integrated System Test - Virtual Target |
| Conduct FTT-3 | 0907 | 3Q FY 2006 - 4Q FY 2006 | • Characterize seeker with unitary HERA target |
| Conduct FTT-4 | 0907 | 3Q FY 2006 - 1Q FY 2007 | • Body-body intercept with separating HERA target |
| Conduct FTT-5 | 0907 | 4Q FY 2006 - 1Q FY 2007 | • Low Endo Controlled Test Flight; Characterize missile flyout |
| Conduct FTT-6 | 0907 | 1Q FY 2007 - 3Q FY 2007 | • High endo intercept of unitary target at medium aspect |
| Conduct FTT-7 | 0907 | 2Q FY 2007 - 4Q FY 2007 | • Mid endo intercept of unitary target at low aspect |
| Conduct FTT-8 | 0907 | 3Q FY 2007 - 1Q FY 2008 | • Exo intercept of unitary target at high aspect |
| Conduct FTT-9 | 0907 | 4Q FY 2007 - 2Q FY 2008 | • Exo intercept of separating target at medium speed |
| Conduct FTT-10 | 0907 | 1Q FY 2008 - 2Q FY 2008 | • Salvo interceptors, high endo intercept of separating target at low aspect |
| Conduct FTT-11 | 0907 | 2Q FY 2008 - 4Q FY 2008 | • Mid endo intercept of separating target at high aspect |

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603881C Ballistic Missile Defense Terminal Defense Segment** |

| Major Event | Project | Timeframe | Description |
|---|---|---|---|
| Conduct FTT-12 | 0907 | 3Q FY 2008 - 4Q FY 2008 | • Exo intercept of complex separating target at low aspect |
| Conduct FTT-13 | 0907 | 4Q FY 2008 - 1Q FY 2009 | • High endo intercept of complex separating target at high aspect |
| Conduct FTT-14 (DUAL) | 0907 | 1Q FY 2009 - 2Q FY 2009 | • Multiple simultaneous engagement of two targets |
| Conduct FTT-15 | 0907 | 1Q FY 2009 - 2Q FY 2009 | • Mid endo intercept of complex separating target at mid aspect |
| Conduct FTT-16 | 0907 | 2Q FY 2009 - 3Q FY 2009 | • Exo intercept of long range separating target |
| Conduct FTT-17 | 0907 | 3Q FY 2009 - 4Q FY 2009 | • Exo intercept of long range separating target |
| **Contract Activity** | | | |
| **Contractual Activities & Events** | | | |
| Fire Unit I and II Contract Award | 0907 | 1Q FY 2007 | • Procure 48 Interceptors; 6 Launchers; 2 THAAD Radars; 2 THAAD Fire Control and Communication (TFCC) (4 Tactical Station Groups (TSGs)) |
| Contractor Logistics Support (CLS) | 0907 | 1Q FY 2008 | • Maintenance and support to software that has been delivered to the field |
| **Delivery** | | | |
| **Deliveries** | | | |
| Fire Unit I | 0907 | 3Q FY 2008 - 3Q FY 2009 | • 24 Interceptors; 3 Launchers; 1 THAAD Radar; 1 THAAD Fire Control and Communication (TFCC) (2 Tactical Station Groups (TSGs)) |
| Fire Unit II | 0907 | 3Q FY 2009 - 4Q FY 2010 | • 24 Interceptors; 3 Launchers; 1 THAAD Radar; 1 THAAD Fire Control and Communication (TFCC) (2 Tactical Station Groups (TSGs)) |

| B. Program Change Summary | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Previous President's Budget (FY 2006 PB) | 928,388 | 1,143,610 | 1,034,676 |
| Current President's Budget (FY 2007 PB) | 914,063 | 1,139,757 | 1,038,310 |
| Total Adjustments | -14,325 | -3,853 | 3,634 |
| Congressional Specific Program Adjustments | 0 | 55,250 | 0 |
| Congressional Undistributed Adjustments | 0 | -59,103 | 0 |
| Reprogrammings | 547 | 0 | 0 |
| SBIR/STTR Transfer | -14,872 | 0 | 0 |
| Adjustments to Budget Years | 0 | 0 | 3,634 |

FY05 reduction of $14.325 million includes the SBIR/STTR transfer and MDA reprogrammings.

FY06 reduction of $3.853 million includes Congressional specific program adjustments ($45.25 million for Arrow Co-Production and $10.0 million for Short Range BMD) and a portion of the MDA Congressional undistributed adjustment.

FY07 increase of $3.634 million includes $1.6M for PAC-3 Block 2006 Debris Mitigation and overhead/infrastructure reductions.

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| COST ($ in Thousands) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0907 Terminal High Altitude Area Defense (THAAD) Block 2008 | 745,801 | 991,007 | 942,457 | 694,496 | 473,926 | 21,300 | 0 |
| RDT&E Articles Qty | 5 | 9 | 9 | 25 | 22 | 0 | 0 |

*Note: THAAD (Project 0907): The ramp-up in FY06/FY07 restores work deferred to this timeframe due to a boost motor facility industrial accident. These efforts include test interceptor hardware for flight and ground testing, targets and range operations to conduct 5 flight tests, Radar fabrication/assembly/integration/test and component qualification testing.*

*RDT&E Articles: FY05 - Deliver 3 Launchers and 2 THAAD Fire Control and Communication (TFCC) Tactical Station Groups (TSGs); and Buy 6 Full-up Interceptors; 1 Launcher, and 1 THAAD Radar for Development Tests. FY06 - Deliver 8 Full-up Interceptors and 1 Launcher; and Buy 12 Full-up Interceptors and 4 TFCC TSGs for Development Test. FY07 - Deliver 7 Full-up Interceptors; 1 THAAD Radar and 1 TFCC TSG; and Buy 6 Full-up Interceptors and 1 Launcher for Development Tests, and 24 Interceptors; 3 Launchers; 2 TFCC TSGs and 1 THAAD Radar for Fire Unit #1. FY08 - Deliver 13 Full-up Interceptors; 3 TFCC TSGs and 1 Launcher for Development Tests and 3 Interceptors; 3 Launchers and 2 TFCC TSGs for Fire Unit #1. FY09 - Deliver 21 Interceptors and 1 THAAD Radar for Fire Unit #1.*

## 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 THAAD element provides the THAAD Interceptor Engage on THAAD Radar engagement sequence of the BMDS. THAAD enhances the TDS by deepening, complementing, and extending the BMDS battle-space and capability to engage ballistic targets in the late mid-course and terminal phases of their trajectory. THAAD will also be a surveillance sensor, providing sensor data to cue other elements of the BMDS. THAAD, in conjunction with the fielded Patriot System, provides the Terminal Defense Segment and supports the MDA objective of enhancing the BMDS capability. Five major components (Interceptors, Launchers, THAAD Radars, THAAD Fire Control and Communication (TFCC), and Support Equipment) will be integrated into the THAAD element and the BMDS.

Block 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 inside and outside the atmosphere. This encompasses the following: (1) Test interceptor with inside and outside the atmosphere algorithms; (2) THAAD Radar with Initial Discrimination Capability; and (3) TFCC with Limited Tactical Digital Information Link and Defense Design Planner. Development through FY06 will lay a foundation for THAAD Interceptor Engage on THAAD Radar Engagement Sequence Groups (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 FY06 and continues into FY07 with a total of 8 flight tests.

Development evolves to achieve a more robust THAAD radar discrimination, intercept capability in stressing inside and outside the atmosphere battlespace; salvo firing doctrine; and the ability to operate in a full spectrum of tactical interceptor environments and survivability. To facilitate tactical employment by soldiers, it also includes TFCC 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. THAAD development efforts will provide future capability or other BMDS elements such as Standard Missile 3 (SM-3) Launch on THAAD Radar. THAAD Radar development continues a collaborative effort with MDA/SN to ensure commonality of the THAAD Radar. The second series of flight tests begins in FY07 and continues into FY09 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 Command Control/Battle Management Communications (C2BMC).

Block 2008 development culminates in demonstrated THAAD capabilities in both inside and outside the atmosphere battlespace against the full spectrum of adversarial capabilities. The Block 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. 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 sensor elements and expanding the system's capability to provide THAAD sensor data to the BMDS. This adds the THAAD Interceptor Engage on THAAD Radar using a cue from other BMDS sensors. The delivery of Fire Unit #1 consists of 24 interceptors, 3 launchers, 1 THAAD Radar and 1 TFCC.

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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 |

**B. Accomplishments/Planned Program**

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Interceptor | 325,317 | 424,268 | 234,765 |
| RDT&E Articles (Quantity) | 0 | 8 | 7 |

The THAAD Interceptor is a certified round that is propelled by a single-stage, solid-propellant rocket booster. Its kill vehicle possesses a divert and attitude control system and an infrared seeker used in destroying its target through hit-to-kill technology.

FY05 Accomplishments:

- Completed Environments Phase I and assembly qualification for flight testing
- Integrated final release of interceptor software in Systems Integration Lab (SIL) for initial flight test
- Prepared for Flight Test Program at White Sands Missile Range (WSMR)
- Delivered interceptor software for initial integrated element flight tests
- Continued upgrades to the interceptor software
- Initiated buy of 6 Full-up Interceptors

FY06 Planned Program:
RDT&E Articles: Deliver 8 Full-Up Interceptors

- Support 5 flight tests
- Support Flight Test Program at WSMR and Pacific Missile Range Facility (PMRF)
- Complete Interceptor Environments Phase II Ground Test
- Continue SIL Hardware in the Loop (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 interceptor software
- Complete interceptor qualification testing
- Initiate fabrication, assembly, and test of interceptor hardware in preparation for Insensitive Munitions (IM) testing and missile rounds required for Interceptor Block Qualification Testing (BQT)
- Initiate early obsolescence upgrades to interceptor hardware

- Initiate buy of 12 Full-Up Interceptors

FY07 Planned Program:
RDT&E Articles: Deliver 7 Full-Up Interceptors

- 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 Interceptor Block Process Validation
- Complete final release of interceptor software
- Initiate buy of 6 Full-up Interceptors

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| THAAD Radar | 153,751 | 145,964 | 74,276 |
| RDT&E Articles (Quantity) | 0 | 0 | 1 |

The THAAD Radar is a solid state, phased array radar capable of tracking multiple threats and multiple interceptors during engagements. The THAAD Radar uses fence, volume, and cued search modes, and provides surveillance, acquisition, track, discrimination, interceptor communications, and hit assessment data collection for the fire control. The THAAD Radar hardware is a transportable system composed of the antenna equipment unit, electronics equipment unit, cooling equipment unit, and the prime power unit.

FY05 Accomplishments:
- Integrated final release of THAAD Radar Software Build 4.1 in System Integration Lab (SIL) for initial flight tests
- Completed integration of THAAD Radar #1
- Continued development and conducted Design Readiness Review (DRR) of THAAD Radar Software Build 4.2
- Initiated design of tactical Prime Power Unit (PPU)
- Delivered THAAD Radar software for first integrated element test at White Sands Missile Range (WSMR)
- Continued upgrades to the THAAD Radar software
- Delivered Build 5 of the THAAD Radar Simulation Model
- Tracked targets of opportunity and dedicated THAAD Radar risk reduction flights

- Completed THAAD Radar metric calibration
- Completed Alternating Current/Direct Current Qualification Test
- Conducted THAAD Radar Block Process Validation
- Initiated buy of one THAAD Radar (production of Transmit/Receive Modules and Transmit/Receive Integrated Multi-Channel Microwave Modules)

FY06 Planned Program:

- Continue manufacturing and assembly of one THAAD 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 THAAD Radar Requirements Verification
- Support Flight Test program at WSMR and Pacific Missile Range Facility (PMRF)
- Initiate software capability for DoD IT Standards Registry (DISR)

FY07 Planned Program:
RDT&E Articles: Deliver 1 THAAD Radar

- Complete integration of THAAD Radar #2 at WSMR
- Initiate THAAD Radar Electromagnetic Environmental Effects (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
- Initiate software upgrades for expanding the system's capability to provide THAAD sensor data to the BMDS
- Initiate build of second THAAD Radar PPU

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| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Launcher | 21,875 | 16,132 | 24,629 |
| RDT&E Articles (Quantity) | 3 | 1 | 0 |

The THAAD Launcher consists of a U.S. Army M1120 Heavy Expanded Mobility Tactical Truck-Load Handling System variant that transports an integrated missile round pallet and supports and secures eight ready-to-launch interceptors.

FY05 Accomplishments:
RDT&E Articles: Delivered 3 Launchers

- Integrated final release of Launcher Software Build 3 in System Integration Lab (SIL) for initial flight tests
- Supported Short Hot Launch (SHotL) test
- Supported element production planning and flight testing
- Continued fabrication, assembly, and test of Launcher hardware
- Delivered hardware and software to SIL Hardware-in-the-Loop (HWIL) activities for Launcher
- Delivered launcher hardware to White Sands Missile Range (WSMR) for flight testing
- Supported flight test program at WSMR
- Continued development of Build 3.1 software upgrade
- Delivered hardware to Pacific Missile Range Facility (PMRF)
- Initiated buy of 1 Launcher

FY06 Planned Program:
RDT&E Articles: Deliver 1 Launcher

- 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 PMRF
- Support Flight Test Program at WSMR and PMRF
- Conduct software upgrade Design Readiness Review
- Continue development of Build 3.1 Software upgrade

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
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- Continue development of Build 4.0 Software upgrade
- Deliver Launcher Build 3.1 Software in support of Flight Test 9 and beyond
- Support Launcher Block Qualification Test
- Complete Launcher Block Process Validation

FY07 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
- Initiate design and development Launcher hardware and software for Launch on Remote and Remoted Launcher capabilities
- Initiate buy of 1 Launcher

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| THAAD Fire Control and Communication (TFCC) Tactical Station Groups (TSGs) | 59,348 | 82,641 | 54,892 |
| RDT&E Articles (Quantity) | 2 | 0 | 1 |

The THAAD Fire Control and Communication (TFCC) is composed of the Tactical Operations Station, the Launch Control Station, and the Station Support Group. These three components together are called the Tactical Station Group. A TFCC includes two Tactical Station Groups. The TFCC provides the planning, control, coordination, execution, and communications necessary to fulfill the THAAD mission in a coherent and fully integrated fashion. It is interoperable with external air and interceptor defense and intelligence systems and agencies integrated into the Ballistic Missile Defense System (BMDS).

FY05 Accomplishments:
RDT&E Articles: Deliver 2 TFCC Tactical Station Groups (TSGs)

- Completed Build 4 TFCC flight test software and delivered to Master Software Development Library, System Integrated Laboratory (SIL) and White Sands Missile Range (WSMR) for Flight Test 2 preparation and testing
- Continued detailed design development and conducted Design Readiness Review of TFCC Software for Build 5
- Supported Flight Test Program preparation at WSMR and SIL

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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** |

- Completed upgrade to software development test tools to support Build 5 development

FY06 Planned Program:
- Complete Block Process Validation of TFCC
- Support Flight Test Program at WSMR and Pacific Missile Range Facility (PMRF)
- Continue integration and test of TFCC hardware
- Maintain software development environment and test tools
- Continue development of TFCC Software Build 5
- Perform tactical software maintenance for TFCC Software Build 4
- Initiate early obsolescence upgrades to TFCC hardware
- Initiate buy of 4 TFCC TSGs

FY07 Planned Program:
RDT&E Articles: Deliver 1 TFCC TSG

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

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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 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Integrated Logistics Support (ILS) | 21,019 | 45,383 | 66,476 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Provides each THAAD component with all aspects of logistics support for all blocks of the program. Responsible for transportability of all THAAD system equipment and for ensuring the required Government Furnished Equipment (GFE) is available as required by contract. Additionally, works with the user in developing all aspects of training for the components and has a key role in the transition effort of the THAAD System to the Army.

FY05 Accomplishments:

- Continued development of Interim Contractor Support System (ICSS)
- Continued to conduct Soldier-in-the-Loop Training and training course development for soldier participation in flight test program
- Supported flight and ground test program utilizing Contractor Logistics Support (CLS) at WSMR
- Conducted System Operator Trainer Course
- Continued development of Draft Integrated Electronic Training Manuals (IETM)/Electronic Training Manuals (ETM)
- Continued development of Performance Based Logistics (PBL) strategy
- Supported Peculiar Support Equipment (PSE) Battery Support Center (BSC) development
- Updated Packaging, Handling, Storage and Transportation (PHS&T) documentation
- Continued supportability analysis and LMI validation
- Continued to procure GFE to support program requirements
- Continued to process BOIP/Qualitative Quantitative Personnel Requirements Information (BOIP/QQPR)
- Continued work to obtain Air Certification Approval for all THAAD Components
- Updated Certificate of Equivalency for ground transport of Missile Round
- Updated Interim Hazard Classification for ground transport of Missile Round
- Completed Explosive Ordnance Disposal (EOD) procedures
- Completed Supply Support Strategy
- Completed Interim Instruction Facility

FY06 Planned Program:

- Support Flight Test program at WSMR and PMRF

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- Continue development of the System Operator Trainer Course
- Procure GFE for program requirements
- Update Manpower Estimate Report
- Update Emergency Activation Plan
- Support the Fire Control Redesign
- Continue update of the Supportability Strategy
- Continue to process BOIP/Qualitative Quantitative Personnel Requirements Information (BOIP/QQPRI)
- Update MANPRINT Management Plan and conduct MANPRINT Joint Working Group meetings

FY07 Planned Program:

- Continue supporting Flight Test program at WSMR and PMRF
- Continue procuring GFE to support program requirements
- Conduct Operator/Maintainer and Data Collector Course
- Continue to process BOIP/QQPRI
- Update TM 60 EOD Publication
- Initiate development of the Materiel Fielding Plan
- Conduct Soldier-in-the-Loop Training
- Review/approve training course material
- Develop IETM task validation/verification plan

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| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| System Test | 65,255 | 133,259 | 158,603 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Responsible for developing and executing all aspects of the THAAD program flight test objectives, ballistic interceptor target solutions, Live Fire Test and Evaluation (LFT&E) program, system flight test execution, government ground testing, range facility preparations, documentation requirements, data analysis and reporting.

FY05 Accomplishments:

- Continued Pacific Missile Range Facility (PMRF) Activation
- Prepared for Flight Tests at White Sands Missile Range (WSMR)
- Continued planning for Block Qualification Test (BQT)
- Continued interceptor Drop Test Planning
- Continued planning for LFT&E program
- Initiated transfer of Launch & Test Support Equipment (L&TSE) and range integration
- Initiated component integration planning to support flight tests at PMRF
- Initiated target integration for flight testing
- Continued Test Planning and Range Operations for flight testing
- Conducted System Requirements Review, Preliminary Design Review / Critical Design Review and Range Working Group meetings for target vehicles to support FTT-3 and FTT-4 flight tests
- Integrated and tested FTT-3 and FTT-4 target vehicles
- Refurbished ground equipment/test equipment associated with FTT-3 and FTT-4 target vehicles at range and contractor facility
- Performed THAAD Radar Cross Section testing required for both mission configurations
- Completed booster buy-off of boosters to support FTT-3 and FTT-4 flight tests

FY06 Planned Program:

- Continue target integration for flight testing
- Complete L&TSE and range integration at PMRF
- Continue Test Planning and Range Operations for PMRF flight testing

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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** |

- Initiate Flight Tests at WSMR
- Perform Data Analysis on Flight Tests
- Complete PMRF range activation and initiate flight testing
- Continue planning Fire Unit #1 Operational Assessment
- Initiate planning for Element demonstrations
- Conduct the risk reduction testing and THAAD Radar Characterization missions at PMRF
- Transport target hardware to WSMR to support FTT-3 and FTT-4 flight tests
- Launch ballistic interceptor target hardware in support of FTT-3 and FTT-4 flight tests per the integrated master test schedule
- Conduct post mission analysis and retrograde of residual hardware for FTT-3 and FTT-4 flight tests
- Modify the Foreign Military Asset (FMA) ballistic interceptor target launch vehicles to support flight tests FTT-6, FTT-7, and FTT-8
- Conduct range integration activities with the PMRF in support of flight tests FTT-6, FTT-7, and FTT-8
- Initiate support for use of Mobile Launch Platform in support of flight tests FTT-6, FTT-7, and FTT-8
- Initiate the procurement of Castor IVB Boosters to support flight tests FTT-9, FTT-10, and FTT-11
- Develop reentry vehicles to support flight tests FTT-9, FTT-10 and FTT-11

FY07 Planned Program:

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

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| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Weapon Sys Engr & Integ Team | 55,859 | 87,198 | 92,764 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Responsible for all engineering efforts required to translate approved Ballistic Missile Defense System (BMDS) capabilities and requirements into operationally suitable THAAD capability blocks. Coordinates and conducts requirements analysis, system integration and verification, software engineering to include independent verification and validation, configuration management, and BMDS integration for each THAAD component by working through the Integrated Process Team (IPT) process on a balanced contractor-government team. Additionally, responsible for all aspects of risk management and security for the THAAD program.

FY05 Accomplishments:

- Initiated System Integration Laboratory (SIL) Hardware-in-the-Loop (HWIL) environment development
- Performed system analysis scenarios and designs
- Performed Parametric Performance Assessments
- Supported Flight Test mission planning
- Completed integration of an autonomous THAAD system in the SIL HWIL facility
- Supported pre-flight testing in the SIL HWIL facility
- Supported Flight Test Program at White Sands Missile Range (WSMR)
- Supported Flight Test data analysis
- Initialized SIL HWIL integration of Final Release of Interceptor Software Build 6.0, Launcher Software Build 3, THAAD Fire Control and Communication (TFCC) Software Build 4 and THAAD Radar Software Build 4.1 for integrated flight testing
- Provided Weapon System Engineering support for the THAAD Radar Software Build 4.2 and TFCC Software Build 5, Interceptor Software Build 7.0, and Launcher Software Build 4 Design Readiness Reviews
- Continued participating in wargames, exercises and interoperability demonstrations
- Planning the integration and implementation of THAAD and its components in the BMDS System Engineering & Integration
- Continued program integration with BMDS System Engineering & Integration

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FY06 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 SIL and 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
- Perform Parametric Performance Assessments
- Updated assessment of Element capability using comprehensive, end-to-end digital simulation
- Support Flight Test mission planning
- Plan integration of THAAD into BMDS Test Bed

FY07 Planned Program:

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

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 |
|---|---|---|---|
| Fire Unit | 0 | 0 | 184,398 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The THAAD Project Office will award a contract in first quarter FY 07 for the manufacturing of a THAAD Fire Unit. The total amount of hardware manufactured under this contract will include 24 interceptors, 3 launchers, 1 THAAD Radar, 1 THAAD Fire Control and Communication (TFCC) (2 Tactical Station Groups (TSGs)), and the required peculiar and common support equipment. It is anticipated that the fire unit will be fielded in FY 09 and, following operational testing, will be transitioned to the U.S. Army.

FY07 Planned Program:

- Initiate the fabrication and assembly of Interceptors, Launchers, THAAD Radar, TFCC and initial spares for the Block 2008 Fire Unit
- 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 Interceptors, 3 Launchers, 2 TFCC TSGs, and 1 THAAD Radar for a total of 30 RDT&E Articles

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 |
|---|---|---|---|
| Program Management | 43,377 | 56,162 | 51,654 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Program Management provides support functions across the 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 Defense Finance Accounting Service (DFAS), internal review and audit, earned-value management, and program assessments.

FY05 Accomplishments:
- Provided management, leadership, and planning for all Block 2008 activities
- Provided salaries, travel, training, supplies, rental and project-wide support
- Supported the preparation of Flight Test Program at White Sands Missile Range (WSMR)
- Continued to provide guidance and management to program
- Provided project-wide programmatic support

FY06 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
- Continue project-wide programmatic support

FY07 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
- Continue project-wide programmatic support

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 capability-based acquisition strategy that emphasizes testing, spiral development, and evolutionary acquisition through the use of two-year capability blocks. The THAAD Block 2008 development program is already on contract with Lockheed Martin Space Systems Company (LMSSC), Sunnyvale, CA. The Cost Plus Award Fee (CPAF) contract was awarded August 4, 2000. In FY07 a Sole Source, CPAF Contract will be awarded to LMSSC for development upgrades to add THAAD capability to Launch on Remote, Remoted Launchers and report non-threatening ballistic interceptors. The Fire Unit #1 contract is targeted to be awarded in FY07 and will consist of the following: (1) Sole Source, CPAF/Cost Plus Incentive Fee (CPIF) contract to Raytheon for THAAD Radar hardware and (2) Sole Source, CPAF/CPIF contract to LMSSC as the element integrator and to procure interceptor, launcher, THAAD fire control and communication and Peculiar Support Equipment hardware. In addition, there will be a sole source Indefinite Delivery, Indefinite Quantity (ID/IQ) Delivery Order Contract to LMSSC for Contractor Logistics Support for the Fire Unit targeted to be awarded in FY08. Block 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 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Interceptor** | | | | | | | | |
| Prime Contract | SS/CPAF | LMSSC/ CA, TX, AL, MA, NH, IL, FL & MD | 943,666 | 399,339 | 1/2Q | 189,742 | 1/2Q | 1,532,747 |
| **THAAD Radar** | | | | | | | | |
| Prime Contract | SS/CPAF | LMSSC and Raytheon/ Huntsville, AL; Bedford, MA, & Texas | 422,708 | 140,637 | 1/2Q | 60,686 | 1/2Q | 624,031 |
| **Launcher** | | | | | | | | |
| Prime Contract | SS/CPAF | LMSSC/ Huntsville, AL & Lufkin, TX | 63,975 | 14,732 | 1/2Q | 20,843 | 1/2Q | 99,550 |
| **THAAD Fire Control and Communication (TFCC) Tactical Station Groups (TSGs)** | | | | | | | | |
| Prime Contract | SS/CPAF | LMSSC and Raytheon/ Huntsville, AL | 158,553 | 78,486 | 1/2Q | 45,855 | 1/2Q | 282,894 |
| **Integrated Logistics Support (ILS)** | | | | | | | | |
| Prime Contract | SS/CPAF | LMSSC/ Huntsville, AL | 33,778 | 27,247 | 1/2Q | 37,326 | 1/2Q | 98,351 |
| **System Test** | | | | | | | | |
| Prime Contract | SS/CPAF | LMSSC/ Sunnyvale, CA; Huntsville, AL; NM & HI | 83,765 | 51,302 | 1/2Q | 56,126 | 1/2Q | 191,193 |
| **Weapon Sys Engr & Integ Team** | | | | | | | | |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 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 | 99,771 | 55,645 | 1/2Q | 55,701 | 1/2Q | 211,117 |
| **Fire Unit** | | | | | | | | |
| Prime Contract | SS | LMSSC & Raytheon/ CA, TX, AL, MA, NH, IL, FL & MD | 0 | 0 | N/A | 167,643 | 1/2Q | 167,643 |
| **Program Management** | | | | | | | | |
| Prime Contract | SS/CPAF | LMSSC/ Sunnyvale, CA | 79,605 | 32,957 | 1/2Q | 24,187 | 1/2Q | 136,749 |
| Subtotal Product Development | | | 1,885,821 | 800,345 | | 658,109 | | 3344275 |

## Remarks

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Interceptor** | | | | | | | | |
| SETA | C | Multiple to include BAE, TSI & L3/ Huntsville, AL & Salt Lake City, UT | 15,244 | 14,353 | 1/2Q | 13,772 | 1/2Q | 43,369 |
| OGA | MIPR | Multiple to include RDEC & SMDC/ Huntsville, AL | 20,539 | 10,576 | 1/2Q | 10,487 | 1/2Q | 41,602 |
| MDA Program Support | C | MDA/ Arlington, VA | 7,888 | 0 | N/A | 20,764 | 1/2Q | 28,652 |
| **THAAD Radar** | | | | | | | | |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| SETA | C | Multiple to include Dynetics & GA Tech/ Huntsville, AL and GA | 6,100 | 2,264 | 1/2Q | 3,300 | 1/2Q | 11,664 |
| OGA | MIPR | Multiple to include CECOM, RDEC & SMDC/ Ft. Monmouth NJ and Huntsville, AL | 8,994 | 3,063 | 1/2Q | 4,028 | 1/2Q | 16,085 |
| MDA Program Support | C | MDA/ Arlington, VA | 3,175 | 0 | N/A | 6,262 | 1/2Q | 9,437 |
| **Launcher** | | | | | | | | |
| SETA | C/FFP | Dynetics/ Huntsville, AL | 2,302 | 661 | 1/2Q | 724 | 1/2Q | 3,687 |
| OGA | MIPR | RDEC & SMDC/ Huntsville, AL | 3,011 | 739 | 1/2Q | 1,045 | 1/2Q | 4,795 |
| MDA Program Support | C | MDA/ Arlington, VA | 477 | 0 | N/A | 2,017 | 1/2Q | 2,494 |
| **THAAD Fire Control and Communication (TFCC) Tactical Station Groups (TSGs)** | | | | | | | | |
| SETA | C | Multiple to include CSC & Dynetics/ Silver Spring, MD & Huntsville, AL | 2,517 | 1,948 | 1/2Q | 2,011 | 1/2Q | 6,476 |
| OGA | MIPR | Multiple to include NRDEC, RDEC & SMDC/ Natick MA & Huntsville, AL | 9,875 | 2,207 | 1/2Q | 2,305 | 1/2Q | 14,387 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| MDA Program Support | C | MDA/ Arlington, VA | 1,315 | 0 | N/A | 4,721 | 1/2Q | 6,036 |
| **Integrated Logistics Support (ILS)** | | | | | | | | |
| SETA | C | Multiple to include Dynetics, TSA & BAE/ Huntsville, AL & Rockville, MD | 5,853 | 1,844 | 1/2Q | 2,029 | 1/2Q | 9,726 |
| OGA | MIPR | Multiple to include IMMC & USAADASCH/ Huntsville, AL & Ft. Bliss | 21,346 | 16,292 | 1/2Q | 23,848 | 1/2Q | 61,486 |
| MDA Program Support | C | MDA/ Arlington, VA | 285 | 0 | N/A | 3,273 | 1/2Q | 3,558 |
| **System Test** | | | | | | | | |
| OGA | MIPR | Multiple to include WSMR, PMRF, ATEC,RDEC & SMDC/ NM, HI, VA, & Huntsville, AL | 31,644 | 15,995 | 1/2Q | 17,970 | 1/2Q | 65,609 |
| MDA Program Support | C | MDA/ Arlington, VA | 742 | 0 | N/A | 5,570 | 1/2Q | 6,312 |
| SETA | C/Various | Multiple/ AL | 0 | 5,590 | 1/2Q | 6,040 | 1/2Q | 11,630 |
| **Weapon Sys Engr & Integ Team** | | | | | | | | |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| SETA | C | Multiple to include Dynetics, TSA and L3/ Huntsville, AL & Salt Lake City, UT | 23,561 | 18,187 | 1/2Q | 18,914 | 1/2Q | 60,662 |
| OGA | MIPR | Multiple to include RDEC & SMDC/ Huntsville, AL | 40,642 | 13,366 | 1/2Q | 13,900 | 1/2Q | 67,908 |
| MDA Program Support | C | MDA/ Arlington, VA | 781 | 0 | N/A | 4,249 | 1/2Q | 5,030 |
| **Fire Unit** | | | | | | | | |
| OGA | MIPR | Multiples to include TACOM/CECOM/ USAADASCH/ Warren, MI; Ft. Monmouth, NJ; Ft. Bliss TX | 0 | 0 | N/A | 16,755 | 1/2Q | 16,755 |
| **Program Management** | | | | | | | | |
| SETA | C | Multiple to include Dynetics, BAE, & L3/ Huntsville, AL Rockville, MD & Salt Lake City, UT | 22,051 | 9,566 | 1/2Q | 9,591 | 1/2Q | 41,208 |
| MDA Program Support | C | MDA/ Arlington, VA | 494 | 0 | N/A | 3,718 | 1/2Q | 4,212 |
| Subtotal Support Costs | | | 228,836 | 116,651 | | 197,293 | | 542780 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603881C Ballistic Missile Defense Terminal Defense Segment |

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **System Test** | | | | | | | | |
| Government Test Planning/Targets | MIPR | Multiple to include WSMR, PMRF & SMDC/ NM, HI & Huntsville, AL | 58,894 | 60,372 | 1/2Q | 72,897 | 1/2Q | 192,163 |
| Subtotal Test and Evaluation | | | 58,894 | 60,372 | | 72,897 | | 192163 |

**Remarks**

## IV. Management Services Cost ( $ in Thousands )

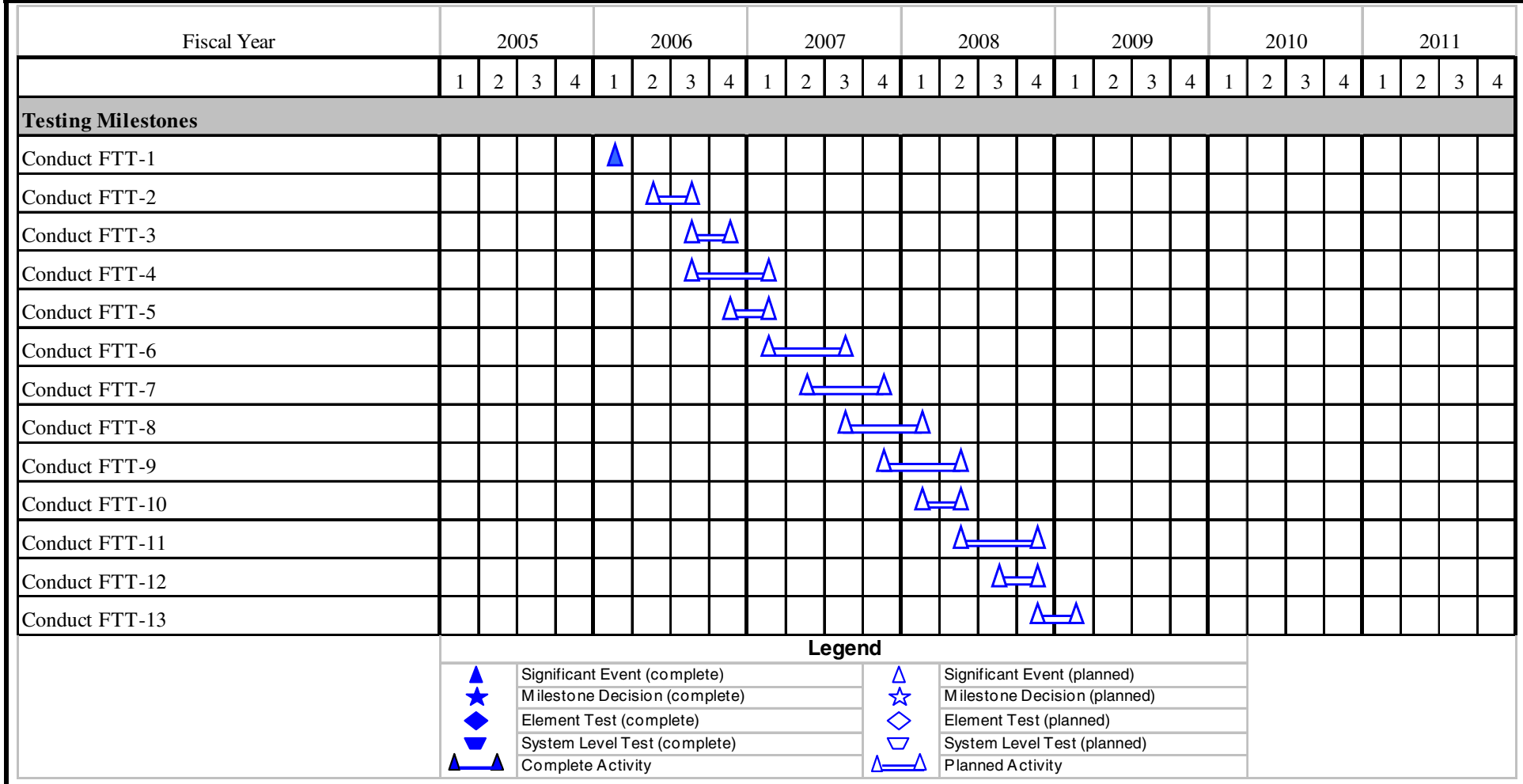
| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Program Management** | | | | | | | | |
| Internal Operating Budget | MIPR | THAAD/ Huntsville, AL | 41,460 | 13,639 | 1/2Q | 14,158 | 1/2Q | 69,257 |
| Subtotal Management Services | | | 41,460 | 13,639 | | 14,158 | | 69257 |

**Remarks**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 2,215,011 | 991,007 | | 942,457 | | 4,148,475 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 | 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 |
| **Testing Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Conduct FTT-14 (DUAL) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Conduct FTT-15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Conduct FTT-16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Conduct FTT-17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **BLOCK 2008** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fire Control and Communication Delivered to WSMR | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Launcher Delivered to WSMR | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| THAAD Radar #1 Integ and Test Complete | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| THAAD Radar B4.2 S/W Critical Design Rev (CDR) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fire Control and Comm S/W B4 Final Rel at SIL | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FTT-2 Interceptor S/W Final Rel Integ at SIL | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| THAAD Radar S/W B4.1 Formal Rel Integ at SIL | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Launcher S/W Build 3 Final Release Integ at SIL | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| Significant Event (complete) | | Significant Event (planned) | |
| Milestone Decision (complete) | | Milestone Decision (planned) | |
| Element Test (complete) | | Element Test (planned) | |
| System Level Test (complete) | | System Level Test (planned) | |
| Complete Activity | | Planned Activity | |

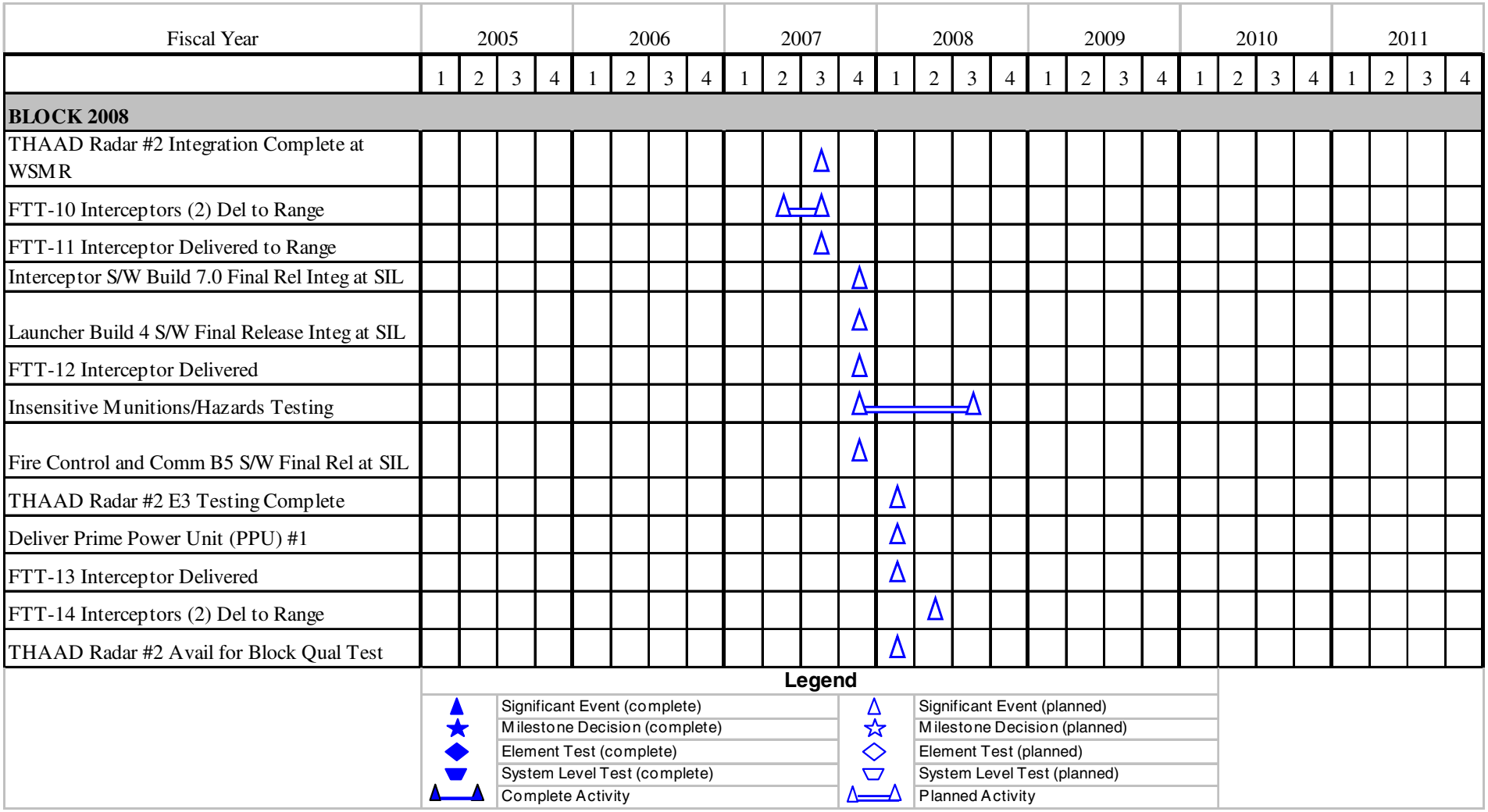
| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603881C Ballistic Missile Defense Terminal Defense Segment |

| Fiscal Year | 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 |
| **BLOCK 2008** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FTT-1 Interceptor Delivered to WSMR | | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | |
| Soldier-in-the-Loop Training Course 2 | | | | | | △ | | | | | | | | | | | | | | | | | | | | | | |
| FTT-2 Interceptor Delivered to WSMR | | | | | | △ | | | | | | | | | | | | | | | | | | | | | | |
| FTT-3 Interceptor Delivered to WSMR | | | | | | △ | | | | | | | | | | | | | | | | | | | | | | |
| Pacific Missile Range Facility Activation | | | | | | △ | | | | | | | | | | | | | | | | | | | | | | |
| FTT-4 Interceptor Delivered to WSMR | | | | | | | △ | | | | | | | | | | | | | | | | | | | | | |
| FTT-5 Interceptor Delivered to WSMR | | | | | | | △ | | | | | | | | | | | | | | | | | | | | | |
| FTT-6 Interceptor Delivered to Range | | | | | | | | △ | | | | | | | | | | | | | | | | | | | | |
| FTT-7 Interceptor Delivered to Range | | | | | | | | △ | | | | | | | | | | | | | | | | | | | | |
| FTT-8 Interceptor Delivered to Range | | | | | | | | | △ | | | | | | | | | | | | | | | | | | | |
| FTT-9 Interceptor Delivered to Range | | | | | | | | | △ | | | | | | | | | | | | | | | | | | | |
| THAAD Radar B4.2 S/W Formal Rel Integ at SIL | | | | | | | | | | | △ | | | | | | | | | | | | | | | | | |
| THAAD Radar #2 Delivered to WSMR for Integ | | | | | | | | | | | △ | | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲▬▲ | Complete Activity | △▬△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 | 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 |
| **BLOCK 2008** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FTT-15 Interceptor Delivered | | | | | | | | | | | | | | △ | | | | | | | | | | | | | | |
| THAAD Radar Data Collection Mission #2 | | | | | | | | | | | | | | △ | | | | | | | | | | | | | | |
| THAAD Radar Prime Power Unit #2 Delivered | | | | | | | | | | | | | | | | △ | | | | | | | | | | | | |
| FTT-16 Interceptor Delivered | | | | | | | | | | | | | | | | | △ | | | | | | | | | | | |
| THAAD Radar B4.2 Formal Maintenance Rel | | | | | | | | | | | | | | | | | △ | | | | | | | | | | | |
| FTT-17 Interceptor Delivered | | | | | | | | | | | | | | | | | △ | | | | | | | | | | | |
| Element Demonstrations | | | | | | | | | | | | | | | | | | △ | — | △ | | | | | | | | |
| Element Weapon System Verification | | | | | | | | | | | | | | | | | | | △ | | | | | | | | | |
| **Contractual Activities & Events** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Contractor Logistics Support (CLS) | | | | | | | | | | | | | △ | | | | | | | | | | | | | | | |
| Fire Unit I and II Contract Award | | | | | | | | | △ | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲—▲ | Complete Activity | △—△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Testing Milestones** | | | | | | | |
| Conduct FTT-1 | | 1Q | | | | | |
| Conduct FTT-2 | | 2Q-3Q | | | | | |
| Conduct FTT-3 | | 3Q-4Q | | | | | |
| Conduct FTT-4 | | 3Q-4Q | 1Q | | | | |
| Conduct FTT-5 | | 4Q | 1Q | | | | |
| Conduct FTT-6 | | | 1Q-3Q | | | | |
| Conduct FTT-7 | | | 2Q-4Q | | | | |
| Conduct FTT-8 | | | 3Q-4Q | 1Q | | | |
| Conduct FTT-9 | | | 4Q | 1Q-2Q | | | |
| Conduct FTT-10 | | | | 1Q-2Q | | | |
| Conduct FTT-11 | | | | 2Q-4Q | | | |
| Conduct FTT-12 | | | | 3Q-4Q | | | |
| Conduct FTT-13 | | | | 4Q | 1Q | | |
| Conduct FTT-14 (DUAL) | | | | | 1Q-2Q | | |
| Conduct FTT-15 | | | | | 1Q-2Q | | |
| Conduct FTT-16 | | | | | 2Q-3Q | | |
| Conduct FTT-17 | | | | | 3Q-4Q | | |
| **BLOCK 2008** | | | | | | | |
| Fire Control and Communication Delivered to WSMR | 2Q | | | | | | |
| Launcher Delivered to WSMR | 2Q | | | | | | |
| THAAD Radar #1 Integ and Test Complete | 2Q | | | | | | |
| THAAD Radar B4.2 S/W Critical Design Rev (CDR) | 2Q | | | | | | |
| Fire Control and Comm S/W B4 Final Rel at SIL | 3Q | | | | | | |
| FTT-2 Interceptor S/W Final Rel Integ at SIL | 3Q | | | | | | |
| THAAD Radar S/W B4.1 Formal Rel Integ at SIL | 3Q | | | | | | |
| Launcher S/W Build 3 Final Release Integ at SIL | 4Q | | | | | | |
| FTT-1 Interceptor Delivered to WSMR | | 1Q | | | | | |
| Soldier-in-the-Loop Training Course 2 | | 2Q | | | | | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| FTT-2 Interceptor Delivered to WSMR | | 2Q | | | | | |
| FTT-3 Interceptor Delivered to WSMR | | 2Q | | | | | |
| Pacific Missile Range Facility Activation | | 2Q | | | | | |
| FTT-4 Interceptor Delivered to WSMR | | 3Q | | | | | |
| FTT-5 Interceptor Delivered to WSMR | | 3Q | | | | | |
| FTT-6 Interceptor Delivered to Range | | 4Q | | | | | |
| FTT-7 Interceptor Delivered to Range | | 4Q | | | | | |
| FTT-8 Interceptor Delivered to Range | | | 1Q | | | | |
| FTT-9 Interceptor Delivered to Range | | | 1Q | | | | |
| THAAD Radar B4.2 S/W Formal Rel Integ at SIL | | | 3Q | | | | |
| THAAD Radar #2 Delivered to WSMR for Integ | | | 3Q | | | | |
| THAAD Radar #2 Integration Complete at WSMR | | | 3Q | | | | |
| FTT-10 Interceptors (2) Del to Range | | | 2Q-3Q | | | | |
| FTT-11 Interceptor Delivered to Range | | | 3Q | | | | |
| Interceptor S/W Build 7.0 Final Rel Integ at SIL | | | 4Q | | | | |
| Launcher Build 4 S/W Final Release Integ at SIL | | | 4Q | | | | |
| FTT-12 Interceptor Delivered | | | 4Q | | | | |
| Insensitive Munitions/Hazards Testing | | | 4Q | 1Q-3Q | | | |
| Fire Control and Comm B5 S/W Final Rel at SIL | | | 4Q | | | | |
| THAAD Radar #2 E3 Testing Complete | | | | 1Q | | | |
| Deliver Prime Power Unit (PPU) #1 | | | | 1Q | | | |
| FTT-13 Interceptor Delivered | | | | 1Q | | | |
| Fire Control and Comm Block Qual Test (BQT) | | | 3Q-4Q | 1Q | | | |
| FTT-14 Interceptors (2) Del to Range | | | | 2Q | | | |
| THAAD Radar #2 Avail for Block Qual Test | | | | 1Q | | | |
| FTT-15 Interceptor Delivered | | | | 2Q | | | |
| THAAD Radar Data Collection Mission #2 | | | | 2Q | | | |
| THAAD Radar Prime Power Unit #2 Delivered | | | | 4Q | | | |
| FTT-16 Interceptor Delivered | | | | | 1Q | | |
| THAAD Radar B4.2 Formal Maintenance Rel | | | | | 1Q | | |
| FTT-17 Interceptor Delivered | | | | | 1Q | | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| Element Demonstrations | | | | | 2Q-4Q | | |
| Element Weapon System Verification | | | | | 3Q | | |
| Launcher S/W B3 Eng Release Integrated at SIL | 1Q | | | | | | |
| Kill Vehicle (KV) Flight Qual Tests | 2Q | | | | | | |
| Interceptor Environments Phase I | 2Q | | | | | | |
| FTT-2 Interceptor S/W Engr Rel Integrated at SIL | | 2Q | | | | | |
| THAAD Radar B4.2 S/W Engr Release Integ at SIL | | 4Q | | | | | |
| Fire Control and Comm Critical Design Review | 4Q | | | | | | |
| Launcher Block Qualification Test (BQT) | | | 2Q-4Q | 1Q-4Q | 1Q | | |
| Interceptor S/W B7.0 Engr Rel Integ at SIL | | | 1Q | | | | |
| Launcher B4 S/W Engr Release Integrated at SIL | | | 4Q | | | | |
| Interceptor Block Qualification Test | | | 4Q | 1Q-2Q | | | |
| THAAD Radar Block Qualification Test (BQT) | | | | 2Q-4Q | | | |
| **Deliveries** | | | | | | | |
| Fire Unit I | | | | 3Q-4Q | 1Q-3Q | | |
| Fire Unit II | | | | | 3Q-4Q | 1Q-4Q | |
| **Contractual Activities & Events** | | | | | | | |
| Contractor Logistics Support (CLS) | | | | 1Q | | | |
| Fire Unit I and II Contract Award | | | 1Q | | | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 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 | 114,461 | 119,300 | 642,318 | 385,548 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 10 | 20 | 0 |

*Note: RDT&E Articles for Fire Unit #2: FY08 - Buy 24 Interceptors and 1 THAAD Radar. FY09 - Buy 3 Launchers, and 2 TFCC Tactical Station Groups (TSGs). FY09 - Deliver 10 Interceptors. FY10 - Deliver 14 Interceptors; 3 Launchers; 2 TFCC TSGs and 1 THAAD Radar.*

## 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 (Interceptors, Launcher, THAAD Radar, THAAD Fire Control and Communication (TFCC), 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, TFCC 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 inside and outside the atmosphere intercepts 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 continues the development of the THAAD System and adds the SM-3 launch on THAAD Radar ESG. This program has the flexibility to retrofit development assets, test the hardware capability to launch the THAAD Interceptor using data

from a remote sensor before the threat enters the field of view of the THAAD Radar; or provide for continuous manufacturing of Fire Unit hardware. In Block 2010, the THAAD Fire Unit #2 consisting of 24 interceptors, 3 launchers, 1 THAAD Radar and 1 TFCC will be delivered.

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## 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. Block 2010 development activities, as well as the delivery 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 2006 |
|---|---|
| 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 | 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 |
| **Program Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Block 10/12 Authority to Proceed (ATP) | | | | | | | | | | | | | △ | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲▬▲ | Complete Activity | △▬△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0401 Israeli Arrow Program | 150,836 | 130,838 | 77,175 | 77,189 | 77,373 | 78,990 | 80,637 |
| RDT&E Articles Qty | 43 | 32 | 8 | 5 | 0 | 0 | 0 |

## A. Mission Description and Budget Item Justification

This project provides funding for the Arrow Weapon System (AWS) development, to include the Arrow System Improvement Program (ASIP), Co-production of Arrow Intercept Missiles, 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 Arrow weapon system 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. In addition to the geo-strategic goals of the Arrow cooperative effort, the United States derives considerable technical benefit from its participation in these projects. Technologies cooperatively developed under these projects provide risk reduction and alternative technologies for U.S. ballistic missile defense programs as well as phenomenology and kill assessment data. U.S. participation in the Arrow development effort also ensures interoperability of the Arrow and the Israeli Missile Defense System with deployed U.S. missile defense assets. The ASIP effort will enhance the performance of the AWS to defeat longer-range and more robust ballistic missile threats expected to be introduced in the Middle East in the near future. The ASIP tested the existing AWS configuration at a U.S. test range against today's existing to verify its baseline performance. Testing of the enhanced AWS in the U.S. against longer range threats is planned for FY08. 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.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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. Accomplishments/Planned Program**

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Arrow System Improvement Program (ASIP) | 55,000 | 56,213 | 55,702 |
| RDT&E Articles (Quantity) | 0 | 2 | 2 |

The Arrow System Improvement Program (ASIP) is a cooperative effort conducted under the ASIP International Agreement. The Arrow System Improvement Program commenced on March 13, 2001 and will run through September 2007. ASIP is a follow-on effort to the ADP to assure that Arrow retains system effectiveness against evolving longer-range, more robust regional TBM threats.

FY05 Accomplishments:

- Continued ASIP Phase II to develop and test technologies to improve Arrow Weapon System performance to defend Israel for emerging TBM threats.
- Continued enhancing Arrow interoperability development and validation to include engagement coordination.
- Completed highly successful Juniper Cobra 05 Joint Exercise.

FY06 Planned Program:
RDT&E Articles: (Two Missile Total) Block 3 Arrow test missile for intercept testing and a Block 3.5 Arrow test missile for intercept testing.

- Complete ASIP Phase II to develop activities to improve Arrow Weapon System performance to defend Israel for emerging ballistic missile threats.
- Initiate verification and validation, Phase III of the ASIP program.
- Conduct ASIP System Critical Design Review.
- Conduct Arrow flight tests in Israel.
- Continue enhancing Arrow interoperability development and validation to include engagement coordination.

FY07 Planned Program:
RDT&E Articles: (2 Missiles) One Block 4.0 Arrow II test missile for Flyout testing and One Block 4.0 Arrow II test missile for intercept testing.

- Conduct Block 3.5/4.0 Arrow flight tests in Israel.
- Conduct Joint Interoperability Exercise Juniper Cobra with Israel and U.S. forces.
- Continue enhancing Arrow interoperability development and validation to include engagement coordination.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 |
|---|---|---|---|
| Israeli Test Bed (ITB) | 3,535 | 3,535 | 3,535 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The Israeli Test Bed (ITB) is a cooperative effort conducted under the Theater Ballistic Missile Defense Test Bed Memorandum of Agreement between the U.S. and Israel. The ITB program commenced on 30 March 1989. The ITB is a large scale human-in-the-loop (HIL) modeling and simulation facility for the purpose of developing, analyzing, and evaluating candidate architectures, battle management concepts, and engagement algorithms. The principal ITB facility resides at Tadiran Systems Division in Holon, Israel. A second ITB capability is operational at the U.S. Army`s Space and Missile Defense Command in Huntsville, Alabama.

FY05 Accomplishments:

- Provided software enhancements in ITB for experiments conducted in FY05 and for those planned in the future
- Conducted ITB experiments in FY05
- Some of the FY05 ITB experiments supported the development of an optimal combined OPLAN and CSOPs between Israel and the US
- Conducted an ITB experiment for evaluation of tools for enhancement of AWS BMC
- Developed and completed SRBM enhancements in ITB and conducted an experiment to explore potential BMC concepts

FY06 Planned Program:

- Provide software enhancements in ITB for experiments to be conducted in FY06 and for those planned in FY07
- Conduct planned ITB experiments in FY06
- An ITB experiment is planned to evaluate ASIP performance specifications against future threats and assess Arrow enhanced interoperability between Israeli and U.S. missile defense systems
- Conduct a preparation exercise for a 2007 live exercise
- Development and testing of potential expanded IS / US BMC3 tools for information sharing and coordination in combined missile defense operations
- Expansion of SRBM models to evaluate tactics and requirements
- ITB model expansion and conduct of regional defense experiment
- Complete code transfer from ADA to C++, C#; to enhance future development of ITB

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603881C Ballistic Missile Defense Terminal Defense Segment** |

FY07 Planned Program:

- Design, Code, and Integrate software enhancements in ITB for experiments to be conducted in FY07 and for those planned in FY08
- Design, Conduct and Provide analysis on ITB experiments in FY07
- Use expanded models of new concepts and systems for SRBM and regional defense during combined Live exercise, and support revised OPLANs and CSOPs as necessary
- Expansion of ITB Citron Tree BMC operational concept models for regional defense
- Development of tools, interfaces and tactics for SRBMD systems
- Evaluation of regional defense concepts and impacts on interoperability
- Proceed on plan to further modularize ITB to bring greater capability and flexibility to US/Israeli users

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

The Israeli Systems Architecture and Integration (ISA&I) program is a cooperative, jointly funded effort by MDA and the Israeli Ministry of Defense (IMOD) that provides analyses and options for the Arrow Weapon System (AWS) and Israeli National Missile Defense architecture. Program objectives are to assess the ballistic missile threats, provide analyses and architecture options, assess missile defense system robustness and issues, and assess Israeli and U.S. missile defense interoperability issues. The ISA&I began in FY 00 to analyze enhancements to the AWS that would be necessary for the system to maintain a robust capability against evolving regional threats. The ISA&I effort is contracted by MDA to WALES, Ltd, an Israeli consulting firm.

FY05 Accomplishments:

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

FY06 Planned Program:

- Assess IMDS performance against emerging regional ballistic missile threats.
- Refine growth path options necessary for the Arrow missile defense system to remain an effective ballistic missile defense for the State of Israel.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603881C Ballistic Missile Defense Terminal Defense Segment** |

- Evaluate Israeli architecture studies to assess near-term U.S. missile defense systems and their impact on contributing to future Israeli missile defense architectures.

FY07 Planned Program:
- Assess IMDS performance against emerging regional ballistic missile 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 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Program Support | 740 | 788 | 791 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The program support task encompasses activities that support but are not part of the U.S./Israeli cooperative programs. These activities include the documentation of foreground and background data rights for ASIP, ITB, ADP, and legacy programs; security support to include development and maintenance of security plans and classification guides; and analysis and engineering support of the ISA&I and ITB programs. It also provides for contractor support and expertise in MDA/IS.

FY05 Accomplishments:
- Continued documentation of background/foreground data rights for ASIP, Arrow co-production, and ITB.
- Maintained security plans and classification guides.
- Managed and support ITB modifications and experiments.
- Supported Israeli and U.S. Missile Defense System integration and related test activities.

FY06 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.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603881C Ballistic Missile Defense Terminal Defense Segment** |

FY07 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 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Arrow Missile Production | 89,520 | 58,222 | 13,000 |
| RDT&E Articles (Quantity) | 43 | 30 | 6 |

The co-manufacturing project will further enhance the Arrow Weapon System by establishing a capability in the United States and Israel to co-produce additional Arrow missiles or components of such missiles. The goals of the Co-production effort are to create the ability to accelerate production of Arrow missiles to meet Israel`s defense requirements and advance the U.S. industrial and technology base in defensive ballistic missile Producibility.

FY05 Accomplishments:

- Completed booster static fire test in Israel..
- Initiated integration of U.S. produced components in Israel..
- Integrated first Arrow II Interceptor with U.S. co-produced components in Israel

FY06 Planned Program:

- Produce cooperatively Arrow missiles to meet Israel's defense requirements. Contract Option I to be exercised and production begins.
- Conduct sustainer static fire test.
- Execute Contract Options II and III for production.

FY07 Planned Program:

- Produce cooperatively Arrow missiles to meet Israel's defense requirements.
- Complete Option I production.
- Execute Contract Options IV and V.
- Initiate Option IV production.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 |
|---|---|---|---|
| Short Range Ballistic Missile Defense Study | 0 | 10,000 | 2,000 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Israel's initiative for a joint 18 month definition/risk reduction phase for developing a low cost SRBMD capability as an enhancement to the Arrow Weapon System. Israel has a need for a wide area active defense system against the current and growing threat to Israeli civilians from short range, relatively low tech and inexpensive ballistic missiles. The current Israeli BMDS (Patriot and Arrow) have capability against some of these short range missile threats but do not provide a cost effective defense.

FY05 Accomplishments:

- IMDO has completed a survey of Israeli industry concepts and has selected two candidates for further evaluation

FY06 Planned Program:

- IMDO/MDA downselect to one candidates for further evaluation (Mar 06)

FY07 Planned Program:

- TBD based on final results of the FY06 study and MDA decision for US Requirement

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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

As a bi-lateral cooperative program with the State of Israeli, the Arrow acquisition strategy doesn't fall under any normal DoD Acquisition Strategy. The program is managed by an Israeli Co-Program Manager and an, equal in responsibility, US Co-Program Manager. All Arrow contracts are on a cost-share basis with Israeli, normally 50/50. Note that half of the Israeli share is from non-financial contributions like facilities and personal. With 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. Additionally with Arrow Missile Production, IMoD contracts on behalf of U.S. government to IAI. IAI then subcontracts to Boeing for manufacture of U.S. components. IAI manufactures Israeli components and performs final assembly. For the Israeli Test Bed, Space and Missiles Defense Command (SMDC) Huntsville contracts directly with Tadiran while IMoD provides additional funds to SMDC. Finally, MDA contracts directly with WALES, Ltd for the Israeli System Architecture and Integration.

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 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 | 267,404 | 56,213 | 1Q | 55,702 | 1Q | 379,319 |
| **Israeli Test Bed (ITB)** | | | | | | | | |
| Israeli Test Bed (ITB) | FFP | Tadiran/ Israel | 12,670 | 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 | 7,462 | 2,080 | 1Q | 2,147 | 1Q | 11,689 |
| **Arrow Missile Production** | | | | | | | | |
| Arrow Missile Production | FFP | IAI&Boeing/ Israel&AL | 162,260 | 58,222 | 2Q | 13,000 | 2Q | 233,482 |
| **Short Range Ballistic Missile Defense Study** | | | | | | | | |
| Short Range Ballistic Missile Defense Study | FFP | IMDO/ Israel | 0 | 10,000 | 2Q | 2,000 | N/A | 12,000 |
| Subtotal Product Development | | | 449,796 | 130,050 | | 76,384 | | 656230 |

## Remarks

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Program Support** | | | | | | | | |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Program Support | FFP | Various/ Ala/Va | 6,702 | 788 | 1Q | 791 | 1Q | 8,281 |
| Subtotal Support Costs | | | 6,702 | 788 | | 791 | | 8281 |

**Remarks**

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 )

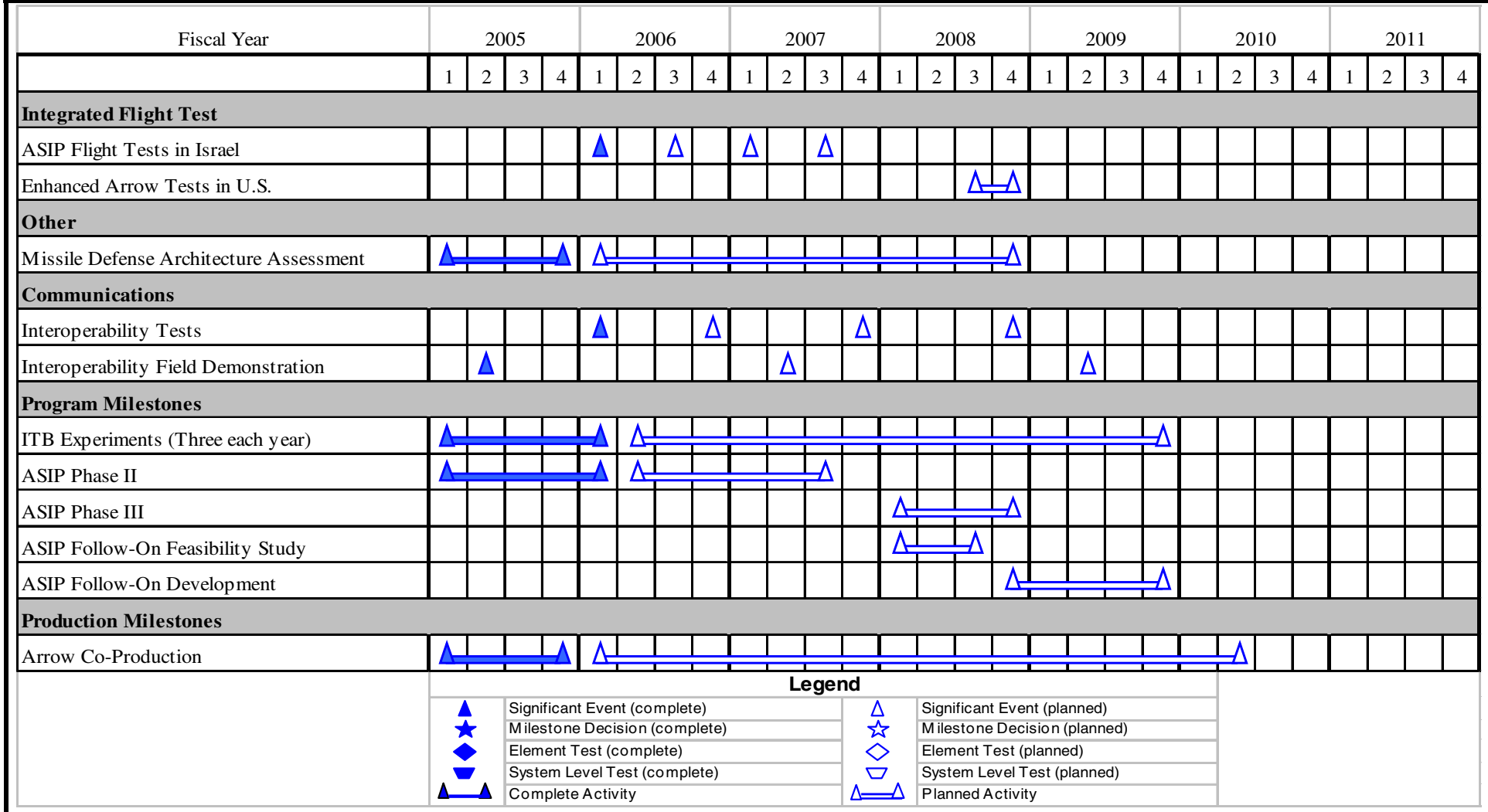
| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Subtotal Management Services | | | | | | | | |

**Remarks**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 456,498 | 130,838 | | 77,175 | | 664,511 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Integrated Flight Test** | | | | | | | |
| ASIP Flight Tests in Israel | | 1Q,3Q | 1Q,3Q | | | | |
| Enhanced Arrow Tests in U.S. | | | | 3Q-4Q | | | |
| **Other** | | | | | | | |
| Missile Defense Architecture Assessment | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | | | |
| **Communications** | | | | | | | |
| Interoperability Tests | | 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 | | |
| ASIP Phase II | 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 | 1Q-2Q | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0806 PAC-3 Block 2006 | 0 | 0 | 1,600 | 1,000 | 0 | 0 | 0 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## A. Mission Description and Budget Item Justification

Upper Tier BM intercepts produce multiple debris tracks that increase radar loading for Lower Tier Missile Defense systems and may potentially lead to missile wastage if debris tracks are engaged. Currently fielded systems must mitigate Upper Tier Intercept Debris effects.

This effort will enable the PAC-3 element of the BMDS to manage radar resources effectively as well as preventing missile wastage on debris created by BMDS Upper Tier elements engagements, enabling a more effective management of BMDS battlespace.

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| PAC-3 Debris Mitigation | 0 | 0 | 1,600 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

FY07 Planned Program:

- Primary SW Design, Coding and Testing of the ECP Algorithm
- Developmental and Operational Testing
- Leveraged participation in FT for ECP checkout

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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

The design objective of the Patriot system is to provide an element of the Ballistic Missile Defense System capable of being modified to cope with the evolving threat. This strategy minimizes technological risks and provides a means of enhancing system capability through planned upgrades of deployed systems.

As a result of the 17 March 2005 MDA CCB approval of ECP-0024 Upper Tier Debris Mitigation, LTPO plans to implement ECP-0024 over a 4 FY period with a projected completion date of 1QTR FY08. The implementation of ECP-0024 will be demonstrated through a series of Flight Tests. Additionally, ECP-0024 is planned for implementation in the normal LTPO Post Deployment Build cycle.

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| COST ($ in Thousands) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0602 Program-Wide Support | 17,426 | 17,912 | 17,078 | 17,052 | 11,434 | 10,954 | 3,015 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## A. Mission Description and Budget Item Justification

Program-Wide Support provides funding for common non-headquarters support functions across the entire program such as strategic planning, program integration, business management, 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 outside services and support contractors that augment government staff in these areas. Many of these costs reside within the Missile Defense Agency 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, although some functions and costs within this program element are performed by MDA employees assigned within the National Capital Region (NCR). Other costs included herein provide facility capabilities for MDA Executing Agent locations, such as physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses. Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Civilian Salaries and Support | 17,426 | 17,912 | 17,078 |
| RDT&E Articles (Quantity) | 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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| Total PE Cost | 4,467,693 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 |
| 0708 Ground-Based Midcourse Defense (GMD) Block 2004 Test Bed/Initial Defensive Capability (IDC) | 822,729 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0808 Ground-Based Midcourse Defense (GMD) Block 2004/2006 Development | 2,430,207 | 2,333,987 | 2,354,003 | 467,800 | 510,300 | 0 | 0 |
| 0908 Ground-Based Midcourse Defense (GMD) Block 2008 Development | 0 | 72,559 | 354,948 | 1,394,803 | 1,186,732 | 500,963 | 340,922 |
| 0008 Ground-Based Midcourse Defense (GMD) Block 2010 | 0 | 0 | 118,900 | 706,000 | 669,800 | 1,575,388 | 1,310,381 |
| 0709 AEGIS Ballistic Missile Defense Block 2004 | 901,299 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0809 AEGIS Ballistic Missile Defense Block 2006 | 121,574 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0402 Japanese Cooperative Program | 69,489 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0602 Program-Wide Support | 122,395 | 35,626 | 49,121 | 81,890 | 30,508 | 72,077 | 33,539 |
| | | | | | | | |
| Amount Included in PE 0904903D | 0 | 0 | 0 | -1,245,012 | -1,079,267 | -1,026,445 | -1,274,867 |
| Total PE Cost Reflected in R-1 | 4,467,693 | 2,442,172 | 2,876,972 | 1,405,481 | 1,318,073 | 1,121,983 | 409,975 |

*Note: Per Congressional direction, all funding for Aegis BMD and Japanese Cooperative efforts transfers in FY06 to PE 0603892C, Ballistic Missile Defense Aegis.*

## A. Mission Description and Budget Item Justification

The Ground-Based Midcourse (GMD) element of the Ballistic Missile Defense System (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.

It is largely within this PE and the new Aegis PE that the IDC is fielded. GMD has fielded an IDC capability to address known threats. The midcourse phase of flight offers 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 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.

GMD has balanced fielding decisions with a robust development program to deliver the maximum operational capability within the resources provided. The FY07 budget submission emphasizes integration of the GMD element into the BMDS by delivering an increased engagement capability against 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. This 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 Ground-Based Interceptor (GBI) against a target. Consistent with the BMDS block development strategy, additional ESGs are incorporated into blocks as sensor systems become available. ESGs are addressed separately in the R-2A for each respective block.

To address recent GMD flight test failures, the MDA Director commissioned an Independent Review Team (IRT) and a Mission Readiness Task Force (MRTF) to review the GMD test program, examine the cause or causes, and recommend improvement to the current program. The IRT made five key recommendations in February 2005:
1). Establish a more rigorous flight readiness certification process
2). Strengthen systems engineering
3). Perform additional ground based qualification testing prior to flight testing
4). Hold contractor functional organizations accountable
5). Assure the GMD program is executable

The MRTF leveraged the IRT study and recommended a near term flight and ground test plan and implemented an improved test readiness process, as well as more robust systems engineering and quality processes. The MRTF recommended flight and ground test plan was approved by OSD (AT&L) in June 2005. The MRTF test strategy is to:
1). Conduct a structured progression of qualification, ground and flight tests
2). Rigorously manage system configuration and test objectives
3). Incrementally retire risk areas
4). Enforce “test as you fight, fight as you test” discipline

The FY07 budget submission accommodates these recommendations.

The Aegis Ballistic Missile Defense (Aegis BMD) mission is to deliver an enduring, operationally effective and supportable Ballistic Missile Defense Capability in Aegis cruisers and destroyers to defend the nation, deployed forces, friends and allies, and to incrementally increase this capability by delivering evolutionary spiral improvements as part of BMDS block upgrades.

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
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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** |

The Aegis BMD element of the BMDS builds upon the existing Aegis Weapons System (AWS) and Standard Missile (SM) infrastructures deployed in Aegis cruisers and destroyers. Aegis BMD provides a forward-deployable, mobile capability to detect and track Ballistic Missiles of all ranges, and the ability to destroy Short-Range Ballistic Missile (SRBM), Medium-Range Ballistic Missile (MRBM), Intermediate-Range Ballistic Missile (IRBM), and selected long-range class threats in the midcourse phase of flight. Spiral upgrades to both the Aegis BMD Weapon System and the SM-3 configurations will enable Aegis BMD to provide effective, supportable defensive capability against more difficult threats, including Long Range Ballistic Missiles (LRBMs).

Aegis BMD is working with the Japan Defense Agency (JDA) on the U.S./Japan Cooperative Research (JCR) project, which is developing advanced missile technologies in four areas: nosecone, Divert and Attitude Control System (DACS), propulsion, and seeker. In addition, the two countries are undertaking an SM-3 Cooperative Development (SCD) program, which consists of a spiral upgrade to the SM-3 Blk IB missile - a 21-inch diameter SM-3 missile (SM-3 Blk II/IIA).

As of FY06, funding for Aegis BMD activities transfers to PE 0603892C, Ballistic Missile Defense Aegis. FY05 accomplishments will be shown in this PE.

**A.1 System Element Description**

The Ground-based Midcourse Element of the BMDS consists of Blocks 2004, 2006, 2008, and 2010:

- Block 2004 (Project 0708) represents the early development and fielding of the IDC including ground-based interceptors, an upgraded Cobra Dane radar, upgraded Early Warning Radars (UEWR), 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 (Project 0808) 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, integrating into the upgraded early warning radar (UEWR) and fielding an IDT 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 (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 GMD Fire Control (GFC) capabilities.

- The Block 2010 (Project 0008) further supports and expands the continuing development, testing, and fielding of new and evolving BMDS technologies.

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

The GMD system provides the capability to the Combatant Commanders to engage, in the midcourse phase of flight, ballistic missiles. The contribution of the GMD system is comprised of:

- Sensors: UEWRs: Cobra Dane, Beale and Fylingdales, Sea-Based X-Band Radar (SBX), and the Aegis external system interface
- Interceptors: On-going interceptor fielding, Orbital Booster Vehicle (OBV) acceleration, and the Exoatmospheric Kill Vehicle (EKV) transition to rate manufacturing
- Fire Control and Communications: High availability with dedicated communications loop inside fire-control ring, 20,000+ miles of terrestrial / submarine fiber, Nine satellite communications (SATCOM) links, Dual redundant fire control nodes
- Infrastructure: Operational and support facilities at Fort Greely, Eareckson Air Station, Vandenberg AFB, Beale AFB, Schriever AFB, Fylingdales, U.K., and Adak, AK
- Physical security including fences, sensors, crash barriers, entry control and lighting

**A.3 Major System Element Goals**

- Return to Flight
- Continue to field the system
- Support and sustain the fielded system
- Complete development, fielding and transition to alert of Block 2004
- Complete development, fielding and transition to Alert of Block 2006
- Verify capability by operationally realistic testing
- Improve BMDS capability through continued development
- Expand BMDS via increased ESGs and depth of inventory
- Build an international foundation for missile defense

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## A.4 Major Events Schedule and Description

| Major Event | Project | Timeframe | Description |
|---|---|---|---|
| **Flight Test** | | | |
| **Flight Tests** | | | |
| FT-1 | 0808 | 1Q FY 2006 | • Completed DEC 2005 |
| FT-2 | 0808 | 3Q FY 2006 | • Advanced Discrimination. Flight test with target |
| FT-3 | 0808 | 4Q FY 2006 | • Intercept Flight Test |
| FT-4 | 0808 | 1Q FY 2007 | • Intercept Flight Test |
| FT-5 | 0808 | 2Q FY 2007 | • Intercept Flight Test |
| FT-6 | 0808 | 3Q FY 2007 | • Intercept Flight Test |
| **Radar Certification Test** | | | |
| FT 04-1 | 0808 | 2Q FY 2006 | • Certification of Beale UEWR Software Upgrade |
| **Other** | | | |
| **Sensors** | | | |
| Upgrades to Fylingdales EWR | 0708 | 1Q FY 2005 | • Fylingdales integration into test bed and LIDS complete (1Q FY 2006) |
| **Integrated/Distributed Ground Tests** | | | |
| GT 04-2 | 0808 | 1Q FY 2006 - 3Q FY 2006 | • Phase I Completed December 2005 |
| **Capability Enhancement GBIs** | | | |
| Install #10 GBI - Greely | 0708 | 1Q FY 2006 | • Installed 1Q FY 2006 |
| Install #11 GBI - Greely | 0708 | 2Q FY 2006 | • Installation scheduled for 2Q FY 2006; weather permitting |
| Install #12 GBI - Greely | 0708 | 3Q FY 2006 | • Installation scheduled for 3Q FY 2006 |
| Install #13 GBI - Greely | 0708 | 3Q FY 2006 | • Installation scheduled for 3Q FY 2006 |
| Install #14 GBI - Greely | 0708 | 3Q FY 2006 | • Installation scheduled for 3Q FY 2006 |
| LDC Missiles 15-18 | 0808 | 4Q FY 2006 - 1Q FY 2007 | |
| **Missile Field Construction** | | | |
| Missile Field 3 (10 Silos) | 0808 | 1Q FY 2007 | |
| GBI 3rd Site Start | 0808 | 2Q FY 2007 | |
| Missile Field I (10 Silos) | 0808 | 4Q FY 2007 | |
| **SBX** | | | |
| SBX Integration | 0808 | 3Q FY 2006 | • SBX Integrated with BMDS |

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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** |

| B. Program Change Summary | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Previous President's Budget (FY 2006 PB) | 4,501,459 | 3,266,196 | 3,945,991 |
| Current President's Budget (FY 2007 PB) | 4,467,693 | 2,442,172 | 2,876,972 |
| Total Adjustments | -33,766 | -824,024 | -1,069,019 |
| Congressional Specific Program Adjustments | 50,000 | -776,939 | 0 |
| Congressional Undistributed Adjustments | 0 | -47,085 | 0 |
| Reprogrammings | -11,128 | 0 | 0 |
| SBIR/STTR Transfer | -72,638 | 0 | 0 |
| Adjustments to Budget Years | 0 | 0 | -1,069,019 |

FY05 reduction of $33.766 million includes a Congressional specific program adjustment, MDA reprogrammings and the SBIR/STTR transfer.

FY06 reduction of $824.024 million includes Congressional specific program adjustments (Sea-based Midcourse Defense Segment and Multiple Kill Vehicles transfers to unique Program Elements) and a portion of the MDA Congressional undistributed adjustment.

FY07 reduction of $1.069 billion includes follow through with the Congressionally directed Sea-based Midcourse Defense Segment transfer to PE #0603892C and Multiple Kill Vehicle transfer to PE #0603894C and overhead/infrastructure reductions.

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| COST ($ in Thousands) | 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) | 822,729 | 0 | 0 | 0 | 0 | 0 | 0 |
| RDT&E Articles Qty | 45 | 0 | 0 | 0 | 0 | 0 | 0 |

## A. Mission Description and Budget Item Justification

The GMD Block 2004 effort provided for the fielding of the IDC. 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 delivered and fielded the initial infrastructure, fielded the initial increment of interceptors, and provided for initial sustainment infrastructure for the IDC (funded in Project 0808). The Block 2004 was 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 provided an enhanced capability and additional assets that can also be utilized for the BMDS Test Bed. It was completed in December 2005. The IDC/LDC 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 provided for the construction of the first missile field with operating infrastructure at Fort Greely, which was completed in 2004.
- Six (6) common silos, launch site components, and command launch equipment were fielded in the first missile field. The IDC initiative provided for the construction of the second missile field at Fort Greely, which was completed in 2005.
- Ten (10) common silos, launch site components, and command launch equipment were fielded in the second missile field.
- Additionally, IDC provided for the modification of four (4) common silos, launch site components, and command launch equipment at Vandenberg AFB in 2004.

Ground Based Interceptor (GBI).
A GBI consists of a booster and exoatmospheric kill vehicle (EKV).
The IDC consists of up to 20 GBIs. The BMDS Test Bed provided up to ten (10) boosters and five (5) EKVs to field an initial five (5) GBIs at Fort Greely in 2004. The IDC initiative provided an additional ten (10) boosters and fifteen (15) EKVs to field up to ten (10) GBIs by the end of 2004 and up to 20 by the end of 2005. Two (2) of the IDC GBIs were used for flight testing purposes. As a result of MRTF recommendations, four (4) operational GBIs will be used for ground testing purposes. Accordingly, up to 12 GBIs were fielded at Fort Greely, AK by the end of 2005. Two (2) GBIs were fielded at VAFB by the end of 2004.

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In-Flight Data Communications Terminals (IDTs.) Consists of five (5) IDTs at multiple sites.

- The BMDS Test Bed provided one IDT at Fort Greely, one IDT at Shemya (AK), one IDT at VAFB in 2004 and one onboard IDT on the Sea-Based X-Band Radar.
- One 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 Schriever 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 Schriever AFB.
- The Schriever 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. The Test Bed 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.

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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** |

The BMDS Test Bed incorporates 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.

**B. Accomplishments/Planned Program**

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Ground-Based Interceptor (GBI) | 9,938 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

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

FY05 Accomplishments:

- Completed silo/interceptor/launch systems ground testing, system level simulation, and verification, validation, and accreditation activities.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Cobra Dane Upgrade | 0 | 0 | 0 |
| RDT&E Articles (Quantity) | 1 | 0 | 0 |

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

FY05 Accomplishments:
RDT&E Test Articles: Acquisition of hardware and software upgrades to the Cobra Dane Radar was initiated in FY 2002 for delivery in FY05.

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

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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 |

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| GMD Fire Control & Communications | 7,003 | 0 | 0 |
| RDT&E Articles (Quantity) | 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 were acquired and installed at Fort Greely and Shemya. The GCN also consists of an existing DSCS terminal at RTS supporting flight test requirements. A Milstar terminal was installed at Fort Greely.

FY05 Accomplishments:
RDT&E Test Articles: Acquisition of a Milstar terminal for Fort Greely, was initiated in FY 2003 for delivery in FY05.

- Completed installation of a Milstar terminal at Fort Greely.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Element Engineering and Integration | 10,277 | 0 | 0 |
| RDT&E Articles (Quantity) | 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 IDC. 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.

FY05 Accomplishments:
- Completed system integration test and checkout.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 |
|---|---|---|---|
| Element Test & Evaluation (T&E) | 2,977 | 0 | 0 |
| RDT&E Articles (Quantity) | 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.

FY05 Accomplishments:

- Completed Systems Test Readiness Review documentation.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Sea-Based X-Band Radar (SBX) | 162,963 | 0 | 0 |
| RDT&E Articles (Quantity) | 2 | 0 | 0 |

The SBX development was initiated in FY 2002. 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 includes an IFICS Data Terminal and GCN. The SBX is a relocatable, phased-array 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) are mounted on a modified, sea-going, semi-submersible platform similar to the oil drilling platforms currently in use worldwide.

FY05 Accomplishments:
RDT&E Test Articles: Acquisition of one (1) Sea-Based X-Band Radar (SBX) was initiated in FY 2002 for delivery in FY05. Acquisition of one (1) IFICS Data Terminal (IDT), fixed to the SBX platform, was initiated in FY 2002 for delivery in FY05.

- Completed installation of radar electronic components.
- Completed installation of IDT and GCN components.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 acquisition and installation of operations and support equipment for platform.
- Completed integration and checkout of Sea-based X-band Radar.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Beale Early Warning Radar Upgrade | 18,957 | 0 | 0 |
| RDT&E Articles (Quantity) | 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.

FY05 Accomplishments:
- Continued Flight and Ground Test support.
- Continued development and fielding of UEWR Software Builds.
- Completed ITWAA integration and certification

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Block 2004 Initial Defensive Capability (UEWR) | 40,837 | 0 | 0 |
| RDT&E Articles (Quantity) | 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 the end of 2005.

FY05 Accomplishments:
- Completed acquisition of UEWR hardware.
- Completed installation of UEWR hardware.
- Completed installation of UEWR software.
- Completed Integrated Tactical Warning and Attack Assessment and certification for the UEWR.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 |
|---|---|---|---|
| Block 2004 Initial Defensive Capability (GBI) | 439,576 | 0 | 0 |
| RDT&E Articles (Quantity) | 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 provides the United States with a fielded Initial Defensive Capability (IDC) against ballistic missile threats. Note: Two (2) operational GBI's will be used for flight testing purposes. And, four (4) operational GBI's will be used for ground testing purposes as recommended by the MRTF.

FY05 Accomplishments:
RDT&E Articles: Acquisition of up to 10 EKVs and up to 10 Boosters was initiated in FY 2004 for delivery in FY05. Acquisition of 10 silos and 10 sets of Launch Station Equipment (LSE) racks was initiated in FY 2004 for delivery in FY05.

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

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Block 2004 Initial Defensive Capability (RDT&E Construction) | 130,201 | 0 | 0 |
| RDT&E Articles (Quantity) | 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 IDC

FY05 Accomplishments:
- Completes construction of 10 common silos and supporting facilities at Fort Greely.
- Completes facilities construction for UEWR [Fylingdales, UK].

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 has been to build and field an initial capability of the BMDS by Dec 2004, while continuing RDT&E work and spiral upgrades such that some number of GMD components 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 2006 |
|---|---|
| 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 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 | 229,475 | 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 | 34,812 |
| **GMD Fire Control & Communications** | | | | | | | | |
| GMD Battle Management (Fire Control) & Comms | SS/CPAF | Boeing/ AL/AK/AZ/CA/CO /TX/VA | 53,002 | 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 | 40,410 | 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 | 17,714 | 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 | 538,479 | 0 | N/A | 0 | N/A | 538,479 |
| **Beale Early Warning Radar Upgrade** | | | | | | | | |
| Beale UEWR | SS/CPAF | Boeing/ AL/CA | 50,585 | 0 | N/A | 0 | N/A | 50,585 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Block 2004 Initial Defensive Capability (UEWR)** | | | | | | | | |
| IDC (UEWR & IDT) | SS/CPAF | Boeing/ AL/AK/CA | 107,502 | 0 | N/A | 0 | N/A | 107,502 |
| **Block 2004 Initial Defensive Capability (GBI)** | | | | | | | | |
| IDC (GBI) | SS/CPAF | Boeing/ AL/AK/AZ/CA/CO /TX/VA | 795,079 | 0 | N/A | 0 | N/A | 795,079 |
| Subtotal Product Development | | | 1,867,058 | 0 | | 0 | | 1867058 |

**Remarks**

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Block 2004 Initial Defensive Capability (RDT&E Construction)** | | | | | | | | |
| Construction | MIPR | COE/AK/CA | 251,034 | 0 | N/A | 0 | N/A | 251,034 |
| Subtotal Support Costs | | | 251,034 | 0 | | 0 | | 251034 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date<br>**February 2006** |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>**RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE<br>**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 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Subtotal Management Services | | | | | | | | |

**Remarks**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 2,118,092 | 0 | | 0 | | 2,118,092 |

**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 2006**

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 | 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 |
| **Sensors** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Upgrades to Fylingdales EWR | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cobra Dane Upgrade | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | |
| SBX Delivered | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | |
| **Capability Enhancement GBIs** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Install #6 GBI - Greely | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Install #7 GBI - VAFB | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Install #8 GBI - VAFB | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Install #9 GBI - Greely | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | |
| Install #10 GBI - Greely | | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | |
| Install #11 GBI - Greely | | | | | | △ | | | | | | | | | | | | | | | | | | | | | | |
| Install #12 GBI - Greely | | | | | | | △ | | | | | | | | | | | | | | | | | | | | | |
| Install #13 GBI - Greely | | | | | | | △ | | | | | | | | | | | | | | | | | | | | | |
| Install #14 GBI - Greely | | | | | | | △ | | | | | | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲—▲ | Complete Activity | △—△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Sensors** | | | | | | | |
| Upgrades to Fylingdales EWR | 1Q | | | | | | |
| Cobra Dane Upgrade | 3Q | | | | | | |
| SBX Delivered | 4Q | | | | | | |
| **Capability Enhancement GBIs** | | | | | | | |
| Install #6 GBI - Greely | 1Q | | | | | | |
| Install #7 GBI - VAFB | 1Q | | | | | | |
| Install #8 GBI - VAFB | 1Q | | | | | | |
| Install #9 GBI - Greely | 3Q | | | | | | |
| Install #10 GBI - Greely | | 1Q | | | | | |
| Install #11 GBI - Greely | | 2Q | | | | | |
| Install #12 GBI - Greely | | 3Q | | | | | |
| Install #13 GBI - Greely | | 3Q | | | | | |
| Install #14 GBI - Greely | | 3Q | | | | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0808 Ground-Based Midcourse Defense (GMD) Block 2004/2006 Development | 2,430,207 | 2,333,987 | 2,354,003 | 467,800 | 510,300 | 0 | 0 |
| RDT&E Articles Qty | 10 | 43 | 20 | 0 | 0 | 0 | 0 |

## A. Mission Description and Budget Item Justification

Block 2004/2006 (Project 0808) provides the funding for flight and ground testing; funding for the fielding of the second increment of the Initial Defensive Capability (IDC), also referred to as Missile Defense Plan II, with additional interceptors (up to 10), and In-Flight Interceptor Communications System (IFICS) Data Terminals (IDTs); the sustainment and support for the fielded capability; and the continuing development and fielding of capabilities to detect, track, intercept, and defeat ballistic missile threats. 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.

The GMD Block 2004/ 2006 development program provides an integrated development and test program of more capable interceptors (both boost and kill vehicles), sensors, battle management technologies, and GMD Fire Control and Communications systems and infrastructure. Block 2006 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.
- 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 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)]

- IDTs at various locations.
- GFC&C development initiatives continue on these technologies and components to meet future block capability requirements. This effort will be developed as part of the BMDS overarching C2BMC 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. Incremental capabilities include multiple launches against multiple threat targets as the block capabilities mature. 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. Interceptors will subsequently be replaced with newer ones from the ongoing manufacturing line to ensure the most technically capable GBI inventory while ensuring backward compatibility to the maximum extent possible.

ESGs are embedded into the 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 testing; EKV and GMD fire control upgrades; and improved GBIs enable improvements to all ESGs and increase warfighter confidence.

GMD demonstrated the capability to execute 3 Block 2004/2006 ESGs:

- Engage on Cobra Dane (CD) & UEWR
- Engage & Launch on Aegis
- Engage & Launch on FBX-T (Search and Track)

Block 2006 incorporates additional BMDS ESGs:

- Engage on Cobra Dane (CD) & UEWR (Mod 1)
- Launch on CD & UEWR
- Engage & Launch on FBX-T
- Engage (Mod1) & Launch on SBX

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Ground Based Interceptor (GBI) | 583,666 | 523,708 | 506,204 |
| RDT&E Articles (Quantity) | 4 | 6 | 8 |

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.

FY05 Accomplishments:
RDT&E Test Articles: Acquisition of 2 GBI (includes both EKV and boost vehicle) was initiated in FY 2003 for delivery in FY05.

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

FY06 Planned Program:
RDT&E Test Articles: Acquisition of 3 GBIs (includes both EKV and boost vehicle) was initiated in FY 2004 for delivery in FY06.

- Initiates acquisition of 6 GBIs (includes both EKV and boost vehicle) for delivery in FY08. Note. Four of these GBIs will be acquired for MRTF replacement requirements.
- 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 4 GBIs (includes both EKV and boost vehicle) initiated in FY05.
- Completes acquisition of 3 GBIs (includes both EKV and boost vehicle) initiated in FY04.
- Initiates GBI producibility / reliability improvements.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603882C Ballistic Missile Defense Midcourse Defense Segment |

FY07 Planned Program:
RDT&E Test Articles: Acquisition of 4 GBIs (includes both EKV and boost vehicle) was initiated in FY05 for delivery in FY07.

- Initiates acquisition of 4 GBIs (includes both EKV and boost vehicle) for delivery in FY09.
- 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 4 GBIs (includes both EKV and boost vehicle) initiated in FY05.
- Continues acquisition of 6 GBIs (EKV and boost vehicle) initiated in FY06.
- Completes GBI producibility / reliability improvements.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| X Band Radar Technology Development | 79,762 | 88,820 | 72,321 |
| RDT&E Articles (Quantity) | 1 | 0 | 1 |

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.

FY05 Accomplishments:
RDT&E Test Articles: Acquisition of XBR software build 2.2 initiated in FY 2003 and delivered in FY05

- Continued the development of XBR Software.
- 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).
- Initiated Primary Support Base development for future fielding options for the Sea-Based X-Band Radar.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603882C Ballistic Missile Defense Midcourse Defense Segment |

FY06 Planned Program:
- Continues the development of XBR software.
- Continues flight and ground test support.
- Supports a Radar Certification Flight (RCF).
- Continues the planning, assessment and evaluation of future X- Band technologies, including technology insertion (Project Hercules).
- Completes Primary Support Base development for the Sea-Based X-Band Radar.

FY07 Planned Program:
- Completes development of XBR software build 3.1.
- Continues flight and ground test support.
- Continues the planning, assessment and evaluation of future X- Band technologies, including technology insertion (Project Hercules).

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Upgraded Early Warning Radar (UEWR) Development | 73,354 | 79,773 | 50,120 |
| RDT&E Articles (Quantity) | 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.

FY05 Accomplishments:
RDT&E Test Articles: Acquisition of one (1) UEWR software build initiated in FY 2004 and delivered in FY05

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

FY06 Planned Program:
- Continues flight and ground test support.
- Supports a radar certification flight.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603882C Ballistic Missile Defense Midcourse Defense Segment** |

FY07 Planned Program:

- Continues flight and ground test support.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Element Engineering & Integration | 181,407 | 176,437 | 154,747 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

GMD Element Engineering provides systems engineering and integration essential for the development and fielding of the functional components of the GMD segment of the BMDS. Establishes element-level development requirements in the GMD Capabilities Document and ensures these are allocated to the component specifications. Complements the BMDS systems engineering capability by providing detailed insight and analysis into component technical and design-specific issues during fabrication, element-level integration, testing and fielding. Defines element-level test requirements and objectives and provides element-level analysis and assessments to verify GMD performance. Provides engineering, integration, and operations planning supporting the BMDS, including assessment of future fielding options. Develops and certifies a simultaneous test and operations capability to ensure no impact to safe operations.

FY05 Accomplishments:

- Completed Block 2004 Integration Phase 3 (IP-3) Integrated Assessment Review (IAR).
- Completed Block 2006 Integration Phase 5 (IP-5) 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.
- Supported integration and testing of launch on Forward-Based Radar ESG.
- Initiated simultaneous test and operations efforts.

FY06 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).

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603882C Ballistic Missile Defense Midcourse Defense Segment |

- 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.

FY07 Planned Program:

- Completes Block 2006 Integration Phase 5 (IP-5) 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.
- Completes the integration and testing of engage on Forward-Based Radar ESG.
- Continues simultaneous test and operations efforts.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| GMD Fire Control & Communications | 218,879 | 160,062 | 148,283 |
| RDT&E Articles (Quantity) | 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 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).

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603882C Ballistic Missile Defense Midcourse Defense Segment |

FY05 Accomplishments:
RDT&E Test Articles: Acquisition of GFC/C software build initiated in FY 2004 and delivered in FY05.

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

FY06 Planned Program:
RDT&E Test Articles: Acquisition of External Systems Interface (ESI) software build initiated in FY 2004 and delivered in FY06. Acquisition of Command Launch Equipment software build was initiated in FY 2004 and delivered in FY06.

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

FY07 Planned Program:
RDT&E Test Articles: Acquisition of GFC/C software build initiated in FY05 and delivered in FY07. Acquisition of External Systems Interface (ESI) software build initiated in FY06 and delivered in FY07

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

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Element Test and Evaluation | 198,813 | 321,301 | 351,393 |
| RDT&E Articles (Quantity) | 3 | 2 | 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.

FY05 Accomplishments:
RDT&E Test Articles: Acquisition of 3 targets initiated in FY 2003 for delivery in FY05.

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

FY06 Planned Program:
RDT&E Test Articles: Acquisition of 2 targets initiated in FY 2004 for delivery in FY06.

- Continues operation and maintenance of System Test Lab, PCIL, and ISTC-2.
- Initiates and completes the ISTC-2 upgrade.
- 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.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603882C Ballistic Missile Defense Midcourse Defense Segment** |

FY07 Planned Program:
RDT&E Test Articles: Acquisition of 3 targets initiated in FY05 for delivery in FY07.

- 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 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Site Activation | 36,459 | 24,319 | 29,219 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

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

FY05 Accomplishments:
- Continued IDC/ Test Bed support.
- Updated IDC/ Test Bed site activation plans.
- Continued siting, NEPA, and ESH analysis for Test Bed/IDC.

FY06 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 IDC/Test Bed site activation plans.

FY07 Planned Program:
- Continues siting, NEPA, and ESH analysis for Block 2008 and future activities.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603882C Ballistic Missile Defense Midcourse Defense Segment** |

- Initiates construction activities for follow-on Test-Bed upgrade programs.
- Updates IDO/Test Bed site activation plans.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Program Planning and Management | 131,007 | 109,128 | 97,570 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

FY05 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.

FY06 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.

FY07 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.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603882C Ballistic Missile Defense Midcourse Defense Segment |

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

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Logistics Planning, Production and Protection | 259,110 | 115,699 | 102,349 |
| RDT&E Articles (Quantity) | 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).

FY05 Accomplishments:
- Continued to coordinate, procure, and provide GFX (over 700 line items) to the prime contractor to support Test Bed activation and GMD test program.
- Continued 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.
- Continued to provide comprehensive on-site logistics support to the Site Activation Command (SAC) Alaska and other IDO/ Test Bed sites as required.
- Continued to provide functional support for production, quality, configuration and change management.
- Conducted sustainment, fielding, siting, and facility planning.
- Continued to provide program protection including physical security.
- Conducted reliability and maintainability analyses.

FY06 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.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603882C Ballistic Missile Defense Midcourse Defense Segment** |

FY07 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 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Sustainment Development Program Phase II (SDP II) | 104,750 | 305,646 | 544,806 |
| RDT&E Articles (Quantity) | 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.

FY05 Accomplishments:

- Established contract for developing and gathering equipment logistics data.
- Completed logistics infrastructure and support concept.
- Initiated SDPII program for logistics support and maintenance of IDO.
- Initiated minimal initial spare acquisitions.

FY06 Planned Program:

- Continues SDPII for logistics support and maintenance of IDC.
- Continues logistic infrastructure and support.
- Initiates logistics support and basing of the SBX.
- Continues minimal initial spare acquisitions.
- Initiates mooring of the SBX at Adak, AK.
- Initiates on-site sustaining engineering.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603882C Ballistic Missile Defense Midcourse Defense Segment** |

FY07 Planned Program:

- Continues SDPII for logistics support and maintenance of IDC.
- Continues logistic infrastructure and support plan.
- Continues logistics support and basing of the SBX.
- Continues minimal initial spare acquisitions.
- Completes mooring of the SBX at Adak, AK.
- Continues on-site sustaining engineering.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Block 2006 Capability Enhancement Interceptors (GBI) | 500,348 | 389,894 | 208,991 |
| RDT&E Articles (Quantity) | 0 | 33 | 5 |

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.

FY05 Accomplishments:

- Initiated acquisition of at least five (5) additional GBIs for Fort Greely.
- Initiated acquisition of fourteen (14) additional common silos for Fort Greely.
- Initiated acquisition of fourteen (14) sets of launch support equipment for Fort Greely.

FY06 Planned Program:

RDT&E Test Articles: Acquisition of at least five (5) GBIs; fourteen (14) common silos and fourteen (14) sets of associated launch support equipment was initiated in FY05 for delivery in FY06.

- Completes acquisition of at least five (5) GBIs for Fort Greely.
- Completes acquisition of fourteen (14) common silos for Fort Greely.
- Completes acquisition of fourteen (14) sets of support launch equipment for Fort Greely.
- Initiates acquisition of at least five (5) additional GBIs for Fort Greely.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603882C Ballistic Missile Defense Midcourse Defense Segment |

FY07 Planned Program:
RDT&E Test Articles: Acquisition of at least five (5) GBIs for Fort Greely was initiated in FY06 for delivery in FY07.

- Completes acquisition of at least five (5) GBIs for Fort Greely.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Block 2006 (IDT) | 22,385 | 8,000 | 2,500 |
| RDT&E Articles (Quantity) | 0 | 0 | 1 |

An additional IDT will be acquired to increase our 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 FY05.

FY05 Accomplishments:
- Initiated acquisition of an IDT at Fort Greely.

FY06 Planned Program:
- Continues acquisition of an IDT at Fort Greely.

FY07 Planned Program:
RDT&E Test Articles: Acquisition of one (1) IDT was initiated in FY05 for delivery in FY07.

- Completes acquisition of an IDT at Fort Greely.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Block 2006 (RDT&E Construction) | 40,267 | 31,200 | 85,500 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

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

FY05 Accomplishments:
- Initiated construction of 10 additional common silos and supporting facilities at Fort Greely.
- Initiated construction of an IDT at Fort Greely.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603882C Ballistic Missile Defense Midcourse Defense Segment** |

FY06 Planned Program:

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

FY07 Planned Program:

- Completes construction for the IDT at Fort Greely, AK.

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 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 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## 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 has been to build and field an initial capability of the BMDS by Dec 2004, while continuing RDT&E work and spiral upgrades such that some number of GMD components 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 2006 |
|---|---|
| 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 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 | 1,053,607 | 506,841 | 1/2Q | 489,337 | 1/2Q | 2,049,785 |
| **X Band Radar Technology Development** | | | | | | | | |
| X Band Radar Technology Development | SS/CPAF | Boeing/ AL/AK/AZ/CA/CO /TX/VA | 135,985 | 77,437 | 1/2Q | 59,909 | 1/2Q | 273,331 |
| **Upgraded Early Warning Radar (UEWR) Development** | | | | | | | | |
| Upgraded Early Warning Radar (UEWR) Development | SS/CPAF | Boeing/ AL/AK/AZ/CA/CO /TX/VA | 65,997 | 64,400 | 1/2Q | 34,747 | 1/2Q | 165,144 |
| **Element Engineering & Integration** | | | | | | | | |
| Systems Engineering & Integration | SS/CPAF | Boeing/ AL/AK/AZ/CA/CO /TX/VA | 276,869 | 125,829 | 1/2Q | 26,007 | 1/2Q | 428,705 |
| Concurrent Test & Ops | | | 20,000 | 21,000 | 1/2Q | 73,000 | 1/2Q | 114,000 |
| FDR Japan - Bundle | | | 0 | 10,000 | 1/2Q | 6,000 | 1/2Q | 16,000 |
| BMDS Integration | | | 0 | 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 | 406,534 | 147,641 | 1/2Q | 135,986 | 1/2Q | 690,161 |
| **Element Test and Evaluation** | | | | | | | | |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| | SS/CPAF | Boeing/ AL/AK/AZ/CA/CO /TX/VA | 104,422 | 280,344 | 1/2Q | 204,736 | 1/2Q | 589,502 |
| **Logistics Planning, Production and Protection** | | | | | | | | |
| Logistics Planning, Production and Protection | SS/CPAF | Boeing/ AL/AK/AZ/CA/CO /TX/VA | 310,103 | 23,178 | 1/2Q | 14,013 | 1/2Q | 347,294 |
| **Block 2006 Capability Enhancement Interceptors (GBI)** | | | | | | | | |
| GBI`s | SS/CPAF | Boeing/ AL/AK/AZ/CA/CO /TX/VA | 233,615 | 290,094 | 1/2Q | 93,400 | 1/2Q | 617,109 |
| Expansion | SS/CPAF | Boeing/ AL/AK/AZ/CA/CO /TX/VA | 266,733 | 89,800 | 1/2Q | 115,591 | 1/2Q | 472,124 |
| European Site Planning | SS/CPAF | Boeing/ AL | 0 | 10,000 | 1/2Q | 0 | N/A | 10,000 |
| **Block 2006 (IDT)** | | | | | | | | |
| IDT | SS/CPAF | Boeing/ AL/AK/AZ/CA/CO /TX/VA | 22,385 | 8,000 | 1/2Q | 2,500 | 1/2Q | 32,885 |
| Subtotal Product Development | | | 2,896,250 | 1,654,564 | | 1,283,226 | | 5834040 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 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 | 2,384 | 231 | 1/2Q | 245 | 1/2Q | 2,860 |
| | SS/FP | BAE/ AL | 15,788 | 7,307 | 1/2Q | 4,207 | 1/2Q | 27,302 |
| | SS/FP | TSI/ AL | 13,585 | 3,333 | 1/2Q | 4,685 | 1/2Q | 21,603 |
| | C/CPAF | Sparta/ AL | 2,788 | 0 | N/A | 0 | N/A | 2,788 |
| | MIPR | AMCOM/ AL | 708 | 1,684 | 1/2Q | 1,875 | 1/2Q | 4,267 |
| | MIPR | USASMDC/ AL | 782 | 482 | 1/2Q | 500 | 1/2Q | 1,764 |
| | MIPR | GSA/ AL | 462 | 662 | 1/2Q | 700 | 1/2Q | 1,824 |
| | MIPR | Mitre/ DC | 582 | 0 | N/A | 0 | N/A | 582 |
| | MIPR | Picatinny/ NJ | 225 | 43 | 1/2Q | 45 | 1/2Q | 313 |
| | MIPR | Crane/ IN | 323 | 32 | 1/2Q | 34 | 1/2Q | 389 |
| | SS/FP | CSC/ AL | 13,596 | 3,093 | 1/2Q | 4,576 | 1/2Q | 21,265 |
| **X Band Radar Technology Development** | | | | | | | | |
| | C/FP | BAE/ AL | 11,690 | 8,905 | 1/2Q | 6,687 | 1/2Q | 27,282 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| | MIPR | AMCOM/ AL | 2,060 | 913 | 1/2Q | 850 | 1/2Q | 3,823 |
| | MIPR | MIT/LL/ MA | 1,300 | 600 | 1/2Q | 575 | 1/2Q | 2,475 |
| | C/CPAF | GA Tech/ GA | 1,130 | 565 | 1/2Q | 550 | 1/2Q | 2,245 |
| | C/CPFF | Xontech/ AL | 592 | 400 | 1/2Q | 3,750 | 1/2Q | 4,742 |
| **Upgraded Early Warning Radar (UEWR) Development** | | | | | | | | |
| | SS/CPAF | Ga. Tech/ GA | 2,440 | 1,720 | 1/2Q | 1,569 | 1/2Q | 5,729 |
| | C/CPFF | Xontech/ AL | 1,560 | 880 | 1/2Q | 880 | 1/2Q | 3,320 |
| | C/FP | Mevatec/ AL | 24,080 | 10,753 | 1/2Q | 10,904 | 1/2Q | 45,737 |
| | MIPR | AMCOM/ AL | 3,251 | 2,020 | 1/2Q | 2,020 | 1/2Q | 7,291 |
| **Element Engineering & Integration** | | | | | | | | |
| | MIPR | SMDC/ AL | 2,311 | 1,285 | 1/2Q | 1,272 | 1/2Q | 4,868 |
| | MIPR | NSWC/ VA | 8,410 | 3,422 | 1/2Q | 4,552 | 1/2Q | 16,384 |
| | MIPR | DTRA/ Ft Belvoir, VA | 1,280 | 749 | 1/2Q | 741 | 1/2Q | 2,770 |
| | MIPR | NAIC/ Wright Patterson, AFB | 1,644 | 843 | 1/2Q | 835 | 1/2Q | 3,322 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| | MIPR | SBIRS SPO/ LA AFB, CA | 3,490 | 0 | N/A | 0 | N/A | 3,490 |
| | MIPR | GMD/ AL | 4,020 | 2,186 | 1/2Q | 2,164 | 1/2Q | 8,370 |
| | MIPR | GME Engineering Analysis/ AL | 3,768 | 2,123 | 1/2Q | 2,102 | 1/2Q | 7,993 |
| | MIPR | John Hopkins/ MD | 1,500 | 505 | 1/2Q | 500 | 1/2Q | 2,505 |
| | MIPR | MIT Lincoln Labs/ MA | 7,430 | 2,630 | 1/2Q | 3,767 | 1/2Q | 13,827 |
| | MIPR | Photon Labs/ VA | 1,534 | 843 | 1/2Q | 835 | 1/2Q | 3,212 |
| | SS/CPAF | IDA/ VA | 90 | 0 | N/A | 0 | N/A | 90 |
| | C/CPAF | Various/ AL | 610 | 928 | 1/2Q | 919 | 1/2Q | 2,457 |
| | MIPR | JNIC/ CO | 7,490 | 3,782 | 1/2Q | 3,744 | 1/2Q | 15,016 |
| | MIPR | ARES/ CA | 609 | 312 | 1/2Q | 309 | 1/2Q | 1,230 |
| **GMD Fire Control & Communications** | | | | | | | | |
| | MIPR | NSWC/ Dahlgren, VA | 6,804 | 3,185 | 1/2Q | 3,061 | 1/2Q | 13,050 |
| | FFRDC | MITRE/ HSV, AL | 2,454 | 1,307 | 1/2Q | 1,307 | 1/2Q | 5,068 |
| | C/FP | TSI/ HSV, AL | 1,263 | 1,250 | 1/2Q | 1,250 | 1/2Q | 3,763 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| | C/CPAF | SPARTA/ HSV, AL | 6,619 | 3,540 | 1/2Q | 3,540 | 1/2Q | 13,699 |
| | C/FP | BAE Systems/ HSV, AL | 401 | 180 | 1/2Q | 180 | 1/2Q | 761 |
| | C/FP | Gray Sys/ HSV, AL | 1,657 | 850 | 1/2Q | 850 | 1/2Q | 3,357 |
| | C/CPAF | CSC/ Arlington, VA | 3,110 | 1,350 | 1/2Q | 1,350 | 1/2Q | 5,810 |
| | C/CPAF | Northup/ COS, CO | 759 | 759 | 1/2Q | 759 | 1/2Q | 2,277 |
| | MIPR | Various | 225 | 0 | N/A | 0 | N/A | 225 |
| **Site Activation** | | | | | | | | |
| | C/CPFF | CSC/ AL | 6,350 | 2,162 | 1/2Q | 1,933 | 1/2Q | 10,445 |
| | MIPR | OGA/ Various | 5,330 | 1,564 | 1/2Q | 2,176 | 1/2Q | 9,070 |
| | MIPR | USACE/ AL | 7,133 | 1,587 | 1/2Q | 1,892 | 1/2Q | 10,612 |
| | C/CPFF | CSC/ AL | 6,071 | 2,105 | 1/2Q | 2,105 | 1/2Q | 10,281 |
| | C/CPFF | L3 Communications/ AL | 2,678 | 1,339 | 1/2Q | 1,339 | 1/2Q | 5,356 |
| | C/CPFF | TSI/ AL | 1,728 | 864 | 1/2Q | 864 | 1/2Q | 3,456 |
| | C/CPFF | CSC/ AL | 15,715 | 4,791 | 1/2Q | 6,629 | 1/2Q | 27,135 |
| | C/CPFF | CSC/ AL | 3,922 | 1,363 | 1/2Q | 1,975 | 1/2Q | 7,260 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| | C/CPFF | L3 Communications/ AL | 4,400 | 2,197 | 1/2Q | 2,200 | 1/2Q | 8,797 |
| | MIPR | OGA/ Various | 5,601 | 1,077 | 2Q | 1,077 | 1/2Q | 7,755 |
| | MIPR | USARAK/ AK | 6,306 | 2,512 | 1/2Q | 4,271 | 1/2Q | 13,089 |
| | C/CPFF | BAE/ AL | 8,567 | 2,309 | 1/2Q | 2,309 | 1/2Q | 13,185 |
| | C/CPFF | BAE/ AL | 898 | 449 | 1/2Q | 449 | 1/2Q | 1,796 |
| **Program Planning and Management** | | | | | | | | |
| SPT DC | C/CPAF | CSC/ VA | 183,508 | 65,874 | 1/2Q | 54,316 | 1/2Q | 303,698 |
| SPT HSV | C/CPAF | CSC/ AL | 51,383 | 43,254 | 1/2Q | 43,254 | 1/2Q | 137,891 |
| TRADOC System Manager | MIPR | SMDC/ AL | 30,393 | 0 | N/A | 0 | N/A | 30,393 |
| **Logistics Planning, Production and Protection** | | | | | | | | |
| Logistics | C/CPFF | L3 Communications/ AL | 7,391 | 2,816 | 1/2Q | 2,816 | 1/2Q | 13,023 |
| | C/CPFF | BAE Systems/ AL | 1,262 | 631 | 1/2Q | 631 | 1/2Q | 2,524 |
| | C/CPFF | CSC/ AL | 1,884 | 942 | 1/2Q | 942 | 1/2Q | 3,768 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| | C/CPFF | TSI/ AL | 2,622 | 1,311 | 1/2Q | 1,311 | 1/2Q | 5,244 |
| | C/CPFF | SPARTA/ AL | 920 | 460 | 1/2Q | 460 | 1/2Q | 1,840 |
| | C/CPFF | CIRRUS/ AL | 998 | 499 | 1/2Q | 499 | 1/2Q | 1,996 |
| | MIPR | MMC/ AL | 522 | 261 | 1/2Q | 261 | 1/2Q | 1,044 |
| | MIPR | ARL/ MD | 904 | 400 | 1/2Q | 400 | 1/2Q | 1,704 |
| | MIPR | Brooks AFB/ TX | 296 | 100 | 1/2Q | 100 | 1/2Q | 496 |
| | MIPR | NSWC/ FL | 426 | 34 | 1/2Q | 34 | 1/2Q | 494 |
| GFX | MIPR | SPAWAR/ CA | 1,700 | 895 | 1/2Q | 895 | 1/2Q | 3,490 |
| | MIPR | AMCOM/ AL | 2,102 | 1,103 | 1/2Q | 1,103 | 1/2Q | 4,308 |
| | MIPR | DISA/ VA | 61,922 | 9,783 | 1/2Q | 9,783 | 1/2Q | 81,488 |
| | MIPR | JSC/ MD | 500 | 250 | 1/2Q | 250 | 1/2Q | 1,000 |
| | MIPR | JNIC/ CO | 5,039 | 1,865 | 1/2Q | 1,865 | 1/2Q | 8,769 |
| | C/CPAF | Boeing/ AL | 2,465 | 650 | 1/2Q | 650 | 1/2Q | 3,765 |
| | MIPR | Hill AFB/ UT | 260 | 130 | 1/2Q | 130 | 1/2Q | 520 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| | MIPR | AMCOM/ AL | 1,350 | 650 | 1/2Q | 650 | 1/2Q | 2,650 |
| | MIPR | NSA/ MD | 2,771 | 500 | 1/2Q | 500 | 1/2Q | 3,771 |
| | MIPR | NIST/ OH | 3,370 | 1,370 | 1/2Q | 1,370 | 1/2Q | 6,110 |
| | MIPR | L3 Communications/ AL | 8,065 | 4,275 | 1/2Q | 4,275 | 1/2Q | 16,615 |
| | MIPR | SMDC/ AL | 21,945 | 5,200 | 1/2Q | 5,200 | 1/2Q | 32,345 |
| | MIPR | 611th / AK | 18,496 | 5,000 | 1/2Q | 5,000 | 1/2Q | 28,496 |
| | MIPR | SMDC/ AL | 5,574 | 1,500 | 1/2Q | 1,500 | 1/2Q | 8,574 |
| | MIPR | VAFB/ CA | 4,856 | 2,500 | 1/2Q | 2,500 | 1/2Q | 9,856 |
| | MIPR | CCPs/ Various | 1,500 | 750 | 1/2Q | 750 | 1/2Q | 3,000 |
| | MIPR | Various/ Various | 521 | 150 | 1/2Q | 150 | 1/2Q | 821 |
| | MIPR | Ft Drum/ NY | 0 | 957 | 1/2Q | 957 | 1/2Q | 1,914 |
| Production | SS/CPFF | TSI/ AL | 237 | 125 | 1/2Q | 125 | 1/2Q | 487 |
| | SS/CPFF | BAE Systems/ AL | 7,728 | 6,722 | 1/2Q | 6,722 | 1/2Q | 21,172 |
| | SS/CPFF | COLSA/ AL | 1,230 | 625 | 1/2Q | 625 | 1/2Q | 2,480 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| | SS/CPFF | CSC/ AL | 580 | 295 | 1/2Q | 295 | 1/2Q | 1,170 |
| | MIPR | AMREDC/ AL | 3,210 | 1,635 | 1/2Q | 1,635 | 1/2Q | 6,480 |
| Protection | SS/CPFF | TAMSCO/ AK | 9,118 | 1,026 | 1/2Q | 1,026 | 1/2Q | 11,170 |
| | SS/CPAF | Boeing/ AL | 1,535 | 0 | N/A | 0 | N/A | 1,535 |
| | SS/CPFF | SDC/ AL | 2,290 | 1,545 | 1/2Q | 1,545 | 1/2Q | 5,380 |
| | SS/CPFF | US Marshall Service/ TX | 404 | 0 | N/A | 0 | N/A | 404 |
| | SS/CPFF | C&A/ AL | 10,674 | 4,355 | 1/2Q | 4,355 | 1/2Q | 19,384 |
| Information Technology | SS/CPFF | SAIC/ AL | 12,305 | 6,751 | 1/2Q | 6,751 | 1/2Q | 25,807 |
| | SS/CPFF | BAE System/ AL | 2,826 | 1,363 | 1/2Q | 1,363 | 1/2Q | 5,552 |
| | MIPR | Various/ Various | 5,385 | 2,598 | 1/2Q | 2,598 | 1/2Q | 10,581 |
| | MIPR | Various/ Various | 8,517 | 2,610 | 1/2Q | 2,610 | 1/2Q | 13,737 |
| TSM | SS/MIPR | SMDC/ AL &DC | 0 | 8,185 | 1/2Q | 4,000 | 1/2Q | 12,185 |
| JNIC (GML) | SS/CPAF | JNIC/ CO | 0 | 9,704 | 1/2Q | 9,704 | 1/2Q | 19,408 |
| **Sustainment Development Program Phase II (SDP II)** | | | | | | | | |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| | SS/CPAF | Boeing/ AL/AK/CA | 104,750 | 305,646 | 1/2Q | 544,806 | 1/2Q | 955,202 |
| **Block 2006 (RDT&E Construction)** | | | | | | | | |
| Facilities Construction | MIPR | COE/ AK | 40,267 | 31,200 | 1/2Q | 85,500 | 1/2Q | 156,967 |
| Subtotal Support Costs | | | 877,504 | 638,466 | | 924,120 | | 2440090 |

**Remarks**

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 | 11,872 | 0 | N/A | 0 | N/A | 11,872 |
| | MIPR | OTAs/ Various | 13,534 | 0 | N/A | 0 | N/A | 13,534 |
| | MIPR | VAFB/ CA | 888 | 437 | 1/2Q | 447 | 1/2Q | 1,772 |
| | MIPR | SNL/ NM | 350 | 343 | 1/2Q | 350 | 1/2Q | 1,043 |
| | MIPR | NAVSEA/ MD | 666 | 395 | 1/2Q | 375 | 1/2Q | 1,436 |
| | MIPR | SMDC/ AL | 825 | 442 | 1/2Q | 450 | 1/2Q | 1,717 |
| | MIPR | Kirtland, AFB/ NM | 685 | 320 | 1/2Q | 340 | 1/2Q | 1,345 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| | MIPR | VAFB/ CA | 1,047 | 520 | 1/2Q | 546 | 1/2Q | 2,113 |
| | MIPR | RTS/ Kwajalein | 370 | 0 | N/A | 0 | N/A | 370 |
| | MIPR | RTS/ Kwajalein | 4,852 | 0 | N/A | 0 | N/A | 4,852 |
| | C/CPFF | COLSA/ AL | 10,816 | 2,915 | 1/2Q | 2,915 | 1/2Q | 16,646 |
| | C/CPFF | COLSA/ AL | 3,176 | 2,730 | 1/2Q | 1,730 | 1/2Q | 7,636 |
| | C/CPFF | ELMCO/ AL | 1,547 | 990 | 1/2Q | 990 | 1/2Q | 3,527 |
| | C/CPFF | IEC/ CA | 5,944 | 3,822 | 1/2Q | 2,822 | 1/2Q | 12,588 |
| | C/CPFF | BAE Systems/ AL | 3,051 | 2,130 | 1/2Q | 2,080 | 1/2Q | 7,261 |
| | C/CPFF | BAE Systems/ AL | 3,236 | 1,700 | 1/2Q | 1,060 | 1/2Q | 5,996 |
| | C/CPFF | COLSA/ AL | 5,061 | 813 | 1/2Q | 813 | 1/2Q | 6,687 |
| | C/CPFF | COLSA/ AL | 7,751 | 4,915 | 1/2Q | 3,295 | 1/2Q | 15,961 |
| | C/CPFF | COLSA/ AL | 864 | 432 | 1/2Q | 500 | 1/2Q | 1,796 |
| | C/CPFF | AMTEC/ AL | 2,359 | 1,744 | 1/2Q | 3,010 | 1/2Q | 7,113 |
| | C/CPFF | CAS/ AL | 2,072 | 1,550 | 1/2Q | 2,095 | 1/2Q | 5,717 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| | C/CPFF | CSC/ AL | 446 | 238 | 1/2Q | 288 | 1/2Q | 972 |
| | C/CPFF | IEC/ CA | 220 | 0 | N/A | 0 | N/A | 220 |
| | C/TM | AMTEC/ AL | 500 | 723 | 1Q | 823 | 1/2Q | 2,046 |
| | MIPR | AMCOM/ AL | 2,900 | 2,250 | 1/2Q | 4,345 | 1/2Q | 9,495 |
| | C/CPFF | L3 Communications/ AL | 7,493 | 5,387 | 1/2Q | 5,387 | 1/2Q | 18,267 |
| | MIPR | AMCOM/ AL | 1,780 | 0 | N/A | 2,012 | 1/2Q | 3,792 |
| | C/CPFF | BAE Systems/ AL | 8,286 | 6,100 | 1/2Q | 4,208 | 1/2Q | 18,594 |
| | MIPR | Various/ AL | 5,003 | 61 | 1/2Q | 76 | 1/2Q | 5,140 |
| Targets | MIPR | MDA/ AL | 103,479 | 0 | 1/2Q | 105,700 | 1/2Q | 209,179 |
| Subtotal Test and Evaluation | | | 211,073 | 40,957 | | 146,657 | | 398687 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Subtotal Management Services | | | | | | | | |

**Remarks**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 3,984,827 | 2,333,987 | | 2,354,003 | | 8,672,817 |

**Remarks**

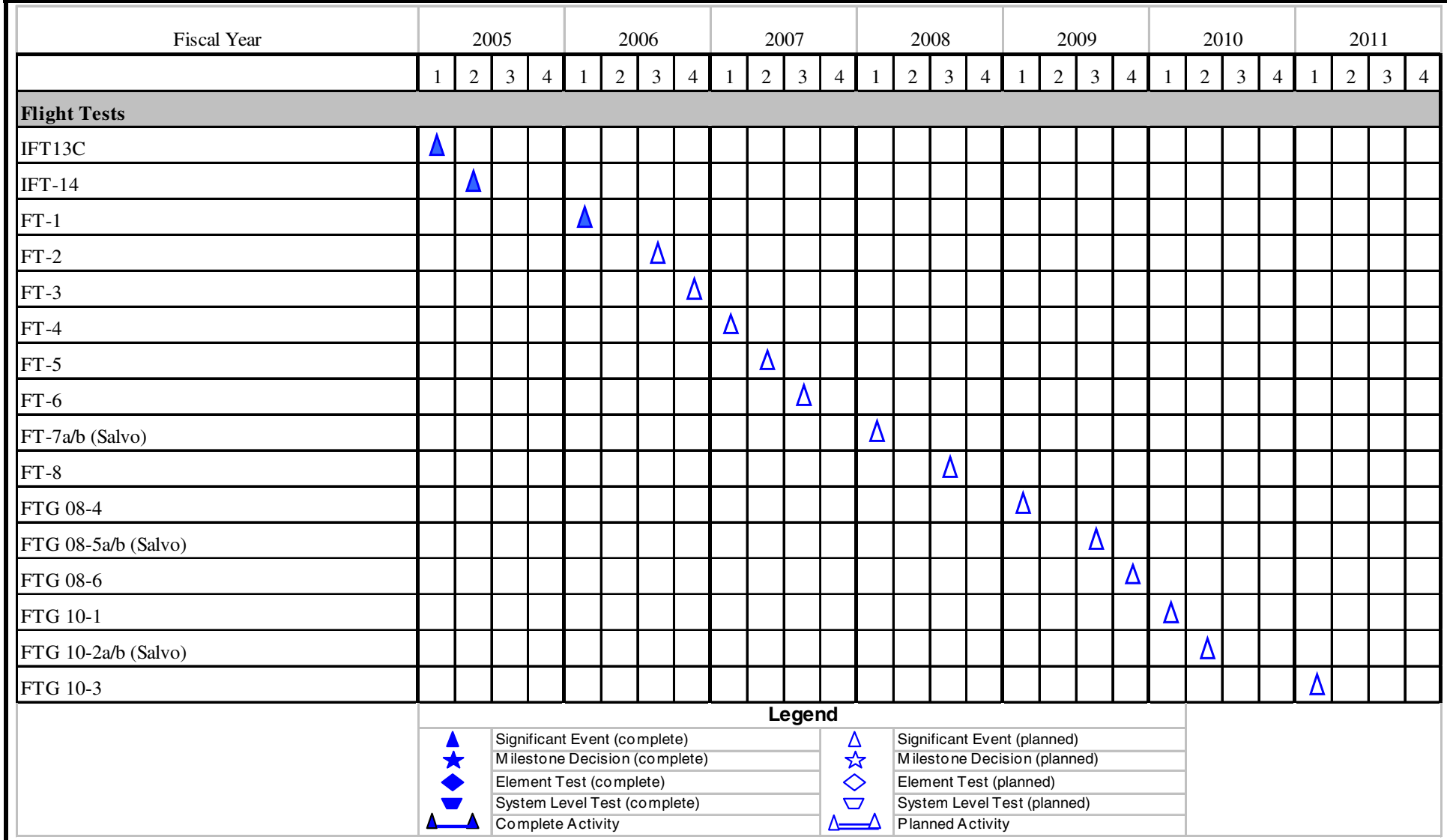
The Prime Contractor has the responsibility to balance resources across the GMD program and allocate funding according to program progress. This may require the Prime Contractor to reallocate funding, which would change the estimates provided in this R-3 document.

**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date: **February 2006**

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 2006**

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 | 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 |
| **Flight Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FTG 10-5a/b (Salvo) | | | | | | | | | | | | | | | | | | | | | | | | | | | △ | |
| FTG 10-6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | △ |
| **Radar Certification Test** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FT 04-1 | | | | | | △ | | | | | | | | | | | | | | | | | | | | | | |
| **Integrated/Distributed Ground Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GT 04-1a (Run For Record) | | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | |
| GT 04-2 | | | | | ▲ | ▲ | △ | | | | | | | | | | | | | | | | | | | | | |
| GT 04-1b (Run For Record) | | | | | | | △ | | | | | | | | | | | | | | | | | | | | | |
| IGT 7 | | | | | | | | △ | | | | | | | | | | | | | | | | | | | | |
| GT 04-4 | | | | | | | | | △ | | | | | | | | | | | | | | | | | | | |
| GT 04-3 | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| DGT (FY08) | | | | | | | | | | | | | △ | | | | | | | | | | | | | | | |
| IGT (FY08) | | | | | | | | | | | | | | | | △ | | | | | | | | | | | | |
| DGT (FY09) | | | | | | | | | | | | | | | | | △ | | | | | | | | | | | |
| IGT (FY09) | | | | | | | | | | | | | | | | | | | | △ | | | | | | | | |
| DGT (FY10) | | | | | | | | | | | | | | | | | | | | | △ | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲——▲ | Complete Activity | △——△ | Planned Activity |

**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date: **February 2006**

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 | 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 |
| **Integrated/Distributed Ground Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IGT (FY10) | | | | | | | | | | | | | | | | | | | | | | | | △ | | | | |
| DGT (FY11) | | | | | | | | | | | | | | | | | | | | | | | | | △ | | | |
| IGT (FY11) | | | | | | | | | | | | | | | | | | | | | | | | | | | | △ |
| **Missile Field Construction** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Missile Field 3 (10 Silos) | | | | | | | | | △ | | | | | | | | | | | | | | | | | | | |
| GBI 3rd Site Start | | | | | | | | | | △ | | | | | | | | | | | | | | | | | | |
| Missile Field 1 (MEB) | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| Missile Field I (10 Silos) | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| **Capability Enhancement GBIs** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LDC Missiles 10-14 | | | | | △ | △ | | | | | | | | | | | | | | | | | | | | | | |
| LDC Missiles 15-18 | | | | | | | | △ | △ | | | | | | | | | | | | | | | | | | | |
| LDC Missiles 19-22 | | | | | | | | | | | | △ | △ | | | | | | | | | | | | | | | |
| LDC Missiles 23-28 | | | | | | | | | | | | | | | | △ | △ | | | | | | | | | | | |
| **SBX** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SBX Integration | | | | | | | △ | | | | | | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲▲ | Complete Activity | △△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Flight Tests** | | | | | | | |
| IFT13C | 1Q | | | | | | |
| IFT-14 | 2Q | | | | | | |
| FT-1 | | 1Q | | | | | |
| FT-2 | | 3Q | | | | | |
| FT-3 | | 4Q | | | | | |
| FT-4 | | | 1Q | | | | |
| FT-5 | | | 2Q | | | | |
| FT-6 | | | 3Q | | | | |
| FT-7a/b (Salvo) | | | | 1Q | | | |
| FT-8 | | | | 3Q | | | |
| FTG 08-4 | | | | | 1Q | | |
| FTG 08-5a/b (Salvo) | | | | | 3Q | | |
| FTG 08-6 | | | | | 4Q | | |
| FTG 10-1 | | | | | | 1Q | |
| FTG 10-2a/b (Salvo) | | | | | | 2Q | |
| FTG 10-3 | | | | | | | 1Q |
| FTG 10-5a/b (Salvo) | | | | | | | 3Q |
| FTG 10-6 | | | | | | | 4Q |
| **Radar Certification Test** | | | | | | | |
| FT 04-1 | | 2Q | | | | | |
| **Integrated/Distributed Ground Tests** | | | | | | | |
| GT 04-1a (Run For Record) | | 1Q | | | | | |
| GT 04-2 | | 1Q-3Q | | | | | |
| GT 04-1b (Run For Record) | | 3Q | | | | | |
| IGT 7 | | 4Q | | | | | |
| GT 04-4 | | | 1Q | | | | |
| GT 04-3 | | | 4Q | | | | |
| DGT (FY08) | | | | 1Q | | | |
| IGT (FY08) | | | | 4Q | | | |
| DGT (FY09) | | | | | 1Q | | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| IGT (FY09) | | | | | 4Q | | |
| DGT (FY10) | | | | | | 1Q | |
| IGT (FY10) | | | | | | 4Q | |
| DGT (FY11) | | | | | | | 1Q |
| IGT (FY11) | | | | | | | 4Q |
| **Missile Field Construction** | | | | | | | |
| Missile Field 3 (10 Silos) | | | 1Q | | | | |
| GBI 3rd Site Start | | | 2Q | | | | |
| Missile Field 1 (MEB) | | | 4Q | | | | |
| Missile Field I (10 Silos) | | | 4Q | | | | |
| **Capability Enhancement GBIs** | | | | | | | |
| LDC Missiles 10-14 | | 1Q-2Q | | | | | |
| LDC Missiles 15-18 | | 4Q | 1Q | | | | |
| LDC Missiles 19-22 | | | 4Q | 1Q | | | |
| LDC Missiles 23-28 | | | | 4Q | 1Q | | |
| **SBX** | | | | | | | |
| SBX Integration | | 3Q | | | | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0908 Ground-Based Midcourse Defense (GMD) Block 2008 Development | 0 | 72,559 | 354,948 | 1,394,803 | 1,186,732 | 500,963 | 340,922 |
| RDT&E Articles Qty | 0 | 0 | 0 | 39 | 16 | 0 | 0 |

## A. Mission Description and Budget Item Justification

Block 2008 includes the next increment of fielded capability with additional interceptors (up to 10; Missiles 31-40). It also supports the continuing development, beginning in FY08, and testing of new and evolving BMDS technologies. This development effort consists of sustaining engineering and spiral upgrades to the GMD components of the Block 2004 and 2006 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, and multi-sensor fusion. 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 development effort also provides hardware, planning, mission support and execution of the GMD test program.

ESGs are embedded into the 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.

Block 2008 incorporates additional BMDS ESGs:

- Engage & Launch on UEWR (Thule)

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Block 2008 Capability Enhancement Interceptors (GBI) | 0 | 69,559 | 325,948 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The Ground-Based Interceptors consist 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 additional interceptors.

FY06 Planned Program:
- Initiates acquisition of ten (10) common silos at Fort Greely.
- Initiates acquisition of ten (10) sets of launch support equipment.
- Initiates acquisition of up to five (5) GBIs.

FY07 Planned Program:
- Continues acquisition of ten (10) common silos at Fort Greely.
- Continues acquisition of ten (10) sets of launch support equipment.
- Continues acquisition of up to five (5) GBIs.
- Initiates acquisition of up to five (5) GBIs.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Block 2008 (RDT&E Construction) | 0 | 3,000 | 29,000 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

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

FY06 Planned Program:
- Initiates construction of 10 additional silos at Fort Greely.

FY07 Planned Program:
- Continues construction of 10 additional silos at Fort Greely.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Block 2008 Capability Enhancement Interceptors (GBI)** | | | | | | | | |
| GBIs | SS/CPAF | Boeing/ AL/AK/AZ/CA/CO /TX/VA | 0 | 50,000 | 1/2Q | 220,948 | 1/2Q | 270,948 |
| Expansion | SS/CPAF | Boeing/ AL/AK/AZ/CA/CO /TX/VA | 0 | 19,559 | 1/2Q | 105,000 | 1/2Q | 124,559 |
| Subtotal Product Development | | | 0 | 69,559 | | 325,948 | | 395507 |

**Remarks**

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Block 2008 (RDT&E Construction)** | | | | | | | | |
| | MIPR | USACOE/ AK | 0 | 3,000 | N/A | 29,000 | 1/2Q | 32,000 |
| Subtotal Support Costs | | | 0 | 3,000 | | 29,000 | | 32000 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 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 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 | 72,559 | | 354,948 | | 427,507 |

**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 2006 |
|---|---|
| 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 | 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 |
| **Flight Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IFT13C | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IFT-14 | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FT-1 | | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | |
| FT-2 | | | | | | | △ | | | | | | | | | | | | | | | | | | | | | |
| FT-3 | | | | | | | | △ | | | | | | | | | | | | | | | | | | | | |
| FT-4 | | | | | | | | | △ | | | | | | | | | | | | | | | | | | | |
| FT-5 | | | | | | | | | | △ | | | | | | | | | | | | | | | | | | |
| FT-6 | | | | | | | | | | | △ | | | | | | | | | | | | | | | | | |
| FT-7a/b (Salvo) | | | | | | | | | | | | | △ | | | | | | | | | | | | | | | |
| FT-8 | | | | | | | | | | | | | | | △ | | | | | | | | | | | | | |
| FTG 08-4 | | | | | | | | | | | | | | | | | △ | | | | | | | | | | | |
| FTG 08-5a/b (Salvo) | | | | | | | | | | | | | | | | | | | △ | | | | | | | | | |
| FTG 08-6 | | | | | | | | | | | | | | | | | | | | △ | | | | | | | | |
| FTG 10-1 | | | | | | | | | | | | | | | | | | | | | △ | | | | | | | |
| FTG 10-2a/b (Salvo) | | | | | | | | | | | | | | | | | | | | | | △ | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲—▲ | Complete Activity | △—△ | Planned Activity |

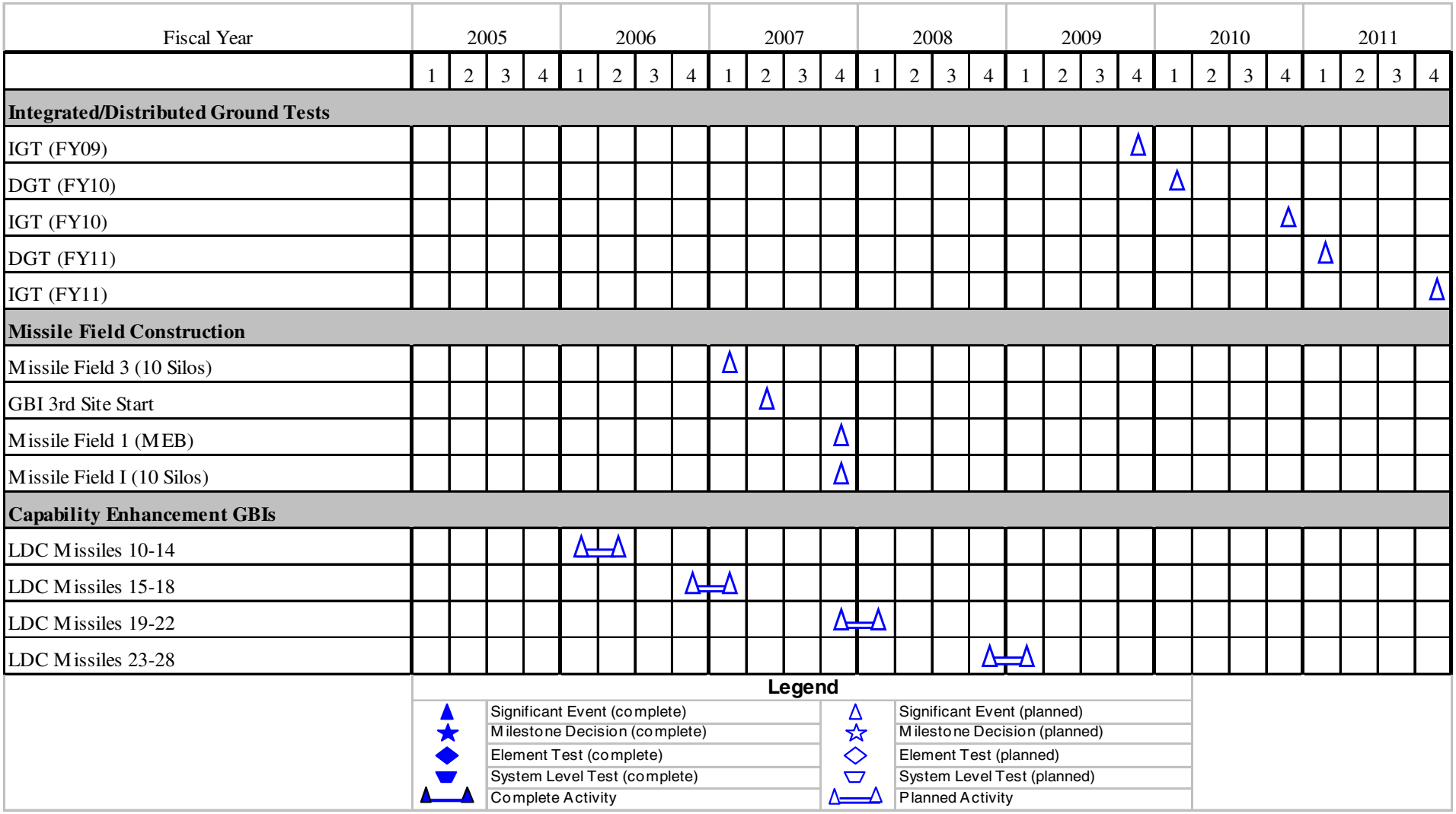
| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603882C Ballistic Missile Defense Midcourse Defense Segment |

| Fiscal Year | 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 |
| **Flight Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FTG 10-3 | | | | | | | | | | | | | | | | | | | | | | | | | △ | | | |
| FTG 10-5a/b (Salvo) | | | | | | | | | | | | | | | | | | | | | | | | | | | △ | |
| FTG 10-6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | △ |
| **Radar Certification Test** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FT 04-1 | | | | | | △ | | | | | | | | | | | | | | | | | | | | | | |
| **Integrated/Distributed Ground Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GT 04-1a (Run For Record) | | | | | △ | | | | | | | | | | | | | | | | | | | | | | | |
| GT 04-2 | | | | | ▲▬▲ | | △ | | | | | | | | | | | | | | | | | | | | | |
| GT 04-1b (Run For Record) | | | | | | △ | | | | | | | | | | | | | | | | | | | | | | |
| IGT 7 | | | | | | | | △ | | | | | | | | | | | | | | | | | | | | |
| GT 04-4 | | | | | | | | | △ | | | | | | | | | | | | | | | | | | | |
| GT 04-3 | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| DGT (FY08) | | | | | | | | | | | | | △ | | | | | | | | | | | | | | | |
| IGT (FY08) | | | | | | | | | | | | | | | | △ | | | | | | | | | | | | |
| DGT (FY09) | | | | | | | | | | | | | | | | | △ | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲▬▲ | Complete Activity | △▬△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Flight Tests** | | | | | | | |
| IFT13C | 1Q | | | | | | |
| IFT-14 | 2Q | | | | | | |
| FT-1 | | 1Q | | | | | |
| FT-2 | | 3Q | | | | | |
| FT-3 | | 4Q | | | | | |
| FT-4 | | | 1Q | | | | |
| FT-5 | | | 2Q | | | | |
| FT-6 | | | 3Q | | | | |
| FT-7a/b (Salvo) | | | | 1Q | | | |
| FT-8 | | | | 3Q | | | |
| FTG 08-4 | | | | | 1Q | | |
| FTG 08-5a/b (Salvo) | | | | | 3Q | | |
| FTG 08-6 | | | | | 4Q | | |
| FTG 10-1 | | | | | | 1Q | |
| FTG 10-2a/b (Salvo) | | | | | | 2Q | |
| FTG 10-3 | | | | | | | 1Q |
| FTG 10-5a/b (Salvo) | | | | | | | 3Q |
| FTG 10-6 | | | | | | | 4Q |
| **Radar Certification Test** | | | | | | | |
| FT 04-1 | | 2Q | | | | | |
| **Integrated/Distributed Ground Tests** | | | | | | | |
| GT 04-1a (Run For Record) | | 1Q | | | | | |
| GT 04-2 | | 1Q-3Q | | | | | |
| GT 04-1b (Run For Record) | | 2Q | | | | | |
| IGT 7 | | 4Q | | | | | |
| GT 04-4 | | | 1Q | | | | |
| GT 04-3 | | | 4Q | | | | |
| DGT (FY08) | | | | 1Q | | | |
| IGT (FY08) | | | | 4Q | | | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| DGT (FY09) | | | | | 1Q | | |
| IGT (FY09) | | | | | 4Q | | |
| DGT (FY10) | | | | | | 1Q | |
| IGT (FY10) | | | | | | 4Q | |
| DGT (FY11) | | | | | | | 1Q |
| IGT (FY11) | | | | | | | 4Q |
| **Missile Field Construction** | | | | | | | |
| Missile Field 3 (10 Silos) | | | 1Q | | | | |
| GBI 3rd Site Start | | | 2Q | | | | |
| Missile Field 1 (MEB) | | | 4Q | | | | |
| Missile Field I (10 Silos) | | | 4Q | | | | |
| **Capability Enhancement GBIs** | | | | | | | |
| LDC Missiles 10-14 | | 1Q-2Q | | | | | |
| LDC Missiles 15-18 | | 4Q | 1Q | | | | |
| LDC Missiles 19-22 | | | 4Q | 1Q | | | |
| LDC Missiles 23-28 | | | | 4Q | 1Q | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0008 Ground-Based Midcourse Defense (GMD) Block 2010 | 0 | 0 | 118,900 | 706,000 | 669,800 | 1,575,388 | 1,310,381 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 5 | 34 | 11 |

## A. Mission Description and Budget Item Justification

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. Planned additional enhancements include:

- Third Missile Site with 10 additional silos with Silo Interface Vault (SIVs )capable of supporting interceptors, Launch Support Equipment (LSE) racks that will interface with the existing Command Launch Equipment (CLE) assets and capabilities comparable to other operational silos
- Ten additional GBIs
- Missile Assembly Building (MAB), GFC/C and Readiness and Control Building, Missile Equipment Building (MEB), 2 Missile Storage Igloos, IDT Building, Military Satellite Communications (MILSATCOM) facility and other facilities at the Third Missile Site capable of providing appropriate protection of equipment
- Two Small Mid-Course Discrimination X-Band Radars, adjunct to the FBX-Ts, with communications connectivity through C2BMC to the GCN and ET. This X-Band Radar is integrated with, but not part of the GMD Element

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.

Block 2010/2012 BMDS ESGs:

- SM-3 Launch on Cobra Dane/UEWR/SBX
- Engage on Spy-1 (Mod 1)
- Launch on SBX (Mod 2)

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Block 2010 (Third Site) | 0 | 0 | 118,900 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

FY07 Planned Program:

- Initiates acquisition of up to ten (10) GBIs
- Initiates geo-technical site survey location studies for a third interceptor launch site
- Initiates planning for third site launch complex
- Conducts environmental, safety and health management analyses/documentation and compliance
- RDT&E Construction request is further justified in the accompanying DD-1391 Exhibits, RDT&E Construction Data

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## 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 has been to build and field an initial capability of the BMDS by Dec 2004, while continuing RDT&E work and spiral upgrades such that some number of GMD components 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 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Block 2010 (Third Site)** | | | | | | | | |
| Third Site | C/CPAF | Boeing/ AL/AK/AZ/CA/CO /TX/VA | 0 | 0 | N/A | 46,765 | 1/2Q | 46,765 |
| GBI`s | C/CPAF | Boeing/ AL/AK/AZ/CA/CO /TX/VA | 0 | 0 | N/A | 63,135 | 1/2Q | 63,135 |
| RDT&E Construction | MIPR | COE/ Europe Site | 0 | 0 | N/A | 9,000 | 1/2Q | 9,000 |
| Subtotal Product Development | | | 0 | 0 | | 118,900 | | 118900 |

**Remarks**

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 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 2006 |
|---|---|
| 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 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 | | 118,900 | | 118,900 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 | 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 |
| **Flight Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IFT13C | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IFT-14 | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FT-1 | | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | |
| FT-2 | | | | | | | △ | | | | | | | | | | | | | | | | | | | | | |
| FT-3 | | | | | | | | △ | | | | | | | | | | | | | | | | | | | | |
| FT-4 | | | | | | | | | △ | | | | | | | | | | | | | | | | | | | |
| FT-5 | | | | | | | | | | △ | | | | | | | | | | | | | | | | | | |
| FT-6 | | | | | | | | | | | △ | | | | | | | | | | | | | | | | | |
| FT-7a/b (Salvo) | | | | | | | | | | | | | △ | | | | | | | | | | | | | | | |
| FT-8 | | | | | | | | | | | | | | | △ | | | | | | | | | | | | | |
| FTG 08-4 | | | | | | | | | | | | | | | | | △ | | | | | | | | | | | |
| FTG 08-5a/b (Salvo) | | | | | | | | | | | | | | | | | | | △ | | | | | | | | | |
| FTG 08-6 | | | | | | | | | | | | | | | | | | | | △ | | | | | | | | |
| FTG 10-1 | | | | | | | | | | | | | | | | | | | | | △ | | | | | | | |
| FTG 10-2a/b (Salvo) | | | | | | | | | | | | | | | | | | | | | | △ | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲——▲ | Complete Activity | △——△ | Planned Activity |

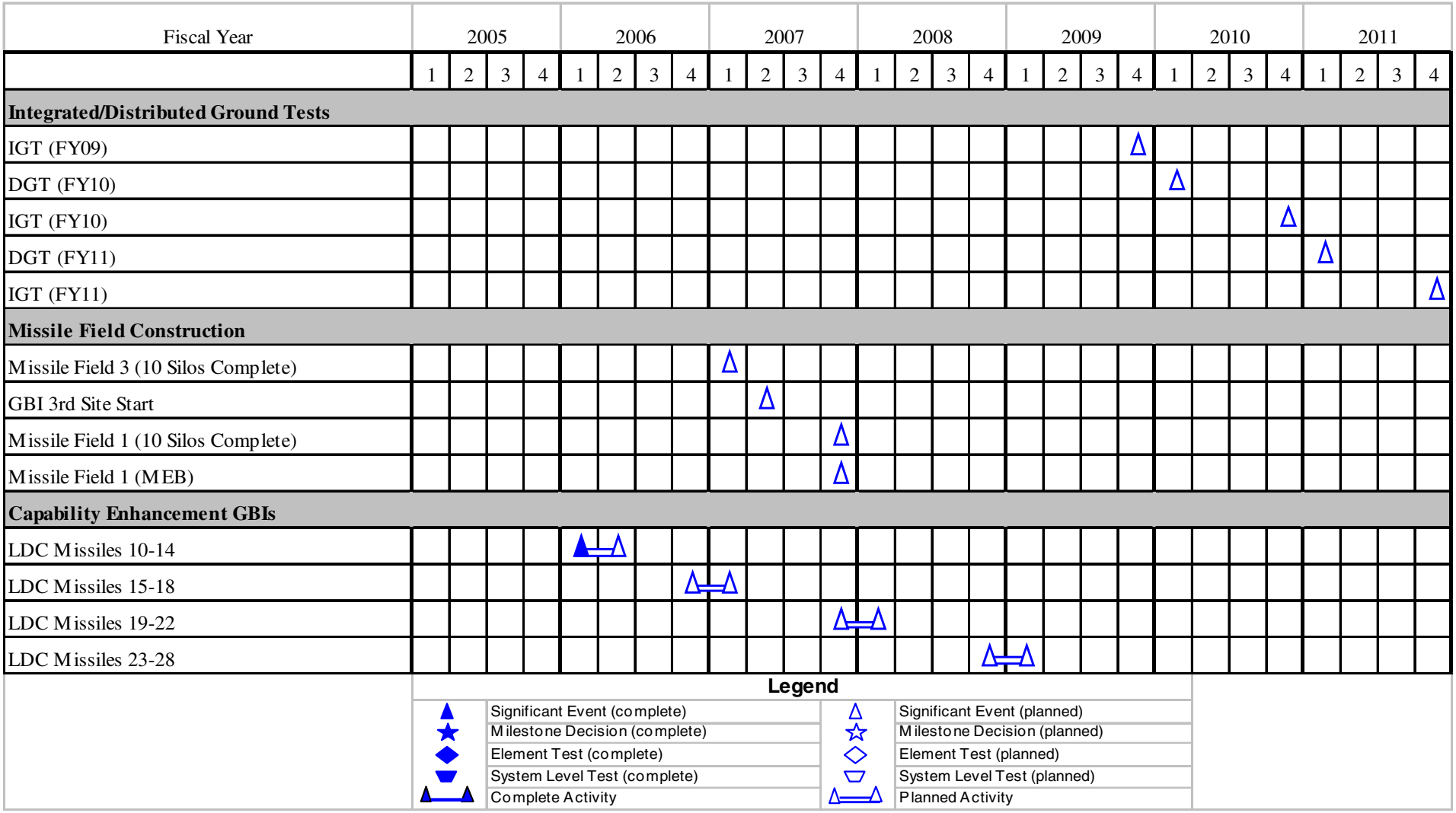
| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603882C Ballistic Missile Defense Midcourse Defense Segment |

| Fiscal Year | 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 |
| **Flight Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FTG 10-3 | | | | | | | | | | | | | | | | | | | | | | | | | △ | | | |
| FTG 10-5a/b (Salvo) | | | | | | | | | | | | | | | | | | | | | | | | | | | △ | |
| FTG 10-6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | △ |
| **Radar Certification Test** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FT 04-1 | | | | | | △ | | | | | | | | | | | | | | | | | | | | | | |
| **Integrated/Distributed Ground Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GT 04-1a (Run For Record) | | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | |
| GT 04-2 | | | | | ▲ | ▲ | △ | | | | | | | | | | | | | | | | | | | | | |
| GT 04-1b (Run For Record) | | | | | | △ | | | | | | | | | | | | | | | | | | | | | | |
| IGT 7 | | | | | | | | △ | | | | | | | | | | | | | | | | | | | | |
| GT 04-4 | | | | | | | | | △ | | | | | | | | | | | | | | | | | | | |
| GT 04-3 | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| DGT (FY08) | | | | | | | | | | | | | △ | | | | | | | | | | | | | | | |
| IGT (FY08) | | | | | | | | | | | | | | | | △ | | | | | | | | | | | | |
| DGT (FY09) | | | | | | | | | | | | | | | | | △ | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲▬▲ | Complete Activity | △▬△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Flight Tests** | | | | | | | |
| IFT13C | 1Q | | | | | | |
| IFT-14 | 2Q | | | | | | |
| FT-1 | | 1Q | | | | | |
| FT-2 | | 3Q | | | | | |
| FT-3 | | 4Q | | | | | |
| FT-4 | | | 1Q | | | | |
| FT-5 | | | 2Q | | | | |
| FT-6 | | | 3Q | | | | |
| FT-7a/b (Salvo) | | | | 1Q | | | |
| FT-8 | | | | 3Q | | | |
| FTG 08-4 | | | | | 1Q | | |
| FTG 08-5a/b (Salvo) | | | | | 3Q | | |
| FTG 08-6 | | | | | 4Q | | |
| FTG 10-1 | | | | | | 1Q | |
| FTG 10-2a/b (Salvo) | | | | | | 2Q | |
| FTG 10-3 | | | | | | | 1Q |
| FTG 10-5a/b (Salvo) | | | | | | | 3Q |
| FTG 10-6 | | | | | | | 4Q |
| **Radar Certification Test** | | | | | | | |
| FT 04-1 | | 2Q | | | | | |
| **Integrated/Distributed Ground Tests** | | | | | | | |
| GT 04-1a (Run For Record) | | 1Q | | | | | |
| GT 04-2 | | 1Q-3Q | | | | | |
| GT 04-1b (Run For Record) | | 2Q | | | | | |
| IGT 7 | | 4Q | | | | | |
| GT 04-4 | | | 1Q | | | | |
| GT 04-3 | | | 4Q | | | | |
| DGT (FY08) | | | | 1Q | | | |
| IGT (FY08) | | | | 4Q | | | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| DGT (FY09) | | | | | 1Q | | |
| IGT (FY09) | | | | | 4Q | | |
| DGT (FY10) | | | | | | 1Q | |
| IGT (FY10) | | | | | | 4Q | |
| DGT (FY11) | | | | | | | 1Q |
| IGT (FY11) | | | | | | | 4Q |
| **Missile Field Construction** | | | | | | | |
| Missile Field 3 (10 Silos Complete) | | | 1Q | | | | |
| GBI 3rd Site Start | | | 2Q | | | | |
| Missile Field 1 (10 Silos Complete) | | | 4Q | | | | |
| Missile Field 1 (MEB) | | | 4Q | | | | |
| **Capability Enhancement GBIs** | | | | | | | |
| LDC Missiles 10-14 | | 1Q-2Q | | | | | |
| LDC Missiles 15-18 | | 4Q | 1Q | | | | |
| LDC Missiles 19-22 | | | 4Q | 1Q | | | |
| LDC Missiles 23-28 | | | | 4Q | 1Q | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0709 AEGIS Ballistic Missile Defense Block 2004 | 901,299 | 0 | 0 | 0 | 0 | 0 | 0 |
| RDT&E Articles Qty | 24 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: Per Congressional direction, funding for all Aegis BMD projects has been transferred to PE 0603892C, Ballistic Missile Defense Aegis, as of FY06.*

*RDT&E Articles for FY05: Eight (8) SM-3 missiles, two (2) targets, four (4) ARAVs, BMD 3.0E installed on seven (7) DDGs, delivery of the BMD 3.0 computer program, and installation of BMD 3.0 on two (2) CGs*

**A. Mission Description and Budget Item Justification**

Aegis BMD Block 2004 supports the BMDS mission of intercepting ballistic missiles of all ranges in all regions and in all phases as follows:

- In all regions: Provide sea-based surveillance, tracking, and engagement capabilities in international waters.
- In all phases of ballistic missile flight: Long Range Surveillance and Track (LRS&T) capability against missile threats in all flight stages; engagement capability against missile threats in the midcourse flight stage
- Against all ranges:
  - Against long-range ballistic missiles by providing surveillance and tracking support as part of the Block 2004 Limited Defensive Capability (LDC).
  - Against short and medium range ballistic missiles by providing engagement support as part of Block 2004.

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

The Aegis BMD Block 2004 program will:

- Defeat unitary and simple separating threats (Short Range Ballistic Missiles (SRBMs) and Medium Range Ballistic Missiles (MRBMs)) with Aegis BMD configured cruisers and destroyers using SM-3 Blk I or IA guided missiles.
- Provide Long Range Ballistic Missile (LRBM) surveillance and track data through the BMDS to the GMD element to cue and initiate fire control Weapons Task Plans.
- Provide Aegis BMD surveillance and track data to the BMDS to support Combatant Commander situational awareness.
- Expand the engagement battle space by using remote (Aegis AN/SPY-1) 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 an operational, engagement-capable system.

Aegis BMD Block 2004 develops three incremental capabilities:
- LRS&T (BMD 3.0E computer program) support as part of LDC;
- A preliminary engagement capability (BMD 3.0 with SM-3 Blk I) for test bed operations and for emergency use, if required; and
- An operationally certified BMD capability that combines the engagement capability with the LRS&T capability (BMD 3.6 with SM-3 Blk I and IA). The final Block 2004 is fully compliant with the Element Capability Specification.

In collaboration with the MDA Systems Engineer, Aegis BMD is contributing to the BMDS in development of engagement sequence groups (ESGs). Aegis BMD supports an autonomous engagement against SRBMs and MRBMs without requiring external cueing.

Aegis BMD Block 2004 will support SM-3 Engage on AN/SPY-1, SM-3 Launch on Remote (AN/SPY-1), GBI Engage on AN/SPY-1, and GBI Launch on AN/SPY-1.

**B. Accomplishments/Planned Program**

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Weapon System Engineering | 189,477 | 0 | 0 |
| RDT&E Articles (Quantity) | 10 | 0 | 0 |

In Block 2004, the Aegis BMD Weapon System Engineering group developed BMD 3.0E to provide LRS&T capability to the BMDS; BMD 3.0 to support testbed and emergency engagement operations; and BMD 3.6 to provide an operationally-certified system. Aegis BMD met the President's LDC objectives by deploying BMD 3.0E in Block 2004.

FY05 Accomplishments:
RDT&E Articles: BMD 3.0 Computer Program (1), BMD 3.0 Cruisers (2), 3.0E LRS&T Destroyers (7)

Aegis BMD Weapon System:
- For Limited Defensive Capability (LDC)(LRS&T Capability):
  - Installed BMD 3.0E LRS&T capability on seven (7) Aegis destroyers.
  - Monitored the operational performance of the BMD 3.0E computer program.

  - Identified, prioritized, and developed plans to incorporate changes in final Block 2004 delivery.
- Participated in Aegis BMD and other BMDS test events to collect and analyze ballistic missile tracking data.

- For engagement capability:
  - Completed and delivered the initial testbed engagement capability, BMD 3.0, and authorized the configuration for emergency activation as necessary.
    - Completed testing BMD 3.0 at the Combat Systems Engineering Development Site (CSEDS).
    - Conducted BMD 3.0 Engineering Assessment to formally characterize the performance of BMD 3.0 as the basis for government acceptance.
    - Obtained 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.
    - Completed authorization of BMD 3.0 weapon system.
    - Completed BMD 3.0 installations on two (2) cruisers for flight testing and potential emergency deployment.
  - Conducted waterfront integration testing.
  - Characterized operational performance of BMD 3.0 with a successful flight mission and in an At-Sea Demonstration.
  - Collected data on separating targets, developed algorithm modifications, continued computer program development, and initiated testing of the BMD 3.6 Weapon System.
  - Began multi-element integration and testing of BMD 3.6.
  - Began CSEDS testing of BMD 3.6.
  - Completed BMD 3.6 ship installation design effort.
  - Completed modifications to engagement models and simulations to support analysis for a low exo-atmospheric intercept firing test.

Vertical Launching System (VLS):

- For engagement capability:
  - Conducted Mk 41 VLS Phase I system ground tests
  - Installed the Mk 41 VLS Phase I modifications to support flight missions.
  - Provided Mk 21 Mod 2 VLS canisters for SM-3 Blk I missiles.
  - Conducted Mk 41 VLS Phase II Critical Design Review (BMD 3.6).
  - Completed development of a multi-mission Mk 41 VLS capability as part of BMD 3.6.
  - Conducted ground tests of Aegis BMD multi-mission Mk 41 VLS capability.
  - Continued circuit card assembly re-design to resolve parts obsolescence.

- Completed Mk 41 VLS Ordnance Alteration Kits (firmware and logistical support upgrades).
- Began purchases of Mk 21 Mod 2 VLS canisters for SM-3 Blk IA missiles.
- Completed VLS/NAVSSI Interface design effort

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| SM-3 Missile | 506,558 | 0 | 0 |
| RDT&E Articles (Quantity) | 8 | 0 | 0 |

Aegis BMD Block 2004 provides the SM-3 Blk I missile that can be used for emergency activation; completed the design efforts of the SM-3 Blk IA and completes component and section level testing of the SM-3 Blk IA. Completes initial non-recurring engineering preparation for rate manufacturing of SM-3 components at various manufacturing facilities.

FY05 Accomplishments:
RDT&E Articles: SM-3 Blk I Missiles (8)

- For engagement capability:
  - Participated in Flight Test Mission (FTM) 04-1 with one (1)SM-3 Blk I missile.
    - Completed pre-flight analysis to verify scenarios and performance assessment.
    - Prepared and completed missile delivery package for the Mission Control Panel reviews.
    - Performed post-flight analysis to validate high fidelity simulations.
    - Conducted post-flight analysis to support Mission Data Reviews (MDRs).
    - Performed analysis of SM-3 Blk I Hardware/Software (HW/SW) based on flight results.
  - Validated interface compliance for missile pre-launch and in-flight support by completing weapon systems integration testing at CSEDS.
  - Delivered the five (5) SM-3 Blk I Initial Deployment Rounds.
  - Completed assembly and delivered three (3) additional SM-3 Blk I missiles.
  - Initiated manufacture and assembly of three (3) SM-3 Blk I missiles that will be delivered in FY06.
  - Continued SM-3 Blk IA HW/SW integration testing to validate requirements for electrical and mechanical interfaces.
  - Initiated SM-3 Blk IA Hazard Assessment and Safety compliance tests.
  - Continued SM-3 Value Engineering Change Proposal (VECP) implementation efforts to ensure service life requirement compliance.
  - Completed SM-3 Blk IA sustain DACS design verification tests.
  - Conducted Third Stage Rocket Motor obsolete material replacement design verification tests.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603882C Ballistic Missile Defense Midcourse Defense Segment** |

- Continued SDACS pulse capability engineering tests.
- Gained approval to proceed with the SM-3 Blk IA hardware/software development by completing the Critical Design Review (CDR).
- Continued to monitor All-Up-Round obsolete material replacement effort.
- Initiated non-recurring engineering preparation for rate manufacturing of SM-3 components in Tucson, AZ; Elkton, MD; Canoga Park, CA; Tempe, AZ, and Camden, AR.
- Began fabrication of sections for first 12 SM-3 Blk IA missiles.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| System Test & Evaluation | 118,305 | 0 | 0 |
| RDT&E Articles (Quantity) | 6 | 0 | 0 |

This effort provides funding for Aegis BMD test and evaluation Block 2004 flight testing missions, as well as other BMDS system-wide tests to support the development of the BMDS.

FY05 Accomplishments:
RDT&E Articles: Targets (2); Aegis Readiness Assessment Vehicles (ARAVs) (4)

- Acquired 1 Group A (SRBM) target for FTM 04-1(FM-7), 1 Group B (MRBM) target for FTM 04-2 (FM-8), and 4 ARAVs for the At-Sea Demonstration (ASD) 3.0 test event and Ballistic Missile Tracking Exercise.
- Began procurement of 1 Group B (MRBM) target for FTM-10 (delivery in FY06)
- Conducted STELLAR DRAGON campaign consisting of FTM 04-1 (FM-7), and At-Sea Demonstration 3.0:
  - Participated in an ARAV Group A simulated engagement to verify BMD 3.0 ability to track.
  - Conducted 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.
  - Conducted ASD 3.0 in a multi-warfare environment to verify BMD 3.0 capability with simulated intercepts of two ARAV Group A targets and a simulated engagement of an ARAV Group B.
- Participated in GMD IFT 13-C flight mission, using an Aegis Destroyer to provide target-tracking data to other BMDS elements.
- Conducted 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.
- Participated in Glory Trip 189 LRS&T test event, which verified AWS capability to search, detect, and track a long-range multi-stage target; and transmit data using satellite Link-16 to BMDS.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603882C Ballistic Missile Defense Midcourse Defense Segment** |

- Participated in Safety Enhanced Reentry Vehicle 2 (SERV-2), which was the first live tracking event for BMD 3.0E. Successfully participated in a multi-objective Ballistic Missile Defense System (BMDS) test, and reported successful equipment performance and data collection/architecture execution following launch of the Minuteman III ICBM from Vandenberg Air Force Base to the Reagan Test Site (RTS).
- Participated in Critical Measurements/Counter Measures 1 (CMCM-1) and collected extensive Aegis BMD Signal Processor (BSP) and Doppler Data Collection System (DDCS) data on the flight vehicle consistent with pre-mission predictions. The Destroyer's tracks were also successfully transmitted via satellite TADIL-J to a JADE configuration at PMRF.
- Conducted the first simulated engagement of a live ballistic missile by a DDG. The DDG detected, tracked and engaged a Group B (MRBM) target that was air-launched from a C-17 during the Medium Range Target (MRT) Risk Reduction Flight.
- Completed modifications to engagement models and simulations to support analysis for a low exo-atmospheric intercept.
- Began test planning for FTM-10 and FTM-11
- Participated in Critical Measurements and Countermeasures (CMCM-1) flight tests with the BSP Advanced Development Model (ADM).
- Conducted STELLAR VALKYRIE campaign consisting of Ballistic Missile Tracking Exercise and FTM 04-2 (FM-8) (completed November 2005):
  - Participated in an ARAV Group B simulated engagement to verify BMD 3.0 ability to track.
  - Conducted FTM 04-2 (FM-8) flight test to verify BMD 3.0 emergency engagement capability with an intercept of a Group B (MRBM) target using an SM-3 Blk I missile.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Block 2004 Targets | 33,296 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort provides ballistic missile target hardware, target range support, logistics support, target integration, and associated launch services to support Aegis BMD Block 2004 flight tests, as well as other system-wide tests that support the development and integration of Aegis BMD into the BMDS.

FY05 Accomplishments:

- Successfully conducted Tactical Target Vehicle (TTV) flight intercept presentation in support of FTM 04-1 at the Pacific Missile Range Facility (PMRF), Kauai, Hawaii.
- Successfully conducted Medium Range Target (MRT) demonstration flight to prove air-launch capability for new target system design.
- Completed design, manufacture, and delivery of one (1) Modified Ballistic Re-entry Vehicles (MBRV) and one (1) Bulk Chemical Front Section (BCFSs) payload insert in support of FTM 04-2.

- Successfully conducted MRT pre-flight analysis, presentation, launch, and post-flight analysis in support of FTM 04-2.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Aegis BMD Block 2004 Fire Control (BMC3) | 12,244 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort provides for Fire Control (BMC3) improvements, including establishment of alternate BMD data paths and enhancements, supporting increased interoperability with other BMDS elements.

FY05 Accomplishments:

- Updated and improved BMDS C2BMC interface control specifications requirements with other elements of the BMDS.
- Completed trade study of a tactical missile-to-ship telemetry receiving system to support real time Kill Assessment.
- Initiated integration of CDLMS v. 3.4 into BMD 3.6 to accomplish multiple satellite data paths (UHF, SHF, and EHF) for improved BMDS interoperability.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| System Engineering & Integration | 17,664 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort provided funding to work in collaboration with the BMDS System Engineer to develop requirements flowdown for Aegis BMD Block 2004, and participate in the definition of appropriate Engagement Sequence Groups to best utilize Aegis BMD capability as part of the overall BMDS.

FY05 Accomplishments:

- Performed analysis to support BMDS Block 2004 capability assessments required to support BMDS-level capability reviews

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 |
|---|---|---|---|
| Operations & Support | 23,755 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

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

FY05 Accomplishments:

- Continued crew training in support of installations.
- Achieved Integrated Logistics Support (ILS) certification for BMD 3.0.
- Conducted crew training for operation and maintenance of BMD 3.0.
- Achieved Integrated Logistics Support (ILS) certification for BMD 3.6.

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## D. Acquisition Strategy

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 2006 |
|---|---|
| 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 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 | 324,685 | 0 | N/A | 0 | N/A | 324,685 |
| AWS | FFRDC | MIT/LL/ MA | 5,325 | 0 | N/A | 0 | N/A | 5,325 |
| AWS | SS/CPFF | JHU/APL/ MD | 7,600 | 0 | N/A | 0 | N/A | 7,600 |
| AWS | MIPR | NSWC/DD/ VA | 28,836 | 0 | N/A | 0 | N/A | 28,836 |
| AWS | MIPR | MITRE/ VA | 1,400 | 0 | N/A | 0 | N/A | 1,400 |
| AWS | MIPR | NSWC/PHD/ CA | 13,824 | 0 | N/A | 0 | N/A | 13,824 |
| AWS | | MDA | 13,586 | 0 | N/A | 0 | N/A | 13,586 |
| AWS | Various | VARIOUS | 19,016 | 0 | N/A | 0 | N/A | 19,016 |
| MISSILE | SS/CPIF | RAYTHEON/ AZ | 704,637 | 0 | N/A | 0 | N/A | 704,637 |
| MISSILE | SS/CPIF | JHU/APL/ MD | 21,693 | 0 | N/A | 0 | N/A | 21,693 |
| MISSILE | FFRDC | MIT/LL/ MA | 1,650 | 0 | N/A | 0 | N/A | 1,650 |
| MISSILE | MIPR | NSWC/DD/ VA | 16,667 | 0 | N/A | 0 | N/A | 16,667 |
| MISSILE | MIPR | NSWC/PHD/ CA | 9,665 | 0 | N/A | 0 | N/A | 9,665 |
| MISSILE | MIPR | WSMR/ NM | 1,642 | 0 | N/A | 0 | N/A | 1,642 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| MISSILE | MIPR | NSWC/CD/ CA | 4,168 | 0 | N/A | 0 | N/A | 4,168 |
| MISSILE | MIPR | NSWC/IH/ MD | 3,013 | 0 | N/A | 0 | N/A | 3,013 |
| MISSILE | MIPR | NAWC/CL/ CA | 1,755 | 0 | N/A | 0 | N/A | 1,755 |
| MISSILE | | MDA/ VA | 24,676 | 0 | N/A | 0 | N/A | 24,676 |
| MISSILE | Various | VARIOUS/ VARIOUS | 6,280 | 0 | N/A | 0 | N/A | 6,280 |
| Subtotal Product Development | | | 1,210,118 | 0 | | 0 | | 1,210,118 |

**Remarks**

**II. Support Costs Cost ( $ in Thousands )**

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 | 7,902 | 0 | N/A | 0 | N/A | 7,902 |
| | SS/CPAF | Lockheed Martin/ NJ | 10,500 | 0 | N/A | 0 | N/A | 10,500 |
| | MIPR | NSWC/DD/ VA | 11,324 | 0 | N/A | 0 | N/A | 11,324 |
| | MIPR | NSWC/PHD/ CA | 6,807 | 0 | N/A | 0 | N/A | 6,807 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| | MIPR | SPAWAR/ CA | 4,734 | 0 | N/A | 0 | N/A | 4,734 |
| | | MDA | 2,489 | 0 | N/A | 0 | N/A | 2,489 |
| | MIPR | NAVSEA/ DC | 3,700 | 0 | N/A | 0 | N/A | 3,700 |
| | MIPR | SupShip Pascagoula/ MS | 4,635 | 0 | N/A | 0 | N/A | 4,635 |
| | MIPR | SupShip Bath/ ME | 1,965 | 0 | N/A | 0 | N/A | 1,965 |
| | MIPR | VARIOUS/SSES Philadelphia/ VARIOUS | 220 | 0 | N/A | 0 | N/A | 220 |
| Subtotal Support Costs | | | 54,276 | 0 | | 0 | | 54276 |

**Remarks**

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **System Test & Evaluation** | | | | | | | | |
| | MIPR | PMRF/ HI | 12,002 | 0 | N/A | 0 | N/A | 12,002 |
| | C/CPFF | HTS/ CA | 3,290 | 0 | N/A | 0 | N/A | 3,290 |
| | SS/CPAF | Xontech/ CA | 2,122 | 0 | N/A | 0 | N/A | 2,122 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| | MIPR | NSWC/PHD/ CA | 11,556 | 0 | N/A | 0 | N/A | 11,556 |
| | MIPR | NAWC/PM/ CA | 8,147 | 0 | N/A | 0 | N/A | 8,147 |
| | MIPR | NSWC/Corona/ CA | 4,584 | 0 | N/A | 0 | N/A | 4,584 |
| | MIPR | NSWC/DD/ VA | 20,306 | 0 | N/A | 0 | N/A | 20,306 |
| | MIPR | CINPACFLT/ HI | 2,650 | 0 | N/A | 0 | N/A | 2,650 |
| | SS/CPFF | JHU/APL/ MD | 20,082 | 0 | N/A | 0 | N/A | 20,082 |
| | MIPR | SMDC/ AL | 4,670 | 0 | N/A | 0 | N/A | 4,670 |
| | MIPR | SPAWAR/ CA | 7,117 | 0 | N/A | 0 | N/A | 7,117 |
| | MIPR | DOI/ DC | 1,210 | 0 | N/A | 0 | N/A | 1,210 |
| | MIPR | MDAO | 49,300 | 0 | N/A | 0 | N/A | 49,300 |
| | Various | VARIOUS/ VARIOUS | 8,613 | 0 | N/A | 0 | N/A | 8,613 |
| | MIPR | WSMR/ CA | 11,035 | 0 | N/A | 0 | N/A | 11,035 |
| | | MDA | 6,397 | 0 | N/A | 0 | N/A | 6,397 |
| Subtotal Test and Evaluation | | | 173,081 | 0 | | 0 | | 173081 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Weapon System Engineering** | | | | | | | | |
| | | NAVSEA/ DC | 26,435 | 0 | N/A | 0 | N/A | 26,435 |
| | SS/CPFF | JHU/APl/ MD | 2,834 | 0 | N/A | 0 | N/A | 2,834 |
| | MIPR | NSWC/DD/ VA | 2,398 | 0 | N/A | 0 | N/A | 2,398 |
| | C/CPFF | Anteon/ VA | 46,749 | 0 | N/A | 0 | N/A | 46,749 |
| | SS/CPFF | Paradigm/ VA | 4,175 | 0 | N/A | 0 | N/A | 4,175 |
| | SS/CPAF | Lockheed Martin/ NJ | 1,700 | 0 | N/A | 0 | N/A | 1,700 |
| | SS/CPAF | Raytheon/ AZ | 2,000 | 0 | N/A | 0 | N/A | 2,000 |
| | | MDA | 14,922 | 0 | N/A | 0 | N/A | 14,922 |
| | Various | Various/ Various | 8,517 | 0 | N/A | 0 | N/A | 8,517 |
| | | MDA (Salaries) | 1,763 | 0 | N/A | 0 | N/A | 1,763 |
| Subtotal Management Services | | | 111,493 | 0 | | 0 | | 111,493 |

**Remarks**

| Project Total Cost | | | 1,548,968 | 0 | | 0 | | 1,548,968 |
|---|---|---|---|---|---|---|---|---|

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 | 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 |
| **Testing Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| At-Sea Demo 3.0 (Concurrent with FM-7) | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Manufacturing Processes and Advanced Materials** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BMD 3.0 Computer Program | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aegis BMD FTM 04-1 configuration | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Development Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| VLS 3.1 Critical Design Review | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BMD 3.0 M&S Performance Assessment | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BMD 3.0 Engineering Assessment | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SM-3 Block IA Critical Design Review | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Flight Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FTM 04-1 (FM-7) | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Integrated Flight Test** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IFT 13C | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IFT 14 | ▲ | ▬ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Fielding Deliveries/Missiles** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Block I Missiles | | | ▲ | ▬ | | | | | | | | | | | | | | | | | | | | | | | | |
| Accelerated Block I Missiles | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲▬▲ | Complete Activity | △▬△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Testing Milestones** | | | | | | | |
| At-Sea Demo 3.0 (Concurrent with FM-7) | 2Q | | | | | | |
| Third Stage Rocket Motor DVT-3 | 3Q | | | | | | |
| **Manufacturing Processes and Advanced Materials** | | | | | | | |
| BMD 3.0 Computer Program | 1Q | | | | | | |
| Aegis BMD FTM 04-1 configuration | 2Q | | | | | | |
| **Development Milestones** | | | | | | | |
| VLS 3.1 Critical Design Review | 1Q | | | | | | |
| BMD 3.0 M&S Performance Assessment | 2Q | | | | | | |
| BMD 3.0 Engineering Assessment | 1Q | | | | | | |
| SM-3 Block IA Critical Design Review | 1Q | | | | | | |
| **Flight Tests** | | | | | | | |
| FTM 04-1 (FM-7) | 2Q | | | | | | |
| **Integrated Flight Test** | | | | | | | |
| IFT 13C | 1Q | | | | | | |
| IFT 14 | 1Q-2Q | | | | | | |
| **Fielding Deliveries/Missiles** | | | | | | | |
| Block I Missiles | 3Q-4Q | | | | | | |
| Accelerated Block I Missiles | 1Q | | | | | | |

FY05 events shown only; the full Block 2004 schedule is shown in PE 0603892C, BMD Aegis.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0809 AEGIS Ballistic Missile Defense Block 2006 | 121,574 | 0 | 0 | 0 | 0 | 0 | 0 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: Per Congressional direction, funding for all Aegis BMD projects has been transferred to PE 0603892C, Ballistic Missile Defense Aegis, as of FY06.*

**A. Mission Description and Budget Item Justification**

Aegis BMD Block 2006 supports the BMDS mission of intercepting ballistic missiles in all regions, in all phases, and of all ranges, as follows:

- In all regions: provide sea-based surveillance, tracking, and engagement capabilities.
- In all phases of ballistic missile flight: Long Range Surveillance and Track (LRS&T) capability against missile threats of all ranges; engagement capability against Short Range Ballistic Missile (SRBM) to Medium Range Ballistic Missile (MRBM)-class missile threats
  - Develop engagement capability against Intermediate range Ballistic Missile (IRBM)-class targets.
- Against all ranges:
  - Enhanced LRS&T capability against Ballistic Missile threats of all ranges through Aegis BMD Signal Processor (BSP) improvements.

Aegis BMD supported LDC by providing Long Range Surveillance and Track (LRS&T) data to other elements of the BMDS. Aegis BMD improved 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 from other Aegis ships in Block 2004. Through development and testing of the Aegis BMD Signal Processor (BSP) in Block 2006, Aegis BMD will provide significant improvements in discrimination capability and performance against more diverse and longer range threats in Block 2008.

The Aegis BMD Block 2006 4.0E Weapon System will continue the evolutionary spiral development of Block 2004 by performing the initial integration of the BSP into the Aegis BMD Weapon System. BMD 4.0E will improve discrimination and tracking capability against more robust threats for BMDS engagements. BMD 4.0E LRS&T upgrades using BSP will go through an Engineering Assessment and be delivered to the testbed (CSEDS) in Block 2006.

BMD 4.0E will continue to evolve into the BMD 4.0 and 4.0.1 configurations; these are to be delivered during Block 2008.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603882C Ballistic Missile Defense Midcourse Defense Segment |

Ongoing missile development in the Block 2006 timeframe is listed and described under Block 2008, project 0909. Block 2006 missile efforts will complete testing of the SM-3 Blk IA missile with the BMD 3.6 Weapon System.

Aegis BMD Block 2006 will:

- Defeat unitary and more complex SRBM and MRBM threats with Aegis BMD configured cruisers, destroyers and Standard Missile-3 (SM-3) Blk I and IA guided missiles.
- Develop a limited IRBM capability.
- Complete development and engineering assessment of BMD 4.0E - testbed capability that provides improved ballistic missile threat tracking, discrimination, and object classification via the BSP Engineering Development Model (EDM).
- Continue installations of the BMD 3.0E surveillance and tracking capability and the BMD 3.6 engagement capability on additional Aegis destroyers, and deliver 22 SM-3 Blk IA missiles.

In collaboration with the MDA Systems Engineer, Aegis BMD is contributing to the BMDS in development of engagement sequence groups (ESGs). Aegis BMD supports an autonomous engagement against SRBMs and MRBMs without external cueing. Aegis BMD also supports an engagement against SRBMs and MRBMs using data from other BMDS elements and external sensors.

Aegis BMD Block 2006 will support SM-3 Engage on/Launch on AN/SPY-1, SM-3 Launch on FBX-T, GBI Engage on AN/SPY-1 Mod. 1,and GBI Launch on AN/SPY-1 Mod 1.

**B. Accomplishments/Planned Program**

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Weapons System Engineering | 76,880 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

FY05 Accomplishments:

- Began improvements to ballistic missile tracking, characterization, discrimination, feature extraction, object classification, and kill assessment as a part of Aegis BSP development, to include:
  - Real-time feature extraction capability and classification algorithm development
  - Initial at-sea testing of the Aegis BSP Advanced Development Model

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603882C Ballistic Missile Defense Midcourse Defense Segment** |

- Commenced development of BMD 4.0E/4.0/4.0.1:
  - Commenced top level requirements flow down for Block 2006 Aegis BMD Weapon System design .
  - Commenced detailed design for Aegis BMD components: SPY radar system, command and control system, weapons control system, and mission planning system.
- Continued 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.
- Began Aegis BMD Multi-Asset Planning in support of Joint Defense Planner.
- Began definition, planning, and initial implementation of Aegis BMD Link certification requirements.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| SM-3 Missile | 41,200 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

During Block 2006 the SM-3 Blk IA missiles will be tested, monitored for improvements, and delivered for deployment.

FY05 Accomplishments:

- Continued Pre-flight analysis support for Block 2006 related Flight Mission Planning Analysis.
- Conducted material engineering to monitor parts obsolescence.
- Compared data analysis and requirements to pace missile updates with evolving threat and weapons system improvements.
- Initiated Block 2006 Element Capability Specification (ECS) requirements analyses for flow down to missile top-level requirements.
- Initiated Block 2006 capability performance assessment studies for the SM-3 Blk IA.
- Reviewed manufacturing practices to lower unit cost of the SM-3 Blk IA via improved manufacturing processes.
- Awarded contract for twelve (12) SM-3 Blk IA missiles with delivery beginning in FY06.
- Initiated IR discrimination risk reduction and algorithm development.
- Conducted engineering level testing of All Reflective Optics (AROs).
- Fabricated generation two Advanced Signal Processor (ASP) to conduct computer-in-the-loop and hardware-in-the-loop testing for improved missile discrimination and mitigate diminished manufacturing source issues.
- Continued development of the two-color seeker, including a captive-carry test during FTM 04-1 (included prototype ARO telescope and initial production two-color Integrated Dewar Assembly (IDA)).
- Continued TDACS design efforts.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 |
|---|---|---|---|
| Aegis BMD Fire Control (BMC3) | 3,494 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort provides for BMC3 improvements, including establishment of alternate BMD data paths and enhancements, supporting increased interoperability with other BMDS elements.

FY05 Accomplishments:

- Began Aegis BMD Multi-Asset Planning in support of Joint Defense Planner.
- Began definition, planning, and initial implementation of Aegis BMD Link certification requirements.

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## D. Acquisition Strategy

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 2006 |
|---|---|
| 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 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 | 75,720 | 0 | N/A | 0 | N/A | 75,720 |
| AWS | FFRDC | MIT/LL/ MA | 5,075 | 0 | N/A | 0 | N/A | 5,075 |
| AWS | CPFF | JHU/APL/ MD | 1,100 | 0 | N/A | 0 | N/A | 1,100 |
| AWS | MIPR | NSWC/DD/ VA | 2,650 | 0 | N/A | 0 | N/A | 2,650 |
| AWS | MIPR | MITRE/ VA | 765 | 0 | N/A | 0 | N/A | 765 |
| AWS | | MDA | 2,000 | 0 | N/A | 0 | N/A | 2,000 |
| AWS | Various | Various | 2,948 | 0 | N/A | 0 | N/A | 2,948 |
| Subtotal Product Development | | | 90,258 | 0 | | 0 | | 90258 |

**Remarks**

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 | 3,191 | 0 | N/A | 0 | N/A | 3,191 |
| | SS/CPAF | Lockheed Martin/ NJ | 1,000 | 0 | N/A | 0 | N/A | 1,000 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| | SS/CPAF | MIT/LL/ MA | 2,570 | 0 | N/A | 0 | 4Q | 2,570 |
| | SS/FPI | NSWC/DD/ VA | 2,862 | 0 | N/A | 0 | N/A | 2,862 |
| | SS/MIPR | NSWC/Corona/ CA | 225 | 0 | N/A | 0 | N/A | 225 |
| | SS/MIPR | NSWC/PHD/ CA | 936 | 0 | N/A | 0 | N/A | 936 |
| | SS/CPAF | RAYTHEON/ AZ | 39,960 | 0 | N/A | 0 | N/A | 39,960 |
| | SS/CPFF | SEG/ VA | 2,095 | 0 | N/A | 0 | N/A | 2,095 |
| | SS/CPFF | TSC/ VA | 365 | 0 | N/A | 0 | N/A | 365 |
| | SS/CPFF | MITRE/ VA | 350 | 0 | N/A | 0 | N/A | 350 |
| Subtotal Support Costs | | | 53,554 | 0 | | 0 | | 53554 |

**Remarks**

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Subtotal Management Services | | | 0 | 0 | | 0 | | 0 |

**Remarks**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 143,812 | 0 | | 0 | | 143,812 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 | 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 |
| **Development Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Block 2006 System Requirements Review | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲▬▲ | Complete Activity | △▬△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Development Milestones** | | | | | | | |
| Block 2006 System Requirements Review | 2Q | | | | | | |

FY05 events shown only; the full Block 2006 schedule is shown in PE 0603892C, BMD Aegis.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0402 Japanese Cooperative Program | 69,489 | 0 | 0 | 0 | 0 | 0 | 0 |
| RDT&E Articles Qty | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: Per Congressional direction, funding for all Aegis BMD projects, including Japanese Cooperative efforts, has been transferred to PE 0603892C, Ballistic Missile Defense Aegis, as of FY06.*

*RDT&E Article for FY05: One (1) SM-3 missile.*

**A. Mission Description and Budget Item Justification**

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 the development of advanced missile technologies in four components of the SM-3 guided missile: sensor, advanced kinetic warhead, second stage propulsion and lightweight nosecone. In FY06, the JCR project will flight test the lightweight nosecone in Joint Control Test Vehicle-1 (JCTV-1).

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

Both work share and cost will be equitably shared by the U.S. and Japan.

The Scope of Work of the SCD project will be conducted through a three-phased engineering approach which completes by 2014. Phase I will consist of requirements definition for the SM-3 Blk II and IIA missile configurations, concurrent with initial risk reduction efforts related to the 21-inch propulsion components, lightweight nosecone, advanced seeker, larger Divert and Attitude Control System (DACS), and preliminary test plans.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603882C Ballistic Missile Defense Midcourse Defense Segment** |

Also in Phase I, information exchange related to production and maintenance of the SM-3 Blk IIA missile will be initiated. Upon completion of requirements definition, a schedule for development and testing, and work share and cost share for development and testing will be refined. Phase II will define the performance allocation and component configuration for the development and testing of the SM-3 Blk II missile; Phase III will define the performance allocation and component configuration for the development and testing of the SM-3 Blk IIA missile.

The SM-3 Blk II/IIA missile will increase the area that can be defended by Aegis BMD and increase the probability of kill against a larger threat set. It will leverage enhanced capability provided by BMDS sensor upgrades.

The SCD project will:

- Develop components for the SM-3 Blk II/IIA missile and integrate them into an All Up Round (AUR)
  - 21" 2nd and 3rd stage components:
    - 21" nosecone
    - Advanced kinetic warhead
    - Advanced Seeker
    - Improved Large Diameter Divert and Attitude Control System
- Modify the Aegis Weapon System to exploit the capability of the SM-3 Blk II/IIA missile and use of threat track data from BMDS sensors.
- Integrate the SM-3 Blk IIA missile and VLS with Aegis ship systems
  - Includes development of a light weight VLS canister
- Conduct test and evaluation using ground and flight tests
  - SM-3 Blk II/IIA missile
  - Aegis BMD ship systems
  - Aegis BMD weapon systems

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Japan Cooperative Program | 69,489 | 0 | 0 |
| RDT&E Articles (Quantity) | 1 | 0 | 0 |

FY05 Accomplishments:
RDT&E Articles: SM-3 Missile (1)

- Conducted Critical Design Review for Ship System and VLS modifications to support JCTV-1 PoP flight test.
- Continued procurement of test articles and ship modifications for JCTV-1.
- Continued ground testing and test planning to support JCTV-1 Proof-of-Principle (PoP) flight test.
- Initiated hazard assessment and insensitive munitions testing of Japan defense Agency (JDA) rocket motors.
- Continued system engineering support for JDA design and development of second stage propulsion, QWIP seeker, lightweight nosecone and SDACS valve and thruster components.

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## 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 flight test. The test 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 Development program will utilize a performance-based approach that ties program decision milestones to the performance of development 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 2006 |
|---|---|
| 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 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 | 77,482 | 0 | N/A | 0 | N/A | 77,482 |
| JCR | SS/CPAF | Lockheed Martin/ NJ | 15,073 | 0 | N/A | 0 | N/A | 15,073 |
| JCR | | Various | 278 | 0 | N/A | 0 | N/A | 278 |
| Subtotal Product Development | | | 92,833 | 0 | | 0 | | 92833 |

**Remarks**

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 | 4,812 | 0 | N/A | 0 | N/A | 4,812 |
| | SS/CPFF | NSWC/PHD/ CA | 895 | 0 | N/A | 0 | N/A | 895 |
| | SS/CPFF | JHU/APL/ MD | 5,493 | 0 | N/A | 0 | N/A | 5,493 |
| | Various | Various/ Various | 2,280 | 0 | N/A | 0 | N/A | 2,280 |
| | SS/MIPR | NAWC/CL/ CA | 725 | 0 | N/A | 0 | N/A | 725 |
| | SS/MIPR | ANTEON/ VA | 4,297 | 0 | N/A | 0 | N/A | 4,297 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| | SS/CPFF | PARADIGM/ VA | 443 | 0 | N/A | 0 | N/A | 443 |
| | | MDA/ VA | 2,994 | 0 | N/A | 0 | N/A | 2,994 |
| | SS | NAVSEA/ DC | 1,531 | 0 | N/A | 0 | N/A | 1,531 |
| | SS/CPAF | Lockheed Martin/ NJ | 3,032 | 0 | N/A | 0 | N/A | 3,032 |
| Subtotal Support Costs | | | 26,502 | 0 | | 0 | | 26502 |

**Remarks**

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 | 190 | 0 | N/A | 0 | N/A | 190 |
| | MIPR | NSWC/PHD/ CA | 1,159 | 0 | N/A | 0 | N/A | 1,159 |
| | MIPR | NAWC/PM/ CA | 610 | 0 | N/A | 0 | N/A | 610 |
| | MIPR | NSWC/Corona/ CA | 735 | 0 | N/A | 0 | N/A | 735 |
| | MIPR | NSWC/DD/ VA | 368 | 0 | N/A | 0 | N/A | 368 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| | SS/CPFF | JHU/APL/ MD | 260 | 0 | N/A | 0 | N/A | 260 |
| | Various | Various | 401 | 0 | N/A | 0 | N/A | 401 |
| Subtotal Test and Evaluation | | | 3,723 | 0 | | 0 | | 3723 |

**Remarks**

## IV. Management Services Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 | | | 123,058 | 0 | | 0 | | 123,058 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 | 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 |
| **Development Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ship System and VLS Critical Design Review | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲▬▲ | Complete Activity | △▬△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Development Milestones** | | | | | | | |
| Ship System and VLS Critical Design Review | 2Q | | | | | | |

FY05 events shown only; the full JCR/SCD schedule is shown in PE 0603892C, BMD Aegis.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0602 Program-Wide Support | 122,395 | 35,626 | 49,121 | 81,890 | 30,508 | 72,077 | 33,539 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## A. Mission Description and Budget Item Justification

Program-Wide Support provides funding for common non-headquarters support functions across the entire program such as strategic planning, program integration, business management, 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 outside services and support contractors that augment government staff in these areas. Many of these costs reside within the Missile Defense Agency 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, although some functions and costs within this program element are performed by MDA employees assigned within the National Capital Region (NCR). Other costs included herein provide facility capabilities for MDA Executing Agent locations, such as physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses. Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Civilian Salaries and Support | 122,395 | 35,626 | 49,121 |
| RDT&E Articles (Quantity) | 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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| Total PE Cost | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 |
| 0710 Airborne Laser (ABL) Block 2004 | 447,934 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0810 Airborne Laser (ABL) Block 2006 | 0 | 454,677 | 595,425 | 0 | 0 | 0 | 0 |
| 0910 Airborne Laser (ABL) Block 2008 | 0 | 0 | 2,660 | 542,559 | 417,425 | 0 | 0 |
| 0010 Airborne Laser (ABL) Block 2010 | 0 | 0 | 0 | 0 | 0 | 416,425 | 647,764 |
| 0602 Program-Wide Support | 24,609 | 16,996 | 33,531 | 34,883 | 38,375 | 40,239 | 39,284 |

## A. Mission Description and Budget Item Justification

### A.1 System Element Description

Program Element 0603883C, Boost Defense Segment (BDS), funds the Airborne Laser (ABL) element portions of the Ballistic Missile Defense System's (BMDS') Blocks 2004, 2006, 2008, and 2010 and other mission area investment activities. The ABL's purpose is to protect the United States, United States forces, allies, friends and areas of vital interest from ballistic missile threats. 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.

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

The primary mission of ABL is to significantly increase the overall defensive capability of the BMDS by reducing the number of targets faced by successive defenders and addressing certain threats difficult for other elements to counter. ABL is the lead boost defense element within the BMDS, uniquely adding the capability to destroy ballistic missiles from theater range to ICBM range during the boost phase. By destroying the missile in boost it also negates the threat prior to their ability to deploy multiple reentry vehicles, submunitions, or countermeasures. Additionally, warheads, and engagement debris, do not reach the intended target areas. Furthermore, there is a high probability that the threat missile debris will fall within the hostile country's own territory, serving as a deterrent and reducing the debris¿ possible affect on protected areas and assets. Secondary missions provide additional threat protection by including early ballistic missile launch warning, launch site location, cueing to BMDS, and impact point location. Detection and tracking during the boost phase significantly reduces the uncertainty in estimating the launch point location and therefore will enhance the probability of a successful counterstrike against aggressor's missile launchers. ABL's sensor capability further increases the robustness of the BMDS by enhancing the performance of other elements. In addition, the unique and revolutionary aspect of ABL's mobility and directed energy weapon add up to a weapon system that creates multiple additional complexities for those trying to develop or employ missile threats.

As an airborne platform, ABL also adds unique deployment flexibility to address a threat concentration and to more readily adapt the overall protection afforded by the BMDS to evolving situations that may threaten the US or its allies. Without ABL, MDA would have to address in much

less viable ways both the further proliferation of threats that is expected and the likely adversary counters to the other BMDS elements. It would also severely impact the development of this transformational technology for other applications with a commensurate negative impact on providing the warfighter a true revolutionary technology for changing how wars are fought. In summary, the ABL is a unique and critical element of the BMDS.

## A.3 Major System Element Goals

The ABL program is designing, building, and testing an air-based laser system to acquire, track, and kill ballistic missiles in their boost phase. ABL integrates three major subsystems (Laser; Beam Control; and Battle Management, Command, Control, Communications, Computers and Intelligence (BMC4I)) into a modified commercial Boeing 747 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 (KPs) are determined and validated on a calendar year basis, and are taken from major milestones within the program for that year.

Some of the major overall program milestones 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 integration of the High Energy Laser (HEL) segment
- Completion of flight testing of the Beam Control/Fire Control (BC/FC) segment
- Completion of integration and ground testing of the ABL weapon system combining the laser, BC/FC, and battle management segments
- Successful demonstration of ABL lethality against a boosting ballistic missile (shoot down)
- Flight testing to expand the ABL weapon system performance envelope

Each milestone supports decisions to complete subsequent program milestones. In FY09, the program starts the second key component in ABL's capability-based evolutionary acquisition strategy by initiating the development of the 2nd ABL weapon system which will focus on weaponization, targeted performance improvements, and affordability.

## A.4 Major Events Schedule and Description

| Major Event | Project | Timeframe | Description |
|---|---|---|---|
| **Flight Test** | | | |
| **Testing Milestones** | | | |
| First Flight with BCFC system | 0710 | 1Q FY 2005 | • CY04 Knowledge Point |
| Perform 1st In-Flight Atmospheric Comp (KP) | 0810 | 1Q FY 2007 | • CY06 Knowledge Point |
| **Program Milestones** | | | |
| System Demonstration | 0910 | 1Q FY 2009 | |

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603883C Ballistic Missile Defense Boost Defense Segment** |

| Major Event | Project | Timeframe | Description |
|---|---|---|---|
| **Ground Test** | | | |
| **Testing Milestones** | | | |
| First Light | 0710 | 1Q FY 2005 | • CY04 Knowledge Point |
| Complete Laser Module Tests in Laser SIL (KP) | 0810 | 1Q FY 2006 | • CY05 Knowledge Point |
| Complete Low Power Active Ground Test (KP) | 0810 | 4Q FY 2006 | • CY06 Knowledge Point |
| Complete Laser Optics Subsys Refurb & Test (KP) | 0810 | 1Q FY 2007 | • CY06 Knowledge Point |
| Complete Low Power Active System Int. & Test | 0810 | 2Q FY 2007 | |
| Complete System Ground Tests | 0910 | 3Q FY 2008 | |
| **Other** | | | |
| **Testing Milestones** | | | |
| Complete Planned Link-16 tests | 0710 | 3Q FY 2005 | |
| Passive LP System Readiness and Flight Tests | 0710 | 4Q FY 2005 | • CY05 Knowledge Point |
| **Program Milestones** | | | |
| Laser Installation on Aircraft | 0810 | 2Q FY 2007 - 4Q FY 2007 | |

| B. Program Change Summary | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Previous President's Budget (FY 2006 PB) | 476,179 | 483,863 | 648,728 |
| Current President's Budget (FY 2007 PB) | 472,543 | 471,673 | 631,616 |
| Total Adjustments | -3,636 | -12,190 | -17,112 |
| Congressional Specific Program Adjustments | 0 | 7,000 | 0 |
| Congressional Undistributed Adjustments | 0 | -19,190 | 0 |
| Reprogrammings | 3,899 | 0 | 0 |
| SBIR/STTR Transfer | -7,535 | 0 | 0 |
| Adjustments to Budget Years | 0 | 0 | -17,112 |

FY05 reduction of $3.636 million includes the SBIR/STTR transfer and MDA reprogrammings.

FY06 reduction of $12.190 million includes Congressional specific program adjustments ($7.0 million for Airborne Laser) and a portion of the MDA Congressional undistributed adjustment.

FY07 reduction of $17.112 million is the result of programmatic changes to refocus the current fiscal environment on near term knowledge points before planning to invest in the second aircraft and overhead/infrastructure reductions.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0710 Airborne Laser (ABL) Block 2004 | 447,934 | 0 | 0 | 0 | 0 | 0 | 0 |
| RDT&E Articles Qty | 5 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: FY05 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.*

## A. Mission Description and Budget Item Justification

The ABL Block 2004 effort continued 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 developed in Block 2004 represents a unique, dedicated, highly mobile weapon system element for the overall BMDS. ABL will provide the commander with an air-based revolutionary weapon system. This system will possess unique capabilities supporting the multi-tiered BMDS concept, providing boost phase defense against ballistic missile threats. The ABL Block 2004 effort capitalized on the technical progress achieved to date in integration and test of the 1st ABL weapon system test bed. The primary focus accomplished key near-term knowledge points while maintaining the overall objective of achieving a lethal demonstration at the earliest possible date. Efforts are in place to reduce the risk and uncertainties associated with follow-on steps to shoot down. The Block 2004 program additionally provided continued ABL-specific technology maturation, integration and testing for future blocks; provided continued infrastructure sustainment to maintain and improve domestic capability to produce advanced optics and sensors for high-energy laser systems; and provided international cooperation exploration. The initial ABL program definition and risk reduction (PDRR) 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. 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 FY06, ABL remains 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 BMDS.

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| 1st ABL | 363,693 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Continued to develop the 1st ABL weapon system testbed. This included ground integration and testing of a flight worthy weapons class laser. This also included significant efforts advancing the integration and testing of the Beam Control/Fire Control (BC/FC) segment on the aircraft. Efforts

resulted in a BC/FC segment ready to begin active testing on the aircraft, as well as repeated demonstration of the ability of the weapons-class laser to achieve power and duration necessary for lethal demonstration and operational capability.

FY05 Accomplishments:

- Completed first flight of the ABL with the Beam Control System to include unstow and pointing of the main optics proving their packaging, integration and air worthiness
- Completed demonstrations of the passive portions of the beam control system to operate as required during flight testing
- Completed first light of the full laser within the laser System Integration Laboratory (SIL) demonstrating 6 modules working together to form the highest power Chemical Oxygen Iodine Laser (COIL) laser ever
- Continued High Energy Laser (HEL) SIL testing to verify operation of all support systems
- Completed planned Link-16 implementation, providing for integration into the BMDS
- Conducted Common Cost Methodology Working Group (CCMWG) efforts in support of ABL life cycle cost estimates, and affordability modeling. This effort incorporated the use of Block 2004 actual costs for estimating a 2nd ABL unit
- Conducted international cooperation efforts to investigate future potential benefits to ABL
- Initiated phased implementation of MDA BMDS security compliance to continue improving the program's security stance

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Government Activities | 75,466 | 0 | 0 |
| RDT&E Articles (Quantity) | 5 | 0 | 0 |

The Block 2004 government activities included 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 (Advisory and Assistance Services, System Engineering Technical Assistance, Federally Funded Research and Development Center), and System Program Office (SPO) administrative operating support.

FY05 Accomplishments:
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.

The delivery of 5 Foreign Military Assets (FMA) was completed in FY05.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603883C Ballistic Missile Defense Boost Defense Segment |

- Completed planned AF Link-16 testing
- Supported ground and flight test operations out of Edwards AFB
- Provided atmospheric decision aid support to ABL flight testing
- Provided diagnostics and targets to support ABL flight testing
- Supported MDA Engagement Sequence Group (ESG) management activities
- Continued modeling and simulation activities to support ABL development and incorporation within the BMDS
- Continued program operations for managing the execution of the ABL program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Infrastructure Improvement | 4,777 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Conducted investments to enhance the ABL-specific industrial base with the focus on large optics, optical coatings, sensors and targeted manufacturing shortfalls for a 2nd ABL weapon system.

FY05 Accomplishments:

- Continued improvements in process and process controls for coating large and small optics to increase quality and repeatability
- Continued optics fabrication and sustainment efforts
- Completed effort to improve Electron Bombarded Charged Couple Device (EBCCD) camera manufacturing yields and processes

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Technology Insertion | 3,998 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Developed promising technologies for possible incorporation in the 1st ABL weapon system after lethal demonstration, and for the 2nd ABL weapon system and later ABLs. Efforts have focused on technologies that will improve ABL lethality, reliability, and maintainability to improve ABL's contribution to the BMDS.

FY05 Accomplishments:

- Continued efforts to reduce optical jitter and improve beam control performance
- Continued project to develop a cryogenically cooled Yb:YAG illuminator laser and initiated form, fit, function illuminator concept definition
- Initiated program to develop EBCCD camera replacement prototype
- Continued effort to develop oxy fluoride glass for laser beam path windows

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
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## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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. Each knowledge 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 integration of the High Energy Laser (HEL) segment
- Completion of flight testing of the Beam Control Fire Control (BC/FC) segment
- Completion of integration and ground testing of the ABL weapon system combining the laser, BC/FC, and battle management segments
- Successful demonstration of ABL lethality against a boosting ballistic missile (shoot down)
- Flight testing to expand the ABL weapon system 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 2006 |
|---|---|
| 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 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 | 1,582,901 | 0 | N/A | 0 | N/A | 1,582,901 |
| **Infrastructure Improvement** | | | | | | | | |
| Contract | SS/MIPR | Multiple, i.e. Lockheed Martin/ Multiple, i.e. MD, CA | 17,597 | 0 | N/A | 0 | N/A | 17,597 |
| **Technology Insertion** | | | | | | | | |
| Contract | SS/MIPR | Multiple, i.e. Northrop Grumman, Lockheed Martin/ Multiple, i.e. CA | 25,405 | 0 | N/A | 0 | N/A | 25,405 |
| Subtotal Product Development | | | 1,625,903 | 0 | | 0 | | 1625903 |

**Remarks** Prior year totals reflect post transfer of ABL from an Air Force program to an MDA program. An FY05 $4.25M Congressional Add is included for international cooperation for the 1st ABL.

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 | 50,774 | 0 | N/A | 0 | N/A | 50,774 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Technical Support Costs | MIPR | Aerospace/ Kirtland AFB | 4,303 | 0 | N/A | 0 | N/A | 4,303 |
| Technical Support Costs | MIPR | Tecolote Research/ Kirtland AFB | 6,885 | 0 | N/A | 0 | N/A | 6,885 |
| Technical Support Costs | MIPR | MITRE/ Kirtland AFB | 1,434 | 0 | N/A | 0 | N/A | 1,434 |
| Government and Other Support Costs | C/FP | ABL SPO/ Kirtland AFB | 300 | 0 | N/A | 0 | N/A | 300 |
| Government and Other Support Costs | MIPR | AFRL/ TX, CA | 3,014 | 0 | N/A | 0 | N/A | 3,014 |
| Government and Other Support Costs | MIPR | AFRL/ Kirtland AFB | 1,395 | 0 | N/A | 0 | N/A | 1,395 |
| Government and Other Support Costs | MIPR | UDRI/ OH | 2,171 | 0 | N/A | 0 | N/A | 2,171 |
| Government and Other Support Costs | MIPR | AFRL/ Kirtland AFB | 2,534 | 0 | N/A | 0 | N/A | 2,534 |
| Government and Other Support Costs | MIPR | NAVAIR/ CA | 781 | 0 | N/A | 0 | N/A | 781 |
| Government and Other Support Costs | MIPR | AFRL/ Kirtland AFB | 1,395 | 0 | N/A | 0 | N/A | 1,395 |
| Government and Other Support Costs | MIPR | AFRL/ Kirtland AFB | 2,802 | 0 | N/A | 0 | N/A | 2,802 |
| Government and Other Support Costs | C/FP | ABL SPO/ Kirtland AFB | 1,116 | 0 | N/A | 0 | N/A | 1,116 |
| Government and Other Support Costs | MIPR | AFRL/ Kirtland AFB, MA | 2,511 | 0 | N/A | 0 | N/A | 2,511 |
| Government and Other Support Costs | C | ABL SPO/ Kirtland AFB | 5,581 | 0 | N/A | 0 | N/A | 5,581 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Government and Other Support Costs | C | ABL SPO/ Kirtland AFB | 7,255 | 0 | N/A | 0 | N/A | 7,255 |
| Government and Other Support Costs | MIPR | ACC/ VA | 2,791 | 0 | N/A | 0 | N/A | 2,791 |
| Government and Other Support Costs | C | ABL SPO/ Kirtland AFB | 307 | 0 | N/A | 0 | N/A | 307 |
| Government and Other Support Costs | MIPR | ABL SPO/ Kirtland AFB | 324 | 0 | N/A | 0 | N/A | 324 |
| Government and Other Support Costs | MIPR | ABL SPO/ Kirtland AFB | 1,105 | 0 | N/A | 0 | N/A | 1,105 |
| Government and Other Support Costs | C | ABL SPO/ Kirtland AFB | 6,217 | 0 | N/A | 0 | N/A | 6,217 |
| Government and Other Support Costs | C | ABL SPO/ Kirtland AFB | 1,674 | 0 | N/A | 0 | N/A | 1,674 |
| Subtotal Support Costs | | | 106,669 | 0 | | 0 | | 106669 |

**Remarks** Prior year totals reflect post transfer of ABL from an Air Force program to an MDA program.

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 | 58,900 | 0 | N/A | 0 | N/A | 58,900 |
| LFT&E-Lethality Baseline Tests | MIPR | AFRL/ Kirtland AFB | 27,846 | 0 | N/A | 0 | N/A | 27,846 |
| Target - Test Instrumentation | MIPR | Hanscom AFB, Peterson AFB | 53,876 | 0 | N/A | 0 | N/A | 53,876 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Subtotal Test and Evaluation | | | 140,622 | 0 | | 0 | | 140622 |

**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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Subtotal Management Services | | | | | | | | |

**Remarks**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 1,873,194 | 0 | | 0 | | 1,873,194 |

**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 2006 |
|---|---|
| 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 | 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 |
| **Testing Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| First Light | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| First Flight with BCFC system | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Complete Planned Link-16 tests | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | |
| Passive LP System Readiness and Flight Tests | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲— | Complete Activity | △— | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Testing Milestones** | | | | | | | |
| First Light | 1Q | | | | | | |
| First Flight with BCFC system | 1Q | | | | | | |
| Complete Planned Link-16 tests | 3Q | | | | | | |
| Passive LP System Readiness and Flight Tests | 4Q | | | | | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0810 Airborne Laser (ABL) Block 2006 | 0 | 454,677 | 595,425 | 0 | 0 | 0 | 0 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## A. Mission Description and Budget Item Justification

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. More specifically, the ABL program will continue preparations for installation of the High Energy Laser (HEL) onto the aircraft, as well as continuing testing of the integrated BC/FC, aircraft, and Battle Management (BMC4I) systems, to include active testing with the beacon and tracking illuminators.

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 aircraft. ABL also includes ABL-specific ground support equipment. ABL will provide the commander with an air-based revolutionary weapon system. This system will possess unique capabilities supporting the multi-tiered BMDS concept, providing boost phase defense against ballistic missile threats. 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 (KPs) for calendar year 2006 are:

- Complete Low Power Active Ground Test - To achieve this knowledge point the program will have to install, activate and demonstrate ground operation of the beacon and tracking illuminators, as well as demonstrate automated interoperation of the entire low-power system.
- Perform First In-Flight Atmospheric Compensation w/tracking illuminator laser (TILL) tracking & beacon illuminator laser (BILL) beacon - This knowledge point demonstrates the critical atmospheric compensation portion of the system in the air.
- Complete Laser Optics Subsystem Test - Completion of this knowledge point will signal that a major portion of the laser refurbishment is complete and that the first major laser subsystems are ready for installation on the aircraft.

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| 1st ABL | 0 | 392,413 | 512,844 |
| RDT&E Articles (Quantity) | 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. Air Vehicle Integration and Test (AVIT)

provides the main framework for integration of all aspects of the weapon system. The Integrated Product Teams (IPTs) are key to ensuring AVIT is able to effectively integrate all components of the weapon system. They provide expert engineering, analysis, and manufacturing associated with their respective system components. The IPTs are working together so that by the completion of FY06 we will have completed all known structural aircraft modifications needed for shoot down, and we will have completed active ground testing of the low-power portion of the weapon system. Additionally, we will have completed System Integration Laboratory (SIL) testing, will have the laser disassembled and begun refurbishment and retrofit of all high-energy laser (HEL) parts, and will have completed substantial laser provisioning in the aircraft. By the end of FY07, low-power system integration will be complete and the HEL integration will be well underway on the aircraft. An increase in funding occurs from FY06-FY07 mainly due to increased Air Vehicle Integration and Test (AVIT) activities at Edwards AFB, the initiation of the Service Life Extension Program (SLEP), spares purchases, Core Standards/Mission Assurance Implementation Plan (MAIP), and the implementation of amended classification guidance and protection plans.

FY06 Planned Program:

Laser ($72.5 million):
- Initiate refurbishment and retrofit of major laser subsystems & components
- Complete planned design, component fabrication, and support of laser provisions integration

Aircraft ($10.1 million):
- Complete engineering support, design, drawings for aircraft structural modifications
- Complete engineering support, design, drawings, for laser provisioning

Beam Control/Fire Control (BC/FC) ($51.7 million):
- Complete Low Power System Integration (LPSI) active ground tests
- Complete integration of BILL and TILL on the aircraft
- Initiate testing of active laser atmospheric compensation using the BILL return

Battle Management ($13.2 million):
- Complete software coding to support system ground test
- Continue software support of low-power flight tests
- Complete software and validation tests to support predictive avoidance certification
- Continue Active Ranging System (ARS) development

Air Vehicle Integration and Test ($213.7 million):

- Complete High Energy Laser (HEL) SIL testing
  - Demonstrate long-duration lasing capability in the SIL
  - Demonstrate repeated long duration lasing
  - Perform power-chemical characterization tests
- Complete laser System Integration Laboratory (SIL) disassembly
  - Remove laser components from the SIL
  - Ready laser components to begin refurbishment
- Complete planned aircraft modifications, laser provisioning and laser integration work
- Complete low-power system ground tests
  - Integrate tracking illuminator into the low-power system
  - Integrate the beacon illuminator into the low-power system
  - Demonstrate ground operation of the integrated low-power system in active mode
- Initiate low-power system flight tests

Program Management/System Engineering ($27.2 million):

- Continue System Engineering and Structural Integrity, Quality Assurance, Safety, Hardware and System Analysis and Integration
- Conduct baseline studies to capture 1st ABL baseline and identify required content and extent of ABL future improvement
- Conduct Common Cost Methodology Working Group (CCMWG) efforts in support of ABL life cycle cost estimates and affordability modeling

Other Support Activities ($4.0 million):

- Continue phased implementation of amended classification guidance and protection plans

FY07 Planned Program:

Laser ($50.2 million):

- Complete laser optics subsystem refurbishment and test
- Complete planned laser refurbishment and retrofits
- Initiate laser integration support on the aircraft

Aircraft ($11.4 million):
- Continue engineering support for aircraft structural modifications, laser provisioning, BC/FC upgrades and rework

Beam Control/Fire Control (BC/FC) ($32.6 million):
- Complete substantiation of acquisition pointing, and tracking with TILL
- Complete demonstration Surrogate High Energy Laser (SHEL) scoring with illuminator laser beacons
- Complete demonstration of first in-flight atmospheric compensation with TILL and BILL
- Complete substantiation of atmospheric compensation with TILL and BILL

Battle Management ($19.7 million):
- Complete software support of low-power flight tests
- Continue software support of weapon system integration and test
- Continue Active Ranging System (ARS) development

Air Vehicle Integration and Test ($261.0 million):
- Complete low-power flight tests
- Initiate integration of the laser into the 1st ABL weapon system
- Initiate laser systems activation
- Complete substantiation of atmospheric compensation with TILL and BILL in flight

Program Management/System Engineering ($39.9 million):
- Continue System Engineering and Structural Integrity, Quality Assurance, Safety, Hardware and System Analysis and Integration
- Conduct Common Cost Methodology Working Group (CCMWG) efforts in support of ABL life cycle cost estimates and affordability modeling
- Continue baseline studies to capture 1st ABL baseline and identify required content and extent of ABL future improvement

Other Support Activities ($98.0 million):
- Initiate Service Life Extension Program (SLEP), activities include; aircraft (engine wear and other maintenance), laser (valves and other plumbing, turbo pumps, gas generators, tanks), BC/FC (processors/cards, steering mirrors, illuminator diodes), BMC4I (processors/cards, Infrared Search and Track (IRST) components)
- Complete implementation of amended classification guidance and protection plans

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603883C Ballistic Missile Defense Boost Defense Segment** |

- Initiate core standards trade studies and Mission Assurance Implementation Plan (MAIP) in order to increase the likelihood of mission success in delivering a useful operational capability
- Initiate purchase of deployable ground support equipment and 1st ABL spares

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Infrastructure Improvement | 0 | 5,550 | 9,623 |
| RDT&E Articles (Quantity) | 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 current and future ABL weapon systems. Maintain an industrial base to ensure critical personnel, facilities and processes are available to meet future ABL requirements. Targeted improvements are in quality, schedule, effectiveness, affordability, reliability, sustainability, maintainability, robustness, flexibility, compatibility and provable ability. Provide a rapid response capability if a critical component is needed while addressing sparing and long lead needs. Funding requirements increased in FY07 due to additional optics sustainment efforts.

FY06 Planned Program:
- Continue sustainment of optics fabrication and coating capabilities
- Continue improvements to bulkhead window production capability
- Continue optical coatings process and chamber control improvements
- Continue to improve Electron Bombarded Charged Couple Device (EBCCD) camera designs

FY07 Planned Program:
- Continue sustainment of optics fabrication and coating capabilities
- Continue improvements to bulkhead window production capability
- Continue optical coatings process and chamber control improvements
- Initiate higher performing, lower risk conformal window coating processes

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 |
|---|---|---|---|
| Technology Insertion | 0 | 11,314 | 10,318 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Develop promising technologies for possible incorporation into the 1st ABL weapon system and later ABLs. Efforts will focus on technologies that will improve ABL lethality, reliability, maintainability and improve ABL's contribution to the BMDS. Provide technical/schedule/cost risk reduction for the 1st ABL and future blocks. Focus on critical performance risk items and areas for high-payoff to operational utility.

FY06 Planned Program:

- Continue efforts to reduce optical jitter and improve beam control performance
- Continue project to develop an enhanced illuminator laser
- Continue efforts to improve ABL's engagement capabilities
- Initiate surveillance sensor study to evaluate infrared search and track (IRST) follow-on options

FY07 Planned Program:

- Continue efforts to reduce optical jitter and improve beam control performance
- Continue to develop an enhanced illuminator laser
- Continue efforts to improve ABL's engagement capabilities
- Continue program to increase high energy laser power, efficiency, and operational regime
- Develop enhanced Electron Bombarded Charged Couple Device (EBCCD) sensor

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Direct Support Activities | 0 | 45,400 | 62,640 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The Block 2006 direct support 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 and live fire test and evaluation (LFT&E). The increase in funding for LFT&E from FY06 to FY07 is due to the increase in the number of target evaluations, initiation of efforts to evaluate alternate target aim-points and initiation of an aggressive full scale lethality evaluation testing process. The increase in funding for diagnostics/instrumentation is due to the purchase of diagnostics for post shoot down.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603883C Ballistic Missile Defense Boost Defense Segment** |

FY06 Planned Program:

Integrated Test Force (ITF) ($15.2 million):
- Support Low Power System Integration - Active (LPSI-A) ground and flight test activities at test ranges
- Support System Integration Lab (SIL) disassembly and refurbishment as well as Hangar 151 modification

Live Fire Test & Evaluation (LFT&E) ($12.7 million):
- Continue intelligence, lethality data collection, assessments and evaluations per Title 10 LFT&E requirements
- Develop modeling and simulation programs and integrate test data to identify compliance with the requirements

Diagnostics/Instrumentation ($17.5 million):
- Provide diagnostics to support ABL flight testing
- Be prepared to execute up to 3 Low-Power Missile Alternative Range Target Instrument (MARTI) launches for LPSI-A
- Continue development of Big Crow (NC-135) backup target board for in-flight testing with ABL aircraft

FY07 Planned Program:

Integrated Test Force (ITF) ($17.8 million):
- Support continued ground test activities at Edwards AFB
- Support integration of the High Energy Laser (HEL) into the ABL aircraft

Live Fire Test & Evaluation (LFT&E) ($17.9 million):
- Continue with survivability and vulnerability for Title 10 compliance documentation
- Initiate aggressive full scale lethality evaluation testing process to support CY08 shoot down

Diagnostics/Instrumentation ($26.9 million):
- Provide diagnostics and long-lead targets acquired through MDA/TC which will support later ABL flight testing
- Continue to develop and acquire High-Power MARTI for High Power System Integration (HPSI) testing

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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. The ABL Block 2006 effort will implement improvements learned in ABL Block 2004 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.

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **1st ABL** | | | | | | | | |
| Prime Contract | C/CPAF | Boeing Defense & Space Group/ Seattle, WA | 0 | 355,677 | 1/4Q | 378,285 | 1/4Q | 733,962 |
| Service Life Extension Program | C/CPAF | Boeing Defense & Space Group/ Seattle, WA | 0 | 0 | 1/4Q | 55,400 | 1/4Q | 55,400 |
| BMDS Security | C/CPAF | Boeing Defense & Space Group/ Seattle, WA | 0 | 4,000 | 1/4Q | 11,300 | 1/4Q | 15,300 |
| 1st ABL Spares | C/CPAF | Boeing Defense & Space Group/ Seattle, WA | 0 | 0 | 1/4Q | 21,800 | 1/4Q | 21,800 |
| BMDS Core Stds/MAIP | C/CPAF | Boeing Defense & Space Group/ Seattle, WA | 0 | 0 | 1/4Q | 6,100 | 1/4Q | 6,100 |
| Deployable Ground Support | C/CPAF | Boeing Defense & Space Group/ Seattle, WA | 0 | 0 | 1/4Q | 3,400 | 1/4Q | 3,400 |
| Technical Support Costs | C/CPAF | Northrop Grumman/Kirtland AFB, Various | 0 | 19,136 | 1/4Q | 22,224 | 1/4Q | 41,360 |
| FFRDC Support | MIPR | Aerospace/MITRE/ Kirtland AFB | 0 | 2,350 | 1/4Q | 2,500 | 1/4Q | 4,850 |
| Technical Support Costs | MIPR | Tecolote Research/Kirtland AFB | 0 | 2,550 | 1/4Q | 2,700 | 1/4Q | 5,250 |
| Government and Other Support Costs | C/FP | ABL SPO/Kirtland AFB | 0 | 330 | 1/4Q | 347 | 1/4Q | 677 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Government and Other Support Costs | MIPR | AFRL/Kirtland AFB, MA, Multiple | 0 | 2,690 | 1/4Q | 2,826 | 1/4Q | 5,516 |
| Government and Other Support Costs | MIPR | UDRI/OH | 0 | 428 | 1/4Q | 449 | 1/4Q | 877 |
| Government and Other Support Costs | MIPR | NAVAIR/CA | 0 | 154 | 1/4Q | 162 | 1/4Q | 316 |
| Government and Other Support Costs | C/FP | ABL SPO/Kirtland AFB | 0 | 220 | 1/4Q | 231 | 1/4Q | 451 |
| Government and Other Support Costs | MIPR | ABL SPO/Kirtland AFB/Multiple | 0 | 4,328 | 1/4Q | 4,542 | 1/4Q | 8,870 |
| Government and Other Support Costs | MIPR | ACC/VA | 0 | 550 | 1/4Q | 578 | 1/4Q | 1,128 |
| **Infrastructure Improvement** | | | | | | | | |
| Contract | SS/MIPR | Multiple, i.e. Lockheed Martin/ Multiple, i.e. MD, CA | 0 | 5,200 | 1/4Q | 8,300 | 1/4Q | 13,500 |
| Technical Support Costs | C/CPAF | Northrop Grumman/Kirtland AFB, Multiple | 0 | 350 | 1/4Q | 1,323 | 1/4Q | 1,673 |
| **Technology Insertion** | | | | | | | | |
| Contract | SS/MIPR | Multiple, i.e. Northrop Grumman, Lockheed Martin/ Multiple, i.e. MD,CA | 0 | 10,600 | 1/4Q | 8,900 | 1/4Q | 19,500 |
| Technical Support Costs | C/CPAF | Northrop Grumman/Kirtland AFB, Multiple | 0 | 714 | 1/4Q | 1,418 | 1/4Q | 2,132 |
| Subtotal Product Development | | | 0 | 409,277 | | 532,785 | | 942062 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603883C Ballistic Missile Defense Boost Defense Segment** |

**Remarks:** Operating support costs have been allocated to the activities they support.

## II. Support Costs Cost ( $ in Thousands )

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

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Direct Support Activities** | | | | | | | | |
| Integrated Test Force | MIPR | AFFTC/ Edwards AFB | 0 | 15,200 | 1/4Q | 17,800 | 1/4Q | 33,000 |
| LFT&E-Lethality Baseline Tests | MIPR | Kirtland AFB | 0 | 12,700 | 1/4Q | 17,900 | 1/4Q | 30,600 |
| Diagnostics/Instrumentation | MIPR | Hanscom AFB, Peterson AFB | 0 | 17,500 | 1/4Q | 26,940 | 1/4Q | 44,440 |
| Subtotal Test and Evaluation | | | 0 | 45,400 | | 62,640 | | 108040 |

## IV. Management Services Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 | 454,677 | | 595,425 | | 1,050,102 |

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 | 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 |
| **Testing Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Complete Laser Module Tests in Laser SIL (KP) | | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | |
| Complete Low Power Active Ground Test (KP) | | | | | | | | △ | | | | | | | | | | | | | | | | | | | | |
| Perform 1st In-Flight Atmospheric Comp (KP) | | | | | | | | | △ | | | | | | | | | | | | | | | | | | | |
| Complete Laser Optics Subsys Refurb & Test (KP) | | | | | | | | | △ | | | | | | | | | | | | | | | | | | | |
| Complete Low Power Active System Int. & Test | | | | | | | | | | △ | | | | | | | | | | | | | | | | | | |
| **Program Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Laser Installation on Aircraft | | | | | | | | | | △ | ▬ | △ | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲▬▲ | Complete Activity | △▬△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Testing Milestones** | | | | | | | |
| Complete Laser Module Tests in Laser SIL (KP) | | 1Q | | | | | |
| Complete Low Power Active Ground Test (KP) | | 4Q | | | | | |
| Perform 1st In-Flight Atmospheric Comp (KP) | | | 1Q | | | | |
| Complete Laser Optics Subsys Refurb & Test (KP) | | | 1Q | | | | |
| Complete Low Power Active System Int. & Test | | | 2Q | | | | |
| **Program Milestones** | | | | | | | |
| Begin SIL Disassembly and Parts Refurbishment | | 1Q | | | | | |
| Integrate TILL and BILL on Aircraft | | 3Q | | | | | |
| Complete A/C Modifications, Laser Provisioning | | 4Q | | | | | |
| Aircraft Return to Edwards AFB | | | 2Q | | | | |
| Laser Installation on Aircraft | | | 2Q-4Q | | | | |
| A/C Residual Provisioning and Mods/BCFC Upgrades | | | 2Q-4Q | | | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0910 Airborne Laser (ABL) Block 2008 | 0 | 0 | 2,660 | 542,559 | 417,425 | 0 | 0 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## A. Mission Description and Budget Item Justification

The ABL Block 2008 continues the spiral development of the ABL for future integration of its capabilities into the BMDS. This is essential to provide a robust boost phase defense capability that dramatically complicates the effort of any potential aggressor to threaten or attack the United States' interests with the use of ballistic missiles. The key component of this spiral activity is the 1st ABL Weapon System test bed. The 1st ABL advances and matures the technology as well as addresses the challenge of integration into a complete weapon system. The weapon system flight testing will culminate in a lethal demonstration of the weapon system. Once lethal demonstration is complete, additional testing to include envelope expansion is planned. The 1st ABL will also provide a flying asset for advancing capability of future ABLs through technology and operations improvement. This system will possess unique capabilities supporting the multi-tiered BMDS concept, providing boost phase defense against ballistic missile threats. To this end, the ABL Block 2008 effort furthers ground and flight testing of the 1st ABL weapon system testbed. The Block 2008 effort continues the ABL-specific technology and infrastructure sustainment efforts. The Block 2008 effort provides for enhancement of BMDS integration and the initiation of future operational ground support development activities. The Block 2008 program will conduct studies and establish the capabilities baseline for an advanced (robust, supportable, and producible) 2nd ABL weapon system.

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Targets | 0 | 0 | 2,660 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort provides the Missile Defense Agency with ballistic missile target hardware, target range support, logistics support, target integration, and associated launch services to support ABL Block 2008 flight tests, as well as other system wide tests to support the development of the Ballistic Missile Defense System.

FY07 Planned Program:

- Refurbish and transport Lance missile assets for LPSI-A (up to 6)
- Integrate and launch Lance missiles for LPSI-A (up to 6)
- Post mission analysis

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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. 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. The Block 2008 effort provides for enhancement of BMDS integration and the initiation of ground support. In FY09, 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.

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 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 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Targets** | | | | | | | | |
| Targets | MIPR | Multiple | 0 | 0 | N/A | 2,660 | 1/4Q | 2,660 |
| Subtotal Test and Evaluation | | | 0 | 0 | | 2,660 | | 2660 |

**Remarks**

## IV. Management Services Cost ( $ in Thousands )

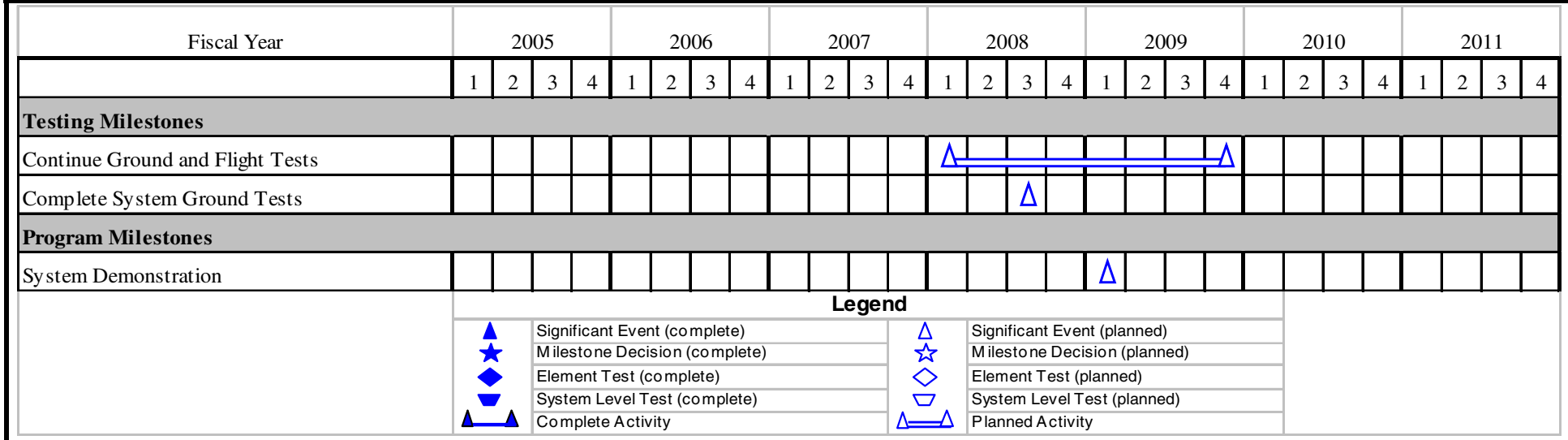
| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Subtotal Management Services | | | | | | | | |

**Remarks**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 0 | 0 | | 2,660 | | 2,660 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603883C Ballistic Missile Defense Boost Defense Segment** |



| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Testing Milestones** | | | | | | | |
| Continue Ground and Flight Tests | | | | 1Q-4Q | 1Q-4Q | | |
| Complete System Ground Tests | | | | 3Q | | | |
| **Program Milestones** | | | | | | | |
| System Demonstration | | | | | 1Q | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0010 Airborne Laser (ABL) Block 2010 | 0 | 0 | 0 | 0 | 0 | 416,425 | 647,764 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## A. Mission Description and Budget Item Justification

The ABL Block 2010 continues the spiral development of the ABL for future integration of its capabilities into the BMDS. This is essential to provide a robust boost phase defense capability that dramatically complicates the effort of any potential aggressor to threaten or attack the United States' interests with the use of ballistic missiles. The two key components of this spiral activity are the 1st ABL Weapon System test bed and the 2nd ABL Weapon System. It will also provide a flying asset for advancing capability of future ABLs through technology and operations improvement. The 2nd ABL effort focuses on developing and producing an ABL that will demonstrate a capability that is operationally significant with a baseline that is robust, reliable, and reproducible in order to support an eventual production decision. To this end, the ABL Block 2010 effort includes evaluations of the 1st ABL 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 continues trade studies and capability baseline efforts for defining the 2nd ABL weapon system leading to completion of a System Requirements Review. It then transitions the 2nd ABL efforts to the system design activities necessary to complete a System Design Review and support subsystem design work for a Preliminary Design Review. Additionally, it initiates the acquisition activities for the purchase of the 2nd Boeing 747 airframe. ABL-specific technology maturation and infrastructure improvement also continues. The increase in funding in FY10 and FY11 is due to the additional development efforts for the 2nd ABL weapon system.

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## 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 program also continues trade studies and then transitions emphasis to design activities and initiates the acquisition of the 2nd Boeing 747 airframe (the green aircraft). ABL-specific technology maturation and infrastructure improvement also continues.

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 | 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 |
| **Testing Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Continued Flight and Ground Tests | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲——▲ | Complete Activity | △——△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0602 Program-Wide Support | 24,609 | 16,996 | 33,531 | 34,883 | 38,375 | 40,239 | 39,284 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## A. Mission Description and Budget Item Justification

Program-Wide Support provides funding for common non-headquarters support functions across the entire program such as strategic planning, program integration, business management, 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 outside services and support contractors that augment government staff in these areas. Many of these costs reside within the Missile Defense Agency 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, although some functions and costs within this program element are performed by MDA employees assigned within the National Capital Region (NCR). Other costs included herein provide facility capabilities for MDA Executing Agent locations, such as physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses. Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Civilian Salaries and Support | 24,609 | 16,996 | 33,531 |
| RDT&E Articles (Quantity) | 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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| Total PE Cost | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 |
| 0811 Ballistic Missile Defense Radars Block 2006 | 271,464 | 234,703 | 222,511 | 84,993 | 102,545 | 0 | 0 |
| 0911 Ballistic Missile Defense Radars Block 2008 | 0 | 38,745 | 276,126 | 470,808 | 404,233 | 184,883 | 160,959 |
| 0011 Ballistic Missile Defense Radars Block 2010 | 2,250 | 180 | 7,061 | 18,530 | 123,779 | 129,318 | 47,992 |
| 0812 Space Tracking and Surveillance System (STSS) Block 2006 | 248,086 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0012 Space Tracking and Surveillance System (STSS) Block 2010 | 42,616 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0602 Program-Wide Support | 2,777 | 4,540 | 8,812 | 15,064 | 16,825 | 12,163 | 11,398 |
| | | | | | | | |
| Amount Included in PE 0904903D | 0 | 0 | 0 | -259,670 | -337,825 | -201,570 | -148,283 |
| Total PE Cost Reflected in R-1 | 567,193 | 278,168 | 514,510 | 329,725 | 309,557 | 124,794 | 72,066 |

*Starting in FY06 funding for the Space Tracking and Surveillance System (STSS) effort is contained within the Space Tracking and Surveillance System (0603893C) Program Element.*

## A. Mission Description and Budget Item Justification

The Sensors PE's mission is to develop, acquire, field and operate BMDS sensors utilizing the Block approach to deliver increasing BMDS capabilities. The BMDS architectural objectives are to enhance sensor synergy, close sensor coverage gaps and expand the Engagement Sequence Group (ESG) possibilities for BMDS. Sensor data is used to detect, track, and discriminate ballistic missile threats; to control interceptors; and to support kill assessment and re-targeting. The Sensor elements in this PE have been developed in coordination with MDA Systems Engineering. Fielding of these sensors will occur in conjunction with BMDS blocks: Block 2006 (Project 0811), Block 2008 (Project 0911), and Block 2010 (Project 0011). 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. Sensor networking and data fusion are coordinated efforts between MDA C2BMC and the Sensors PE. This strategy will minimize gaps in sensor coverage to improve track continuity and situational awareness.

## A.1 System Element Description

The Sensors PE will add four Forward Based X-Band Radar - Transportability (FBX-Ts) to the BMDS sensor architecture. The FBX-T is a phased array radar capable of search, track, and discrimination of ballistic missiles and provides fire control quality data to the BMDS. The radar leverages the THAAD radar's hardware design and incorporates the Hercules Algorithms to accomplish it's new role as a forward-based radar.

Detection and tracking during the boost phase significantly reduces the uncertainty in target discrimination and reaction time, increasing the BMDS's probability of a successful engagement. Adding Mechanical Steering Kits (MSKs) to these radars enables FBX-Ts to rotate the radar and increases BMDS sensor coverage. Deploying an Adjunct Sensor with the FBX-T will extend tracking/discrimination ranges and support target hand-off to midrange sensors (enables BMDS to close sensor gaps between some forward and mid range sensors to provide continuous tracking and discrimination). Evolving radar configurations will use additional algorithms and provide enhanced capabilities for Block 2008 and beyond. The Sensors PE will validate Hercules forward-based algorithms and other algorithms using the FBX-T Testbed Radar (i.e. TPS-X, a prototype to the FBX-T). The TPS-X allows for testing X-Band algorithms in a live environment before incorporating them in other BMDS X-Band radars. TPS-X significantly reduces the development risk to these radars and ensures the algorithms will enhance BMDS search, track and discrimination capabilities on ballistic missiles in all phases of flight (boost, midcourse and terminal).

The Thule Early Warning Radar (EWR) is a phased array UHF radar capable of search , track and target classification. The Sensors PE will provide upgrades to EWR located at Thule Air Base, Greenland. These upgrades will include hardware and software modifications to enhance processing capabilities and integrate the Thule UEWR into the BMDS Senor architecture as a midcourse sensor.

The Sensors PE is leveraging the use of external sensors to assist in missile defense engagements. External sensors refers to sensors that are not part of the BMDS but can provide useful cueing, track and/or discrimination data to BMDS. The Sensors PE will use an external sensors laboratory to capture the data from external sensors, correlate and fuse the useful data, and then provide it to BMDS via an interface with C2BMC. This process will allow BMDS to demonstrate the ability to utilize External Sensors in Engagement Sequence Groups.

The Sensors PE was provided a Congressional Plus up in FY05 and FY06 for the Airborne Infrared Surveillance (AIRS) program and in FY05 for a rocket plume signatures study. AIRS is used to evaluate the feasibility of using EO/IR Sensor capabilities to enhance BMDS engagement sequence group options.

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

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. 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 high probability of success.

Locating the FBX-T's near potential threats (e.g. far-east, middle-east) gives BMDS early track and discrimination capability on missiles in their boost phase and transition to midcourse. Having four FBX-T radars that are transportable gives the BMDS the ability to move the sensors to respond

to changes in geographical threats. Mechanical Steering Kits and Adjunct Sensors improve the FBX-T's ability to adapt to and operate in a variety of geographical locations. Deploying an Adjunct Sensor in conjunction with an FBX-T extends the tracking and discrimination range where needed to provide continuous sensor coverage between the forward-based radar and a midcourse sensor.

The Thule upgraded EWR will be used to provide coverage from asymmetric threats and ICBMs in the midcourse phase of flight. Together with other BMDS sensors the upgrades will help enable continuous tracking and discrimination on ballistic missile threats and provide BMDS with additional Engagement Sequence Group (ESG) possibilities.

External Sensors contribute to the BMDS layered approach to sensors that includes diversity in spectra, basing modes and technologies. The External Sensors and other BMDS track data provide new opportunities for data fusion to improve discrimination and situational awareness. The External Sensor data provides for new ESG's that have the potential to enhance the performance of the BMDS.

**A.3 Major System Element Goals**

MDA sensors activities are focused on: 1) develop, upgrade, integrate, field, and verify sensors within the BMDS sensor network; 2) provide BMDS sensors sustainment and Warfighter (Combatant Commanders) support; 3) enhance the performance of the BMDS by extending sensor coverage and accuracy provided by a network of layered sensors.

Block 2006
- Develop FBX-T #1 and deploy
- Deliver FBX-T #2

Block 2008
- Deliver FBX-T#3 and #4
- Develop Adjunct Sensor #1
- Upgrade Thule radar to UEWR configuration

Block 2010
- Deliver Adjunct Sensor #2
- Integrate External Sensor Data into BMDS

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

## A.4 Major Events Schedule and Description

| Major Event | Project | Timeframe |
|---|---|---|
| **Contract Activity** | | |
| **Acquisition Milestones** | | |
| Award FBX-T CLS Contract | 0811 | 2Q FY 2005 |
| Thule Upgrade Contract Award | 0911 | 3Q FY 2006 |
| Award Adjunct Sensor Contract | 0911 | 1Q FY 2007 |
| Award Mechanical Steering Kit (MSK) Contract | 0911 | 1Q FY 2007 |
| **Other** | | |
| **Testing Milestones** | | |
| FBX-T #1 Integration with BMDS at VAFB | 0811 | 3Q FY 2005 - 1Q FY 2006 |
| FBX-T #2 Integration with BMDS at VAFB | 0811 | 2Q FY 2007 - 4Q FY 2007 |
| Thule Certification | 0911 | 4Q FY 2009 |
| **Program Milestones** | | |
| FBX-T #1 Operational | 0811 | 4Q FY 2006 |
| FBX-T #2 Operational | 0811 | 1Q FY 2008 |
| FBX-T #3 Operational | 0911 | 2Q FY 2009 |
| FBX-T #4 Operational | 0911 | 2Q FY 2010 |

| B. Program Change Summary | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Previous President's Budget (FY 2006 PB) | 577,297 | 529,829 | 995,711 |
| Current President's Budget (FY 2007 PB) | 567,193 | 278,168 | 514,510 |
| Total Adjustments | -10,104 | -251,661 | -481,201 |
| Congressional Specific Program Adjustments | 0 | -230,547 | 0 |
| Congressional Undistributed Adjustments | 0 | -21,114 | 0 |
| Reprogrammings | -833 | 0 | 0 |
| SBIR/STTR Transfer | -9,271 | 0 | 0 |
| Adjustments to Budget Years | 0 | 0 | -481,201 |

FY05 reduction of $10.104 million includes the SBIR/STTR transfer and MDA reprogrammings.

FY06 reduction of $251.661 million includes the Congressionally directed transfer of the Space Surveillance and Tracking System to a unique Program Element (PE #0603893C) and a portion of the MDA Congressional undistributed adjustment.

FY07 reduction of $481.201 million follows through with the Space Surveillance and Tracking System transfer and includes overhead/infrastructure reductions.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0811 Ballistic Missile Defense Radars Block 2006 | 271,464 | 234,703 | 222,511 | 84,993 | 102,545 | 0 | 0 |
| RDT&E Articles Qty | 1 | 0 | 1 | 0 | 0 | 0 | 0 |

*Note: RDT&E Articles: Two FBX-T radars will be delivered under Block 2006. Acquisition of one radar, FBX-T #1, was initiated in FY03 and delivered in FY05 with CR1, search and track functionality. Acquisition of FBX-T #2 radar was initiated in FY04 for delivery in FY07.*

## A. Mission Description and Budget Item Justification

The Ballistic Missile Defense Radars Block 2006 (Project 0811) effort is mostly focused on the Forward Based X-Band Radar-Transportable (FBX-T). Additional Block 2006 efforts include operation of the TPS-X test bed asset, operations and sustainment activities, test and evaluation efforts, and AIRS. 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.

Block 2006 efforts include:

- Availability for overseas deployment to Japan of the first Forward Based X-Band Radar-Transportable (FBX-T #1);
- Production and deployment planning of the second Forward Based X-Band Radar-Transportable (FBX-T #2);
- Contractor Logistics Support (CLS) contract to operate and sustain the deployed FBX-T Radars; and
- Implement with the MDA Battle Management/Command and Control Directorate (BC) and other MDA Elements sensor netting.

Through FY07, Block 2006 funds primarily support development and production of two FBX-Ts. The out year funds will provide for CLS support to all FBX-Ts through FY09 with the increased funding in FY09 reflecting the acquisition of FBX-T depot spares.

The FBX-T is a high-resolution, X-band, phased array radar . It includes modified software algorithms for tracking and discrimination from a forward based perspective. The radar will have a direct interface with the BMDS C2BMC. The radar will perform surveillance autonomously or as cued by other sensors, and it will acquire, track and discriminate threat missiles and missile components.

Four FBX-T's will be developed and deployed to protect the United States from Intercontinental Ballistic Missiles (ICBMs) and medium range threats (3rd and 4th radars will be Block 2008 assets).

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603884C Ballistic Missile Defense Sensors |

Advanced capabilities will be added through upgrades and improvement programs via a series of spiral software enhancements. FBX-T forward-based discrimination enhancements will be added in Block 2006 as part of the BMDS Test Bed.

A Contractor Logistics Support (CLS) contract will be used to deploy, operate, and sustain the radars.

Block 2006 efforts include investigation of Electro-Optical/Infrared (EO/IR) sensors. The program's primary objective is to evaluate the AIRS ability to operate as the primary sensor in an Engagement Sequence Group. This is a congressionally directed program with funding in FY05.

**B. Accomplishments/Planned Program**

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| FBX-T Basic Program (includes FBX-T #1) | 133,954 | 80,577 | 62,538 |
| RDT&E Articles (Quantity) | 1 | 0 | 0 |

The basic FBX-T program includes development of the first FBX-T with software Capability Release 1 (CR1) for search and track in a forward-based role. Capability Release 2 (CR2) software development incorporates forward-based discrimination algorithms from project Hercules. This effort also provides the FBX-T program infrastructure, modeling and simulation capability, hardware-in-the-loop facilities, software maintenance, and systems engineering/management support for all radars. The 1st FBX-T provides the BMD System with a forward-based capability and extends the sensor coverage.

FY05 Accomplishments:
RDT&E Test Article: Acquisition of one FBX-T #1 radar was initiated in FY03 and delivered in FY05 with CR1, search and track functionality

- Completed FBX-T #1 hardware production
- Delivered CR1 software for testing
- Began integration and test of C2BMC interface for FBX-T
- Completed Preliminary Design Review for FBX-T software Capability Release 2 (CR2)
- Continued sensor analysis to support definition of BMDS
- Completed final integration and test of FBX-T #1 hardware

FY06 Planned Program:

- Complete FBX-T CR1 software verification
- Develop tool for generation of operational mission plans and search profiles

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

- Implement Anti-Tamper program and complete security documentation
- Complete integration and test of C2BMC interface for FBX-T
- Continue FBX-T software development of Capability Release 2 (CR2)
- Complete Critical Design Review for CR2
- Develop models and simulations for input into MDWAR for wargaming participation
- Upgrade hardware in the loop facility with radar digital signal injection system for discrimination testing
- Begin life cycle support

FY07 Planned Program:
RDT&E Test Article: Develop and test FBX-T Capability Release 2 software with forward-based discrimination algorithms from Project Hercules

- Complete FBX-T CR2 software development
- Complete BMDS integration testing with FBX-T CR2 software
- Begin FBX-T software development for CR3
- Maintain hardware in the loop facility to support test and modification activities
- Continue life cycle support of software maintenance

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| FBX-T #2 Manufacture | 62,582 | 66,499 | 40,467 |
| RDT&E Articles (Quantity) | 0 | 0 | 1 |

This effort includes the material, labor, engineering and management support for manufacture and acceptance testing of the 2nd FBX-T radar. Software development and system integration are covered under the basic FBX-T program. FBX-T #2 is scheduled for delivery in FY07. The 2nd FBX-T provides the BMD System with a forward based capability and extents the sensor coverage.

FY05 Accomplishments:

- Continued FBX-T #2 hardware production
- Completed manufacture of Monolithic Microwave Integrated Circuits (MMICs) for FBX-T #2
- Completed manufacture of Transmit/Receive Modules (TRMs) for FBX-T #2
- Began production of FBX-T #2 initial spares

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

FY06 Planned Program:

- Continue FBX-T #2 hardware production & integration
- Complete assembly of Transmit/Receive Integrated Microwave Modules (TRIMMs) for FBX-T #2
- Complete Near Field Range (NFR) Testing

FY07 Planned Program:
RDT&E Test Article: Acquisition of FBX-T #2 radar was initiated in FY04 for delivery in FY07

- Complete FBX-T #2 acceptance testing
- Deliver FBX-T #2 for system testing with Capability Release 2 (CR2)
- Complete production of FBX-T #2 initial spares

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| FBX-T #3 Manufacture | 13,224 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort includes the material, labor, engineering and management support for manufacture and acceptance testing of the 3rd FBX-T radar. Software development and system integration efforts are covered under the basic. The remainder of the radar production effort and delivery of FBX-T #3 is included in Block 2008 (Project 0911).

FY05 Accomplishments:

- Began FBX-T #3 production of long lead material
- Completed manufacture of Monolithic Microwave Integrated Circuits (MMICs) for FBX-T #3

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Deployment/Site Prep/Activation | 17,545 | 20,514 | 38,635 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The FBX-T radars will be deployed to sites located near expected missile threats. The Block 2006 effort includes deployment of FBX-T #1 and FBX-T #2. FBX-T #1 is scheduled to be deployed to Japan to meet immediate missile threat. The Deployment/ Site Preparation / Activation efforts include planning and coordination with host nation and Combatant Commanders (COCOMs), radar site design, site construction, transport of the radar to the

overseas site, and radar setup, calibration and activation. This effort also includes deployment preparations, site activation, and radar operations at Vandenberg AFB during final integration & test.

FY05 Accomplishments:
- Planned and conducted search and tracking testing with Targets of Opportunity (TOO) SERV 1, 2, GT-187 and GT-189 from test site at Vandenberg AFB
- Planned and conducted integration testing with C2BMC for message transfer
- Prepared scenarios for ground testing with BMDS including GT 04-1A, GT 04-2A(Phase1)
- Began initial site planning and develop facility requirements for FBX-T #1
- Conducted site surveys for FBX-T #1 overseas site
- Developed and generated operational mission plans and search profiles for FBX-T #1 deployed site
- Sustained operations at Vandenberg AFB to include: training CLS team, development of SOP's, and preparation for deployment

FY06 Planned Program:
- Complete FBX-T #1 deployment site design
- Complete FBX-T #1 deployment construction
- Transport and install FBX-T #1 radar
- Complete installation and checkout of FBX-T #1
- Identify facility requirements for FBX-T #2

FY07 Planned Program:
- Complete host nation agreements for FBX-T #2
- Conduct site survey for FBX-T #2 overseas site
- Begin initial site planning for FBX-T #2
- Ensure readiness for operational use for FBX-T #2

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Test & Evaluation | 276 | 4,003 | 17,703 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort includes funds for test infrastructure and test operations (TITO). Conduct flight, ground tests including wargames to demonstrate the capabilities of the forward-based radar to search, track, and discriminate. The testing will demonstrate ability to receive battle management direction from the C2BMC and send the C2BMC messages with tracks and threat data. Effort includes planning, resourcing test sites, creating test files, test execution, analysis and reporting of test event data. This test program will provide an understanding of the capability of the FBX-T, completion of the radar qualification, characterization of an upgraded FBX-T Radar on overall BMDS.

FY05 Accomplishments:
- Provided government oversight and support services to testing
- Provided site services to Vandenberg AFB

FY06 Planned Program:
- Plan CR 2 verification site testing
- Plan and conduct TOO flight tests - SERV 3, GT-190, and GT-191
- Provide test site support at Vandenberg AFB
- Plan and prepare scenarios
- Participate in BMDS Missile Defense Integration Exercises
- Participate in BMDS ground testing

FY07 Planned Program:
- Conduct CR 2 verification testing at Vandenberg AFB, including integration with C2BMC
- Plan and conduct TOO flight tests - GT-194, GT-195, and GT-196, including test site support at Vandenberg AFB
- Plan, prepare scenarios, and participate in Missile Defense Integration Exercises
- Complete environmental testing for FBX-T
- Provide test site support at Vandenberg AFB

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Operations and Support (Sustainment) | 14,625 | 45,644 | 63,168 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

MDA will use Contractor Logistics Support (CLS) to operate and sustain the FBX-T radars. The Block 2006 effort includes overseas operation and sustainment of FBX-T #1 and #2; and depot level logistics support for the radars. The O&S efforts include radar operators/maintainers, site security personnel, site maintenance costs, fuel costs, utility costs, and communications support. The operations and sustainment effort will provide support for the FBX-T, which will ensure a critical tracking capability for the BMDS. The GBR-P radar has been placed in a care-taker status while upgrade options are being considered for its future role in the BMDS.

FY05 Accomplishments:
- Established depot and repair infrastructure
- Awarded Contractor Logistics Support (CLS) contract for FBX-T Operation and Sustainment
- Acquired initial spares to support FBX-T #1
- Operated and sustained FBX-T #1 at Vandenberg AFB

FY06 Planned Program:
- Maintain depot and repair infrastructure
- Operate and sustain FBX-T #1
- Acquire spares to support FBX-T #2 overseas deployment
- Develop and update mission profiles and security plans
- Maintain GBR-P in an operational configuration to support BMDS

FY07 Planned Program:
- Operate and sustain FBX-T #1 and #2
- Develop mission plans for FBX-T radars
- Conduct depot, return, and repair program

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603884C Ballistic Missile Defense Sensors |

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| FBX-T Risk Reduction Test-Bed (TPS-X) | 14,866 | 11,402 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The primary function of the TPS-X is a test asset radar, where the Project Hercules algorithms and the FBX-T C2BMC interface can be tested while the FBX-T radars are in production. TPS-X provides risk reduction for the FBX-T program by validating the forward-based algorithms that will be used in the CR-2 software release for FBX-T.

FY05 Accomplishments:

- Tested full Project Hercules algorithm suite with decision logic during CMCM-1A and CMCM-1B flight test
- Supported FBX-T - C2BMC integration and testing using a prototype C2BMC Network Interface Processor (CNIP)
- Demonstrated cued acquisition from FBX-T Radar to TPS-X Radar during SERV-1 mission
- Supported FBX-T cue Aegis BMD hardware in the loop demonstration

FY06 Planned Program

- Complete testing and validation of forward-based algorithms with TPS-X
- Demonstrate the ability to accept and execute a cue/focus search plan from an overhead sensor
- Administration resource management using radar tasking commands
- Develop a strategic plan on operating and sustaining the TPS-X

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| EO/IR Sensors | 10,149 | 6,064 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The Airborne Infrared Surveillance (AIRS) program is a proof of concept program to demonstrate and evaluate the potential benefits of airborne infrared sensor systems to the Ballistic Missile Defense System (BMDS). The program's scope of work 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).

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

FY05 Accomplishments:

- Enhanced HALO II sensor tracking performance and calibrated sensor gyros
- Demonstrated AIRS ability to show airborne IR launch and engagement functionality on IFT-13C, IFT-14, SERV-2, MRTF, GT-189, and Cobra Dane/LRALT target launches
- Demonstrated the AIRS search surveillance fence scan on several flight missions
- Communicated 3D state vectors with AIRS encrypted Iridium link from HALO II to a ground station at PMRF

FY06 Planned Accomplishments:

- Demonstrate AIRS ability to provide airborne IR launch and engagement functionality on SERV-3, GT-191, SERV-4, and other MDA flight test opportunities throughout FY06.
- Continue to demonstrate the AIRS search surveillance fence scan during flight test opportunities.
- Communicate 3D state vectors with AIRS encrypted communications link from HALO II to a ground station with C2BMC interface.
- Integrate and test discrimination algorithms on AIRS processing equipment post-processed and also real-time onboard HALO II.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| FBX-T #4 Manufacture | 4,243 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort includes the material, labor, engineering and management support for manufacture and acceptance testing of the 4th FBX-T radar. Software development and system integration efforts are covered under the basic. The remainder of the radar production effort and delivery of FBX-T #4 is included in Block 2008. The 4th FBX-T provides the BMD System with a forward-based capability and extents the sensor coverage.

FY05 Accomplishments:

- Began FBX-T #4 production of long lead items
- Began manufacture of Monolithic Microwave Integrated Circuits (MMICs) for FBX-T #4

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 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 development strategy includes utilizing the TPS-X radar as a risk reduction asset for the BMDS Sensors through FY06. The BMDS radar (FBX-T) project used an existing radar design to minimize development costs and schedule. Design enhancements focus on software changes for the forward-based algorithms and C2BMC connectivity. The contract is a cost plus award fee.

A Contractor Logistics Support (CLS) contract was awarded in FY05 to operate and maintain the FBX-T radars. The CLS contract provides the operations and support activities required for site surveys, planning, and relocation; depot maintenance; system operations; and repair and replacement. The contract is an IDIQ task order contract.

The AIRS program is executed under an existing MDA contract.

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **FBX-T Basic Program (includes FBX-T #1)** | | | | | | | | |
| FBX-T Radar Basic Program (includes FBX-T #1) | SS/CPAF | Raytheon/ MA | 232,295 | 62,121 | 1Q | 50,349 | 1Q | 344,765 |
| Assessment | MIPR | OGA | 0 | 3,021 | N/A | 3,352 | N/A | 6,373 |
| FBX-T Radar | | TBD | 0 | 8,717 | 3Q | 2,927 | 3Q | 11,644 |
| **FBX-T #2 Manufacture** | | | | | | | | |
| FBX-T #2 Manufacture | SS/CPAF | Raytheon/ MA | 66,320 | 58,387 | 1Q | 34,474 | 1Q | 159,181 |
| GFE | MIPR | | 0 | 75 | 2/3Q | 0 | N/A | 75 |
| Assessment | MIPR | OGA | 0 | 2,494 | 3Q | 2,169 | N/A | 4,663 |
| **FBX-T #3 Manufacture** | | | | | | | | |
| FBX-T #3 Manufacture | SS/CPAF | Raytheon/ MA | 12,535 | 0 | N/A | 0 | N/A | 12,535 |
| **Deployment/Site Prep/Activation** | | | | | | | | |
| Deployment/Site Prep/Activation | SS/CPAF | Raytheon/ MA | 16,247 | 12,984 | 1/2Q | 20,141 | 1Q | 49,372 |
| Deployment Support/Transportation | MIPR | VAFB, Travis AFB, & TRANSCOM/ CA | 383 | 5,050 | 2Q | 12,772 | 3Q | 18,205 |
| Assessment | MIPR | OGA | 0 | 774 | N/A | 2,071 | N/A | 2,845 |
| **Operations and Support (Sustainment)** | | | | | | | | |
| Deployed Site Operations/Depot Support/ Spares | SS/CPAF | Raytheon/ MA | 13,863 | 35,772 | 1Q | 49,325 | 1Q | 98,960 |
| Base Support Services/Security | MIPR | TBD | 0 | 4,355 | 2Q | 4,487 | 3Q | 8,842 |
| Assessment | MIPR | OGA | 0 | 1,711 | 2/3Q | 3,386 | N/A | 5,097 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **FBX-T Risk Reduction Test-Bed (TPS-X)** | | | | | | | | |
| TPS-X Operations and Support | SS/CPAF | Raytheon/ MA | 4,841 | 4,311 | 1Q | 0 | N/A | 9,152 |
| TPS-X Testing & Evalaution Support | FFRDC | MIT/LL/ MA | 8,550 | 4,386 | 1Q | 0 | N/A | 12,936 |
| Range Support | MIPR | PMRF/ HI | 700 | 275 | 1Q | 0 | N/A | 975 |
| Assessment | MIPR | OGA | 0 | 1,479 | 2/3Q | 0 | N/A | 1,479 |
| **EO/IR Sensors** | | | | | | | | |
| AIRS Prime | SS/CPFF | L3/Aeromet/ OK | 4,328 | 2,386 | 3Q | 0 | N/A | 6,714 |
| AIRS Requirements | FFRDC | JHU/APL/ MD | 2,308 | 1,220 | 3Q | 0 | N/A | 3,528 |
| Tactical Component Network Concept | SS/CPAF | Raytheon/ MA | 1,000 | 578 | 3Q | 0 | N/A | 1,578 |
| Plume Study | | Montana State University/ MT | 900 | 0 | 3Q | 0 | N/A | 900 |
| Technical Engineering and Testing Support | MIPR | MIT/LL; and Peterson AFB/ MA, & CO | 1,085 | 1,146 | 3Q | 0 | N/A | 2,231 |
| Assessment | MIPR | OGA | 0 | 227 | 3Q | 0 | N/A | 227 |
| **FBX-T #4 Manufacture** | | | | | | | | |
| FBX-T#4 Manufacture | SS/CPAF | Raytheon/ MA | 4,022 | 0 | N/A | 0 | N/A | 4,022 |
| Subtotal Product Development | | | 369,377 | 211,469 | | 185,453 | | 766299 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **FBX-T Basic Program (includes FBX-T #1)** | | | | | | | | |
| Engineering Technical Support | C/FFP | CSC/ VA | 4,922 | 3,747 | 1Q | 3,866 | 1Q | 12,535 |
| Business Operations Support Services | C/FFP | Northrop Grumman/ VA | 4,906 | 2,709 | 1Q | 2,803 | 1Q | 10,418 |
| MDA Civilian | | | 1,820 | 1,995 | 1/4Q | 2,040 | 1/4Q | 5,855 |
| Sensors and Sensor Networking | FFRDC | Johns Hopkins University/Applied Physics Lab/ MD | 8,054 | 6,554 | 1Q | 6,527 | 1Q | 21,135 |
| FBX-T Technical Oversight | FFRDC | MIT/Lincoin Lab/ MA | 1,975 | 1,200 | 1Q | 1,200 | 1Q | 4,375 |
| FBX-T Performance Analysis | FFRDC | MITRE/ VA | 1,506 | 700 | 1Q | 700 | 1Q | 2,906 |
| MDA Program Support | | MDA/ VA | 661 | 1,849 | 1Q | 2,649 | 1Q | 5,159 |
| Assessment | MIPR | OGA | 0 | 811 | N/A | 1,243 | N/A | 2,054 |
| Subtotal Support Costs | | | 23,844 | 19,565 | | 21,028 | | 64437 |

## Remarks

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Test & Evaluation** | | | | | | | | |
| Govt Testing Oversight | MIPR | NSWC PHD/ CA | 262 | 500 | 1/4Q | 1,000 | 1/4Q | 1,762 |
| Radar Testing | SS/CPAF | Raytheon/ MA | 0 | 2,719 | 1Q | 4,500 | 1Q | 7,219 |
| Testing Site Support | MIPR | VAFB, MDA directed support & FBX-T testing | 0 | 300 | 1/4Q | 1,800 | 1/4Q | 2,100 |
| Environmental Qualification Testing for FBX-T | MIPR | NAWC Pax River/ MD | 0 | 0 | N/A | 7,781 | 2Q | 7,781 |
| Assessment | MIPR | OGA | 0 | 150 | 3Q | 949 | N/A | 1,099 |
| Subtotal Test and Evaluation | | | 262 | 3,669 | | 16,030 | | 19961 |

**Remarks**

## IV. Management Services Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 | | | 393,483 | 234,703 | | 222,511 | | 850,697 |

**Remarks**

**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date: **February 2006**

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

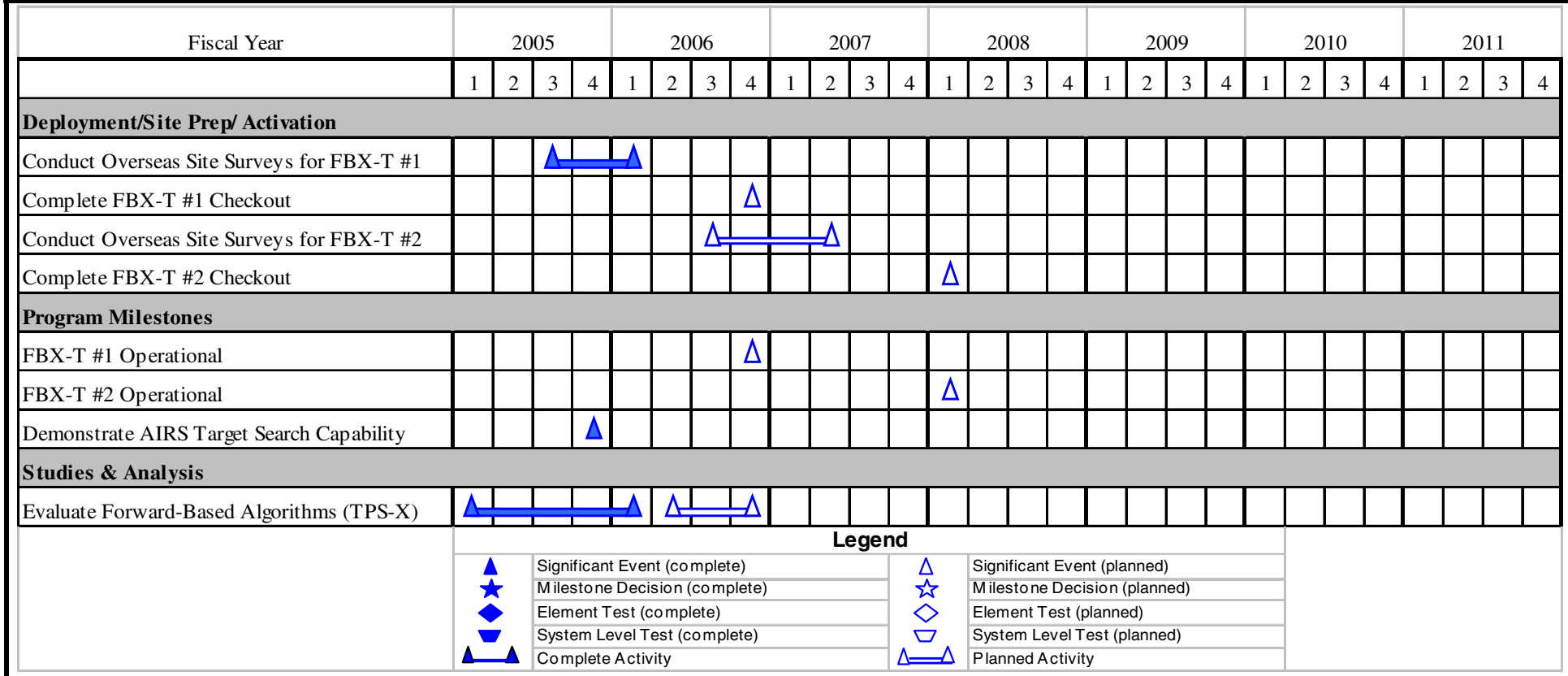
R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors**

| Fiscal Year | 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 |
| **Acquisition Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Award FBX-T CLS Contract | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Award FBX-T #1 Site Construction Contract | | | | | | △ | | | | | | | | | | | | | | | | | | | | | | |
| Award FBX-T #2 Site Construction Contract | | | | | | | | | | △ | | | | | | | | | | | | | | | | | | |
| Award Cooperative Agreement for Plume Study | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | |
| **Studies & Analyses** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Evaluate Forward-Based Algorithms (TPS-X) | ▲ | ▬ | ▬ | ▬ | ▬ | △ | ▭ | ▭ | | | | | | | | | | | | | | | | | | | | |
| Perform Sensor Architecture Analysis | ▲ | ▬ | ▬ | ▬ | ▬ | △ | ▭ | ▭ | ▭ | ▭ | ▭ | ▭ | | | | | | | | | | | | | | | | |
| **Development Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FBX-T #1 Factory Integration & Test Complete | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Testing Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FBX-T #1 Integration with BMDS at VAFB | | | ▬ | ▬ | | | | | | | | | | | | | | | | | | | | | | | | |
| Targets Of Opportunity (TOO) Flight Testing | | | ▬ | ▬ | | ▭ | ▭ | | | ▭ | ▭ | ▭ | | | | | | | | | | | | | | | | |
| FBX-T #2 Integration with BMDS at VAFB | | | | | | | | | | ▭ | ▭ | ▭ | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▬ | Complete Activity | ▭ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Acquisition Milestones** | | | | | | | |
| Award FBX-T CLS Contract | 2Q | | | | | | |
| Award FBX-T #1 Site Construction Contract | | 2Q | | | | | |
| Award FBX-T #2 Site Construction Contract | | | 2Q | | | | |
| Award Cooperative Agreement for Plume Study | 4Q | | | | | | |
| **Studies & Analyses** | | | | | | | |
| Evaluate Forward-Based Algorithms (TPS-X) | 1Q-4Q | 1Q-4Q | | | | | |
| Perform Sensor Architecture Analysis | 1Q-4Q | 1Q-4Q | 1Q-4Q | | | | |
| **Development Milestones** | | | | | | | |
| FBX-T #1 Factory Integration & Test Complete | 1Q | | | | | | |
| Develop Op Mission Plan & Search Profile Tool | | 1Q-4Q | | | | | |
| Manufacture FBX-T #2 Hardware | 1Q-4Q | 1Q-4Q | 1Q | | | | |
| Manufacture FBX-T #3 Long-lead Items | 1Q-4Q | | | | | | |
| Manufacture FBX-T #4 Long-lead Items | 1Q-4Q | | | | | | |
| **Testing Milestones** | | | | | | | |
| FBX-T #1 Integration with BMDS at VAFB | 3Q-4Q | 1Q | | | | | |
| Targets Of Opportunity (TOO) Flight Testing | 3Q-4Q | 1Q-3Q | 2Q-4Q | | | | |
| SERV 1 FBX-T#1 | 4Q | | | | | | |
| SERV 2 FBX-T #1 | 4Q | | | | | | |
| GT-187 FBX-T #1 | 4Q | | | | | | |
| GT-189 FBX-T #1 | 4Q | | | | | | |
| SERV 3 FBX-T #1 (If Available) | | 2Q | | | | | |
| GT-190 FBX-T #1 (If Available) | | 3Q | | | | | |
| GT-191 FBX-T #1 (If Available) | | 3Q | | | | | |
| Integrated and Distributed Ground Testing | | 1Q-3Q | 3Q-4Q | | | | |
| GT 04-1a FBX-T #1 | | 1Q | | | | | |
| GT 04-2a (Phase 1) FBX-T #1 | | 1Q | | | | | |
| GT 04-1b FBX-T #1 (If Available) | | 3Q | | | | | |
| GT 04-2a (Phase 2) FBX-T #1 (If Available) | | 2Q | | | | | |
| GT 04-2b FBX-T #1 (If Available) | | 3Q | | | | | |
| FBX-T #2 Integration with BMDS at VAFB | | | 2Q-4Q | | | | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| GT-194 FBX-T #2 | | | 3Q | | | | |
| GT-195 FBX-T #2 | | | 4Q | | | | |
| GT-196 FBX-T #2 | | | 3Q | | | | |
| DGT 06-2 FBX-T #2 | | | 4Q | | | | |
| Missile Defense Integrated Exercises (MDIE) | | | 4Q | | | | |
| AIRS Targets Of Opportunity (TOO) Flight Testing | 1Q-4Q | | | | | | |
| IFT - 13C AIRS | 1Q | | | | | | |
| SERV 2 AIRS | 4Q | | | | | | |
| IFT - 14 AIRS | 2Q | | | | | | |
| GT - 189 AIRS | 4Q | | | | | | |
| MRT AIRS | 3Q | | | | | | |
| Cobra Dane/LRALT AIRS | 4Q | | | | | | |
| **Deployment/Site Prep/ Activation** | | | | | | | |
| Conduct Overseas Site Surveys for FBX-T #1 | 3Q-4Q | 1Q | | | | | |
| Complete FBX-T #1 Site design | | 1Q | | | | | |
| FBX-T #1 Site Construction | | 1Q-3Q | | | | | |
| Complete FBX-T #1 Checkout | | 4Q | | | | | |
| Conduct Overseas Site Surveys for FBX-T #2 | | 3Q-4Q | 1Q-2Q | | | | |
| Complete FBX-T #2 Site Design | | | 2Q | | | | |
| FBX-T #2 Site Construction | | | 2Q-4Q | | | | |
| Complete FBX-T #2 Checkout | | | | 1Q | | | |
| **Operation & Sustainment** | | | | | | | |
| FBX-T #1 O & S | 4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | | |
| FBX-T #2 O & S | | | 4Q | 1Q-4Q | 1Q-4Q | | |
| FBX-T #3 O & S | | | | 4Q | 1Q-4Q | | |
| FBX-T #4 O & S | | | | | 3Q-4Q | | |
| **Program Milestones** | | | | | | | |
| FBX-T #1 Operational | | 4Q | | | | | |
| FBX-T #2 Operational | | | | 1Q | | | |
| Enhanced HALO II Sensor Track Performance | 1Q-2Q | | | | | | |
| Demonstrate AIRS Target Search Capability | 4Q | | | | | | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| Provide 3D State Vectors to PMRF | 1Q-4Q | | | | | | |
| **Studies & Analysis** | | | | | | | |
| Evaluate Forward-Based Algorithms (TPS-X) | 1Q-4Q | 1Q-4Q | | | | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0911 Ballistic Missile Defense Radars Block 2008 | 0 | 38,745 | 276,126 | 470,808 | 404,233 | 184,883 | 160,959 |
| RDT&E Articles Qty | 0 | 0 | 0 | 1 | 1 | 0 | 0 |

*Note: RDT&E Articles: Two FBX-T radars will be delivered under Block 2008. Acquisition of both FBX-T #3 and FBX-T #4 were initiated in FY05 with delivery of FBX-T #3 in FY08 and FBX-T #4 in FY09. Acquisition of an Adjunct Sensor will be initiated in FY07 with delivery in FY09.*

## A. Mission Description and Budget Item Justification

The Ballistic Missile Defense Radar Block 2008 (Project 0911) will continue the spiral development to enhance and expand on the sensor capabilities provided to the BMDS under Block 2006. This increased sensor coverage will give the BMDS more opportunities to engage ballistic missile threats which improves the probability of successfully destroying the target. The deployment and networking of additional sensors supports the MDA goals of using a layered sensor architecture to provide a more robust BMDS. Expanding the layered sensor architecture will improve BMDS ability to detect, track and engage ballistic missiles in all phases of their flight.

Block 2008 efforts include delivery of Forward Based X-Band Radar-Transportable (FBX-T) #3 and #4 which will expand the BMDS coverage with the two additional radars. Development of the Adjunct Sensor to use with FBX-T will extend the tracking and discrimination range to close BMDS sensor gaps. The Thule upgrade provides extended range sensor. Improved tracking and discrimination is provided by implementing sensor netting through sensor coordination and data collection.

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. Included in the FY10 and FY11 are the O&S costs required to maintain the FBX-T's and other sensors.

The Block 2008 funding in FY08 reflects the continuing efforts on FBX-T #3 and #4 as well as the contractor efforts on Adjunct Sensors and Thule upgrade.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| FBX-T Basic Program (Block 2008 Enhancements) | 0 | 2,000 | 10,652 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The FBX-T Basic program includes software upgrades to support Block 2008 ESGs and common software (FY07-FY09) that will support both the FBX-T and the THAAD radar missions. This effort also includes FY08 thru FY09 funding for the FBX-T program infrastructure, modeling and simulation capability, hardware-in-the-loop facilities, software maintenance, and systems engineering/management support for all radars.

FY06 Planned Program:
- Initiate develop of a common radar specification

FY07 Planned Program:
- Complete common radar specification
- Begin implementing common radar specification

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| FBX-T #3 Manufacture | 0 | 28,420 | 88,673 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort includes the material, labor, engineering and management support for production of the 3rd FBX-T radar. The 3rd FBX-T provides the BMD System with a forward-based capability and extents the sensor coverage.

FY06 Planned Program:
- Continue FBX-T #3 hardware production begun in Block 2006 (Project 0811)
- Complete manufacture of Transmit/Receive Modules (TRMs) for FBX-T #3

FY07 Planned Program:
- Complete production and assembly of Transmit/Receive Integrated Microwave Modules (TRIMMs) for FBX-T #3
- Continue FBX-T #3 hardware production & integration
- Begin Near Field Range (NFR) testing of FBX-T #3

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Adjunct Sensor #1 | 0 | 0 | 10,652 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The Adjunct Sensor is a radar that is currently being designed to perform the forward-based mission cooperatively with the FBX-T providing extended range tracking and discrimination to reduce sensor coverage gaps for more threat missiles. The FBX-T will handover targets to the Adjunct Sensor which will track and discriminate targets and provide engagement quality data to the BMDS C2BMC.

The primary mission of the Adjunct Sensor is to provide discrimination and track of ballistic missile threats. The Adjunct Sensor is planned to be transportable and will be co-located with the FBX-T. The Adjunct Sensor will have a limited search capability to support cued acquisition of targets from FBX-T. These sensors will reduce discrimination gaps for most missile trajectories from specific rogue nations, thereby improving BMDS effectiveness. Procurement of the Adjunct Sensors will begin in FY07 with delivery of Adjunct Sensor #1 in Block 2008 and Adjunct Sensor #2 in Block 2010. 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.

FY07 Planned Program:
- Award Contract for two Adjunct Sensors (Block 2008 and Block 2010)
- Begin manufacture of Adjunct Sensors #1
- Begin integration and development efforts of Adjunct Sensors and FBX-T

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Test & Evaluation | 0 | 0 | 1,598 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Block 2008 includes integration of the Adjunct Sensor with FBX-T. Test & Evaluation includes participating in flight and ground tests including wargames to demonstrate the capabilities of the sensors to search, track, and discriminate against strategic and tactical threats. Completion of this test planning is needed to ensure adequate and timely resources to conduct a Block 2008 testing of Adjunct Sensor, and define and start long lead test site preparations to be ready to receive and test an Adjunct Sensor.

FY07 Planned Program:
- Plan the test program for Adjunct Sensor and FBX-T integration
- Define test site modifications for the Adjunct Sensor testing at Vandenberg AFB

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603884C Ballistic Missile Defense Sensors |

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Mechanical Steering Kit (MSK) | 0 | 0 | 32,252 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The Mechanical Steering Kit (MSK) is designed to support and elevate the FBX-T Antenna Equipment and Electronic Equipment Units. The MSK provides the FBX-T with real-time rotation in both azimuth and elevation, and significantly increases the radar's real-time performance capabilities. This task consists of the MSK design, fabrication, assembly, and test; software development and test; and MSK integration and deployment with the FBX-T.

FY07 Planned Program:
- Award Mechanical Steering Kit (MSK) contract
- Conduct hardware and software design reviews
- Begin hardware fabrication

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| FBX-T #4 Manufacture | 0 | 8,325 | 54,537 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort includes the material, labor, engineering and management support for production of the 4th FBX-T radar. The 4th FBX-T provides the BMD System with a forward based capability and extents the sensor coverage.

FY06 Planned Program:
- Continue FBX-T #4 hardware production begun in Bock 2006 (Project 0811)
- Complete manufacture of Monolithic Microwave Integrated Circuits (MMICs) for FBX-T #4 begun in Bock 2006
- Begin manufacture of Transmit/Receive Integrated Microwave Modules (TRIMMs) for FBX-T #4

FY07 Planned Program:
- Continue FBX-T #4 hardware production
- Complete manufacture of Transmit/Receive Integrated Microwave Modules (TRIMMs) for FBX-T #4
- Begin hardware integration for FBX-T #4

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Thule Early Warning Radar | 0 | 0 | 77,762 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

In FY06 MDA will initiate a program to upgrade the Early Warning Radar located at Thule Air Base, Greenland for incorporation into the Ballistic Missile Defense System (BMDS). The addition of the Thule Upgraded Early Warning Radar (UEWR) into the BMDS sensor architecture will improve BMDS sensor coverage, and will support Engagement Sequence Groups.

The scope of the Thule UEWR program is similar to the ongoing upgrades to the Early Warning Radars at Beale Air Force Base, CA and RAF Fylingdales, United Kingdom, and will use the same baseline hardware and software configuration. It will entail site supporting activities, procuring hardware and software upgrade, modifying the Thule EWR facility, installation of the upgraded hardware and software kits, and integration of the Thule UEWR into the BMDS.

FY07 Planned Program:

- Complete support facility modifications.
- Continue development of hardware and software upgrade
- Begin modifications to Early Warning Radar facility

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 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. The BMDS radar (FBX-T) project used an existing radar design to minimize development costs and schedule. Design enhancements focus on software changes for the forward based algorithms and C2BMC connectivity. The contract was awarded in FY03 and is a cost plus award fee.

A Contractor Logistics Support (CLS) contract was awarded in FY05 to operate and maintain the FBX-T radars. The CLS contract provides the operations and support activities required for site surveys, planning, and relocation; depot maintenance; failure reporting, analysis, and corrective action system; system operations; and repair and replacement. The contract is an Indefinite Delivery Indefinite Quantity (IDIQ) task order contract.

An RFP will be issued in FY06 and the contract will be awarded in FY07 to build two Adjunct Sensors. The first one will be a Block 2008 capability and the other will be delivered in Block 2010. An acquisition strategy will be developed in FY07 to operate and sustain the Adjunct Sensors.

An acquisition strategy will be developed for the Mechanical Steering Kit in FY06.

The Acquisition Strategy is to award a sole source contract for procurement and installation of the Thule Early Warning Radar hardware and software upgrade kits.

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **FBX-T Basic Program (Block 2008 Enhancements)** | | | | | | | | |
| Software Enhancements | SS/CPAF | Raytheon/ MA | 0 | 2,000 | 2Q | 10,000 | 2Q | 12,000 |
| Assessment | MIPR | OGA | 0 | 0 | N/A | 652 | 3Q | 652 |
| **FBX-T #3 Manufacture** | | | | | | | | |
| FBX-T #3 Manufacture | SS/CPAF | Raytheon/ MA | 0 | 28,420 | 1/4Q | 83,243 | 3Q | 111,663 |
| Assessment | MIPR | OGA | 0 | 0 | N/A | 5,430 | 3Q | 5,430 |
| **Adjunct Sensor #1** | | | | | | | | |
| Adjunct Sensor #1 Procurement | | TBD | 0 | 0 | N/A | 10,000 | 2Q | 10,000 |
| Assessment | MIPR | OGA | 0 | 0 | N/A | 652 | 3Q | 652 |
| **Mechanical Steering Kit (MSK)** | | | | | | | | |
| MSK #1 Development & MSK #2 Manufacture | SS/CPAF | Raytheon/ MA | 0 | 0 | N/A | 30,277 | 2Q | 30,277 |
| Assessment | MIPR | OGA | 0 | 0 | N/A | 1,975 | 3Q | 1,975 |
| **FBX-T #4 Manufacture** | | | | | | | | |
| FBX-T #4 Manufacture | SS/CPAF | Raytheon/ MA | 0 | 8,325 | 1Q | 51,197 | 1Q | 59,522 |
| Assessment | MIPR | OGA | 0 | 0 | N/A | 3,340 | 3Q | 3,340 |
| **Thule Early Warning Radar** | | | | | | | | |
| Upgrade Thule EWR | SS/CPAF | Raytheon/ MA | 0 | 0 | N/A | 73,000 | 2Q | 73,000 |
| Assessment | MIPR | OGA | 0 | 0 | N/A | 4,762 | 3Q | 4,762 |
| Subtotal Product Development | | | 0 | 38,745 | | 274,528 | | 313273 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Test & Evaluation** | | | | | | | | |
| Adjunct Sensor Test Planning and Preparation | CPAF | TBD | 0 | 0 | N/A | 1,598 | 3Q | 1,598 |
| Subtotal Test and Evaluation | | | 0 | 0 | | 1,598 | | 1598 |

**Remarks**

## IV. Management Services Cost ( $ in Thousands )

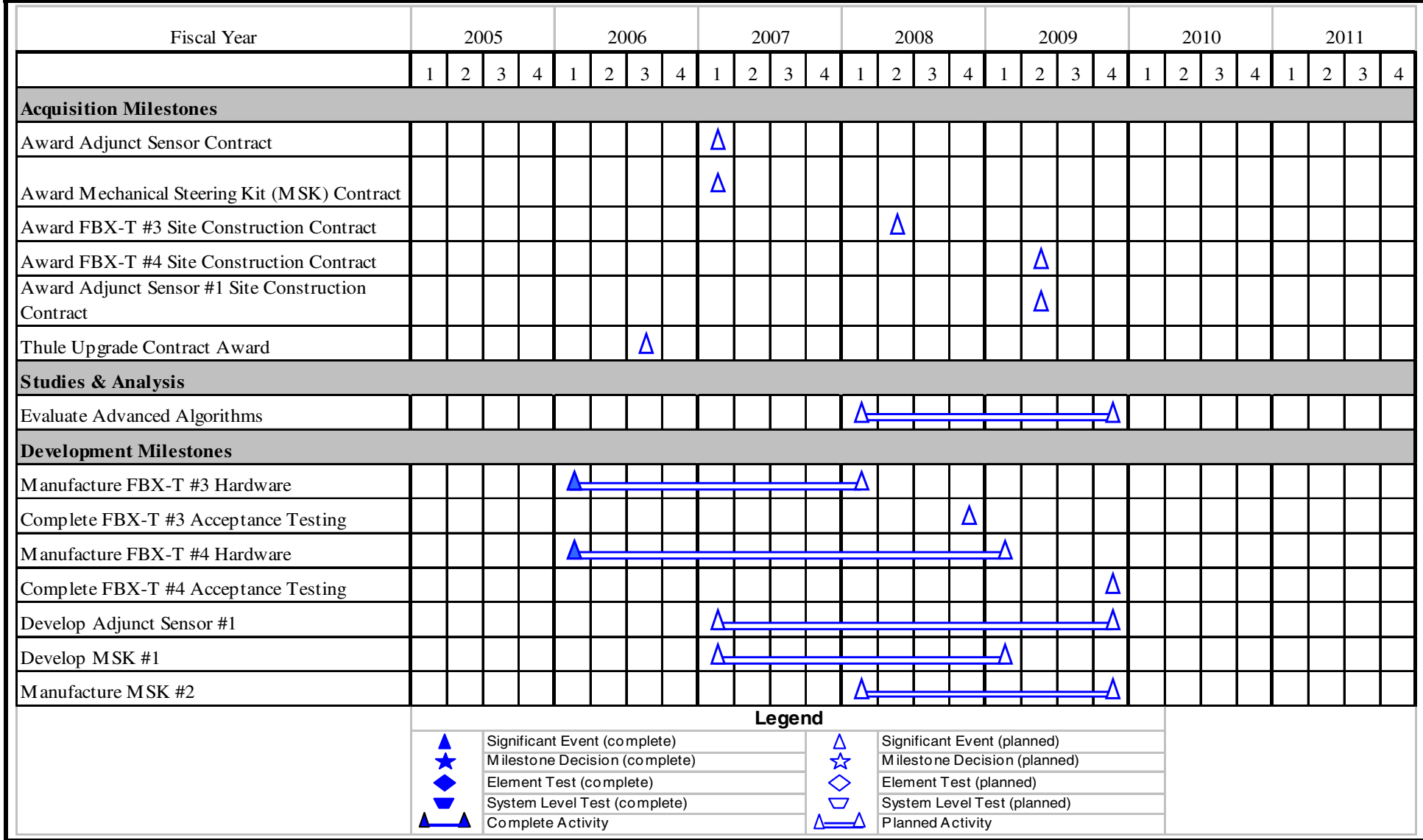
| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Subtotal Management Services | | | | | | | | |

**Remarks**

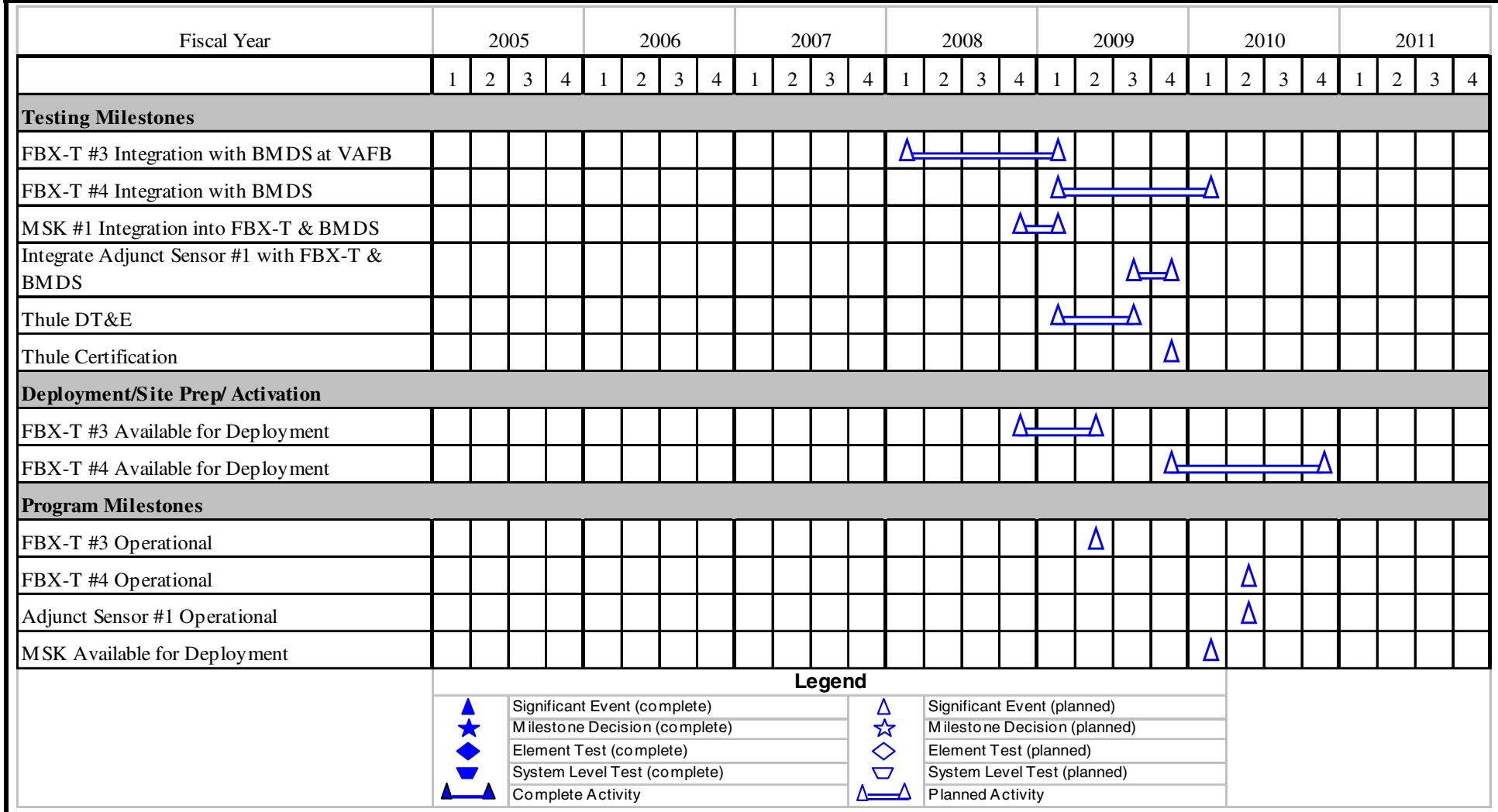
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 0 | 38,745 | | 276,126 | | 314,871 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Acquisition Milestones** | | | | | | | |
| Award Adjunct Sensor Contract | | | 1Q | | | | |
| Award Mechanical Steering Kit (MSK) Contract | | | 1Q | | | | |
| Award FBX-T #3 Site Construction Contract | | | | 2Q | | | |
| Award FBX-T #4 Site Construction Contract | | | | | 2Q | | |
| Award Adjunct Sensor #1 Site Construction Contract | | | | | 2Q | | |
| Thule Upgrade Contract Award | | 3Q | | | | | |
| **Studies & Analysis** | | | | | | | |
| Evaluate Advanced Algorithms | | | | 1Q-4Q | 1Q-4Q | | |
| Integrate Adv Algorithms | | | | 1Q-4Q | 1Q-4Q | | |
| Perform Sensor Architecture Analysis | | 1Q-4Q | 1Q-4Q | | | | |
| **Development Milestones** | | | | | | | |
| Develop Models & Simulations for MDWAR | | | | 1Q-4Q | | | |
| Upgrade FBX-T HWIL Facility (Blk 2008 Capability) | | | | 1Q-4Q | | | |
| Manufacture FBX-T #3 Hardware | | 1Q | 1Q-4Q | 1Q | | | |
| FBX-T #3 Hardware Integration & Test Complete | | | | 1Q | | | |
| Deliver FBX-T Blk 2008 Software for System Test | | | | 1Q | | | |
| Complete FBX-T #3 Acceptance Testing | | | | 4Q | | | |
| Manufacture FBX-T #4 Hardware | | 1Q | 1Q-4Q | 1Q-4Q | 1Q | | |
| FBX-T #4 Hardware Integration & Test Complete | | | | | 1Q | | |
| Complete FBX-T #4 Acceptance Testing | | | | | 4Q | | |
| Develop Adjunct Sensor #1 | | | 1Q-4Q | 1Q-4Q | 1Q-4Q | | |
| Develop MSK #1 | | | 1Q-4Q | 1Q-4Q | 1Q | | |
| Manufacture MSK #2 | | | | 1Q-4Q | 1Q-4Q | | |
| Thule Facility Design Complete | | | 3Q | | | | |
| Thule Hardware & Software Installation | | | | 2Q-4Q | | | |
| **Testing Milestones** | | | | | | | |
| FBX-T #3 Integration with BMDS at VAFB | | | | 1Q-4Q | 1Q | | |
| Targets Of Opportunity Flight Testing FBX-T #3 | | | | 1Q-4Q | 1Q | | |
| Integ & Distributed Ground Test FBX-T #3 | | | | 1Q-4Q | 1Q | | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| FBX-T #4 Integration with BMDS | | | | | 1Q-4Q | 1Q | |
| Targets Of Opportunity Flight Testing FBX-T #4 | | | | | 1Q-4Q | 1Q | |
| Integ & Distributed Ground Test FBX-T #4 | | | | | 1Q-4Q | 1Q | |
| Missile Defense Integration Exercise | | | | | 3Q-4Q | | |
| MSK #1 Integration into FBX-T & BMDS | | | | 4Q | 1Q | | |
| Targets Of Opportunity Flight Testing MSK #1 | | | | 4Q | 1Q | | |
| Integ & Distributed Ground Test MSK #1 | | | | 4Q | 1Q | | |
| Integrate Adjunct Sensor #1 with FBX-T & BMDS | | | | | 3Q-4Q | | |
| Test Site Modification for Adjunct Sensor | | | | 1Q-4Q | 1Q-2Q | | |
| Targets Of Opportunity Flight Testing Adj Sensor | | | | | 3Q-4Q | | |
| Integ & Distributed Ground Test Adj Sensor | | | | | 3Q-4Q | | |
| Thule DT&E | | | | | 1Q-3Q | | |
| Thule Certification | | | | | 4Q | | |
| **Deployment/Site Prep/ Activation** | | | | | | | |
| FBX-T #3 Deployment Planning | | | 1Q-4Q | 1Q-2Q | | | |
| FBX-T #3 Site Design & Construction | | | | 1Q-4Q | 1Q | | |
| FBX-T #3 Available for Deployment | | | | 4Q | 1Q-2Q | | |
| FBX-T #4 Deployment Planning | | | | 1Q-4Q | 1Q-2Q | | |
| FBX-T #4 Site Design & Construction | | | | | 1Q-4Q | | |
| FBX-T #4 Available for Deployment | | | | | 4Q | 1Q-4Q | |
| Adjunct Sensor #1 Deployment Planning & Site Mods | | | | 2Q-4Q | 1Q-4Q | | |
| **Operation & Sustainment** | | | | | | | |
| FBX-T #1 O & S | | | | | | 1Q-4Q | 1Q-4Q |
| FBX-T #2 O & S | | | | | | 1Q-4Q | 1Q-4Q |
| FBX-T #3 O & S | | | | | | 1Q-4Q | 1Q-4Q |
| FBX-T #4 O & S | | | | | | 1Q-4Q | 1Q-4Q |
| Adjunct Sensor #1 O & S | | | | | | 1Q-4Q | 1Q-4Q |
| Adjunct Sensor #2 O & S | | | | | | 1Q-4Q | 1Q-4Q |
| **Program Milestones** | | | | | | | |
| FBX-T #3 Operational | | | | | 2Q | | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| FBX-T #4 Operational | | | | | | 2Q | |
| Adjunct Sensor #1 Operational | | | | | | 2Q | |
| MSK Available for Deployment | | | | | | 1Q | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0011 Ballistic Missile Defense Radars Block 2010 | 2,250 | 180 | 7,061 | 18,530 | 123,779 | 129,318 | 47,992 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 1 | 0 | 0 |

*Note: The External Sensor program was formerly known as the National Sensor Integration Rapid Prototyping (NSIRP) and was funded under PE 0603890C Project 0102 through FY06. In FY05 data from an external sensor was identified that could be used to support BMDS testing. Funds to accomplish this work were provided using the Sensor PE, because they became the Program Manager. Starting in FY07 the External Sensor Program will be funded as a Block 2010 activity (Project 0011) under the Sensors Program Element (0603884C).*

**A. Mission Description and Budget Item Justification**

The Ballistic Missile Defense Radar Block 2010 (Project 0011) will continue the spiral development to enhance and expand on the sensor capabilities provided BMDS under Block 2008. This increased sensor coverage will give BMDS more opportunities to engage ballistic missile threats which improves the probability of successfully destroying the target. The deployment and networking of additional sensors supports the MDA goals of using a layered sensor architecture to provide a more robust BMDS. Expanding the layered sensor architecture will improve BMDS ability to detect, track and engage ballistic missiles in all phases of their flight. Enhancement of the existing sensor architecture will be based on continued sensor coverage gap analysis.

The Sensor PE in Block 2010 provides for the production and fielding of two additional Mechanical Steering Kits (MSKs) and a second Adjunct Sensor to enhance FBX-T performance. The MSK's will give the FBX-T radars the ability to rotate in the horizontal and vertical plane increasing BMDS leverage. This capability allows BMDS to rapidly adjust to changes in the threat axis. Adding the Adjunct Sensor to work in conjunction with an FBX-T radar permits the BMDS to extend the tracking and discrimination range where needed to help support cueing and handoff to midcourse sensors. The majority of this effort is funded in FY08 and out. This also includes funding in FY10-11 for FBX-T software enhancements needed to support new BMDS Block 10 Engagement Sequence Groups and maintain sensor network interoperability.

Starting in FY05 and out the Sensors PE will begin to leverage non-MDA sensors or External Sensors to enhance the BMDS sensor capabilities. Expanding the layered sensor architecture will improve BMDS ability to detect, track and engage ballistic missiles in all phases of their flight. In addition to expanding sensor coverage, the External Sensors enhance BMDS discrimination capabilities to address changing threats. The Sensor PE will use an External Sensors Laboratory to collect and fuse the external sensors data into useful track and discrimination data. The External Sensors Laboratory will be interfaced to the C2BMC to provide capability to the BMDS situational awareness and Engagement Sequence Strategies.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| External Sensors | 2,250 | 180 | 7,061 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Upgrade the External Sensors Lab (ESL) to provide the capability to fuse data from external Overhead Non-imaging Infrared (ONIR) sensors to allow for the acquisition and tracking of targets from horizon to horizon. NSIRP was justified and funded in FY05 and FY06 in PE 0603890C (Project 0102). Subsequent to the transfer of the program in FY05, data from an external sensor was provided for use to the BMDS. This experience demonstrated utilization of the data to the BMDS thus solidifying the decision to transfer the program to the Sensor PE to operationalize the capability.

FY05 Accomplishments:
- Initiated development of ESL SBIRS High Auto Track Transfer Data to BMDS

FY06 Planned Program:
- External Sensor FY06 activities are presented in the Ballistic Missile Defense System Core Program Element 0603890C (Project 0102)

FY07 Planned Program:
- Investigate new sensor techniques and develop algorithms to utilize capability in BMDS
- Demonstrate operational capability using foreign and domestic targets of opportunity by providing cueing information to BMDS C2BMC
- Perform sensor cueing function in support of FBX-T
- Provide support and maintenance for the external sensor laboratory operations
- Hardware upgrades to SCI lab to improve reliability
- Develop new message set to allow ESL to communicate with elements of BMDS
- Algorithm development to improve performance in all phase of flight
- JNIC support and lab accreditation

| C. Other Program Funding Summary | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs – MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters – MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## D. Acquisition Strategy

An acquisition strategy will be developed in FY06 with the intent to award a sole source contract for an External Sensors Lab system integrator and software developer.

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **External Sensors** | | | | | | | | |
| Import SBIRS Data into BMDS | MIPR | AFC/ CO | 2,250 | 0 | N/A | 0 | 4Q | 2,250 |
| Prime Contract | SS/CPAF | Northrop Grumman/ CA | 0 | 0 | N/A | 5,949 | 3Q | 5,949 |
| External Sensors Program Support | MIPR | NASIC; NSWC DD; Aerospace Corp; & MIT/LL/ CO & MA | 0 | 0 | N/A | 850 | N/A | 850 |
| Assessment | | OGA | 0 | 180 | N/A | 262 | N/A | 442 |
| Subtotal Product Development | | | 2,250 | 180 | | 7,061 | | 9491 |

**Remarks**

## II. Support Costs Cost ( $ in Thousands )

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

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Subtotal Management Services | | | | | | | | |

**Remarks**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 2,250 | 180 | | 7,061 | | 9,491 |

**Remarks**

**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date: **February 2006**

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

R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors**

| Fiscal Year | 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 |
| **Acquisition Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Award ESL SBIRS High Auto Track Transfer Contract | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | |
| Award Adjunct Sensor #2 Site Construction Contract | | | | | | | | | | | | | | | | | | | | | | △ | | | | | | |
| **Development Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Complete FBX-T Block 10 Acceptance Testing | | | | | | | | | | | | | | | | | | | | △ | | | | | | | | |
| Adjunct Sensor #2 Manufacture | | | | | | | | | | | | | | | | | △ | | | | | | | △ | | | | |
| MSK #3 Manufacture | | | | | | | | | | | | | | | | | △ | | | | | | | △ | | | | |
| MSK #4 Manufacture | | | | | | | | | | | | | | | | | | | | | △ | | | | | | | △ |
| Deliver SBIRS Hi Auto Track Transfer Capability | | | | | | | | | | | | | △ | | | | | | | | | | | | | | | |
| **Testing Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Adjunct Sensor #2 Integration with FBX-T | | | | | | | | | | | | | | | | | | | | | | | | △ | | | | |
| **Program Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Adjunct Sensor #2 Operational | | | | | | | | | | | | | | | | | | | | | | | | △ | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲——▲ | Complete Activity | △——△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Acquisition Milestones** | | | | | | | |
| Award ESL SBIRS High Auto Track Transfer Contract | 4Q | | | | | | |
| Award Adjunct Sensor #2 Site Construction Contract | | | | | | 2Q | |
| **Development Milestones** | | | | | | | |
| Develop Models & Simulations for MDWAR | | | | 1Q-4Q | | | |
| Upgrade FBX-T HWIL Facility (Block 10 Capability) | | | | | | 1Q-4Q | |
| Deliver FBX-T Blk 10 Software for System Test | | | | | 1Q | | |
| Complete FBX-T Block 10 Acceptance Testing | | | | | 4Q | | |
| Adjunct Sensor #2 Manufacture | | | | | 1Q-4Q | 1Q-4Q | |
| MSK #3 Manufacture | | | | | 1Q-4Q | 1Q-4Q | |
| MSK #4 Manufacture | | | | | | 1Q-4Q | 1Q-4Q |
| External Sensor Lab Upgrade of Hardware | | | 2Q | | | | |
| Deliver SBIRS Hi Auto Track Transfer Capability | | | | 1Q | | | |
| **Testing Milestones** | | | | | | | |
| Adjunct Sensor #2 Integration with FBX-T | | | | | | 3Q-4Q | |
| Integ & Distributed Ground Test Adj Sensor | | | | | | 3Q-4Q | |
| Targets Of Opportunity Flight Testing Adj Sensor | | | | | | 3Q-4Q | |
| **Deployment/Site Prep/ Activation** | | | | | | | |
| Adjunct Sensor #2 Deployment Planning & Site Mods | | | | | 2Q-4Q | 1Q-4Q | |
| **Operation & Sustainment** | | | | | | | |
| FY 2010 and FY 2011 O&S Covered in Block 2008 | | | | | | 1Q-4Q | 1Q-4Q |
| **Program Milestones** | | | | | | | |
| Adjunct Sensor #2 Operational | | | | | | 4Q | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0812 Space Tracking and Surveillance System (STSS) Block 2006 | 248,086 | 0 | 0 | 0 | 0 | 0 | 0 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: Per Congressional Direction to restructure allowing for greater visibility and oversight of the STSS program in a separate PE, FY06 and out funding has been transferred to PE 0603893C.*

**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.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Space | 131,665 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

FY05 Accomplishments:

- Furnished initial payment to NASA toward Launch Services for the 2 Block 2006 Satellites
- Completed Payload Software Build 3
- Conducted System Compatibility Tests (Payload and Satellite Bus)
- Conducted bus integration for Satellite 1
- Completed Thermal Vac testing/payload acceptance testing

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Ground | 25,394 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

FY05 Accomplishments:

- Completed Ground Hardware Integration to install and checkout the two processing strings of operational hardware at the Missile Defense Space Experimentation Center (MDSEC) and one duplicate string at the LSOC which is the contractor's alternate operations center
- Completed the Qualification of the first of two software builds. Version 1.4h is the qualified software that encompasses the five Software Items (SIs): Mission Management (MM), Ground Mission Data Processing (GMDP), System Control (SC), Services and Infrastructure (S&I), and Training and Simulation (T&S)
- Completed the first iteration of operations procedures that are used to conduct Initial Crew Training and are the foundation for how the system will be operated.
- Conducted Ground Acceptance Test 1 (1 GAT) to demonstrate the capability of the qualified Build 1 software integrated on the qualified hardware to command and control a simulated STSS satellite and the software's readiness to support training.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603884C Ballistic Missile Defense Sensors |

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Government | 26,067 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

FY05 Accomplishments:
- Continued program management FFRDC support to manage execution of the STSS program
- Provided Program Office Support to Travel, Cost Estimating Support, Administrative Management Services, Hardware and Software purchases and maintenance, Computer Network Support, Supplies and reimbursement for AF Civilian positions

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| SE/PM | 61,553 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

FY05 Accomplishments:
- Conducted System Compatibility Tests (Payload, Satellite Bus and Ground System)
- Conducted BMDS system trades leveraging Block 2006 program office, MDA system engineers and Block 2006 contractor
- Initiated development of a capability based/spiral development acquisition strategy
- Conducted Advanced Algorithm Development studies

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| IR Engagement Sequence | 3,407 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

(Note: In FY05, AIRS was funded and managed in project 0811. STSS will continue to participate as a user of Airborne Infrared (IR) data, and to leverage lessons learned from IR sensor contributions to the BMDS.)

FY05 Accomplishments:
- Continue testing and evaluation of Infrared/Visible (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

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 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), 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 third 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 2006 |
|---|---|
| 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 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 | 198,820 | 0 | N/A | 0 | N/A | 198,820 |
| Launch Vehicle Integration | Various | NASA & AFRL/ FL & NM | 42,341 | 0 | N/A | 0 | N/A | 42,341 |
| Target Acquisition | Various | Various/ Various | 200 | 0 | N/A | 0 | N/A | 200 |
| **Ground** | | | | | | | | |
| Capability Based R&D Contract | SS/CPAF | NGST/ CA | 64,440 | 0 | N/A | 0 | N/A | 64,440 |
| **SE/PM** | | | | | | | | |
| Capability Based R&D Contract | SS/CPAF | NGST/ CA | 128,574 | 0 | N/A | 0 | N/A | 128,574 |
| Advanced Algorithm Development | Various | MIT/LL & Various/ Hanscomb AFB, MA & Various | 9,413 | 0 | N/A | 0 | N/A | 9,413 |
| **IR Engagement Sequence** | | | | | | | | |
| Airborne Infrared Surveillance (AIRS) | Various | Various/ Various | 7,002 | 0 | N/A | 0 | N/A | 7,002 |
| Data Collection and Analysis | Various | MIT/LL & AFRL/ Hanscomb AFB, MA & Kirtland AFB, NM | 9,981 | 0 | N/A | 0 | N/A | 9,981 |
| Subtotal Product Development | | | 460,771 | 0 | | 0 | | 460771 |

**Remarks**

The Capability Based R&D contract was awarded in FY02. Prior year and FY03 costs were included in Project 5041.

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 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 | 18,677 | 0 | N/A | 0 | N/A | 18,677 |
| Subtotal Support Costs | | | 18,677 | 0 | | 0 | | 18677 |

**Remarks:** All system program office support costs have been allocated to Block 2006, through the launch in FY07.

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Government** | | | | | | | | |
| FFRDC | FFRDC | AEROSPACE/ CA | 25,547 | 0 | N/A | 0 | N/A | 25,547 |
| Subtotal Management Services | | | 25,547 | 0 | | 0 | | 25547 |

**Remarks:** All FFRDC costs have been allocated to Block 2006, through the launch in FY07.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 504,995 | 0 | | 0 | | 504,995 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603884C Ballistic Missile Defense Sensors** |

| Fiscal Year | 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 |
| **BLOCK 2006** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IR Engagement Sequence | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| System Test/Operational Planning | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Spacecraft Integration and Test | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Payload Fabrication and Integration & Test | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ground Software Development | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ground Hardware/Segment Integration & Test | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Satellite Integration and Test | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| System Compatibility Tests | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲——▲ | Complete Activity | △——△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **BLOCK 2006** | | | | | | | |
| IR Engagement Sequence | 1Q-4Q | | | | | | |
| System Test/Operational Planning | 1Q-4Q | | | | | | |
| Spacecraft Integration and Test | 1Q-4Q | | | | | | |
| Payload Fabrication and Integration & Test | 1Q-4Q | | | | | | |
| Ground Software Development | 1Q-4Q | | | | | | |
| Ground Hardware/Segment Integration & Test | 1Q-4Q | | | | | | |
| Satellite Integration and Test | 2Q-4Q | | | | | | |
| System Compatibility Tests | 3Q,4Q | | | | | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0012 Space Tracking and Surveillance System (STSS) Block 2010 | 42,616 | 0 | 0 | 0 | 0 | 0 | 0 |
| RDT&E Articles Qty | 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. Location of documentation can be made available upon request but not in this document

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Future Block Development | 42,616 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Activity is described elsewhere due to classification. Location of documentation can be made available upon request but not in this document

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603884C Ballistic Missile Defense Sensors |

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## D. Acquisition Strategy

Activity is described elsewhere due to classification. Location of documentation can be made available upon request but not in this document

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0602 Program-Wide Support | 2,777 | 4,540 | 8,812 | 15,064 | 16,825 | 12,163 | 11,398 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## A. Mission Description and Budget Item Justification

Program-Wide Support provides funding for common non-headquarters support functions across the entire program such as strategic planning, program integration, business management, 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 outside services and support contractors that augment government staff in these areas. Many of these costs reside within the Missile Defense Agency 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, although some functions and costs within this program element are performed by MDA employees assigned within the National Capital Region (NCR). Other costs included herein provide facility capabilities for MDA Executing Agent locations, such as physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses. Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Civilian Salaries and Support | 2,777 | 4,540 | 8,812 |
| RDT&E Articles (Quantity) | 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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| Total PE Cost | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 |
| R113 Ballistic Missile Defense Interceptor Block 2012 | 256,809 | 0 | 0 | 0 | 0 | 0 | 0 |
| R213 Ballistic Missile Defense Interceptor Block 2014 | 0 | 201,933 | 386,300 | 400,000 | 851,900 | 1,149,000 | 1,651,018 |
| 0602 Program-Wide Support | 15,255 | 7,409 | 19,208 | 25,417 | 43,191 | 53,485 | 23,681 |

*Note: Congress directed that funding and work associated with the Near Field Infrared Experiment program transfer from the Ballistic Missile Defense System Interceptors PE to the Ballistic Missile Defense Technology PE (0603175C).*

*The Agency transitioned the Space Test Bed Program (Project R216) to the Ballistic Missile Defense System Space Program (Project 0517, PE 0603895C).*

**A. Mission Description and Budget Item Justification**

The Ballistic Missile Defense System Interceptors mission is to develop, test, and field land and sea-based interceptor capabilities within an integrated Ballistic Missile Defense System that are cost effective and have high mission assurance. The Missile Defense Agency will exploit the benefits of strategic interceptors deployment and mobility, early engagement, and distributed sensors to attack and defeat the adversary in new ways across the entire battle space. Our goal is to fill layered defense gaps, provide complimentary capabilities to existing and planned systems against the current threat, and provide a foundation for next generation systems to keep pace with the threat.

**A.1 System Element Description**

The Missile Defense Agency is developing a strategically deployable, land-mobile, multi-use (boost, ascent, and midcourse) Kinetic Energy Interceptor Element that consists of a very fast, high acceleration interceptor, a land-mobile fire control and communications system, and a land-mobile launcher. The interceptor design is compatible with both land-mobile and sea-mobile operations and features a high performance booster designed to carry multiple payload types. The program will leverage and build upon Ballistic Missile Defense System sensor and Command Control, Battle Management, and Communication capabilities. The Kinetic Energy Interceptor design adheres to new Agency quality, safety, environmental and mission assurance standards and contains several unique design features including: direct downlink of overhead infrared sensor data to a mobile weapon, advanced boost phase target tracking and prediction algorithms, a fast burning rocket motor, a high velocity at burnout with heavy payloads, and a large divert capability that enables early weapon commits.

The Kinetic Energy Interceptor near term program emphasis is on component capability risk reduction and element engineering. The Agency's goal is to mitigate critical risk areas prior to making full budget commitments. The performance, manufacturing, and cost knowledge we gain through FY08

knowledge point tests will drive investment decisions. The major knowledge point events include: 1) a campaign of real-time battle management and fire control tests with fully integrated Ballistic Missile Defense System Command, Control, Battle Management, and Communications and sensor capabilities to verify our quick response timeline and engagement sequences; and 2) a series of wind tunnel tests, booster first and second stage static firing tests and an integrated booster flight test to demonstrate booster capabilities. The booster design flown in the FY08 flight test is traceable to our tactical design. In addition to Kinetic Energy Interceptors execution performance, other Ballistic Missile Defense System investment priorities and threat evolution will dictate budget adjustments. At the knowledge-based decision points, the Missile Defense Agency Director will decide whether to continue the project as planned, terminate the effort, slow down the project, or accelerate the planned capabilities in pursuit of specific Test Bed or operational capability objectives.

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

Kinetic Energy Interceptors is a vital element of the layered Ballistic Missile Defense System. Early threat engagement in the boost/ascent regime is where target intercepts and observations from the kill vehicle offer the greatest defensive payoff. We are adding a boost/ascent layer and mobile midcourse capabilities to earlier Blocks to pace the threat and increase Ballistic Missile Defense System robustness. The Kinetic Energy Interceptors system will have the capability to counter medium-range, intermediate-range, and intercontinental ballistic missiles in all phases of flight outside the atmosphere.

The Kinetic Energy Interceptors program provides a high confidence path to an initial boost phase defense layer and complements the unique operational capabilities of the revolutionary directed energy Airborne Laser. A boost phase intercept negates the threat prior to payload and countermeasure release. The presence of a forward boost layer dramatically complicates the effort of any aggressor to threaten or attack the United States or its friends and allies with ballistic missiles. The Agency is maintaining parallel development paths through FY08 with Airborne Laser and Kinetic Energy Interceptors to ensure delivery of the critical boost layer by Block 2014. The additional Kinetic Energy Interceptor capability to intercept in the early ascent phase, enabling single forward-based sites to deny and defend extremely large regions. The early ascent phase fills coverage gaps that may arise due to geopolitical basing limitations, threat advancements, or adversary launch tactics. The capability of the Kinetic Energy Interceptor to intercept in the early ascent phase also enhances forward-based sensor effectiveness by constraining threat response (launch area and timing) options while also providing forward sensor protection.

The Agency's Responsible Engineering organization requires new payload and sensor capabilities to defeat emerging or future threats in midcourse. The Kinetic Energy Interceptor common booster is designed to carry the multiple kill vehicle and discrimination augmentation payloads needed to counter complex threats in midcourse. The Kinetic Energy Interceptor's mobility, fast acceleration, and heavy lift capacity enable the ability to

deliver these payloads early in the midcourse timeline. The early Kinetic Energy Interceptors shots, in combination with later Ground Based Interceptor or Aegis Ballistic Missile Defense shots, increase the protection level and robustness of the Ballistic Missile Defense System.

The intelligence communities' ability to predict exactly what the ballistic missile threat will be ten years from now is limited. The mobile Kinetic Energy Interceptor offers the warfighter and our Allies a responsive weapon capability to counter the rapid emergence of new adversaries, countermeasures, and tactics. When based in the United States or Allied country, the Kinetic Energy Interceptors battery can provide wide-area asymmetric defense coverage against any threat that flies in the exoatmosphere (short-to-long range ballistic missiles). In a forward-based role, the warfighter can employ the Kinetic Energy Interceptor to cut off vulnerable attack corridors designed to exploit fixed site defenses. The strategic basing flexibility of the Kinetic Energy Interceptor is enhanced by its ability to engage targets with only space-based sensor support.

The Kinetic Energy Interceptors ability to execute this suite of gap-filling missions is enabled by a flexible fire control design that allows the interceptor to receive and react to fused data from a diverse suite of ballistic missile defense sensors (land, sea, and space). This data is integrated with the Kinetic Energy Interceptors element via Ballistic Missile Defense System Command and Control, Battle Management and Communications. Prior to Block 2014, Kinetic Energy Interceptor developed early threat typing, rapid state vector generation, and threat trajectory prediction capabilities will be integrated into Ballistic Missile Defense System Command and Control, Battle Management and Communications Test Beds to enhance overall Ballistic Missile Defense System performance.

A top acquisition priority of the Kinetic Energy Interceptors is to improve interceptor quality and mission assurance, lower producibility risk, and reduce costs. The Kinetic Energy Interceptors contractor team is designing in product quality, affordability, core standards, and mission assurance at the outset of the program where the systems engineering investment yields the most leverage. Early program focus on manufacturing design and affordability will allow us to purchase high performance, multi-use, mobile interceptors at lower cost.

**A.3 Major System Element Goals**

Kinetic Energy Interceptors Development and Test:

- Successfully complete knowledge point development and test events in support of FY08 decision point
  - Verify battle management and fire control capabilities (timelines and engagement sequences) through multiple real-time battle management and fire control tests with fully integrated Ballistic Missile Defense System sensor and Command, Control, Battle Management, and Communications capabilities
  - Conduct a series of wind tunnel and booster (first and second stage) static firing test events
  - Conduct an integrated booster flight test by 4th quarter FY08 with a booster design that is traceable to the tactical design

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors** |

- Design the Block 2014 multi-use interceptor and fire control capabilities in close collaboration with the Agency Systems Engineering team
- Demonstrate mobile intercept capabilities in flight test by Block 2012 and complete multi-use (boost, ascent, midcourse) intercept test series by Block 2014

## A.4 Major Events Schedule and Description

| Major Event | Project | Timeframe | Description |
|---|---|---|---|
| **Flight Test** | | | |
| **Kinetic Energy Interceptors Knowledge Point Events** | | | |
| Booster flight test #1 | R213 | 4Q FY 2008 | |
| Booster flight test #2 | R213 | 3Q FY 2010 | |
| **Ground Test** | | | |
| **Integration and Test** | | | |
| Conduct Element Ground Test | R213 | 3Q FY 2010 | |
| Conduct Integrated Ground Test | R213 | 4Q FY 2011 | |
| **Kinetic Energy Interceptors Knowledge Point Events** | | | |
| Kill vehicle integrated ground test | R213 | 4Q FY 2011 | |
| **Other** | | | |
| **Element Engineering** | | | |
| Generate final ECS and A-Spec | R213 | 3Q FY 2007 | |
| Complete multi-use performance assessment #3 | R213 | 4Q FY 2007 | |
| Conduct element SDR | R213 | 4Q FY 2007 | |
| Conduct design review - 0 | R213 | 3Q FY 2009 | |
| Conduct design review - 1 | R213 | 1Q FY 2011 | |
| **Government System Engineering & Program Management** | | | |
| Sea Mobile Alternatives Assessment Phase-0 | R113 | 4Q FY 2005 | |
| Sea Mobile Alternatives Assessment | R213 | 1Q FY 2006 - 3Q FY 2007 | |
| Support Boost/Ascent Reports to Congress | R213 | 2Q FY 2006 - 4Q FY 2006 | |
| Complete transition of KI office to Huntsville, AL | R213 | 4Q FY 2006 | |
| **Kinetic Energy Interceptors Knowledge Point Events** | | | |
| Conduct DSP Direct Downlink Fire Control Tests | R113 | 3Q FY 2005 | • In Pathfinder Shelter |
| Stage 2 proof of concept static fire | R213 | 2Q FY 2006 | |
| Complete booster wind tunnel tests | R213 | 3Q FY 2006 | |
| Conduct fused ONIR-Radar fire control tests | R213 | 3Q FY 2006 | • In Pathfinder shelter (multiple engagement sequences) |
| Stage 1 proof of concept static fire | R213 | 4Q FY 2006 | |
| Conduct fused ONIR-Radar fire control tests | R213 | 3Q FY 2007 | • With deployed KEI shelter (multiple engagement sequences) |
| Stage 2 development motor static fire | R213 | 3Q FY 2007 | |

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors** |

| Major Event | Project | Timeframe | Description |
|---|---|---|---|
| Stage 1 development motor static fire | R213 | 4Q FY 2007 | |
| Stage 1 development motor static fire | R213 | 1Q FY 2008 - 2Q FY 2008 | |
| Stage 2 development motor static fire | R213 | 1Q FY 2008 - 2Q FY 2008 | |
| Conduct fused ONIR-Radar - STSS fire control tests | R213 | 3Q FY 2008 | • With deployed KEI shelter (multiple engagement sequences) |
| Stage 1 design update static fire test | R213 | 3Q FY 2009 | |
| Stage 2 design update static fire test | R213 | 3Q FY 2009 | |

| B. Program Change Summary | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Previous President's Budget (FY 2006 PB) | 279,815 | 229,658 | 444,900 |
| Current President's Budget (FY 2007 PB) | 272,064 | 209,342 | 405,508 |
| Total Adjustments | -7,751 | -20,316 | -39,392 |
| Congressional Specific Program Adjustments | 0 | -13,706 | 0 |
| Congressional Undistributed Adjustments | 0 | -6,610 | 0 |
| Reprogrammings | -3,133 | 0 | 0 |
| SBIR/STTR Transfer | -4,618 | 0 | 0 |
| Adjustments to Budget Years | 0 | 0 | -39,392 |

FY05 reduction of $7.751 million includes the SBIR/STTR transfer and MDA reprogrammings.

FY06 reduction of $20.316 million includes the Congressionally directed transfer of the Near Field Infrared Experiment (NFIRE) the BMD Technology Program Element (PE #0603175C) and a portion of the MDA Congressional undistributed adjustment.

FY07 Reduction of $39.392 million follows through with the Congressionally directed transfer of the NFIRE to the BMD Technology PE #0603175C and includes overhead/infrastructure reductions.

The Kinetic Energy Interceptors Development and Test program was restructured prior to the FY06 President's budget submission to include only the essential development and test efforts required to support the FY08 knowledge-based decision point. For FY07, the overall program plan and objectives remain the same; however, we have subsequently conducted detailed planning of our near term risk reduction activities through FY08. As a result, we removed the early two-color seeker risk reduction work from the Kinetic Energy Interceptors program. Aegis Ballistic Missile Defense now has the lead for MDA. These changes keep the scope of our risk reduction activities within available funding. The second stage rocket motor

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date<br>**February 2006** |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>**RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE<br>**0603886C Ballistic Missile Defense System Interceptors** |

static fire moved into FY06 (from 4th quarter FY05) to allow a detailed investigation of an observed bonding separation between the propellant and liner in one area of the motor. In the FY06 President's Budget exhibits, we indicated that we expected the delivery of kinetic, multi-use intercept capabilities in Block 2012/2014. We now expect to begin intercept flight testing in Block 2012 with a planned completion of ten intercept tests by Block 2014.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| R113 Ballistic Missile Defense Interceptor Block 2012 | 256,809 | 0 | 0 | 0 | 0 | 0 | 0 |
| RDT&E Articles Qty | 3 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: RDT&E Articles: Development Verification Test Pathfinder Shelter (1); Near Fire Infrared Experiment targets (2)*

## A. Mission Description and Budget Item Justification

The Kinetic Energy Interceptors program is developing and testing mobile interceptor and fire control capabilities for the Agency's next generation, multi-use (boost, ascent, and midcourse) kinetic intercept capabilities. The land-mobile Kinetic Energy Interceptor Element consists of a very fast, high acceleration interceptor, a land-mobile fire control and communications system, and a land-mobile launcher. A single interceptor design is compatible with both land and sea-mobile basing, and the booster is designed to accommodate multiple payload types (single or multiple kill vehicles). The Kinetic Energy Interceptor relies on distributed external sensors and flexible communication capabilities to deliver responsive layered defensive capabilities to the Ballistic Missile Defense System. The program execution focus through FY08 is the completion of booster and fire control knowledge point events that conclusively demonstrate the programs' readiness to proceed to intercept flight testing and Ballistic Defense System Test Bed integration. The knowledge point testing includes ten rocket motor static fires, a wind tunnel test series, an integrated tactical booster flight test in FY08, and a campaign of real-time battle management and fire control tests with integrated Ballistic Missile Defense System sensors, and Command, Control, Battle Management, and Communication capabilities. The knowledge-point development and testing, along with parallel objective element design, is enabled by a disciplined systems engineering effort across all the integrated product teams. We plan to transition to intercept flight testing in Block 2012 if the FY08 knowledge point events are successful. The MDA Director will determine the initial flight test mission emphasis (boost or ascent/midcourse) of the Kinetic Energy Interceptor program after the FY08 decision point based on threat evolution and the performance of other Ballistic Missile Defense System elements such as the Airborne Laser.

The Kinetic Energy Interceptors is a vital element of the layered Ballistic Missile Defense System. Kinetic Energy Interceptors unique mobility and performance combination enables early threat engagements in the boost/ascent regime where target intercepts and sensor observations offer the greatest defensive payoff. By adding a kinetic boost layer and flexible ascent/midcourse capabilities to earlier Block deployments, we are able to pace the threat, fill performance gaps, and increase Ballistic Missile Defense System robustness.

The Kinetic Energy Interceptors development and test effort is comprised of element engineering, interceptor, fire control and communications, launcher, integration and test, government system engineering and program management, and government system integration and test work packages.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Element Engineering | 28,275 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The Kinetic Energy Interceptors element engineering activities include all prime contractor program management operations, capability and interface specification development and flow-down, operations concept definition, element-level design trades, engagement sequence definition, element analyses and performance assessments, configuration control and change management, manufacturing, quality, affordability and risk-reduction, simulation development, and collaborative engineering planning and management with the Kinetic Energy Interceptor integrated product teams and key Agency organizations (Systems Engineering, Sensors, and Command, Control, Battle Management and Communications).

FY05 Accomplishments:

- Updated concept design baseline to incorporate Agency core standard requirements (e.g., nuclear hardening, insensitive munitions), anti-tamper technology protection, a 2-color seeker, and expanded signal processing capacity
- Updated element capability and interface specifications
- Completed element boost/ascent phase performance assessment #1
- Generated FY08 knowledge point test objectives and product development requirements

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Interceptor | 113,969 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The interceptor component development and test activities include requirements definition, design, fabrication, and test of multi-use interceptor capabilities. The near term interceptor development focus is on executing a series of wind tunnel tests and static fires leading to a tactically representative booster flight test in FY08.

FY05 Accomplishments:

- Developed boost flight test objectives, requirements, and interface specifications
- Defined baseline booster configuration for the FY08 booster flight test
- Executed initial booster flight wind tunnel tests series to validate critical stability and control requirements
- Performed 1st and 2nd stage propellant characterization tests
- Designed, manufactured, assembled and loaded the Stage 2 Proof of Concept static fire rocket motor

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors** |

- Conducted nozzle characterization tests to characterize the performance of the Stage 2 Proof of Concept trapped ball nozzle and the thrust vector control actuators

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Fire Control and Communications | 19,828 | 0 | 0 |
| RDT&E Articles (Quantity) | 1 | 0 | 0 |

The fire control and communications component development and test activities include requirements definition, design, fabrication, and verification/validation of the Block 2014 capability. This effort also includes execution of near-term activities to reduce risk associated with Ballistic Missile Defense System interface definition, fire control algorithm performance and robustness, internal and external latencies, and false alarm rate. Risk reduction work includes building a prototype shelter and testing data fusion and decision software with live overhead and radar sensor data.

FY05 Accomplishments:
RDT&E Articles: Development Verification Test Pathfinder Shelter (1)

- Built a fire control Pathfinder shelter with direct downlink capability and real-time tracking and fire control software to validate and verify Kinetic Energy Interceptor engagement sequences and timelines against global targets of opportunity
- Demonstrated through live and playback test events the ability to generate boost phase intercept fire control solutions with direct downlink of overhead sensor data
- Defined and demonstrated Kinetic Energy Interceptor to Ballistic Missile Defense System interfaces by passing messages in series of ground-based demonstration experiments
- Completed design of the X-band radar sensor interface to the Pathfinder shelter
- Completed In-Flight Communications System waveform study and antenna breadboard design for anti-jamming and operations in a nuclear environment

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Launcher | 11,540 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The near term land-mobile launcher development and test activities are limited to concept design, requirements definition, and interface definition in support of a System Design Review in FY07. In FY05, the launcher activity included both the launcher and interceptor canister. Canister development in FY06 and is now part of the interceptor development and test work package.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors |

FY05 Accomplishments:

- Developed a draft all-up-round requirements specification that established critical functional requirements and interfaces for the integrated canister and interceptor
- Conducted a launcher Concept Design Review that documented baseline launcher and canister capability and established requirements for mechanical and electrical interfaces from the canister to the interceptor
- Developed a draft launcher to all-up-round interface control document that established critical functional interfaces and communication message definitions

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Integration and Test | 2,244 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The Kinetic Energy Interceptor integration and test activities include development master test planning, coordination of test range interfaces, participation in ballistic missile defense war games, integration event and facility planning, and target requirement definition in collaboration with the Agency Systems Engineering team.

FY05 Accomplishments:

- Drafted Developmental Master Test Plan
- Continued range resource and safety planning and coordination for the FY08 booster flight
- Assessed potential sites for the System Integration Facility and Element Integration Facility
- Selected site for the System Integration Laboratory (Huntsville, Alabama) to become operational in FY09
- Participated in Nimble Titan Wargame
- Drafted target requirements document

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Government Systems Engineering and Program Management | 14,703 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The Government Systems Engineering and Program Management effort includes the program office, service laboratory and intelligence agency generation of threat data packages for the Kinetic Energy Interceptors development and test contract, Ballistic Missile Defense System interface definition and implementation support outside the Kinetic Energy Interceptor program office, off-contract technology risk reduction efforts, and off-contract special studies such as congressional reports and the sea-based alternatives assessment.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors** |

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 surface combatants, submarines, and large non-combatant ships. In FY05 we completed a joint study with the Navy on the concept of operations and feasibility of sea-mobile multi-use missions. In FY06 and FY07 we will continue our joint efforts to conduct a comprehensive alternatives assessment of viable sea-mobile platforms. The study group will recommend a platform strategy allowing us to begin platform-specific planning, system engineering, and risk reduction to facilitate a smooth start on future sea-mobile development and test after the FY08 decision point.

FY05 Accomplishments:

- Continued program office operations
- Delivered a Report to Congress on Kinetic Energy land- and sea-mobile capabilities
- Delivered boost and ascent threat data packages to prime contractor
- Completed a joint Kinetic Energy Interceptors Midcourse Concept of Operations Study with the Navy
- Completed Phase 0 of the sea-based alternatives assessment study with the Navy
- Completed concept design of a variable controlled thrust solid divert and attitude control system, an alternate path to our liquid divert and attitude control system baseline

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Government Systems Integration & Test | 550 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The Government Systems Integration and Test effort includes the Kinetic Energy Interceptors lethality project and target of opportunity data collection and analysis to reduce key program risks such as plume-to-hardbody handover and early ascent phase discrimination. The Kinetic Energy Interceptors lethality strategy extensively leverages previous work by other Ballistic Missile Defense System elements. The lethality project includes computer simulation of various boost/ascent and midcourse engagements between the Kinetic Energy Interceptors kill vehicle and threat missiles. The simulation results will ultimately be corroborated by collecting engagement data from Kinetic Energy Interceptors flight tests. A key aspect of our lethality approach is early involvement by the Director, Operational Test and Evaluation in our strategy development and execution.

FY05 Accomplishments:

- Conducted lethality simulations of various boost/ascent engagements between the Kinetic Energy Interceptors kill vehicle and one of four long range threat missiles

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors** |

- Developed requirements for an instrumented threat representative target to be used during Kinetic Energy Interceptors flight tests to corroborate simulation results

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| NFIRE | 65,700 | 0 | 0 |
| RDT&E Articles (Quantity) | 2 | 0 | 0 |

Congress directed that funding and work associated with the Near Field Infrared Experiment program transfer from the Ballistic Missile Defense System Interceptors PE to the Ballistic Missile Defense Technology PE (0603175C). Years affected are FY06 ($13,706) and FY07 ($10,800).

FY05 Accomplishments:
RDT&E Articles: 2 targets

- Completed calibration of the tracking sensor payload to establish the sensor baseline performance
- Initiated spacecraft bus assembly, integration, and test to prepare for integrating the sensor on the spacecraft
- Initiated ground segment development and testing to establish the space and ground communications network for training and operations
- Initiated experiment planning to define the specific events, resources, and coordination required for data collections
- Initiated development of target vehicles to support Near Field Infrared Experiment fly-by missions
- Refurbished ground equipment/test equipment for fly-by target vehicles at range and contractor facility

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 Kinetic Energy Interceptors acquisition strategy focuses on developing gap-filling, multi-use kinetic energy capabilities for strategically deployable land-mobile and sea-mobile platforms. A feature distinguishing this acquisition strategy 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 and fire control capabilities in realistic test environments prior to Design Review-0 in FY09. The FY05-FY08 development verification test results mitigate critical program risks, and provide the agency very detailed design, performance, cost, and programmatic knowledge to support the FY08 knowledge point decision. This strategy also implements early proofing of critical manufacturing processes as an integral part of the design process. The payoff for these up front 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 and Software Readiness Levels as maturity and risk indicators for proceeding forward with detailed design, building flight hardware and having a production off-ramp. In response to budget reductions, we will maintain our event-based knowledge points and allow the event completion dates to slip. This is the basis for the program restructure from Block 2012 to Block 2014.

To implement the development and 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 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Element Engineering** | | | | | | | | |
| Contractor Element Engineering | C/CPAF | Northrop Grumman, Arlington, VA | 28,275 | 0 | N/A | 0 | N/A | 28,275 |
| **Interceptor** | | | | | | | | |
| Interceptor | C/CPAF | Raytheon, Tuscon, AZ | 112,769 | 0 | N/A | 0 | N/A | 112,769 |
| TDACS | C/CPAF | SMDC, Huntsville, AL | 1,200 | 0 | N/A | 0 | N/A | 1,200 |
| **Fire Control and Communications** | | | | | | | | |
| Fire Control and Communications | C/CPAF | Northrop Grumman, Huntsville, AL/Boulder, CO | 18,312 | 0 | N/A | 0 | N/A | 18,312 |
| GFE | C/CPAF | Northrop Grumman, Arlington, VA | 61 | 0 | N/A | 0 | N/A | 61 |
| C2BMC | C/CPAF | Missle Defense Agency/BC, Washington, DC | 1,455 | 0 | N/A | 0 | N/A | 1,455 |
| **Launcher** | | | | | | | | |
| Launcher | C/CPAF | Northrop Grumman, Sunnyvale, CA | 11,540 | 0 | N/A | 0 | N/A | 11,540 |
| **Integration and Test** | | | | | | | | |
| Integration & Test | C/CPAF | Northrop Grumman, El Segundo, CA | 2,244 | 0 | N/A | 0 | N/A | 2,244 |
| **NFIRE** | | | | | | | | |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Spacecraft | C/CPAF | General Dynamics, Gilbert, AZ | 17,380 | 0 | N/A | 0 | N/A | 17,380 |
| Tracking Payload | C/CPAF | AFRL, Kirtland AFB, NM | 6,101 | 0 | N/A | 0 | N/A | 6,101 |
| Launch Vehicle | CPAF | SMC Det 12, Orbital, Chandler, AZ | 9,947 | 0 | N/A | 0 | N/A | 9,947 |
| Targets | C/CPAF | MDA/TC/KAFB, Albuquerque, NM/OSC, Chandler, AZ | 18,487 | 0 | N/A | 0 | N/A | 18,487 |
| Secure Communications | MIPR | Com Sec Gear, San Antonio, TX | 500 | 0 | N/A | 0 | N/A | 500 |
| Science Team | MIPR | Aerospace, El Segundo, CA | 1,315 | 0 | N/A | 0 | N/A | 1,315 |
| Mission Operations | C/CPAF | JNIC, Colorado Springs, CO | 5,530 | 0 | N/A | 0 | N/A | 5,530 |
| Calibration & Analysis | MIPR | AEDC, Arnold AFB, TN | 983 | 0 | N/A | 0 | N/A | 983 |
| Calibration & Analysis | C/CPAF | Space Dynamics Lab, North Logan, UT | 1,669 | 0 | N/A | 0 | N/A | 1,669 |
| Science Team | MIPR | MIT/LL, Hanscom AFB, MA | 2,770 | 0 | N/A | 0 | N/A | 2,770 |
| Tracking Payload | C/CPFF | MEI, Arlington, VA | 1,018 | 0 | N/A | 0 | N/A | 1,018 |
| Subtotal Product Development | | | 241,556 | 0 | | 0 | | 241556 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors |

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Government Systems Engineering and Program Management** | | | | | | | | |
| Engineering Technical Support | MIPR | NSWC/DD, Dahlgren, VA | 305 | 0 | N/A | 0 | N/A | 305 |
| Civilian Salaries | | Missile Defense Agency, Washington, DC | 615 | 0 | N/A | 0 | N/A | 615 |
| Government Travel | | Missile Defense Agency, Washington, DC | 41 | 0 | N/A | 0 | N/A | 41 |
| SETA | C/FFP | MEI, Arlington, VA | 5,676 | 0 | N/A | 0 | N/A | 5,676 |
| SETA | C/FFP | Sparta, Rosslyn, VA | 275 | 0 | N/A | 0 | N/A | 275 |
| Strategic Studies | C/FFP | Center for Strategic Studies, Washington, DC | 46 | 0 | N/A | 0 | N/A | 46 |
| VV&A Training | MIPR | NAVAIR, China Lake, CA | 20 | 0 | N/A | 0 | N/A | 20 |
| Security Specialist | C/FFP | BETA, Maryland, VA | 151 | 0 | N/A | 0 | N/A | 151 |
| EMC Support | MIPR | Joint Spectrum Center, Annapolis, MD | 195 | 0 | N/A | 0 | N/A | 195 |
| Sea Mobile POAM | C/FFP | Booz-Allen, McLean, VA | 76 | 0 | N/A | 0 | N/A | 76 |
| KEI BMDS Interfaces | C/CPAF | SMDC, Huntsville, AL | 2,425 | 0 | N/A | 0 | N/A | 2,425 |
| KEI BMDS Interfaces | MIPR | NSWC/DD, Dahlgren, VA | 300 | 0 | N/A | 0 | N/A | 300 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| KEI BMDS Interfaces | C/FFP | Sparta, Rosslyn, VA | 75 | 0 | N/A | 0 | N/A | 75 |
| Sea Mobile Platform AA | MIPR | NSWC/DD, Dahlgren, VA | 592 | 0 | N/A | 0 | N/A | 592 |
| Sea Mobile Platform AA | MIPR | Naval Research, Arlington, VA | 37 | 0 | N/A | 0 | N/A | 37 |
| KEI Technical Support | MIPR | Army Research, Redstone Arsenal, AL | 250 | 0 | N/A | 0 | N/A | 250 |
| Adversary Capability High Fidelity | C/CPAF | AFRL, Kirtland AFB, NM | 2,140 | 0 | N/A | 0 | N/A | 2,140 |
| BMDS Sensor Data Generation | C/CPAF | AFRL, Kirtland AFB, NM | 100 | 0 | N/A | 0 | N/A | 100 |
| FBX-T Interface Development | C/FFP | Raytheon | 500 | 0 | N/A | 0 | N/A | 500 |
| ONIR Sensor Model Validation | MIPR | Surface Warfare Center, Schriever AFB, CO | 500 | 0 | N/A | 0 | N/A | 500 |
| Conus KEI | C/CPAF | JNIC, Colorado Springs, CO | 115 | 0 | N/A | 0 | N/A | 115 |
| Sea Mobile Platform AA | C/FFP | JHU/APL, Baltimore, MD | 60 | 0 | N/A | 0 | N/A | 60 |
| STSS Special Study | MIPR | SMC/ISPB, El Segundo, CA | 100 | 0 | N/A | 0 | N/A | 100 |
| KEI Support | C/FFP | JHU/APL, Baltimore, MD | 9 | 0 | N/A | 0 | N/A | 9 |
| KEI BMDS Interfaces | MIPR | SMDC, Huntsville, AL | 100 | 0 | N/A | 0 | N/A | 100 |
| Subtotal Support Costs | | | 14,703 | 0 | | 0 | | 14703 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors |

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Government Systems Integration & Test** | | | | | | | | |
| Lethality | MIPR | Sandia National Lab, Abuquerque, NM | 550 | 0 | N/A | 0 | N/A | 550 |
| TOOs | MIPR | VAFB, Santa Barbara, CA | 0 | 0 | N/A | 0 | N/A | |
| Subtotal Test and Evaluation | | | 550 | 0 | | 0 | | 550 |

**Remarks**

## IV. Management Services Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 | | | 256,809 | 0 | | 0 | | 256,809 |

**Remarks**

The Prime Contractor has the responsibility to balance resources across the KEI 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 2006 |
|---|---|
| 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 | 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 |
| **Kinetic Energy Interceptors Knowledge Point Events** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Conduct DSP Direct Downlink Fire Control Tests | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Element Engineering** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Concept design baseline update | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | |
| Generate booster and fire control DVT requirements | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | |
| Complete boost/ascent performance assessment #1 | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | |
| **Fire Control and Communications** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Build pathfinder shelter | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | |
| Conducted Direct Downlink Experiment | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Government System Engineering & Program Management** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sea Mobile Alternatives Assessment Phase-0 | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | |
| **Near Field Infrared Experiment** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Complete calibration of tracking sensor payload | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲— | Complete Activity | △— | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Kinetic Energy Interceptors Knowledge Point Events** | | | | | | | |
| Conduct DSP Direct Downlink Fire Control Tests | 3Q | | | | | | |
| **Element Engineering** | | | | | | | |
| Concept design baseline update | 3Q | | | | | | |
| Deliver KEI SIM Version 1.1 | 3Q | | | | | | |
| Generate booster and fire control DVT requirements | 3Q | | | | | | |
| Update element capability interface specifications | 3Q | | | | | | |
| Complete boost/ascent performance assessment #1 | 4Q | | | | | | |
| **Interceptor** | | | | | | | |
| 1st and 2nd stage propellant tests | 2Q | | | | | | |
| Booster Wind Tunnel Tests | 3Q | | | | | | |
| **Fire Control and Communications** | | | | | | | |
| Build pathfinder shelter | 3Q | | | | | | |
| Conducted Direct Downlink Experiment | 3Q | | | | | | |
| Demonstrated data fusion in lab | 3Q | | | | | | |
| **Launcher** | | | | | | | |
| Conduct Initial Requirements Review | 2Q | | | | | | |
| **Integration and Test** | | | | | | | |
| Assessed Potential Sites for Facility Mods | 2Q-4Q | | | | | | |
| Publish/Update Development Master Test Plan | 3Q | | | | | | |
| Publish/Update Target Requirements Documentation | 3Q | | | | | | |
| Participate in Nimble Titan Wargame | 4Q | | | | | | |
| **Government System Engineering & Program Management** | | | | | | | |
| Deliver Report to Congress on KEI Basing | 2Q | | | | | | |
| Deliver Boost/Ascent threat data packages | 3Q | | | | | | |
| Complete Navy Concept of Operations Study | 4Q | | | | | | |
| Sea Mobile Alternatives Assessment Phase-0 | 4Q | | | | | | |
| TDACS concept design | 4Q | | | | | | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Near Field Infrared Experiment** | | | | | | | |
| Experiment planning | 1Q-4Q | | | | | | |
| Ground segment development and testing | 1Q-4Q | | | | | | |
| Spacecraft bus assembly, integration, and test | 1Q-4Q | | | | | | |
| Complete calibration of tracking sensor payload | 2Q | | | | | | |
| **Government Integration and Test** | | | | | | | |
| Lethality sims boost/ascent long-range targets | 4Q | | | | | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| R213 Ballistic Missile Defense Interceptor Block 2014 | 0 | 201,933 | 386,300 | 400,000 | 851,900 | 1,149,000 | 1,651,018 |
| RDT&E Articles Qty | 0 | 1 | 0 | 0 | 4 | 5 | 11 |

*Note: Congress directed that funding and work associated with the Near Field Infrared Experiment program transfer from the Ballistic Missile Defense System Interceptors PE to the Ballistic Missile Defense Technology PE (0603175C).*

*The Agency transitioned the Space Test Bed Program (Project R216) to the Ballistic Missile Defense System Space Program (Project 0517, PE 0603895C).*

*RDT&E Articles: FY06 - Booster Flight 1 - First and Second stage motors with moc payload (1). FY09 - Booster Flight 2 - First and Second stage motors with moc payload (1); Partial full scale - Interceptor flight with moc payload (1); Engineering Model Launcher (1); Prototype with Version 1 software - used for controlled test vehicle flight (1). FY10 - Controlled Test Vehicle - first flight with active Kill Vehicle (inert Liquid Divert and Attitude Control System (1); Element Charactrization Flight - First Interceptor flight against target (1); Spare Interceptor (1); Operational Model Launcher 1 - Used for Element Characterization Flight (1); Operational Model Launcher 2 - Used for Environmental and Mobility testing (1). FY11 - Ship risk Reduction Flight - Interceptor flight against target from ship platform (1); Integrated Flight Test 1 (1); Integrated Flight Test 2 (1); Integrated Flight Test 3 - First Production Interceptor (1); Operational Model Launcher 3 - Used for controlled test vehicle and ship risk reduction flights, spare for IT1 (1); Engineering Unit 1 with Version 2 software used for Element Characterization Flight (1); Engineering Unit 2 with Version 2 software used for ship risk reduction flight (1); Solid target for Element Characterization Flight (1); Spare solid target (1); Solid target for ship risk reduction flight (1); Liquid two-stage target for integrated flight test 1 (1)*

## A. Mission Description and Budget Item Justification

The Kinetic Energy Interceptors program is developing and testing mobile interceptor and fire control capabilities for the Agency's next generation, multi-use (boost, ascent, and midcourse) kinetic intercept capabilities. The land-mobile Kinetic Energy Interceptor Element consists of a very fast, high acceleration interceptor, a land-mobile fire control and communications system, and a land-mobile launcher. A single interceptor design is compatible with both land and sea-mobile basing, and the booster is designed to accommodate multiple payload types (single or multiple kill vehicles). The Kinetic Energy Interceptor relies on distributed external sensors and flexible communication capabilities to deliver responsive layered defensive capabilities to the Ballistic Missile Defense System. The program execution focus through FY08 is the completion of booster and fire control knowledge point events that conclusively demonstrate the programs' readiness to proceed to intercept flight testing and Ballistic Defense System Test Bed integration. The knowledge-point testing includes ten rocket motor static fires, a wind tunnel test series, an integrated tactical

booster flight test in FY08, and a campaign of real-time battle management and fire control tests with integrated Ballistic Missile Defense System sensors, and Command, Control, Battle Management, and Communication capabilities. The knowledge point development and testing, along with parallel objective element design, is enabled by a disciplined systems engineering effort across all the integrated product teams. We plan to transition to intercept flight testing in Block 2012 if the FY08 knowledge point events are successful. The MDA Director will determine the initial flight test mission emphasis (boost or ascent/midcourse) of the Kinetic Energy Interceptor program after the FY08 decision point based on threat evolution and the performance of other Ballistic Missile Defense System elements such as the Airborne Laser.

The Kinetic Energy Interceptors is a vital element of the layered Ballistic Missile Defense System. Kinetic Energy Interceptors unique mobility and performance combination enables early threat engagements in the boost/ascent regime where target intercepts and sensor observations offer the greatest defensive payoff. By adding a kinetic boost layer and flexible ascent/midcourse capabilities to earlier Block deployments, we are able to pace the threat, fill performance gaps, and increase Ballistic Missile Defense System robustness.

The Kinetic Energy Interceptors development and test effort is comprised of element engineering, interceptor, fire control and communications, launcher, integration and test, government system engineering and program management, and government system integration and test work packages.

**B. Accomplishments/Planned Program**

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Element Engineering | 0 | 40,908 | 68,352 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The Kinetic Energy Interceptors element engineering activities include all prime contractor program management operations, capability and interface specification development and flow-down, operations concept definition, element-level design trades, engagement sequence definition, element analyses and performance assessments, configuration control and change management, manufacturing, quality, affordability and risk-reduction, simulation development, and collaborative engineering planning and management with the Kinetic Energy Interceptor integrated product teams and key Agency organizations (Systems Engineering, Sensors, and Command, Control, Battle Management and Communications).

FY06 Planned Program:

- Continue prime contractor program management operations
- Conduct concept baseline update review to capture multi-use (boost, ascent, midcourse) design updates
- Update element capability and interface specifications
- Generate draft A-spec and flow-down to component integrated product teams

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors |

- Complete boost/ascent/midcourse performance assessment #2
- Deliver Kinetic Energy Interceptors Simulation (KEISIM) version 2.0

FY07 Planned Program:
- Continue prime contractor program management operations
- Conduct System Design Review
- Complete Kinetic Energy Interceptors Test Bed Description Document, system specification, and element capability and interface specifications
- Generate final element A-spec and flow down to component integrated product teams
- Complete boost/ascent/midcourse performance assessment #3
- Deliver Kinetic Energy Interceptors Simulation (KEISIM) version 3.0

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Interceptor | 0 | 106,138 | 220,390 |
| RDT&E Articles (Quantity) | 0 | 1 | 0 |

The FY07 interceptor component development and test activities build on FY06 Stage 1 and 2 Proof of Concept static motor firings and focus on the essential efforts required to fly a tactically representative booster in FY08. These activities include extensive ground testing and integration of key components (rocket motors, thrust vector control units, avionics and software, etc.) necessary to demonstrate the booster capability with a high probability of mission success. Upon successful completion of the booster flight knowledge/decision point, we will directly leverage the booster flight design and knowledge gained to engineer a robust Block 2014 multi-use interceptor that is both producible and reliable. We will demonstrate this capability through an increasingly complex set of ground and flight tests ranging from static motor firings to fully integrated intercept tests.

FY06 Planned Program:
RDT&E Articles: Booster Flight 1 - First and Second stage motors with moc payload (1)

- Conduct the Stage 2 Proof of Concept rocket motor static firing
- Complete booster hypersonic wind tunnel test series
- Conduct booster flight test Preliminary Design Review
- Proof test an inert Stage 1 motor case to validate the pressure capability of the composite case and demonstrate the production, propellant loading and processing of the Stage 1 motor

- Conduct the Stage 1 Proof of Concept rocket motor static firing
- Initiate procurement of long-lead hardware for FY08 booster flight test

FY07 Planned Program:
- Conduct booster flight test Critical Design Review to define the final configuration for FY08 boost flight
- Conduct Stage 1 and 2 rocket motor static firings to subject the motors to increasingly severe environmental and load testing
- Perform ground testing of the boost flight avionics and associated software
- Execute ground testing of the Stage 1 to Stage 2 stage separation hardware
- Burst test a Stage 2 rocket motor case to determine the ultimate pressure capability of the booster flight motor configuration
- Conduct bench testing of thrust vector control actuators
- Conduct interceptor component System Design Review for Block 2014 multi-use capability
- Begin fabrication and test of booster flight hardware

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Fire Control and Communications | 0 | 23,798 | 36,938 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The fire control and communications component development and test activities include requirements definition, design, fabrication, and verification/validation of the Block 2014 objective capability. This effort also includes execution of near-term activities to reduce risk associated with Ballistic Missile Defense System interface definition, fire control algorithm performance and robustness, internal and external communication latencies, and false alarm rate. Risk reduction work includes building a prototype Kinetic Energy Interceptor Fire Control shelter and testing data fusion and decision software with live overhead infrared and radar sensor data.

FY06 Planned Program:
- Demonstrate forward-based radar interface and fusion of radar and infrared data in the Pathfinder shelter (playback and live fire control test events)
- Demonstrate our ability to receive and process national sensor data in the field to support formation of accurate missile tracks in the boost phase
- Complete in-flight data link compatibility analysis with the Navy Cooperative Engagement Capability System to ensure non-interference operations on land and sea
- Build antenna panels to characterize in-flight communications system performance

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors |

- Update interface requirements to the Ballistic Missile Defense System Command and Control, Battle Management and Communications element

FY07 Planned Program:
- Conduct fire control and communication component System Design Review
- Continue to demonstrate multi-use (boost, ascent, and midcourse) Kinetic Energy Interceptor engagement sequences in the field with mobile Pathfinder shelter (overhead non-imaging infrared and forward-based radar sensors)
- Establish an integration lab to check out and test our fire control and communications subcomponents in a controlled environment
- Initiate compatibility testing with prototype transmit panel to demonstrate compatibility with Navy Cooperative Engagement Capability system
- Test in-flight communications system transmit panel in lab to validate transmitter design
- Initiate procurement of hardware and software for the System Integration Lab and System Integration Facility

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Launcher | 0 | 7,377 | 14,001 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The near term land-mobile launcher development and test activities include requirements definition, launcher design, and interface definition in support of a Kinetic Energy Interceptor System Design Review in FY07.

FY06 Planned Program:
- Conduct land-mobile launcher concept design trades
- Develop draft launcher prime item development specification to establish the baseline performance requirements for the launcher hardware and software
- Define launcher interfaces between the launcher component, fire control and communications component, and all-up-round to assure interoperability
- Provide launcher input to support element operational concept development

FY07 Planned Program:
- Complete launcher concept design trades and functional requirements analyses
- Complete launcher prime item development specification
- Conduct launcher System Design Review to finalize the launcher functional baseline and capability definition

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors** |

- Establish launcher interface requirements to other Kinetic Energy Interceptors components (all-up round and fire control)

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Integration and Test | 0 | 4,760 | 27,052 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The Kinetic Energy Interceptor integration and test responsibilities include development master test planning, coordination of test range interfaces, participation in ballistic missile defense war games, integration facility planning and design, integration facility construction, environmental analyses and documentation, manufacturability planning, and target requirements definition in collaboration with the Agency Systems Engineering team.

FY06 Planned Program:

- Continue range resource and safety planning and coordination for FY08 booster flight
- Select site for System Integration Facility and Element Integration Facility and initiate environmental analysis
- Initiate detailed requirements analysis and design of System Integration Lab, System Integration Facility, and Element Integration Facility
- Publish target requirements documentation (liquid and solid target capabilities)
- Publish Development Master Test Plan
- Participate in Nimble Titan Wargame

FY07 Planned Program:

- Perform detailed range resource and safety planning and coordination for FY08 booster flight
- Complete detailed requirements analysis and design of System Integration Lab, System Integration Facility, and Element Integration Facility
- Initiate development and construction (architecture and engineering contracts) of System and Element Integration Facilities
- Update Development Master Test Plan and Targets Requirement Document for Element System Design Review
- Deliver lower level plans and analyses for the element System Design Review (Manufacturing Plan, Integration Plan, and Ground Support Equipment and Test Support Equipment Analyses)
- Participate in Nimble Titan Wargame
- Initiate long-lead range resource and safety and environmental planning and coordination for flight tests after FY08 knowledge point

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors |

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Government Systems Engineering and Program Management | 0 | 18,545 | 17,425 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The Government Systems Engineering and Program Management effort includes the program office, service laboratory and intelligence agency generation of threat data packages for the Kinetic Energy Interceptors development and test contract, Ballistic Missile Defense System interface definition and implementation support outside the Kinetic Energy Interceptor program office, off-contract technology risk reduction efforts, and off-contract special studies such as congressional reports and the sea-based alternatives assessment.

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 surface combatants, submarines, and large non-combatant ships. In FY05 we completed a joint study with the Navy on the concept of operations and feasibility of the sea-mobile multi-use mission. In FY06 and FY07 we will continue our joint efforts to conduct a comprehensive alternatives assessment of viable sea-mobile platforms. The study group will recommend a platform strategy allowing us to begin platform-specific planning, system engineering, and risk reduction to facilitate a smooth start on future sea-mobile development and test after the FY08 decision point.

FY06 Planned Program:
- Continue program office operations
- Transition program office operations from Arlington, Virginia to Huntsville, Alabama
- Continue joint Sea-Based Alternatives Assessment study with the Navy
- Update boost, ascent, and midcourse threat data package deliverables to prime contractor
- Conduct User Concept of Operation Table Top exercises to generate early warfighter feedback into development process
- Support delivery of Reports to Congress on Ballistic Missile Defense System boost and ascent phase capabilities

FY07 Planned Program:
- Continue program office operations
- Complete joint Sea-Based Alternatives Assessment study with the Navy and select a sea-mobile platform
- Complete Kinetic Energy Interceptors sections of Ballistic Missile Defense System Test Bed Description Document and System Specification in collaboration with MDA Systems Engineering team
- Update boost, ascent, and midcourse threat data package deliverables to Kinetic Energy Interceptors prime contractor

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603886C Ballistic Missile Defense System Interceptors** |

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Government Systems Integration & Test | 0 | 407 | 2,142 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The Government Systems Integration and Test effort includes the lethality project and target of opportunity data collection and analysis to reduce key program risks such as tracking and discrimination in all phases of flight. The Kinetic Energy Interceptors lethality strategy extensively leverages previous work by other Ballistic Missile Defense System elements. The lethality project includes computer simulation of various boost/ascent and midcourse engagements between the Kinetic Energy Interceptors kill vehicle and threat missiles. The simulation results will ultimately be corroborated by collecting engagement data from Kinetic Energy Interceptors flight tests. A key aspect of our lethality approach is early involvement by the Director, Operational Test and Evaluation in our strategy development and execution.

FY06 Planned Program:

- Conduct lethality simulations of various boost/ascent engagements between the Kinetic Energy Interceptors kill vehicle and the second of four long range threat missiles
- Analyze relevant Targets of Opportunity test data and incorporate results into Kinetic Energy Interceptors simulations and engineering notebooks

FY07 Planned Program:

- Conduct lethality simulations of various boost/ascent engagements between the Kinetic Energy Interceptors kill vehicle and the third of four long range threat missiles
- Begin conducting lethality simulations of midcourse engagements between the Kinetic Energy Interceptors kill vehicle and medium-to-long range threat missiles
- Employ airborne and ground sensors to collect data on dedicated Near Field Infrared Experiment Targets (3-D measurements with satellite)
- Analyze Targets of Opportunity test data and incorporate results into Kinetic Energy Interceptors simulations and engineering notebooks
- Continue planning for FY08-09 ground tests of instrumentation to be used in threat representative test target

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 Kinetic Energy Interceptors development and test acquisition strategy focuses on developing gap-filling, multi-use kinetic energy capabilities for strategically deployable land-mobile and sea-mobile platforms. A feature distinguishing this acquisition strategy 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 and fire control capabilities in realistic test environments prior to Design Review-0 in FY09. The FY05-FY08 development verification test results mitigate critical program risks, and provide the agency very detailed design, performance, cost, and programmatic knowledge to support the FY08 knowledge point decision. This strategy also implements early proofing of critical manufacturing processes as an integral part of the design process. The payoff for these up front 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 and Software Readiness Levels as maturity and risk indicators for proceeding forward with detailed design, building flight hardware and having a production off-ramp. In response to budget reductions, we will maintain our event-based knowledge points and allow the event completion dates to slip. This is the basis for the program restructure from Block 2010 to Block 2014.

To implement the development and 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 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Element Engineering** | | | 0 | 0 | N/A | 0 | N/A | |
| Contractor Element Engineering | C/CPAF | Northrop Grumman, Arlington, VA | 0 | 40,908 | 2Q | 68,352 | 2Q | 109,260 |
| **Interceptor** | | | 0 | 0 | N/A | 0 | N/A | |
| Interceptor | C/CPAF | Raytheon, Tuscon, AZ | 0 | 106,138 | 1Q | 218,986 | 1Q | 325,124 |
| TDACS | C/CPAF | SMDC, Huntsville, AL | 0 | 0 | N/A | 1,404 | 1Q | 1,404 |
| **Fire Control and Communications** | | | 0 | 0 | N/A | 0 | N/A | |
| Fire Control and Communications | C/CPAF | Northrop Grumman, Huntsville, AL/Boulder, CO | 0 | 23,798 | 1Q | 36,938 | 1Q | 60,736 |
| **Launcher** | | | 0 | 0 | N/A | 0 | N/A | |
| Launcher | C/CPAF | Northrop Grumman, Sunnyvale, CA | 0 | 7,377 | 1Q | 14,001 | 1Q | 21,378 |
| **Integration and Test** | | | 0 | 0 | N/A | 0 | N/A | |
| Integration & Test | C/CPAF | Northrop Grumman, El Segundo, CA | 0 | 4,760 | 1Q | 27,052 | 1Q | 31,812 |
| Subtotal Product Development | | | 0 | 182,981 | | 366,733 | | 549714 |

## Remarks

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603886C Ballistic Missile Defense System Interceptors |

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Government Systems Engineering and Program Management** | | | 0 | 0 | N/A | 0 | N/A | |
| Civilian Salaries | | Missile Defense Agency, Washington, DC | 0 | 1,072 | 1Q | 3,543 | 1Q | 4,615 |
| Government Travel | | Missile Defense Agency, Washington, DC | 0 | 934 | 2Q | 677 | 2Q | 1,611 |
| SETA | C/FFP | MEI, Arlington, VA | 0 | 7,644 | 1Q | 7,287 | 1Q | 14,931 |
| KEI BMDS Interfaces | C/CPAF | Northrop Grumman, Arlington, VA | 0 | 5,395 | 1Q | 1,598 | 1Q | 6,993 |
| Sea Based | MIPR | NSWC/DD | 0 | 3,500 | 2Q | 4,320 | 2Q | 7,820 |
| Subtotal Support Costs | | | 0 | 18,545 | | 17,425 | | 35970 |

**Remarks**

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Government Systems Integration & Test** | | | 0 | 0 | N/A | 0 | N/A | |
| Lethality | MIPR | Sandia National Lab, Abuquerque, NM | 0 | 407 | 1Q | 1,229 | 1Q | 1,636 |
| TOOs | MIPR | VAFB, Santa Barbara, CA | 0 | 0 | N/A | 913 | 1Q | 913 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Subtotal Test and Evaluation | | | 0 | 407 | | 2,142 | | 2549 |

**Remarks**

## IV. Management Services Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 | 201,933 | | 386,300 | | 588,233 |

**Remarks**

The Prime Contractor has the responsibility to balance resources across the KEI 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 2006 |
|---|---|
| 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 | 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 |
| **Kinetic Energy Interceptors Knowledge Point Events** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Stage 2 proof of concept static fire | | | | | | △ | | | | | | | | | | | | | | | | | | | | | | |
| Complete booster wind tunnel tests | | | | | | | △ | | | | | | | | | | | | | | | | | | | | | |
| Conduct fused ONIR-Radar fire control tests | | | | | | | △ | | | | △ | | | | | | | | | | | | | | | | | |
| Stage 1 proof of concept static fire | | | | | | | | △ | | | | | | | | | | | | | | | | | | | | |
| Stage 2 development motor static fire | | | | | | | | | | | △ | | △ | △ | | | | | | | | | | | | | | |
| Stage 1 development motor static fire | | | | | | | | | | | | △ | △ | △ | | | | | | | | | | | | | | |
| Conduct fused ONIR-Radar - STSS fire control tests | | | | | | | | | | | | | | | △ | | | | | | | | | | | | | |
| Booster flight test #1 | | | | | | | | | | | | | | | | △ | | | | | | | | | | | | |
| Stage 1 design update static fire test | | | | | | | | | | | | | | | | | | | △ | | | | | | | | | |
| Stage 2 design update static fire test | | | | | | | | | | | | | | | | | | | △ | | | | | | | | | |
| Booster flight test #2 | | | | | | | | | | | | | | | | | | | | | | | △ | | | | | |
| Kill vehicle integrated ground test | | | | | | | | | | | | | | | | | | | | | | | | | | | | △ |
| **Element Engineering** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲—▲ | Complete Activity | △—△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 | 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 |
| **Element Engineering** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Complete multi-use performance assessment #2 | | | | | | | | △ | | | | | | | | | | | | | | | | | | | | |
| Concept design baseline update | | | | | | | | △ | | | | | | | | | | | | | | | | | | | | |
| Generate final ECS and A-Spec | | | | | | | | | | | △ | | | | | | | | | | | | | | | | | |
| TBSS | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| Complete multi-use performance assessment #3 | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| Conduct element SDR | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| Conduct design review - 0 | | | | | | | | | | | | | | | | | | | △ | | | | | | | | | |
| Conduct design review - 1 | | | | | | | | | | | | | | | | | | | | | | | | | △ | | | |
| **Interceptor** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Static Fire 1st and 2nd stage rocket motors | | | | | | △ | — | △ | | | | | | | | | | | | | | | | | | | | |
| Booster wind tunnel test complete | | | | | | | △ | | | | | | | | | | | | | | | | | | | | | |
| Booster Preliminary Design Review | | | | | | | | △ | | | | | | | | | | | | | | | | | | | | |
| Booster rocket motor static test | | | | | | | | | | △ | — | — | — | △ | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲— | Complete Activity | △— | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 | 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 |
| **Interceptor** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Booster Critical Design Review | | | | | | | | | | | △ | | | | | | | | | | | | | | | | | |
| Interceptor Component SDR | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| Conduct booster flight #1 | | | | | | | | | | | | | | | | △ | | | | | | | | | | | | |
| Interceptor design review 0 | | | | | | | | | | | | | | | | | | | △ | | | | | | | | | |
| Conduct booster flight #2 | | | | | | | | | | | | | | | | | | | | | | | △ | | | | | |
| Conduct Partial Full Scale (PFS) test 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | △ | |
| Conduct Kill Vehicle Hover Test | | | | | | | | | | | | | | | | | | | | | | | | | | | | △ |
| **Fire Control and Communications** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Demonstrate Radar-ONIR Fusion/Live Event | | | | | | | | | | | △ | | | | | | | | | | | | | | | | | |
| Demonstrate data fusion - Live Event | | | | | | | | | | | △ | | | | | | | | | | | | | | | | | |
| Demonstrate transmit antenna panel | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| Demonstrate Radar -ONIR-STSS fusion | | | | | | | | | | | | | | | △ | | | | | | | | | | | | | |
| Complete Design Review-0 | | | | | | | | | | | | | | | | | | | △ | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲▬▲ | Complete Activity | △▬△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 | 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 |
| **Launcher** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Conduct Launcher System Design Review | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| Launcher Design Review-0 | | | | | | | | | | | | | | | | | | | △ | | | | | | | | | |
| Conduct the Launcher Off-Road Mobility Test | | | | | | | | | | | | | | | | | | | | | △ | | | | | | | |
| Deliver Pre-Production Launcher | | | | | | | | | | | | | | | | | | | | | | | | △ | | | | |
| **Integration and Test** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Select Element Integration Facility site | | | | | | | △ | | | | | | | | | | | | | | | | | | | | | |
| Select System Integration Facility site | | | | | | | | △ | | | | | | | | | | | | | | | | | | | | |
| Initiate facility architecture and engineering | | | | | | | | | | △ | | | | | | | | | | | | | | | | | | |
| Complete System Integration Lab facility | | | | | | | | | | | | | | | | | | | | △ | | | | △ | | | | |
| Complete Element Integration Lab facility | | | | | | | | | | | | | | | | | | | | | | | △ | | | | | |
| Conduct Element Ground Test | | | | | | | | | | | | | | | | | | | | | | | △ | | | | | |
| Conduct Integrated Ground Test | | | | | | | | | | | | | | | | | | | | | | | | | | | | △ |
| **Government System Engineering & Program Management** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sea Mobile Alternatives Assessment | | | | | △ | | | | | | △ | | | | | | | | | | | | | | | | | |
| Support Boost/Ascent Reports to Congress | | | | | | △ | | △ | | | | | | | | | | | | | | | | | | | | |
| Complete transition of KI office to Huntsville, AL | | | | | | | | △ | | | | | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲—▲ | Complete Activity | △—△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Kinetic Energy Interceptors Knowledge Point Events** | | | | | | | |
| Stage 2 proof of concept static fire | | 2Q | | | | | |
| Complete booster wind tunnel tests | | 3Q | | | | | |
| Conduct fused ONIR-Radar fire control tests | | 3Q | 3Q | | | | |
| Stage 1 proof of concept static fire | | 4Q | | | | | |
| Stage 2 development motor static fire | | | 3Q | 1Q-2Q | | | |
| Stage 1 development motor static fire | | | 4Q | 1Q-2Q | | | |
| Conduct fused ONIR-Radar - STSS fire control tests | | | | 3Q | | | |
| Booster flight test #1 | | | | 4Q | | | |
| Stage 1 design update static fire test | | | | | 3Q | | |
| Stage 2 design update static fire test | | | | | 3Q | | |
| Booster flight test #2 | | | | | | 3Q | |
| Element Integrated Ground Test - 1 | | | | | | | 2Q |
| Kill vehicle integrated ground test | | | | | | | 4Q |
| **Element Engineering** | | | | | | | |
| Deliver KEI SIM Version 2.0 | | 3Q | | | | | |
| Update element capability interface specifications | | 3Q | | | | | |
| Complete multi-use performance assessment #2 | | 4Q | | | | | |
| Concept design baseline update | | 4Q | | | | | |
| Deliver KEI SIM Version 3.0 | | | 3Q | | | | |
| Generate final ECS and A-Spec | | | 3Q | | | | |
| Complete KEI section of BMDS TBDD and TBSS | | | 4Q | | | | |
| Complete multi-use performance assessment #3 | | | 4Q | | | | |
| Conduct element SDR | | | 4Q | | | | |
| Conduct design review - 0 | | | | | 3Q | | |
| Conduct design review - 1 | | | | | | | 1Q |
| **Interceptor** | | | | | | | |
| Static Fire 1st and 2nd stage rocket motors | | 2Q-4Q | | | | | |
| Booster wind tunnel test complete | | 3Q | | | | | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| Booster Preliminary Design Review | | 4Q | | | | | |
| Booster rocket motor static test | | | 2Q-4Q | 1Q-2Q | | | |
| Booster Critical Design Review | | | 3Q | | | | |
| Interceptor Component SDR | | | 4Q | | | | |
| Deliver booster flight #1 components | | | | 3Q | | | |
| Conduct booster flight #1 | | | | 4Q | | | |
| Interceptor design review 0 | | | | | 3Q | | |
| Conduct booster flight #2 | | | | | | 3Q | |
| Deliver Booster Flight #2 Article | | | | | | 3Q | |
| Conduct Partial Full Scale (PFS) test 4 | | | | | | | 3Q |
| Conduct Kill Vehicle Hover Test | | | | | | | 4Q |
| Deliver Control Test Vehicle (CTV) Article | | | | | | | 4Q |
| **Fire Control and Communications** | | | | | | | |
| Conduct Algorithm/Timeline Demonstrations | | 3Q | | | | | |
| Demonstrate CKEI data fusion in shelter | | 3Q | | | | | |
| Demonstrate Radar-ONIR Fusion in Shelter | | 3Q | | | | | |
| Conduct algorithm/timeline demonstration - Live | | | 3Q | | | | |
| Demonstrate Radar-ONIR Fusion/Live Event | | | 3Q | | | | |
| Demonstrate data fusion - Live Event | | | 3Q | | | | |
| Demonstrate transmit antenna panel | | | 4Q | | | | |
| Direct Downlink Experiment - Live Event | | | 4Q | | | | |
| Establish integration lab | | | 4Q | | | | |
| Demonstrate Radar -ONIR-STSS fusion | | | | 3Q | | | |
| Complete component System Design Review | | | | 4Q | | | |
| Complete Design Review-0 | | | | | 3Q | | |
| Deliver production representative component | | | | | | | 3Q |
| **Launcher** | | | | | | | |
| Conduct Launcher System Design Review | | | 4Q | | | | |
| Launcher Design Review-0 | | | | | 3Q | | |
| Conduct the Launcher Off-Road Mobility Test | | | | | | 1Q | |
| Deliver Pre-Production Launcher | | | | | | 4Q | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Integration and Test** | | | | | | | |
| Participate in Nimble Titan Wargame Exercise | | 3Q | 3Q | 3Q | 3Q | 3Q | 3Q |
| Publish/Update Development Master Test Plan | | 3Q | 4Q | 4Q | 4Q | 4Q | 4Q |
| Publish/Update Target Requirements Documentation | | 3Q | 3Q | 3Q | 3Q | 3Q | 3Q |
| Publish/Update VV&A Plan | | 3Q | 3Q | 3Q | 3Q | 3Q | 3Q |
| Select Element Integration Facility site | | 3Q | | | | | |
| Select System Integration Facility site | | 4Q | | | | | |
| Initiate facility architecture and engineering | | | 2Q | | | | |
| Conduct booster flight #1 | | | | 4Q | | | |
| Complete System Integration Lab facility | | | | | 4Q | 4Q | |
| Complete Element Integration Lab facility | | | | | | 3Q | |
| Conduct Element Ground Test | | | | | | 3Q | |
| Conduct booster flight #2 | | | | | | 3Q | |
| Conduct Partial Full Scale (PFS) Test | | | | | | | 2Q |
| Conduct Integrated Ground Test | | | | | | | 4Q |
| **Government System Engineering & Program Management** | | | | | | | |
| Sea Mobile Alternatives Assessment | | 1Q-4Q | 1Q-3Q | | | | |
| Support Boost/Ascent Reports to Congress | | 2Q-4Q | | | | | |
| Inputs to MBDS Master Integration Plan | | 3Q | | | | | |
| Complete transition of KI office to Huntsville, AL | | 4Q | | | | | |
| Deliver Boost/Ascent/Midcourse threat data package | | | 2Q | | | | |
| Generate KEI sections of TBDD & TBSS with MDA/SE | | | 3Q | | | | |
| Test bed description document and specification | | | 3Q | | | | |
| **Government Integration and Test** | | | | | | | |
| Target of Opportunity Data Analysis | | 3Q | 3Q | 3Q | 3Q | 3Q | 3Q |
| Lethality sims boost/ascent long-range targets | | 4Q | 4Q | 4Q | | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0602 Program-Wide Support | 15,255 | 7,409 | 19,208 | 25,417 | 43,191 | 53,485 | 23,681 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## A. Mission Description and Budget Item Justification

Program-Wide Support provides funding for common non-headquarters support functions across the entire program such as strategic planning, program integration, business management, 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 outside services and support contractors that augment government staff in these areas. Many of these costs reside within the Missile Defense Agency 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, although some functions and costs within this program element are performed by MDA employees assigned within the National Capital Region (NCR). Other costs included herein provide facility capabilities for MDA Executing Agent locations, such as physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses. Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Civilian Salaries and Support | 15,255 | 7,409 | 19,208 |
| RDT&E Articles (Quantity) | 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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| Total PE Cost | 697,801 | 608,663 | 591,911 | 587,064 | 620,222 | 626,693 | 646,936 |
| 0304 Test & Evaluation | 245,581 | 219,167 | 208,213 | 217,805 | 228,081 | 221,261 | 227,105 |
| 0704 Test & Evaluation Block 2004 | 140,456 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0804 Test & Evaluation Block 2006 | 9,769 | 133,972 | 128,760 | 0 | 0 | 0 | 0 |
| 0904 Test & Evaluation Block 2008 | 0 | 0 | 45,184 | 127,791 | 132,309 | 0 | 3,625 |
| 0004 Test & Evaluation Block 2010 | 0 | 0 | 0 | 35,157 | 39,815 | 119,011 | 110,446 |
| R104 Test & Evaluation Block 2012 | 0 | 0 | 0 | 0 | 0 | 56,161 | 75,884 |
| 0305 Targets & Countermeasures Core | 22,697 | 19,868 | 20,209 | 20,719 | 21,075 | 21,609 | 21,979 |
| 0705 Targets & Countermeasures Block 2004 | 250,077 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0805 Targets & Countermeasures Block 2006 | 24,765 | 224,387 | 158,987 | 0 | 0 | 0 | 0 |
| 0905 Targets & Countermeasures Block 2008 | 0 | 4,226 | 20,533 | 173,533 | 151,327 | 0 | 0 |
| 0005 Targets & Countermeasures Block 2010 | 0 | 500 | 2,500 | 5,353 | 41,721 | 191,425 | 162,878 |
| R105 Targets & Countermeasures Block 2012 | 0 | 0 | 0 | 0 | 0 | 6,000 | 39,181 |
| 0602 Program-Wide Support | 4,456 | 6,543 | 7,525 | 6,706 | 5,894 | 11,226 | 5,838 |

*Note: The decrease in Project 0305 funding from FY05 to FY06 and out is due to a realignment of funds to the Integration Product Line in Projects 0805, 0905, and 0005.*

## A. Mission Description and Budget Item Justification

As part of the total Ballistic Missile Defense System (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 thirteen 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; Targets & Countermeasures Block 2012; and Program Wide Support.

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 developing 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 element PE.

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603888C Ballistic Missile Defense Test and Targets** |

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. The structure of MDA's T&E Directorate, hereafter referred to as the MDA Responsible Test Organization (RTO), centralizes authority, control, and responsibility for all BMDS testing. The RTO is responsible for executing BMDS system tests and conducting post-test analysis to characterize BMDS system performance to support system verification. BMDS system test objectives are determined by the Responsible Engineering Organization (REO) and include threat capability in the selection of targets and test parameters. RTO activities are grouped into four functional areas: Test Policy and Integration; BMDS Combined Test Force; Test Resources; Facilities, Siting, and Environmental management.

The Test Policy and Integration program supports the development and implementation of strategic planning, test policy, standards, and procedures for creating a unified BMD test process. This program also includes funding for the BMDS Capability Assessment (BCA) team and funding for all of the Service Operational Test Agencies (OTAs) to conduct a BMDS Operational Assessment (OA). The RTO also includes the BMDS Combined Test Force (CTF) which plans, executes, analyzes, and reports all BMD system test events. 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 Facilities, Siting and Environmental program provides guidance, environmental analysis and documentation, real property facility siting, acquisition, and facility operational support for BMD systems.

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 and analysis 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 (DMTP) that detail the element contributions to the overall test program. Elements design their component test programs via the DMTP 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 (TRMP) that supports the overall test approach.

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603888C Ballistic Missile Defense Test and Targets** |

The Targets and Countermeasures Directorate provides targets (hardware and launch services) to the MDA Elements to test the integrated BMDS. The Targets and Countermeasures Directorate oversees the associated funding for the testing. The funding for these targets reside in the Elements respective Program Elements.

**A.1 System Element Description**

Test and Evaluation Description:

- MDA's Responsible Test Organization (RTO) structure centralizes authority, control, and responsibility for all BMDS testing
  - Plans tests according to BMDS and Element objectives
  - Provides test ranges, instrumentation and infrastructure
  - Develops MDA test policy
  - Directs the Combined Test Force (CTF)
  - Plans, executes, and conducts analysis of BMDS ground and flight tests
    - Demonstrates integrated BMDS capability
    - Addresses critical measurements for growth and capability
  - Collects data for BMDS analysis and manages MDA data centers
  - Provides documentation of BMDS and Element performance results for use by MDA, the OTAs, STRATCOM, and senior decision makers
  - Provides civil engineering / facility acquisition expertise, oversees all construction funding, and ensures environmental compliance of all MDA activities

Targets and Countermeasures Description:

The Targets and Countermeasures Program is a supporting BMDS program that provides targets to test the integrated, layered BMDS, including targets, countermeasures, and instrumentation to support testing prior to initial defensive operational capability.

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

Test and Evaluation Contribution to the BMDS:

- Plan and conduct testing of the BMDS Engagement Sequence Groups (ESGs) developed by the REO
- Collect and provide test data in order to support the effectiveness, suitability, survivability, and interoperability assessments of the BMDS
- Provide infrastructure and environmental compliance necessary to support increasingly complex tests
- Provide risk reduction for the BMDS through measurements flight testing to include technology demonstration, algorithm and model validation, and threat and countermeasure characterization

- Develop MDA BMDS testing policy with common, repeatable processes

Targets and Countermeasures Contribution to the BMDS:
The Targets and Countermeasures Program develops 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.

**A.3 Major System Element Goals**

Major Test and Evaluation Goals:

- Form one BMDS test team under the RTO that is accountable to the MDA Director and Element program directors
- Provide leadership and guidance under the CTF for the planning, execution, analysis, and reporting of BMD system test events to support system verification
- Establish single BMD system test processes that reflect the best practices of existing Element processes
  - Benchmark and merge existing Elements and executing processes into BMDS processes
  - Develop Element Lessons Learned and Best Practices to support single BMDS test design processes
- Provide required infrastructure and environmental compliance for robust BMD system testing

Major Targets and Countermeasures Goals:
The Targets and Countermeasures Program is developing a Flexible Target Family (FTF). This approach emphasizes commonality and modularity. The FTF will minimize the set of different booster stages, provide common FTS and Instrumentation components, provide common vehicle support equipment, provide common launch support equipment, and provide common interfaces. Targets and Countermeasure Program has incorporated a Product Line strategy to better manage the Program. Product Lines consist of Systems Engineering, Launch Vehicle, Data and Instrumentation, Countermeasures, Re-entry Vehicles, Logistics, Integration, and Mission Management. Product Lines will develop common target components for BMDS testing which will reduce both cycle time and cost while maximizing flexibility. Product Lines will prove the flexibility to allow common target components to be developed, integrated, and tested.

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603888C Ballistic Missile Defense Test and Targets** |

## A.4 Major Events Schedule and Description

| Major Event | Project | Timeframe | Description |
|---|---|---|---|
| **Flight Test** | | | |
| **System Flight Tests** | | | |
| FT-1 | 0304 | 1Q FY 2006 | • COMPLETED<br>• ESG tested: Element Development Test<br>• Participants include: GMD GFC 4.A.2.4 |
| FTM 04-2 | 0304 | 1Q FY 2006 | • COMPLETED<br>• ESG tested: SM-3 EO AN/SPY-1<br>• Participants include: Aegis BMD 3.0/3.0E |
| FT 04-1 | 0304 | 2Q FY 2006 | • ESG tested: GBI EO CD/UEWR (simulated GBI engagement)<br>• Participants include: GMD GFC 4B.1, C2BMC 4.5, DSP-SBIRS SBR 05-2 |
| FTG-2 | 0304 | 3Q FY 2006 | • ESG tested: GBI EO CD/UEWR<br>• Participants include: GMD GFC 4B.1; Beale UEWR |
| FTM 06-1 | 0304/0805 | 3Q FY 2006 | • ESG tested: SM-3 EO AN/SPY-1<br>• Participants include: C2BMC 4.5, Aegis BMD 3.0E/3.6 |
| FT 06-1 | 0304 | 4Q FY 2006 | • ESG tested: Multi-Element Development Test<br>• Participants include: C2BMC 4.5; GMD GFC 4B.1, SBX 1.6 |
| FTG-3 | 0304 | 4Q FY 2006 | • ESGs tested: GBI EO CD/UEWR; GBI LO/EO SBX (Possible)<br>• Participants include: GMD GFC 4B.1; DSP-SBIRS 06-1; Aegis BMD 3.0; C2BMC 4.5; SBX 1.6; Beale UEWR |
| FTT-04 | 0304/0805 | 4Q FY 2006 | • ESG tested: THAAD Interceptor EO BDR-XB<br>• Participants include: TFCC Bld 4.0; BDR-XB(T) Radar 4.1; PATRIOT PDB 6.0; C2BMC 4.5 |
| FTG-4 | 0304/0805 | 1Q FY 2007 | • ESGs tested: GBI EO CD/UEWR; GBI EO AN/SPY-1; GBI LO/EO SBX<br>• Participants include: GMD GFC 4B.1; SBX 1.6 (Shadow); C2BMC 4.5; Aegis BMD 3.6 (Shadow); DSP-SBIRS SBR 06-1; Beale UEWR |
| FTM 06-2 | 0304/0805 | 1Q FY 2007 | • ESG tested: SM-3 EO AN/SPY-1<br>• Participants include: Aegis BMD 3.6; C2BMC 6.2 |
| FTG 06-1 | 0304 | 2Q FY 2007 | • ESG Tested: Element Development Test<br>• Participants include: GMD GFC 6A.1 |
| FTM 06-5 | 0304 | 2Q FY 2007 | • ESG tested: SM-3 EO AN/SPY-1<br>• Participants include: Aegis BMD 3.6; C2BMC 6.2 |
| FTT 06-2 | 0304/0805 | 3Q FY 2007 | • ESG tested: THAAD Interceptor EO BDR-XB<br>• Participants include: TFCC Bld 4.1; BDR-XB(T) Radar 4.2; Aegis BMD 3.0E/3.6; C2BMC 6.2; PATRIOT PDB 6.0 HWIL |

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603888C Ballistic Missile Defense Test and Targets** |

| Major Event | Project | Timeframe | Description |
|---|---|---|---|
| FT 06-7 (TMDD-1) | 0304 | 1Q FY 2008 | • ESG tested: Element Development Test<br>• Participants include: STSS Blk06 |
| FT 06-8 (SMDD-1) | 0304 | 1Q FY 2008 | • ESG tested: Element Development Test<br>• Participants include: STSS Blk06 |
| FTG 06-2 | 0304 | 1Q FY 2008 | • ESG tested: GBI EO SBX Mod 1 (SBIRS)<br>• Participants include: C2BMC 6.2; GMD GFC 6A.1; Aegis BMD 3.6; DSP-SBIRS SBR 07-1; Beale UEWR; SBX 1.6 |
| FTT 06-5 | 0304/0805 | 1Q FY 2008 | • ESG tested: THAAD Interceptor EO BDR-XB(T)<br>• Participants include: C2BMC 6.4; TFCC Bld 5; BDR-XB(T) Radar 4.2; Aegis BMD 3.6; PATRIOT PDB 6.0 HWIL |
| P6X-2 | 0304 | 1Q FY 2008 | • ESG tested: PAC-2 GEM EO AN/MPQ-53/65<br>• Participants include: C2BMC 6.4; PATRIOT PDB 6.0; THAAD HWIL |
| FTT 06-6 | 0304/0905 | 3Q FY 2008 | • ESG tested: THAAD Interceptor EO BDR-XB<br>• Participants include: C2BMC 6.4; TFCC Bld 5; BDR-XB(T) Radar 4.2; Aegis 4.0; PATRIOT PDB 6.0 HWIL |
| **Measurement Tests** | | | |
| FT 04-4 (CMCM-2) | 0304/0705 | 3Q FY 2006 | • ESG tested: SM-3 EO AN/SPY-1 (Sim)<br>• Participants include: Aegis BMD 3.0; C2BMC 4.5; TPS-X (BDR-XB(F) Surrogate); DSP-SBIRS (STSS Surrogate Test Bed) |
| **Ground Test** | | | |
| **System Ground Tests** | | | |
| GTD 06-1 | 0304 | 4Q FY 2006 | • Participants include: C2BMC 4.5; GMD GFC 4B.a & 6A.1; Aegis BMD 3.0E/3.6; FBX-T CR1; TFCC B4; PDB 5.5.2; SBIRS MCS 06-1; CD/UEWR (Fylingdales) |
| GTI 06-1 | 0304 | 4Q FY 2006 | • Participants include: C2BMC 4.5; GMD GFC 4B.1 & 6A.1; Aegis BMD 3.0/3.6; FBX-T CR1; TFCC B4; PDB 5.5.2; CD/UEWR |
| GTI 06-2 | 0304 | 2Q FY 2007 | • Participants include: C2BMC 6.2; GMD 6A.1; Aegis BMD 3.0E/3.6; FBX-T CR1; TFCC B4; PDB 6.0; SBIRS MCS 06-2 |
| GTD 06-2 | 0304 | 3Q FY 2007 | • Participants include: C2BMC 6.2; GMD 6A.1; Aegis BMD 3.0E/3.6; FBX-t CR1; THAAD FCU B4; PDB 6.0; SBIRS MCS 06-2 |
| GTD 06-3 | 0304 | 1Q FY 2008 | • Participants include: C2BMC 6.4; GMD 6A.1; Aegis BMD 3.0E/3.6; FBX-T CR2; TFCC B5; PDB 6.0; SBIRS MCS 07-2 |
| GTI 06-3 | 0304 | 1Q FY 2008 | • Participants include: C2BMC 6.4; GMD 6A.1; Aegis BMD 3.0E/3.6; FBX-T CR2; TFCC B5; PDB 6.0; SBIRS MCS 07-1 |

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| 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 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Previous President's Budget (FY 2006 PB) | 718,049 | 617,456 | 676,388 |
| Current President's Budget (FY 2007 PB) | 697,801 | 608,663 | 591,911 |
| Total Adjustments | -20,248 | -8,793 | -84,477 |
| Congressional Specific Program Adjustments | 0 | 19,740 | 0 |
| Congressional Undistributed Adjustments | 0 | -28,533 | 0 |
| Reprogrammings | -8,962 | 0 | 0 |
| SBIR/STTR Transfer | -11,286 | 0 | 0 |
| Adjustments to Budget Years | 0 | 0 | -84,477 |

FY05 reduction of $20.248 million includes the SBIR/STTR transfer and MDA reprogrammings.

FY06 reduction of $8.793 million includes Congressional specific program adjustments (most notably $3.4 million for Optical Sensors for PMRF (SHOTS) and $2.55 million for Multi-frame Blind Deconvolution) and a portion of the MDA Congressional undistributed adjustment.

FY07 reduction of $84.477 million is the result of programmatic changes which facilitate a $17.604 million reduction in testing and a corresponding $62.086 million reduction in targets and includes overhead/infrastructure reductions.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0304 Test & Evaluation | 245,581 | 219,167 | 208,213 | 217,805 | 228,081 | 221,261 | 227,105 |
| RDT&E Articles Qty | 0 | 2 | 0 | 1 | 0 | 0 | 0 |

*Note: RDT&E Articles: FY06 - Delivery of Two (2) Transportable Telemetry Systems. FY08 - X-Band Transportable Radar (XTR-1).*

## 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, execute, analyze, and report BMD system test events. 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. The Test Policy and Integration program also develops strategic plans and International policy for the RTO. Target certification reports are 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 Capability Assessment (BCA) team and System-Level Operational Assessments. The BCA team will provide a non-advocate, independent assessment of the BMDS throughout its life-cycle. Where possible, BCA team-members will recommend changes to the current test program and mitigation efforts to reduce performance degradation, implementation, and integration risks. Operational Test Agency (OTA) funding is consolidated within the RTO so they can provide 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.

BMDS Combined Test Force (CTF) Core activities consist of: a. BMDS Common System Test Support; b. planning for and analysis of the Measurements Program; c. the Lethality Program, and d. the Applied Data Analysis Center (ADAC).

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|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603888C Ballistic Missile Defense Test and Targets** |

a. BMDS Common System Test Support includes test planning support for Flight and Measurements test events. Government personnel at SMDC plan and execute test events and SETA personnel provide support for the CTF. The Test Configuration Control Board (TCCB), a new initiative, was established to maintain BMDS system test configuration. International Programs promotes international participation in developing the BMDS through joint test and technology development activities. A new TE initiative, the Test Assurance office, will improve test event timeliness and mission success.

b. 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 (i.e., provide an understanding of how the BMDS visible, infrared and radar sensors perform when observing ballistic missile targets and countermeasures during flight). Measurements requirements are collected, prioritized and validated by the Measurements Program Assessment Team (MPAT) to support Block Characterization (understanding how the system will perform in a given configuration against a given threat), Modeling and Simulation, Validation and Accreditation, Phenomenology (understanding the physics of what was observed during a test event and its effects on BMDS sensors) and Advanced Concepts. Requirements are allocated to specific tests. Note: funding associated with Critical Measurements and Counter Measures (CMCM) flight tests are captured in projects 0804, 0904, 0004 and R104 but is managed as part of the Measurements Program.

c. The CTF Lethality program seeks to characterize the effectiveness of BMDS engagements (i.e., determining the fate of threat targets post-engagement) and assure 10 USC 2366 requirements for BMDS lethality Live Fire Test and Evaluation (LFT&E) are achieved, and to investigate how successful a given BMDS engagement will be in destroying the incoming warhead. Laboratory, ground and flight tests are defined and executed in response to the MDA System Engineer's requirement for data on the resultant space, atmosphere and ground effects of engaging high explosive and weapon of mass destruction (WMD) payloads. Flight test data requirements are achieved by leveraging planned BMDS intercept or Measurements Program with alternative targets, supplemental payloads and ancillary sensor coverage. The CTF integrates lethality LFT&E testing across MDA and coordinates with related programs (e.g. PAC-3) to establish an efficient, requirements driven approach to BMDS lethality characterization.

d. 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 Program development, program objectives, and performance characterization, MDA Test and Evaluation provides resources to support the activities

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of the Radar Data Exploitation (RDE), Radar Cross Section (RCS) data analysis, and optical data analysis. This activity supports data planning, collection and analysis of radar for missions supported by Observation Island.

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 includes development, maintenance and modernization of the MDA mobile instrumentation tool box, BMD-unique ground test facilities, and MDA data centers. The mobile instrumentation tool box includes telemetry, radar, and optical data collection assets such as three (3) test aircraft equipped with optical sensors, mobile telemetry systems, the Kwajalein Mobile Range Safety System, the Mobile Launch Platform, and the Pacific Collector Mobile Instrumentation Ship. These assets are required to collect the spatial data needed to safely execute the tests and the measurement data needed for BMDS performance evaluation. The Test Resources Program also makes focused investments to improve MDA-unique capability at Major Range & Test Facility Base (MRTFB) activities including the NP-3D improvement program with the Navy. 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 as the basis to evaluate the future resource needs of the BMDS. A continuous analysis pitting data collection requirements and test scenarios against existing and planned test assets identifies 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 range mission planning and execution expertise, 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 analyses and documentation, real property facility siting, acquisition, and facility operational support for the BMDS. 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.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Test Policy and Integration | 25,200 | 26,747 | 32,733 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The Test Policy and Integration program supports the development and implementation of test policy, standards, and procedures for creating unified BMDS test processes. Efforts to achieve this mission include: applying best practices of existing Element processes for flight, ground and software testing; establishing standardized documentation for test planning, test reporting and data archiving; providing non-advocate, independent assessment of the BMDS throughout its life-cycle via the BMDS Capability Assessment team; providing for operational assessments of the BMDS via Operational Test Agency participation; developing target accreditation reports to ensure targets meet test objectives; providing for test mission assurance; and developing strategic Planning and strategy for the RTO. Budget is increased in FY07 due to the consolidation of funding which supports the OTA activities.

FY05 Accomplishments:

- BMDS Capability Assessment (BCA) team (formerly BOCA) continued to provide a non-advocate assessment of the BMDS readiness.
- Completed Target Accreditation Reports for the IFT-14, FTM 04-1, FT-04-2, FT-04-5, and Medium Range Target (MRT) Risk Reduction Flight to ensure target satisfies mission objectives.
- Completed Responsible Test Organization (RTO) Directive 3002.01, Establishment of the MDA RTO, March 9, 2005 which centralize responsibility and authority for planning, provisioning, executing analyses, and reporting of the BMDS test program.
- Finalized MOA with OTAs to establish the OLG; OLG facilitates communication and interaction between BMDS development community and the Service Operational test communities.
- Drafted Target Planning Process Directive to establish long-term planning of target capabilities required for BMDS testing.
- Drafted Guideline for MDA Formal Test Reviews and Post-Test Reporting Requirements to formalize MDA test review process and post-test reporting activities. These reviews provide assurance that test design, planning, and execution activities are progressing and completed on time to support mission success.
- Drafted Mission Assurance Implementation Plan to outline the steps by which the MDA Assurance Provision are managed and implemented in TE.
- Established MOA with OTAs on BMDS Data Analysis Working Group to support and facilitate interaction and data on matters concerning testing and assessment.
- Prepared draft Test and Evaluation sections of MDA policy and guidance for software acquisition.

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| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603888C Ballistic Missile Defense Test and Targets** |

FY06 Planned Program:

- Completed MDA Directive 5000.2, Target Planning Process Directive, November 8, 2005 to establish long-term planning of target capabilities required for BMDS testing.
- Completed Mission Assurance Implementation Plan, November 2005 to outline the steps by which the MDA Assurance Provision are managed and implemented in TE.
- BMDS Capability Assessment (BCA) team will update the non-advocate assessment of the BMDS readiness, investigate BMDS performance issues, propose mitigation plans, contribute to BMDS test activity planning, and plan for operational system characterization.
- Prepare Target Accreditation Reports for MRTF FT-2, MRTF FT-3, MRTF FT-4, FTM-04-1, FTM-04-2, FTM-04-3, FTM-06-1, FT-04-4, JCTV-1, THAAD FT-3, and THAAD FT-4 to ensure target satisfies mission objectives.
- Initiate Target Accreditation Reports for FTM-06-2 and FTT 06-1 to ensure target satisfies mission objectives.
- Continue to integrate mission assurance, best practices and lessons learned into test policy, process, and procedures.
- Continue communications and coordination with the Service operational test communities as established by the MOA. Fund BMDS Operational Assessment Efforts by the OTA.
- Prepare draft RTO Software Acquisition Improvement Plan to comply with MDA policy for compliance with FY2003 NDAA, Section 804, Software Acquisition Process Improvement.
- Prepare draft RTO Knowledge Management Plan to ensure TE consciously and comprehensively gathers, organizes, shares, and analyzes its knowledge in terms of resources, documents, and people skills and in such a manner as to effectively leverage MDA enterprise resources.

FY07 Planned Program:

- BMDS Capability Assessment (BCA) team will continue to update the non-advocate assessment of the BMDS readiness and investigate BMDS performance issues and propose mitigation plans.
- Prepare Target Accreditation Reports for FT-06-4, FTG-06-1, FTG 06-2, FTM 06-3, FTT 06-1, FTT 06-2, FTT 06-3, and FTT 06-4.
- 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 Operational Test Agencies (OTA). Continue funding BMDS Operational Assessment Efforts.
- Continue the development and implementation of test policy, standards, and procedures for creating unified BMD test processes.

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|---|---|
| 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 | FY 2006 | FY 2007 |
|---|---|---|---|
| BMDS CTF Core | 51,933 | 58,368 | 59,672 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The BMDS Combined Test Force (CTF) plans, executes, analyzes, and reports all BMD system test events. Efforts to achieve this mission include: integrating elements/components into a comprehensive system test program of flight tests, ground tests and exercise overlays (i.e. war games); allocating system test objectives to system test events in the IMTP; integrating test data for BMDS assessments by the systems engineer, OTAs, and military utility assessment agents; planning and executing the BMDS measurements program; conducting and evaluating BMD lethality testing to assure effective munitions systems are developed against known and postulated threats; directing and coordinating efforts of the Applied Data Analysis Center (ADAC); executing the target characterization program; radar and optical data analysis, and directing the kill assessment program.

FY05 Accomplishments:

a. BMDS Common System Test Support:

- Organized the CTF to conduct BMD System Testing to support verification of BMDS element and component interoperability. Began transition of the CTF to Huntsville.
- Provided Government Personnel at SMDC and SETA support for ongoing test planning and execution activities.
- Organized the Test Configuration Control Board (TCCB), and began placing BMDS system tests under configuration control.
- Drafted and coordinated the BMDS Integrated Master Test Plan (IMTP).
- International Programs:
  - 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).
- Organized the Test Assurance Office to improve test event timelines and mission success.

b. Measurements Program:

- Collected, prioritized, validated and documented requirements for MDA Measurements Program. Allocated requirements to Block 06 tests.
- 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 of the Long Range Air Launched Target (LRALT) characterization risk reduction flight.
- Conducted test planning, test execution, and post test analysis the Short Range Air Launched Target (SRALT) characterization risk reduction flight.
- Successfully launched FT04-2, and began analyzing test results.
- Conducted test & sensor planning, range integration efforts, and design reviews in support of Medium Range Target (MRT) characterization and risk reduction flight (FT 04-3).
- Drafted the Measurements Master Test Plan (MMTP).

c. CTF Lethality Program:

- Conducted successful collaborative intercept flight test (PAC-3 DT/OT 12) with the US Army Lower Tier Project Office to characterize the fate of a surrogate chemical agent threat payload.
- Began analytical predictions, test planning and target development for collaborative CY 2006 THAAD FTT-03 and FTT-04 intercept tests.
- Completed payload and associated instrumentation development for the FT 04-4A (Measurements Program) CTF chemical sub-munition experiment.
- Supported development of a revised lethality LFT&E Strategy for THAAD.

d. Advanced Data Analysis Center (ODA, RDA, and RDE):

- Supported BMDS data collection objectives, conducted mission planning for FT 04-3, FT04-02, and FT 04-4 performed sensor execution for FT 04-3, FT04-02, and FT04-04, performed data analysis for CMP-4, LRALT, SRALT, MRT, FT04-02, 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.
- Updated the Measurements Master Test Plan (MMTP).
- Continued 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, and FT04-02, perform sensor execution for CMP-4, LRALT, and SRALT, perform data analysis for CMP-4, LRALT, SRALT, and BMD System Tests, explored phenomenology data gathering opportunities to improve future BMD systems and new mission areas, and provided characterization and assessment for Measurements and BMDS flight test programs.
- Continued Radar Data Exploitation (RDE) analysis efforts of all source data collection during foreign flight tests.

- Conducted test planning, test execution, and post test analysis for Medium Range Target (FT 04-3) Characterization of FT 04-3 Risk Reduction Flight. Collected target signature data for new target performance, characterization analysis, and for algorithm development.
- Coordinated requirements, sensor planning, data collection, data analysis, and reporting for approximately 4 Tests of Opportunity (TOOs).
- Continued to coordinate and revise the BMDS Integrated Master Test Plan (IMTP).
- 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.

FY06 Planned Program:

a. BMDS Common System Test Support:
- Continue CTF Reengineering efforts and transfer to Huntsville, AL with goal of being Fully Operational Capable (FOC) on 1 Oct 06.
- Continue to coordinate, revise and fully coordinate the BMDS Integrated Master Test Plan (IMTP).
- Continue to operate and improve the TCCB process to control the content and schedule of BMDS system test events.
- Continue to provide the CTF with the SMDC Government and SETA support necessary to plan and execute BMDS system test events.
- Provide initial funding to establish the Test Assurance organization within TE to improve test mission success.
- Establish the Test Assurance organization and fully staff to improve the BMDS mission success.
- Conduct Special Program Tests as opportunities arise.
- International Program:
  - 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.

b. Measurements Program:
- 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.

c. CTF Lethality Program:
- 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.
- Support tasks to update lethality LFT&E requirements and execute strategy for GMD, Aegis BMD, KEI, ABL and MKV.

- Conduct collaborative intercept flight tests FTT-03 and FTT-04 with the TPO to characterize the fate of a surrogate unitary chemical target payload. Continue analytical predictions, test planning and target development for intercept flight test ATM-48 (PAC-2 GEM) to characterize the fate of a surrogate unitary chemical target payload.
- Begin analytical predictions, test planning and target development for two collaborative FY 07 THAAD intercept tests to characterize the fate of a sub-munition target payload.

d. Applied Data Analysis Center (ADAC):

- 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.
- The Kill Assessment (KA) Test Program:
  - 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.

FY07 Planned Program:

a. BMDS Common System Test Support:

- Complete transition BMDS test planning and execution to Huntsville. Continue to coordinate and revise the BMDS Integrated Master Test Plan (IMTP).
- Continue to operate and improve the TCCB process to control the content of and schedule of BMDS system test events.
- Continue to provide SMDC Government and SETA support necessary to plan and execute BMDS system test events.
- Transfer the Test Assurance mission support and effort to TE.
- Conduct Special Program Tests as opportunities arise.

- International Program:
  - 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.
  - Transfer International Policy and Planning within TE to Test Policy and Integration (TEP).

b. Measurements Program:

- Update the Measurements Master Test Plan (MMTP). Continue to collect, prioritize, validate, and document requirements for MDA Measurements Program. Allocate requirements to test.

c. CTF Lethality Program:

- Support tasks to update lethality LFT&E requirements and execute strategy for GMD, Aegis BMD, KEI, ABL and MKV.
- Conduct two collaborative intercept flight tests with the TPO to characterize the fate of a surrogate submunition target payload.
- Continue analytical predictions, test planning and execute intercept flight test ATM-48 (PAC-2 GEM) tasks to characterize the response of a surrogate unitary chemical target payload.
- Begin analytical predictions, test planning and target development to characterize the fate of surrogate WMD target payloads in two collaborative FY 08 LTPO intercept tests and out-year ABL shoot-down events.

d. Applied Data Analysis Center (ADAC):

- 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.
- Reengineer ADAC. Transfer Data Analysis Functions to CTF Joint Data Analysis Center (JDAC).
- Resolve key questions pertaining to bulk chemical target payloads after BMD engagements.
- Kill Assessment (KA) Test Program:
- Continue to develop 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.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603888C Ballistic Missile Defense Test and Targets** |

- Develop 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.
- Continue to provide 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.
- Conduct RV Intercept Signature Kill Assessment (RISK) Model Development to predict optical signatures resulting from target intercepts.
- Perform Hydrocode Model Assessment to determine the utility of hydrocodes to support Kill Assessment.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Test Resources | 165,208 | 130,619 | 111,981 |
| RDT&E Articles (Quantity) | 0 | 2 | 0 |

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.

FY05 Accomplishments:

- 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.
- Continued to operate, maintain and improve airborne sensors instrumentation platforms HALO-I, HALO-II and WASP to support IR measurement data collection for BMDS testing and development activities.
- Maintained the MDA-unique ground test facilities, including wind tunnels, space-environment chambers, light gas gun, ladar performance lab, rocket-plume sensor capabilities, and hardware-in-the-loop simulation facility to support component level Hardware in the Loop risk reduction testing.
- 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.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603888C Ballistic Missile Defense Test and Targets** |

- Validated the PRST concept on FT 04-5, a flight test conducted solely with mobile assets for the critical test functions of flight safety, telemetry, test control and communications, and IR data collection. (The PRST concept teams the Pacific Ranges to provide comprehensive test planning and execution support to MDA).
- Continued development of the PRST Flight Safety Guide for Range Users that provides a standard process for MDA elements to use when testing at various MDA ranges.
- Initiated software development of the Range Safety Modeling Toolkit (RSMT) to provide common safety analysis tools.
- Initiated coordination with the Targets Program to develop and qualify common Flight Termination and Range Tracking Systems that will simplify target integration at the ranges.
- Maintained the MDA Data Centers Program to provide efficient data archiving, access, distribution and furnish relevant expertise for MDA Mission oriented data.
- Awarded follow-on task order to Alaska Aerospace Development Corporation (AADC) to provide for operation and sustainment of the Kodiak Launch Complex (KLC) to support MDA target launches.
- Initiated activation of a reserve fleet ship to support MDA as the “Pacific Collector.” The ship will serve as a mobile instrumentation ship to support off-range BMDS testing and increasingly complex test scenarios.
- Continued support of the Test and Evaluation Data Analysis Capability (TEDAC) to provide test communications among the MDA ranges and test situational awareness to MDA HQ.
- Continued development of the Transportable Telemetry Systems (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.
- Initiated development of the X-band Transportable Radar (XTR-1) to support off-range BMDS testing and increasingly complex test scenarios.
- Initiated upgrade of the Kwajalein Mobile Range Safety System (KMRSS).
- Coordinated with OSD test resources community/programs (DTRMC, CTEIP, etc.). Developed agreement on the NP-3D upgrade program to provide three (3) aircraft that will have the capability to support MDA operations.
- Maintained and operated the Kauai Test Facility (KTF) to enable the launch of target systems supporting BMD Test Activities. (Congressional Earmark)
- Continued Upgrades to PMRF Sensors, Command and Control Systems, Data Analysis Tools, and Range Safety Systems to support BMDS testing. (Congressional Adds)
- Characterized advanced technology in the terrestrial neutron environments which allows simulation of unique BMD Environments at the Indiana University Cyclotron Facility. (Congressional Add)

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603888C Ballistic Missile Defense Test and Targets** |

FY06 Planned Program:
RDT&E Articles: Delivery of Two (2) Transportable Telemetry Systems

- Develop, maintain, integrate and upgrade MDA unique range facilities and instrumentation at the following ranges in accordance with DTRMC Guidance: 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).
- Operate High Altitude Observatory II (HALO-II), WASP, High Altitude Observatory (HALO-I) for data collection services and services of BMD Flight Test.
- Maintain and upgrade MDA unique Ground Test Facilities to support all the BMDS developmental program hardware and software testing. These facilities provide hardware in the loop capability, threat signature measurement capability, and sensor calibration standards.
- Upgrade the Hypervelocity Ballistic Range G Light Gas Gun at AEDC to provide higher fidelity projectiles in support of BMDS Live Fire Test & Evaluation (LFT&E).
- 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.
- Complete development of the PRST Flight Safety Guide for Range Users that provides a standard process for MDA elements to use when testing at various MDA ranges.
- Complete development and independent verification and validation (IV&V) of the Range Safety Modeling Toolkit (RSMT) to provide common safety analysis tools.
- Continue coordinating with the Targets Program to develop and qualify common Flight Termination and Range Tracking Systems that will simplify target integration at the ranges.
- Recommend innovative solutions to mitigate Range Safety Officer shortfalls through the PRST's Range Safety Augmentation Program (RSAP).
- 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 Naval Surface Warfare Center.
- Complete activation of the Pacific Collector to support off-range BMDS testing and increasingly complex test scenarios.
- Continue support of the Test and Evaluation Data Analysis Capability (TEDAC) to provide test communications among the MDA ranges and test situational awareness to MDA HQ.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603888C Ballistic Missile Defense Test and Targets** |

- Complete development and transition to test operations of two Transportable Telemetry Systems (TTS) which provides long range missile telemetry acquisition, processing and archiving capability.
- Continue development of the X-band Transportable Radar (XTR-1) to support off-range BMDS testing and increasingly complex test scenarios.
- Complete upgrade of the Kwajalein Mobile Range Safety System (KMRSS).
- Sustain the Mobile Range Safety System (MRSS) at PMRF.
- Coordinate with OSD test resources community/programs (DTRMC, CTEIP, etc.)
- Initiate the NP-3 Upgrades in conjunction with OSD/CTEIP and the Navy to support off-range BMDS testing and increasingly complex test scenarios.
- 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)

FY07 Planned Program:

- Develop, maintain, integrate and upgrade MDA unique range facilities and instrumentation at the following ranges in accordance with DTRMC guidance: 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).
- 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 upgrade MDA unique Ground Test Facilities to support all the BMDS developmental program hardware and software testing. These facilities provide hardware in the loop capability, threat signature measurement capability, and sensor calibration standards.
- 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.
- Continue coordinating with the Targets Program to develop and qualify common Flight Termination and Range Tracking Systems that will simplify target integration at the ranges.
- 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.

- Sustain the Pacific Collector to support off-range BMDS testing and increasingly complex test scenarios.
- Continue support of the Test and Evaluation Data Analysis Capability (TEDAC) to provide test communications among the MDA ranges and test situational awareness to MDA HQ.
- Continue development of the X-band Transportable Radar (XTR-1) to support off-range BMDS testing and increasingly complex test scenarios.
- Coordinate with OSD test resources community/programs (DTRMC, CTEIP, etc.).
- Continue the NP-3D Upgrades in conjunction with OSD/CTEIP and the Navy to support off-range BMDS testing and increasingly complex test scenarios.
- Sustain the Kwajalein Mobile Range Safety System (KMRSS).
- Sustain the Mobile Range Safety System (MRSS) at PMRF.
- Maintain and operate the Kauai Test Facility (KTF) to enable the launch of target systems supporting BMD Test Activities.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Facilities, Siting & Environmental | 3,240 | 3,433 | 3,827 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The Facilities, Siting and Environmental (FS&E) Program is comprised of two areas: the Civil Engineering Division and the Environmental Management Division. The Civil Engineering Division is the functional area for facility siting, real property acquisition, and facility sustainment and support for the BMDS. The Civil Engineering Division also oversees facility acquisition through the Military Construction (MILCON) and RDT&E construction programs. The Environmental Management Division is the functional area for BMDS environmental compliance, pollution prevention, NEPA process support, and other environmental efforts. The Environmental Management Division ensures environmental compliance of all BMDS activities with federal, state, local, DOD and international law, treaties and regulations.

FY05 Accomplishments:

The Civil Engineering Division:

- Provided oversight for real property acquisition of the Military Construction (MILCON) and RDT&E construction programs.
- Managed the reprogramming, design and execution award of the Von Braun Complex II MILCON project on Redstone Arsenal, AL
- Supported the MDA facility requirements in the 2005 BRAC process including a new facility on Redstone Arsenal, AL
- Reorganized the Real Property Facility Project Validation Working Group (PVWG) under the MDA Facility Board (FB)

- Processed FY07 MILCON and RDT&E Facility projects requirement through the PVWG and FB
- Supported the siting and facility requirements development for the FBX-T Radar at an OCONUS location
- Drafted FY06 facility budget documentation and supported actions to obtain Congressional funding for a FY06 MILCON Emergency Services Facility on Meck Island for MDA test support
- Obtained facility work required to support MDA FTM 06-5 test on Wake Island
- Supported actions related to completing the THAAD MILCON project at PMRF, HI
- Supported actions related to the completion of the Missile Defense System Test Bed construction program in Alaska and California

The Environmental Management Division:

- Ensured that all MDA BMDS testing activities were conducted in compliance with all applicable federal, state, local, DOD and international law, treaties and regulations concerning environmental compliance.
- Provided guidance and supported MDA's compliance with the National Environmental Policy Act (NEPA), environmental management system requirements of E.O. 13148, and other environmental management efforts, including green procurement, pollution prevention, and permitting.
- Prepared / provided oversight on Records of Environmental Consideration (REC) for the following activities/events:
  - Ground-to-Air Lasing at WSMR
  - Space Tracking and Surveillance System (STSS) Block 2006 Launch
  - Cobra Dane LRALT (FT04-5) (Overarching REC)
  - Critical Measurements & Countermeasures (FT-04-4)
  - FTM 04-2, 04-3 and JFM-1 (Record of Categorical Exclusion)
  - Ground-Based Midcourse Defense Entry Control Facility Relocation at Fort Greely, Alaska
  - MDA-510, Telemetry Building Extension at the Pacific Missile Range Facility
  - Passive Roto-plane testing by Airborne Laser at WSMR
  - THAAD Intercept Debris Measurements Program
  - Early Launch Detection & Typing Experiment
- Prepared / provided oversight on Environmental Assessments for the following activities / events:
  - Proposed THAAD Missile Project, Anniston Army Depot, AL
  - Fort Greely Installation
  - Ground Based Midcourse Defense (GMD) Sea-Based X-Band Radar (SBX) Placement and Operation Adak, Alaska (Draft)
  - Enhanced Laser and Range Operations at the High Energy Laser System Test Facility (HELSTF)
  - MDA Mobile Sensors

- MUDPACK II Lethality Experiment
- Orbital/Sub-Orbital Program (Draft)
- Small Targets Launch Site at VAFB (Draft)

- Prepared the MDA Programmatic Environmental Impact Statement (PEIS) for the Ballistic Missile Defense System (BMDS) - Draft and holding four public hearings in CA, AK, HI, and DC
- Established HQ policy for environmental compliance and providing quality assurance and management oversight for all MDA environmental compliance matters
- Prepared an Strategic Plan for Environmental Management and Documented MDA's Environmental Management System (EMS)
- Coordinated air quality permitting issues with Vandenberg Air Force Base and Regulators for the FBX-T Radar

FY06 Planned Program:

The Civil Engineering Division:

- Draft FY07 facility budget documentation and supported actions to obtain Congressional funding for a FY07 MILCON Life Safety Upgrade project on Meck Island for MDA test support
- Oversee the construction execution of the Von Braun Complex II MILCON project on Redstone Arsenal, AL
- Oversee the construction award of the FY06 facility MILCON Emergency Services Facility on Meck Island
- Support obtaining OSD approval and Congressional notification for establishment of a Flexible Target Family Single Integration Facility Complex
- Oversee establishment of facilities required for an OCONUS FBX-T Radar

The Environmental Management Division:

- Complete the BMDS Programmatic Environmental Impact Statement
- Complete the environmental review for the FBX-T radar OCONUS
- Prepare / provide oversight on the following EAs
  - Orbital/Sub-Orbital Program
  - Small Targets Launch Site
  - ABL Debris
  - Flexible Target Family
- Complete numerous RECs for projects including the STSS, Thunderball, Big Crow, and FT-06-4.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603888C Ballistic Missile Defense Test and Targets |

FY07 Planned Program:
The Facilities, Siting and Environmental Program will continue to provide facility siting and environmental compliance support for the BMDS.

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## 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 2006 |
|---|---|
| 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 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 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Test Policy and Integration** | | | | | | | | |
| BCA | Various | Various/ NJ, CA, MD, MA | 8,622 | 9,315 | 1Q | 9,641 | 1Q | 27,578 |
| Operational Test Agency Participation in System Test | Various | OTAs/ Various | 5,556 | 5,899 | 1Q | 11,213 | 1Q | 22,668 |
| Target Certification | Various | USASMDC/ Huntsville, AL | 575 | 598 | 1Q | 622 | 1Q | 1,795 |
| **BMDS CTF Core** | | | | | | | | |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Optical Data Analysis | Various | USASMDC, HANSCOM AFB & NAVSEA/ Huntsville, AL, MA & Crystal City, VA | 9,083 | 5,000 | 1Q | 5,850 | 1Q | 19,933 |
| Radar Data Analysis | Various | USASMDC, NAVSEA & HANSCOM AFB/ Huntsville, AL, Crystal City, VA & MA | 8,983 | 4,350 | 1Q | 4,800 | 1Q | 18,133 |
| Lethality | Various | USASMDC / Huntsville, AL | 8,205 | 2,841 | 1Q | 2,830 | 1Q | 13,876 |
| Kill Assessment | Various | USASMDC / Huntsville, AL | 6,590 | 3,889 | 1Q | 3,792 | 1Q | 14,271 |
| International Programs | Various | USASMDC, HANSCOM AFB, WRIGHT PATTERSON AFB & NAVSE/ Huntsville, AL, MA, OH & Crystal City, VA | 2,049 | 1,124 | 1Q | 1,178 | 1Q | 4,351 |
| Target Characterization | Various | USASMDC / Huntsville, AL | 8,797 | 0 | N/A | 0 | N/A | 8,797 |
| Special Programs Tests | Various | MDA/ Washington, D.C. | 212 | 5,000 | 1Q | 3,600 | 1Q | 8,812 |
| CMP-4 | Various | USASMDC / Huntsville, AL | 16,505 | 0 | N/A | 0 | N/A | 16,505 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Corporate Data Collection | Various | Various including Sandia, APL-JHU, MITLL & USAMCOM | 3,920 | 0 | N/A | 0 | N/A | 3,920 |
| TPS-X | Various | Various including NSWC-DD, SPAWAR, NSWC-PHD/PMRF | 2,425 | 0 | N/A | 0 | N/A | 2,425 |
| Radar Exploitation | Various | USASMDC/ Huntsville, AL | 5,365 | 2,892 | 1Q | 2,993 | 1Q | 11,250 |
| FT 04-2 & FT 04-4 | Various | USASMDC / Huntsville, AL | 84,549 | 0 | 1Q | 0 | 1Q | 84,549 |
| Measurements Strategic Planning | Various | MDA & USASMDC/ Washington, D.C. & Huntsville, AL | 0 | 1,000 | 1Q | 1,000 | 1Q | 2,000 |
| BMDS Strategic Planning | Various | USASMDC & MDA / Huntsville, AL & Washington, D.C. | 0 | 5,236 | 1Q | 5,286 | 1Q | 10,522 |
| Capability Requirements Demo | Various | JNIC/ Colorado Springs, CO | 0 | 330 | 1Q | 0 | N/A | 330 |
| Test Configuration Control Board | Various | MDA/ Washington, D.C. | 0 | 2,742 | 1Q | 3,000 | 1Q | 5,742 |
| Test Assurance Directorate | Various | MDA/ Washington, D.C. | 0 | 2,970 | 1Q | 3,495 | 1Q | 6,465 |
| **Test Resources** | | | | | | | | |
| Ground Test Facilities | Various | Army, Air Force/ AL, FL, MD, TN, | 16,655 | 7,468 | 1Q | 7,794 | 1Q | 31,917 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Ranges and Instrumentation | Various | Various/ CA, HI, NM, Marshall Is, Alaska | 64,978 | 63,794 | 1Q | 63,655 | 1Q | 192,427 |
| Airborne Sensors | C/CPAF | L3 Communications/ CA, OK, NM | 37,118 | 25,395 | 1Q | 26,258 | 1Q | 88,771 |
| PMRF Upgrades (Congressional Adds) | Various | Various / HI | 33,329 | 15,940 | N/A | 0 | N/A | 49,269 |
| Environmental Radiation Effects Simulation (Congressional Add) | Various | Indiana U, Bloomington, IN | 1,450 | 1,800 | N/A | 0 | N/A | 3,250 |
| Data Centers | Various | Various, TN, CO, AL, CA | 10,143 | 9,585 | 1Q | 7,560 | 1Q | 27,288 |
| **Facilities, Siting & Environmental** | | | | | | | | |
| Facilities & Siting | Various | Various | 0 | 0 | N/A | 0 | N/A | |
| Environmental Compliance | Various | Various | 0 | 0 | N/A | 0 | N/A | |
| Subtotal Test and Evaluation | | | 335,109 | 177,168 | | 164,567 | | 676844 |

## Remarks

Test Resources:

- Ground Test Facility (GTF) Funding is issued from MDA to the Army and Air Force. The services provide funds to the Army Missile Optical Range (AMOR) in AL, the Kinetic Hardware In The Loop Simulator in FL, and the Arnold Engineering Development Center in TN. Each Facility then places funds on contract and/or retains funding to support on-site personnel.
- Ranges and Instrumentation funding is distributed to executing agents through the services and issued directly from MDA. The Army (SMDC) issues MDA funds for the Mobile Launch Platform (MLP) and MIPRs funds to the Reagan Test Site in the Marshall Islands for range operations, instrumentation upgrades, and various PRST efforts. The Air Force issues funding to Wake Island for test operations support. The remaining funds are issued directly from MDA. Funds are MIPRed to members of the Pacific Range Support Team (PRST) (Patrick AFB, Vandenberg AFB, Pacific Missile Range Facility, Naval Air Warfare Center/Patuxent River & Pt Mugu, White Sands Missile Range, and Sandia National Labs), MIT/LL (Airborne Sensor support, Test Infrastructure support, Flexible Target Family support, and XTR-1 development), NRL (BMDS

Test Communications and NP-3D upgrades), and DOT/Maritime Administration (Texas Clipper Activation). Funds are placed directly on an MDA contract with the Alaska Aerospace Development Corporation (AADC) for Kodiak Launch Complex Operations and Sustainment.

- PMRF Upgrades is a Congressional Add. Funds are issue from MDA to the Navy. The Navy provides funding to various contractors providing support to PMRF.
- Environmental Radiation Effects Simulation is a Congressional Add.
- Data Center Funding is issued from MDA to the Army, Air Force, Navy, and the Joint National Integration Center (JNIC). The services provide funds to the Army Missile Signature Center in TN, Naval Surface Warfare/Weapons Center (Corona) in CA, Missile Defense Data Center in AL, and the BMDS Integration Data Center in CO. The Data Centers place the funds on contract and/or retain funding to support on-site personnel.

## IV. Management Services Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Test Policy and Integration** | | | | | | | | |
| TE Government Salaries | TM | Wash, DC | 5,258 | 5,500 | 1Q | 5,720 | 1Q | 16,478 |
| Support Contracts | C/FFP | TASC, SPARTA/ Arlington, VA | 4,463 | 4,746 | 1Q | 4,828 | 1Q | 14,037 |
| TE Travel | TM | | 586 | 544 | 1Q | 558 | 1Q | 1,688 |
| SMDC Government Salaries | TM | USASMDC/ Huntsville, AL | 140 | 145 | 1Q | 151 | 1Q | 436 |
| **BMDS CTF Core** | | | | | | | | |
| SMDC Government Salaries | TM | USASMDC/ Huntsville, AL | 7,685 | 5,154 | 1Q | 5,254 | 1Q | 18,093 |
| Support Contracts | C/FFP | Various/ TASC, SPARTA, RNB Arlington, VA | 26,429 | 15,840 | 1Q | 16,594 | 1Q | 58,863 |
| **Test Resources** | | | | | | | | |
| SMDC Government Salaries | TM | USASMDC/ Huntsville, AL | 501 | 923 | 1Q | 919 | 1Q | 2,343 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Support Contracts | C/FFP | Northrop Grumman/ Arlington, VA | 5,432 | 5,816 | 1Q | 6,107 | 1Q | 17,355 |
| **Facilities, Siting & Environmental** | | | | | | | | |
| Support Contracts | C/FFP | ICF & SciComm/ VA & MD | 3,240 | 3,331 | 1Q | 3,515 | 1Q | 10,086 |
| Subtotal Management Services | | | 53,734 | 41,999 | | 43,646 | | 139379 |

**Remarks**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 388,843 | 219,167 | | 208,213 | | 816,223 |

**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.

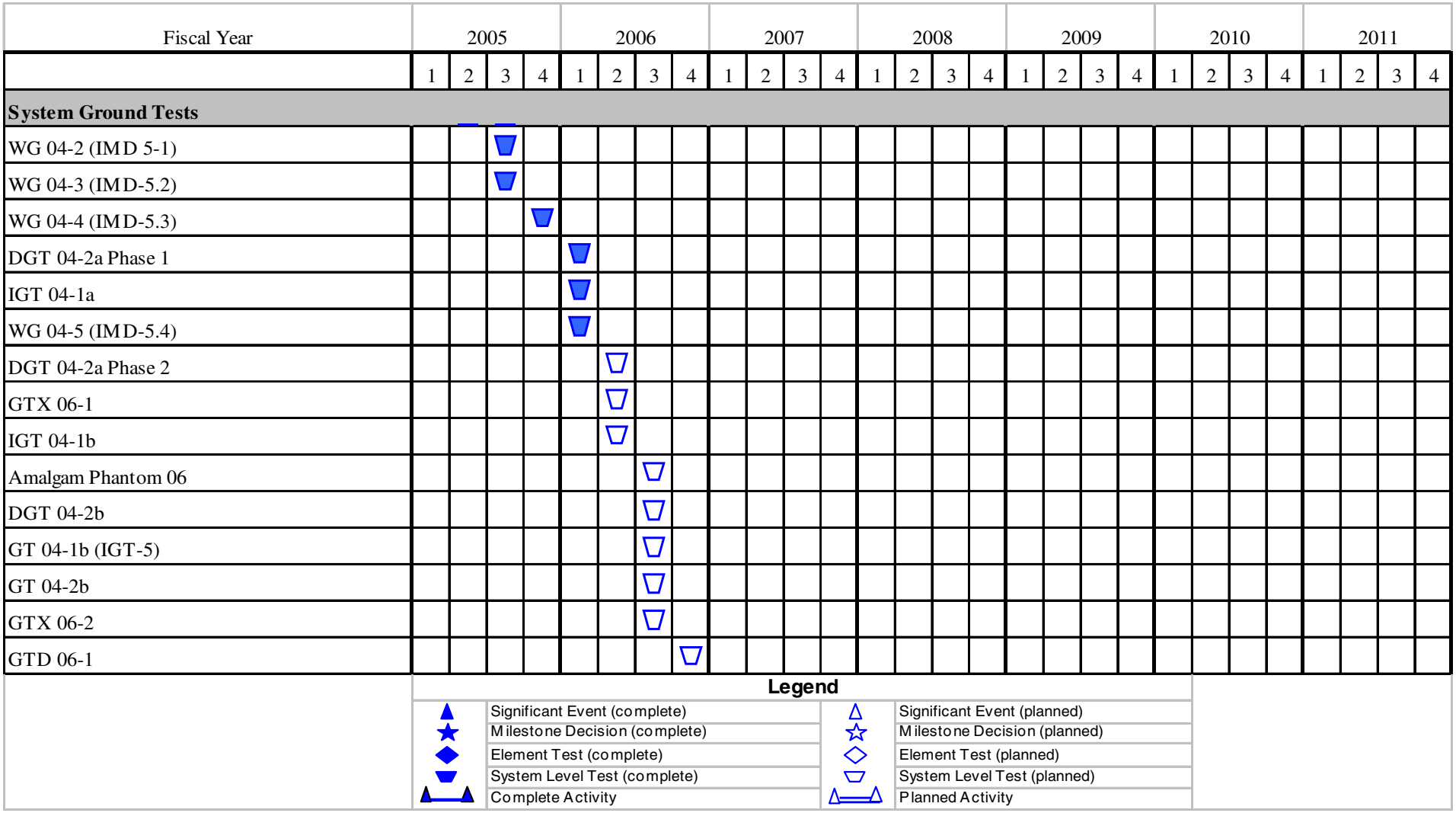
| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603888C Ballistic Missile Defense Test and Targets |

| Fiscal Year | 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 |
| **Aegis BMD Cooperative Research Program** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| JCTV-1 | | | | | | ◇ | | | | | | | | | | | | | | | | | | | | | | |
| **ARROW System Improvement Program** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AST-10 | | | | | ◆ | | | | | | | | | | | | | | | | | | | | | | | |
| AST-11 | | | | | | | ◇ | | | | | | | | | | | | | | | | | | | | | |
| AST-12 | | | | | | | | | ◇ | | | | | | | | | | | | | | | | | | | |
| AST-13 | | | | | | | | | | | | ◇ | | | | | | | | | | | | | | | | |
| **ABL** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| First Flight | ◆ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| First Light | ◆ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **System Ground Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IGT-3 | ▼ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IGT-4b | ▼ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| WG 04-1 (IMD-04.5) | ▼ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GT 04-1a (IGT-5) | | ▼ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GT 04-2 (DGT-1) | | ▼ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GT 04-5 (MDIE 05a) | | | ▼ | | | | | | | | | | | | | | | | | | | | | | | | | |

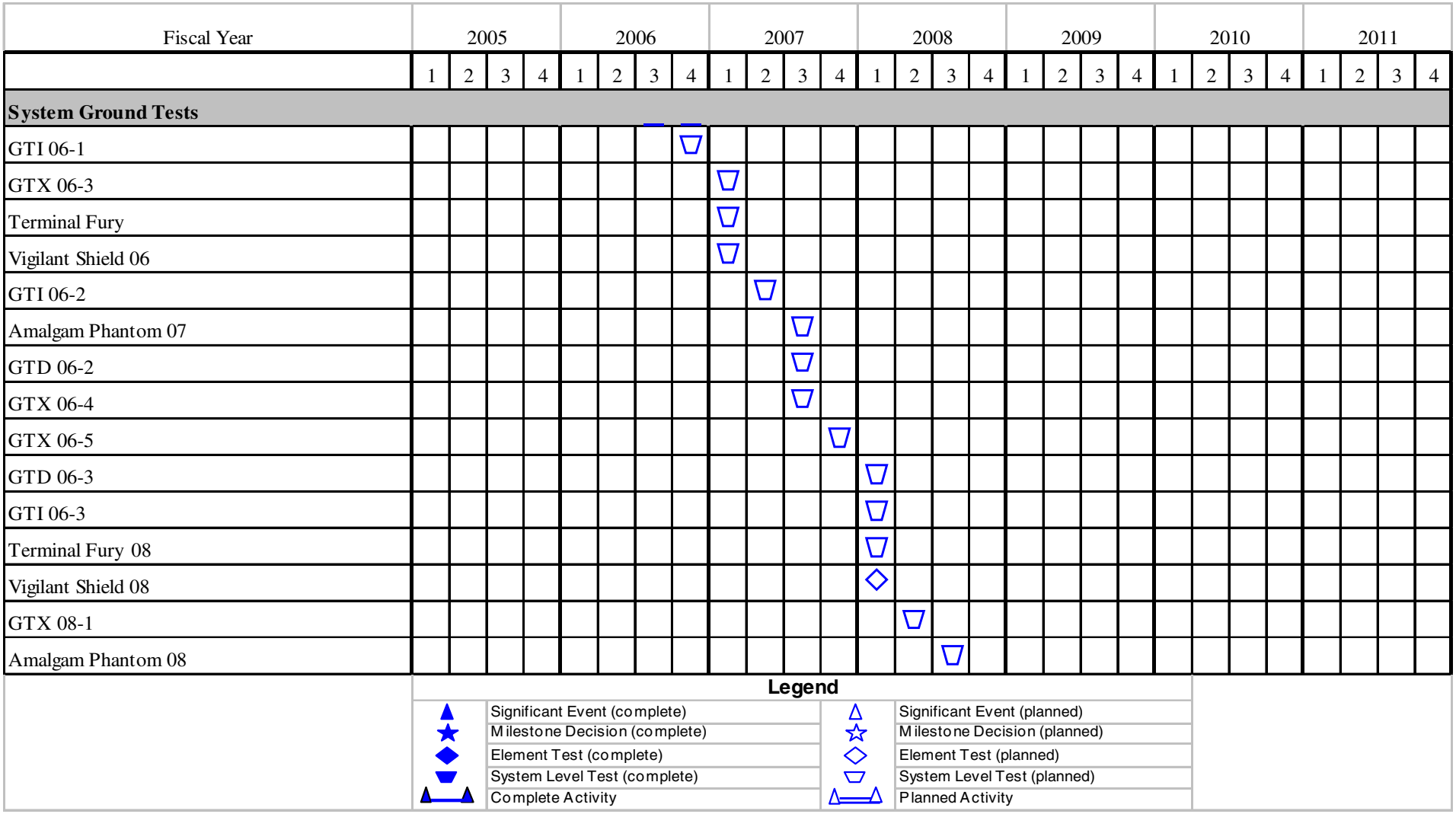
**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲—▲ | Complete Activity | △—△ | Planned Activity |

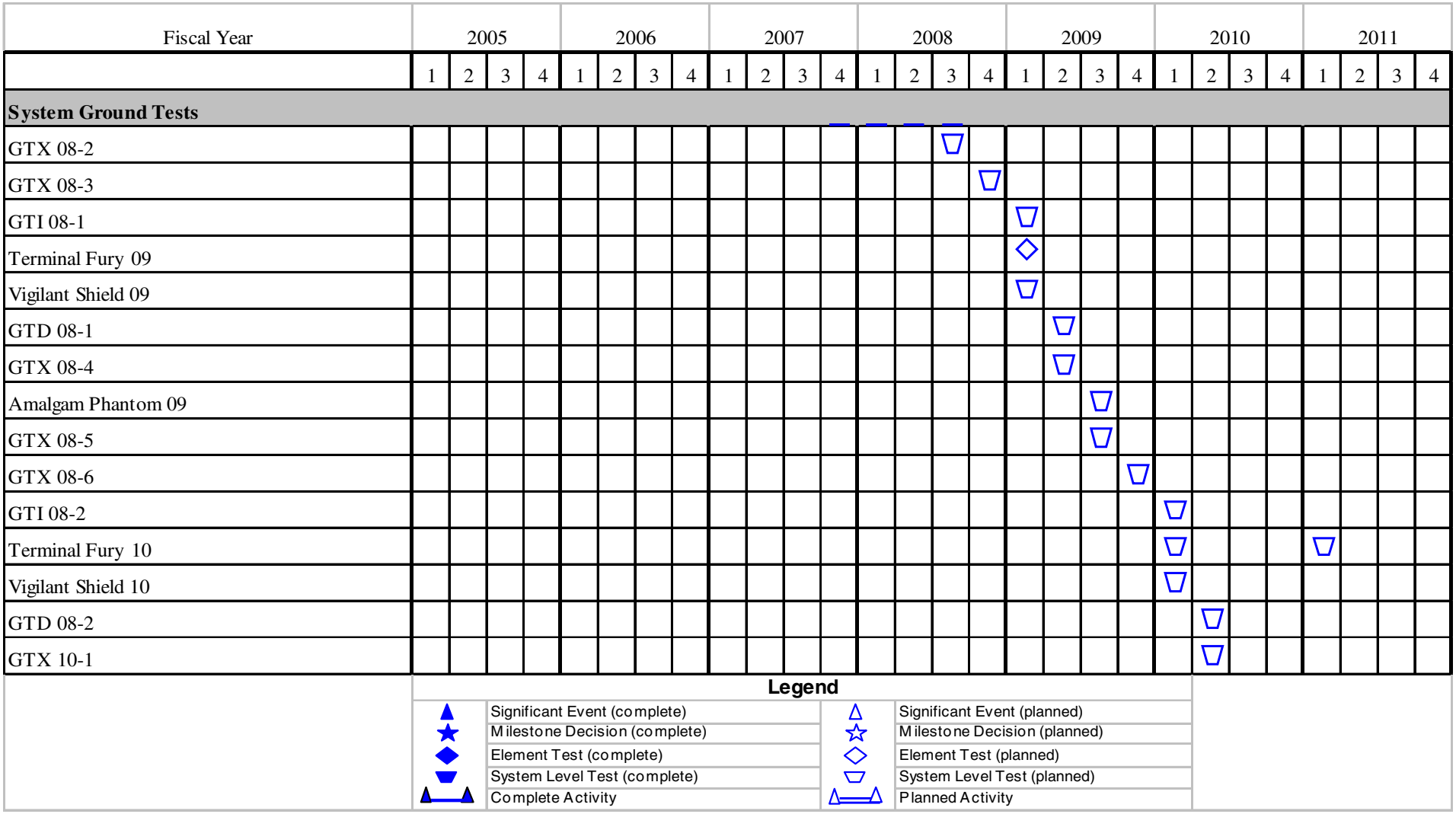
| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603888C Ballistic Missile Defense Test and Targets |



| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 2006 |
|---|---|
| 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 2006**

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 | 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 |
| **System Ground Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Amalgam Phantom 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GTX 10-2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GTX 10-3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GTI 10-1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Vigilant Shield 11 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GTD 10-1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GTX 10-4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Amalgam Phantom 11 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GTX 10-5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GTX 10-6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **System Flight Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IFT-13c | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FTM 04-1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IFT-14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PAC-2 GEM: 2-1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FT 04-5 (Cobra Dane LRALT) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PAC-3: 2-2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

**Legend**

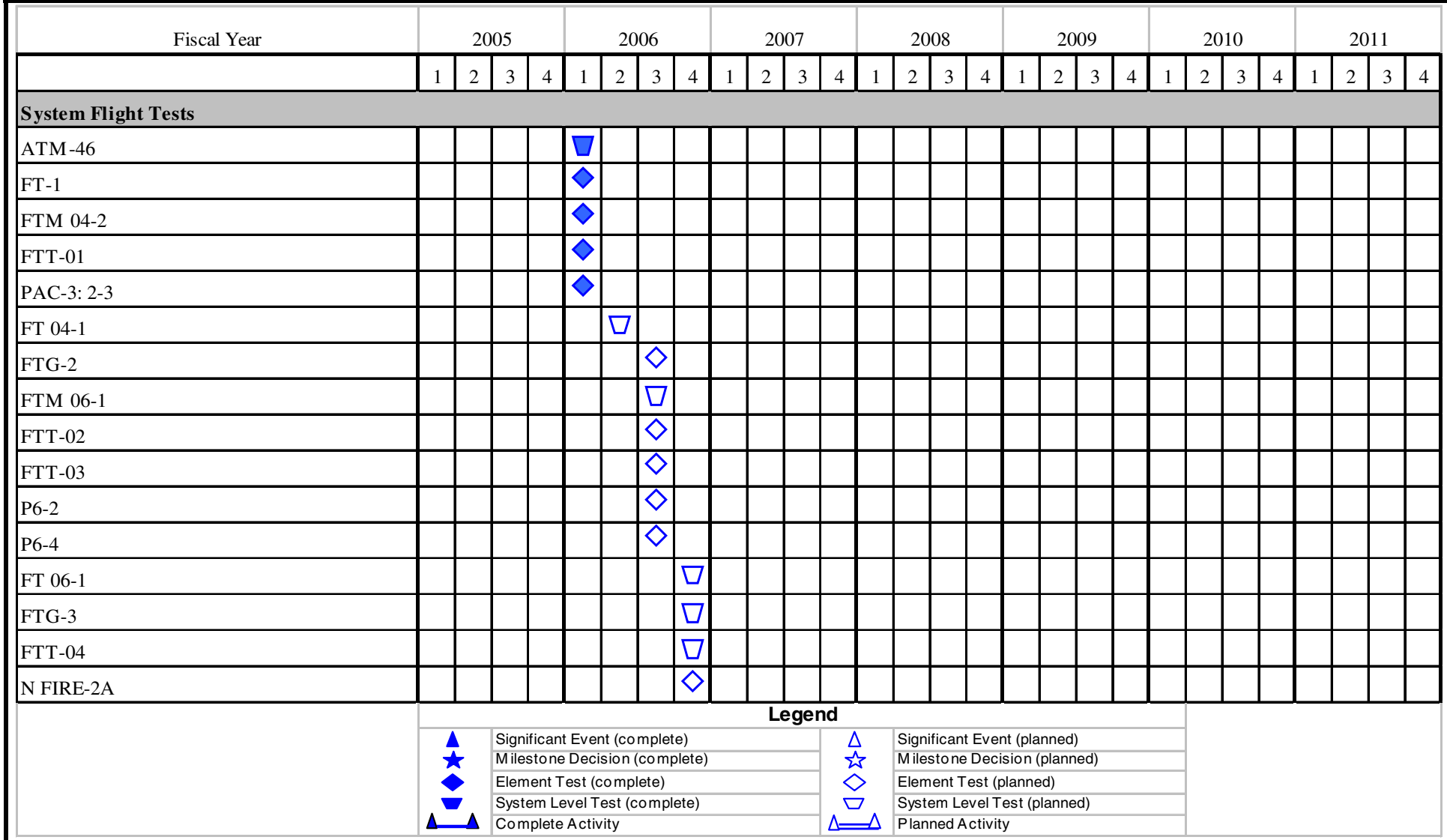
| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲▲ | Complete Activity | △△ | Planned Activity |

**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date: **February 2006**

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

R-1 NOMENCLATURE: **0603888C Ballistic Missile Defense Test and Targets**

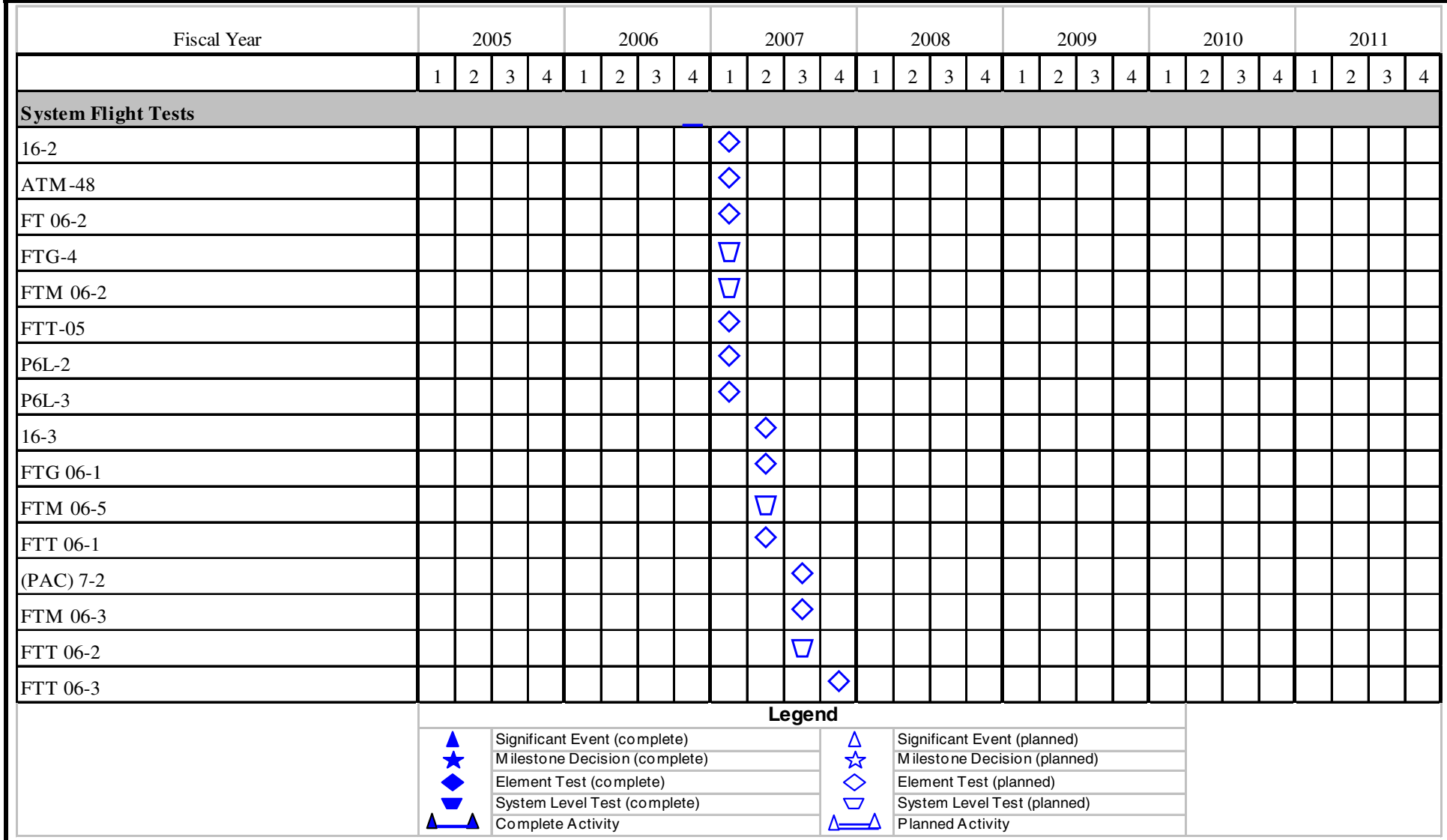


**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date: **February 2006**

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 2006**

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

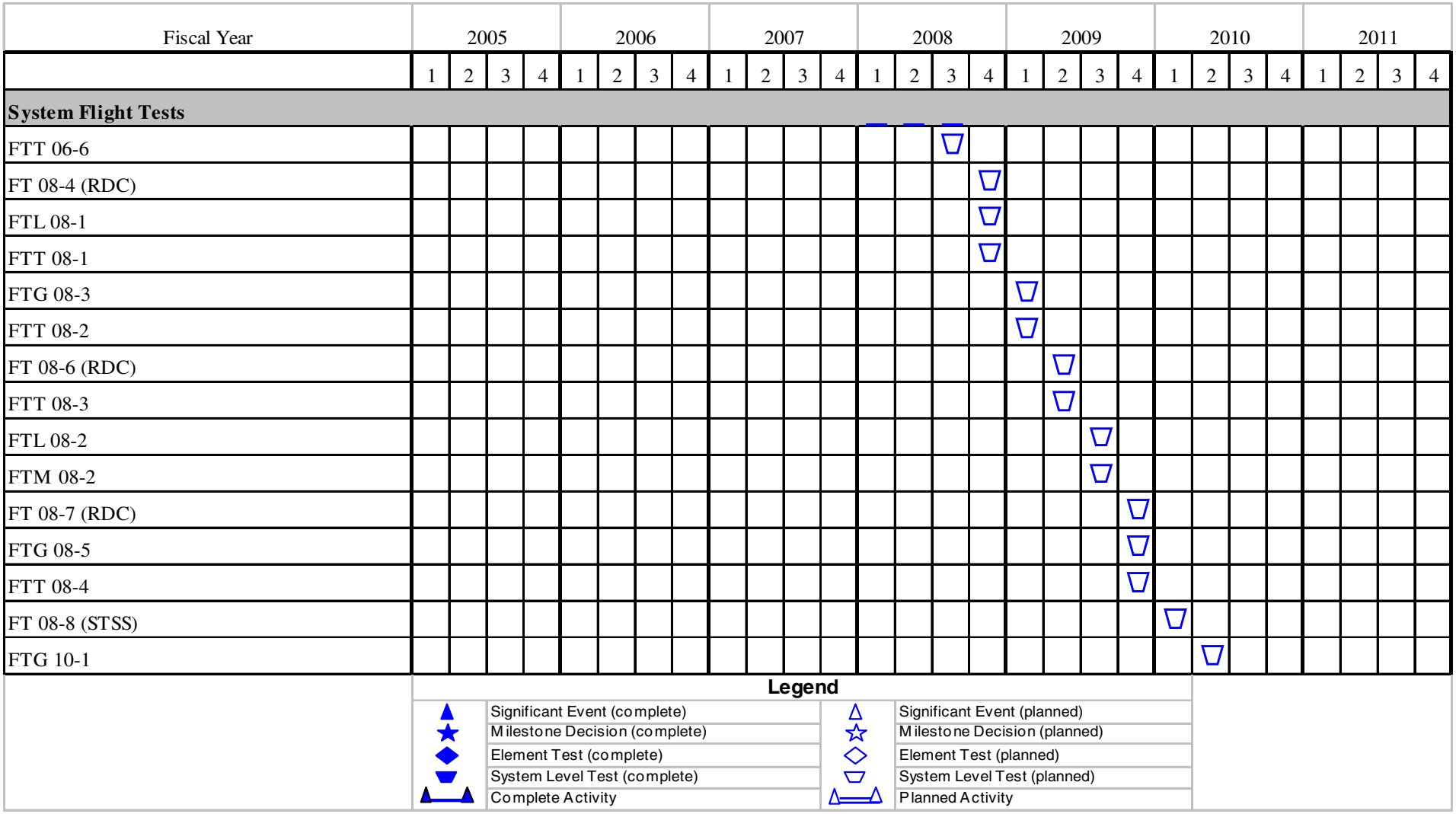
R-1 NOMENCLATURE: **0603888C Ballistic Missile Defense Test and Targets**

| Fiscal Year | 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 |
| **System Flight Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FTT 06-4 | | | | | | | | | | | | ◇ | | | | | | | | | | | | | | | | |
| (PAC) 7-3 | | | | | | | | | | | | | ◇ | | | | | | | | | | | | | | | |
| FT 06-7 (TMDD-1) | | | | | | | | | | | | | ▽ | | | | | | | | | | | | | | | |
| FT 06-8 (SMDD-1) | | | | | | | | | | | | | ▽ | | | | | | | | | | | | | | | |
| FT 08-1 (RDC) | | | | | | | | | | | | | ◇ | | | | | | | | | | | | | | | |
| FTG 06-2 | | | | | | | | | | | | | ▽ | | | | | | | | | | | | | | | |
| FTM 06-4 | | | | | | | | | | | | | ◇ | | | | | | | | | | | | | | | |
| FTT 06-5 | | | | | | | | | | | | | ▽ | | | | | | | | | | | | | | | |
| JBMD-1 | | | | | | | | | | | | | ◇ | | | | | | | | | | | | | | | |
| P6X-2 | | | | | | | | | | | | | ▽ | | | | | | | | | | | | | | | |
| P6X-4 | | | | | | | | | | | | | ◇ | | | | | | | | | | | | | | | |
| FT 08-2 (TMDD-2) | | | | | | | | | | | | | | ▽ | | | | | | | | | | | | | | |
| FTG 06-3 | | | | | | | | | | | | | | ▽ | | | | | | | | | | | | | | |
| FT 08-3 (SMDD-2) | | | | | | | | | | | | | | | ▽ | | | | | | | | | | | | | |
| FTG 08-1 | | | | | | | | | | | | | | | ▽ | | | | | | | | | | | | | |
| FTM 08-1 | | | | | | | | | | | | | | | ▽ | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲▬▲ | Complete Activity | △▬△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 2006 |
|---|---|
| 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 | 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 |
| **System Flight Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FTL 10-1 | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | | | |
| FTT 10-1 | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | | | |
| FT 10-1 (RDC) | | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | | |
| FT 10-2 (STSS) | | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | | |
| FTM 10-1 | | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | | |
| FTG 10-2 | | | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | |
| FTL 10-2 | | | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | |
| FTT 10-2 | | | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | |
| FTG 10-3 | | | | | | | | | | | | | | | | | | | | | | | | | ▽ | | | |
| FTL 10-3 | | | | | | | | | | | | | | | | | | | | | | | | | ▽ | | | |
| FT 10-4 (STSS) | | | | | | | | | | | | | | | | | | | | | | | | | | ▽ | | |
| FTT 10-3 | | | | | | | | | | | | | | | | | | | | | | | | | | ▽ | | |
| FTG 10-4 | | | | | | | | | | | | | | | | | | | | | | | | | | | ▽ | |
| FTL 10-4 | | | | | | | | | | | | | | | | | | | | | | | | | | | ▽ | |
| FTM 10-2 | | | | | | | | | | | | | | | | | | | | | | | | | | | ▽ | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲——▲ | Complete Activity | △——△ | Planned Activity |

**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date: **February 2006**

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

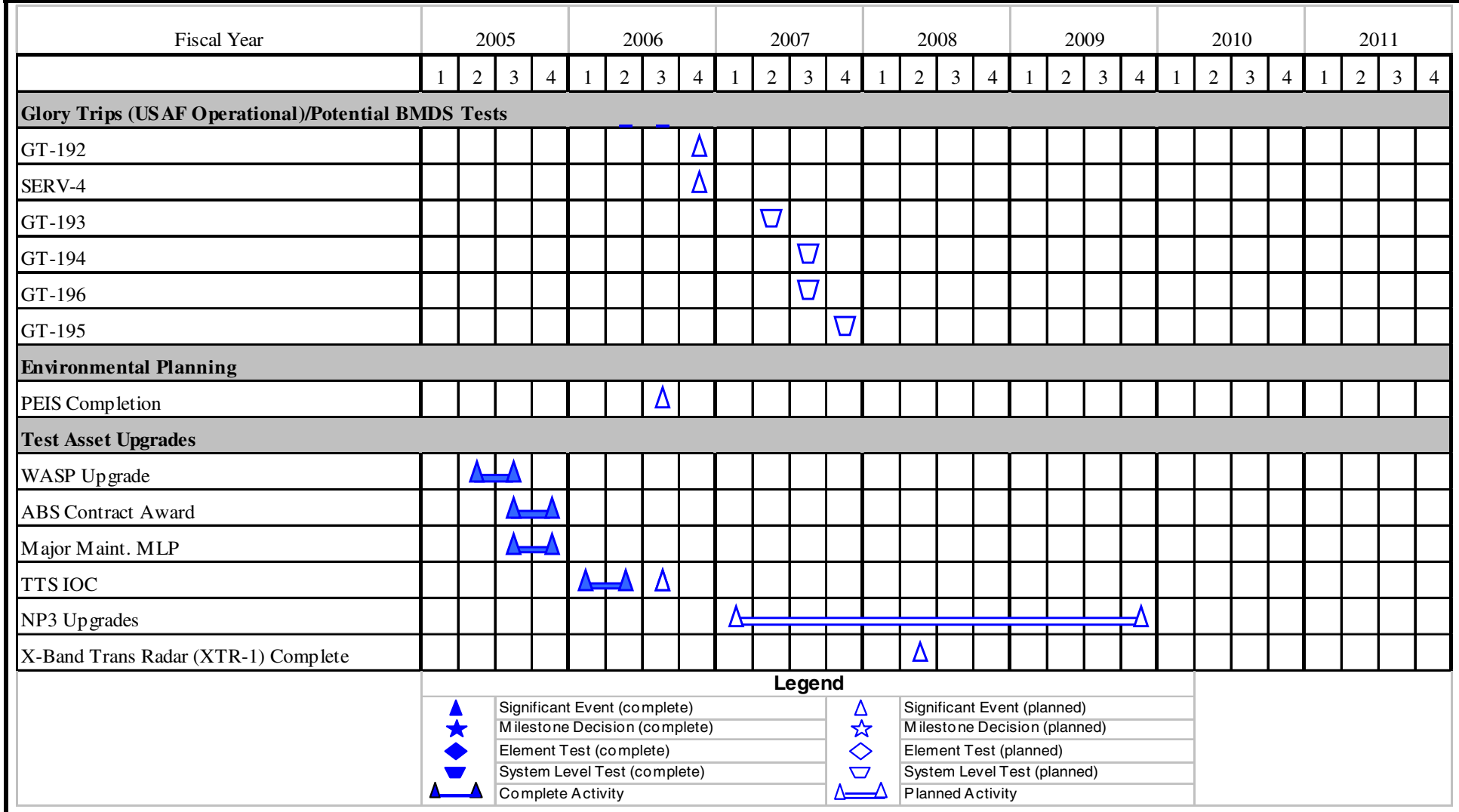
R-1 NOMENCLATURE: **0603888C Ballistic Missile Defense Test and Targets**

| Fiscal Year | 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 |
| **System Flight Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FT 10-5 (RDC) | | | | | | | | | | | | | | | | | | | | | | | | | | | | ▽ |
| FTG 10-5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | ▽ |
| FTT 10-4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | ▽ |
| **Measurement Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FT 04-2 (CMCM-1) | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | |
| FT 04-4 (CMCM-2) | | | | | | | △ | | | | | | | | | | | | | | | | | | | | | |
| FT 06-4 (CMCM-4) | | | | | | | | | | | | | | △ | | | | | | | | | | | | | | |
| FT 08-5 (CMCM-8) | | | | | | | | | | | | | | | | | | | | | | △ | | | | | | |
| **Glory Trips (USAF Operational)/Potential BMDS Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GT-188 | | ▼ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GT-187 | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | |
| GT-189 | | | | ▼ | | | | | | | | | | | | | | | | | | | | | | | | |
| SERV-2 | | | | ▼ | | | | | | | | | | | | | | | | | | | | | | | | |
| SERV-3 | | | | | | △ | | | | | | | | | | | | | | | | | | | | | | |
| GT-190 | | | | | | | △ | | | | | | | | | | | | | | | | | | | | | |
| GT-191 | | | | | | | △ | | | | | | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲—▲ | Complete Activity | △—△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Aegis BMD Cooperative Research Program** | | | | | | | |
| JCTV-1 | | 2Q | | | | | |
| **ARROW System Improvement Program** | | | | | | | |
| AST-10 | | 1Q | | | | | |
| AST-11 | | 3Q | | | | | |
| AST-12 | | | 1Q | | | | |
| AST-13 | | | 4Q | | | | |
| **ABL** | | | | | | | |
| First Flight | 1Q | | | | | | |
| First Light | 1Q | | | | | | |
| **System Ground Tests** | | | | | | | |
| IGT-3 | 1Q | | | | | | |
| IGT-4b | 1Q | | | | | | |
| WG 04-1 (IMD-04.5) | 1Q | | | | | | |
| GT 04-1a (IGT-5) | 2Q | | | | | | |
| GT 04-2 (DGT-1) | 2Q | | | | | | |
| GT 04-5 (MDIE 05a) | 3Q | | | | | | |
| WG 04-2 (IMD 5-1) | 3Q | | | | | | |
| WG 04-3 (IMD-5.2) | 3Q | | | | | | |
| WG 04-4 (IMD-5.3) | 4Q | | | | | | |
| DGT 04-2a Phase 1 | | 1Q | | | | | |
| IGT 04-1a | | 1Q | | | | | |
| WG 04-5 (IMD-5.4) | | 1Q | | | | | |
| DGT 04-2a Phase 2 | | 2Q | | | | | |
| GTX 06-1 | | 2Q | | | | | |
| IGT 04-1b | | 2Q | | | | | |
| Amalgam Phantom 06 | | 3Q | | | | | |
| DGT 04-2b | | 3Q | | | | | |
| GT 04-1b (IGT-5) | | 3Q | | | | | |
| GT 04-2b | | 3Q | | | | | |
| GTX 06-2 | | 3Q | | | | | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| GTD 06-1 | | 4Q | | | | | |
| GTI 06-1 | | 4Q | | | | | |
| GTX 06-3 | | | 1Q | | | | |
| Terminal Fury | | | 1Q | | | | |
| Vigilant Shield 06 | | | 1Q | | | | |
| GTI 06-2 | | | 2Q | | | | |
| Amalgam Phantom 07 | | | 3Q | | | | |
| GTD 06-2 | | | 3Q | | | | |
| GTX 06-4 | | | 3Q | | | | |
| GTX 06-5 | | | 4Q | | | | |
| GTD 06-3 | | | | 1Q | | | |
| GTI 06-3 | | | | 1Q | | | |
| Terminal Fury 08 | | | | 1Q | | | |
| Vigilant Shield 08 | | | | 1Q | | | |
| GTX 08-1 | | | | 2Q | | | |
| Amalgam Phantom 08 | | | | 3Q | | | |
| GTX 08-2 | | | | 3Q | | | |
| GTX 08-3 | | | | 4Q | | | |
| GTI 08-1 | | | | | 1Q | | |
| Terminal Fury 09 | | | | | 1Q | | |
| Vigilant Shield 09 | | | | | 1Q | | |
| GTD 08-1 | | | | | 2Q | | |
| GTX 08-4 | | | | | 2Q | | |
| Amalgam Phantom 09 | | | | | 3Q | | |
| GTX 08-5 | | | | | 3Q | | |
| GTX 08-6 | | | | | 4Q | | |
| GTI 08-2 | | | | | | 1Q | |
| Terminal Fury 10 | | | | | | 1Q | 1Q |
| Vigilant Shield 10 | | | | | | 1Q | |
| GTD 08-2 | | | | | | 2Q | |
| GTX 10-1 | | | | | | 2Q | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| Amalgam Phantom 10 | | | | | | 3Q | |
| GTX 10-2 | | | | | | 3Q | |
| GTX 10-3 | | | | | | 4Q | |
| GTI 10-1 | | | | | | | 1Q |
| Vigilant Shield 11 | | | | | | | 1Q |
| GTD 10-1 | | | | | | | 2Q |
| GTX 10-4 | | | | | | | 2Q |
| Amalgam Phantom 11 | | | | | | | 3Q |
| GTX 10-5 | | | | | | | 3Q |
| GTX 10-6 | | | | | | | 4Q |
| **System Flight Tests** | | | | | | | |
| IFT-13c | 1Q | | | | | | |
| FTM 04-1 | 2Q | | | | | | |
| IFT-14 | 2Q | | | | | | |
| PAC-2 GEM: 2-1 | 2Q | | | | | | |
| FT 04-5 (Cobra Dane LRALT) | 4Q | | | | | | |
| PAC-3: 2-2 | 4Q | | | | | | |
| ATM-46 | | 1Q | | | | | |
| FT-1 | | 1Q | | | | | |
| FTM 04-2 | | 1Q | | | | | |
| FTT-01 | | 1Q | | | | | |
| PAC-3: 2-3 | | 1Q | | | | | |
| FT 04-1 | | 2Q | | | | | |
| FTG-2 | | 3Q | | | | | |
| FTM 06-1 | | 3Q | | | | | |
| FTT-02 | | 3Q | | | | | |
| FTT-03 | | 3Q | | | | | |
| P6-2 | | 3Q | | | | | |
| P6-4 | | 3Q | | | | | |
| FT 06-1 | | 4Q | | | | | |
| FTG-3 | | 4Q | | | | | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| FTT-04 | | 4Q | | | | | |
| N FIRE-2A | | 4Q | | | | | |
| 16-2 | | | 1Q | | | | |
| ATM-48 | | | 1Q | | | | |
| FT 06-2 | | | 1Q | | | | |
| FTG-4 | | | 1Q | | | | |
| FTM 06-2 | | | 1Q | | | | |
| FTT-05 | | | 1Q | | | | |
| P6L-2 | | | 1Q | | | | |
| P6L-3 | | | 1Q | | | | |
| 16-3 | | | 2Q | | | | |
| FTG 06-1 | | | 2Q | | | | |
| FTM 06-5 | | | 2Q | | | | |
| FTT 06-1 | | | 2Q | | | | |
| (PAC) 7-2 | | | 3Q | | | | |
| FTM 06-3 | | | 3Q | | | | |
| FTT 06-2 | | | 3Q | | | | |
| FTT 06-3 | | | 4Q | | | | |
| FTT 06-4 | | | 4Q | | | | |
| (PAC) 7-3 | | | | 1Q | | | |
| FT 06-7 (TMDD-1) | | | | 1Q | | | |
| FT 06-8 (SMDD-1) | | | | 1Q | | | |
| FT 08-1 (RDC) | | | | 1Q | | | |
| FTG 06-2 | | | | 1Q | | | |
| FTM 06-4 | | | | 1Q | | | |
| FTT 06-5 | | | | 1Q | | | |
| JBMD-1 | | | | 1Q | | | |
| P6X-2 | | | | 1Q | | | |
| P6X-4 | | | | 1Q | | | |
| FT 08-2 (TMDD-2) | | | | 2Q | | | |
| FTG 06-3 | | | | 2Q | | | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| FT 08-3 (SMDD-2) | | | | 3Q | | | |
| FTG 08-1 | | | | 3Q | | | |
| FTM 08-1 | | | | 3Q | | | |
| FTT 06-6 | | | | 3Q | | | |
| FT 08-4 (RDC) | | | | 4Q | | | |
| FTL 08-1 | | | | 4Q | | | |
| FTT 08-1 | | | | 4Q | | | |
| FTG 08-3 | | | | | 1Q | | |
| FTT 08-2 | | | | | 1Q | | |
| FT 08-6 (RDC) | | | | | 2Q | | |
| FTT 08-3 | | | | | 2Q | | |
| FTG 08-4 | | | | | 3Q | | |
| FTL 08-2 | | | | | 3Q | | |
| FTM 08-2 | | | | | 3Q | | |
| FT 08-7 (RDC) | | | | | 4Q | | |
| FTG 08-5 | | | | | 4Q | | |
| FTT 08-4 | | | | | 4Q | | |
| FT 08-8 (STSS) | | | | | | 1Q | |
| FTG 10-1 | | | | | | 2Q | |
| FTL 10-1 | | | | | | 2Q | |
| FTT 10-1 | | | | | | 2Q | |
| FT 10-1 (RDC) | | | | | | 3Q | |
| FT 10-2 (STSS) | | | | | | 3Q | |
| FTM 10-1 | | | | | | 3Q | |
| FTG 10-2 | | | | | | 4Q | |
| FTL 10-2 | | | | | | 4Q | |
| FTT 10-2 | | | | | | 4Q | |
| FTG 10-3 | | | | | | | 1Q |
| FTL 10-3 | | | | | | | 1Q |
| FT 10-4 (STSS) | | | | | | | 2Q |
| FTT 10-3 | | | | | | | 2Q |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| FTG 10-4 | | | | | | | 3Q |
| FTL 10-4 | | | | | | | 3Q |
| FTM 10-2 | | | | | | | 3Q |
| FT 10-5 (RDC) | | | | | | | 4Q |
| FTG 10-5 | | | | | | | 4Q |
| FTT 10-4 | | | | | | | 4Q |
| **Measurement Tests** | | | | | | | |
| FT 04-2 (CMCM-1) | 4Q | | | | | | |
| FT 04-4 (CMCM-2) | | 3Q | | | | | |
| FT 06-4 (CMCM-4) | | | | 2Q | | | |
| FT 08-5 (CMCM-8) | | | | | | 2Q | |
| **Glory Trips (USAF Operational)/Potential BMDS Tests** | | | | | | | |
| GT-188 | 2Q | | | | | | |
| GT-187 | 4Q | | | | | | |
| GT-189 | 4Q | | | | | | |
| SERV-2 | 4Q | | | | | | |
| SERV-3 | | 2Q | | | | | |
| GT-190 | | 3Q | | | | | |
| GT-191 | | 3Q | | | | | |
| GT-192 | | 4Q | | | | | |
| SERV-4 | | 4Q | | | | | |
| GT-193 | | | 2Q | | | | |
| GT-194 | | | 3Q | | | | |
| GT-196 | | | 3Q | | | | |
| GT-195 | | | 4Q | | | | |
| **Environmental Planning** | | | | | | | |
| PEIS Completion | | 3Q | | | | | |
| **Test Asset Upgrades** | | | | | | | |
| WASP Upgrade | 2Q-3Q | | | | | | |
| ABS Contract Award | 3Q-4Q | | | | | | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| Major Maint. MLP | 3Q-4Q | | | | | | |
| TTS IOC | | 1Q-3Q | | | | | |
| NP3 Upgrades | | | 1Q-4Q | 1Q-4Q | 1Q-4Q | | |
| X-Band Trans Radar (XTR-1) Complete | | | | 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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0704 Test & Evaluation Block 2004 | 140,456 | 0 | 0 | 0 | 0 | 0 | 0 |
| RDT&E Articles Qty | 4 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: FY05 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 2004 Test and Evaluation Program funded system-level flight tests (BMDS FTs), Measurements Tests, Ground Tests (BMDS GTs) and Missile Defense Integration Exercises (MDIEs), and Integrated Missile Defense (IMD) Wargames. This project conducted BMD System Tests to support verification of achieved BMDS block capability and to support the verification and anchoring of Models and Simulations, and planning for Block 2006 test events. These System Tests examined the capability of the BMDS to detect, track, and engage targets. BMDS Ground Tests demonstrated 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. Ground test events were conducted to support characterization and verification of the Block 2004 capability and planning for Block 2006 Ground tests. This project also provided 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.

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Flight Tests | 24,331 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The BMDS Combined Test Force (CTF) plans, executes, analyzes, and reports all BMD system test events to demonstrate integrated BMDS capability and address critical measurements for growth and capability.

FY05 Accomplishments:

- Planned and supported execution of BMD System Tests; IFT-13C, IFT-14, FT 04-3, SERV-2, GT-189, FT 04-5, FTM 04-1.
- Conducted post test data analysis on FM-6, GT-185, IFT-13C, IFT-14, FT 04-3, SERV-2, GT-189, FT04-5, FTM 04-1. Test resulted support BMD Capability Verification and Assessment.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603888C Ballistic Missile Defense Test and Targets** |

- Continued to populate the BMDS Characterization Data Base with the latest test data inputs to support assessments by Systems Engineering, JTAMDO/STRATCOMMS and OTAs.

FY06 Accomplishment:
- Planned and supported execution of BMD System Test PATRIOT PAC-2 GEM ATM-46, FTM 04-2, FTT-1 and GMD FT-1. (FY05 Tests that slipped into FY06).

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Ground Tests | 15,705 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The BMDS CTF plans, executes, and analyses all BMD system ground tests to demonstrate integrated BMDS capability and address critical measurements for growth and capability.

FY05 Accomplishments:
- Conducted test planning for GT 04-1, GT 04-2, GT 04-5 and GT 04-6.
- Executed and conducted Post Test Analysis of GT 04-5. Analysis provided verification feedback to the developers for system improvement.
- Performed post test data analysis of MDIE 04b, IGT-4a, IGT-4b, IGT-3. Note: GT 04-1 and GT04-2 were slipped into FY06, because of system maturity issues.
- GT 04-6 was canceled because of schedule conflicts with the GMD and C2BMC system simulation laboratories (ISTC-1 and BITC). These labs were not available for BMDS system testing because they were needed to support element developmental test events.
- Successfully conducted and executed WG 04-1, WG 04-2, WG 04-3, WG 04-4 and WG 04-5.
- Performed Post Test Analysis of IMD 4.4a, IMD 4.4b, WG 04-1, WG 04-2, WG 04-3 and WG 04-4.
- Conducted initial planning for GTI 06-1.

FY06 Accomplishments/Planned Program:
- Provide support for a Ground Test Laboratory build-out to provide a BMDS Integration and Test Center (BITC) capability dedicated to Ground Test activities. This will alleviate one of the problems that led to GT 04-6 cancellation.
- Conduct test planning for GT 06-1 to transfer Block 2004 test cases from GT 04-6.
- Conduct Post Test Analysis of GT 04-1 and GT 04-2.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603888C Ballistic Missile Defense Test and Targets** |

- Conducted WG04-5 (completion slipped from FY05 to FY06).

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Measurements Tests | 100,420 | 0 | 0 |
| RDT&E Articles (Quantity) | 4 | 0 | 0 |

The BMDS CTF plans and executes the BMDS measurements program by providing data products that support block characterization, modeling and simulation validation, phenomenology, algorithm development, and new technology developments. These critical measurements are conducted for block development and to characterize threats and countermeasures.

FY05 Accomplishments:
RDT&E Articles: Integrated and delivered two (2) test articles for FT 04-2 (CMCM-1) & two (2) for FT 04-4 (CMCM-2).

- Designed and planned 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.
- Conducted and executed (FT 04-2 CMCM-1 A&B) two-shot, guided, short range campaign..
- Completed post test analysis for CMP-4A&B campaign.
- Initiated test planning, sensor planning, range integration and design reviews of FT 04-4 (CMCM-2 A&B) two-shot, guided, short range campaign. FT 04-4 was scheduled to be accomplished in FY05, but was slipped to FY06, because of test range schedule conflicts.

FY06 Planned Program:
- Conduct and execute FT04-4 (CMCM-2) campaign.
- Complete post-test analysis of FT04-2.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2006 |
|---|---|
| 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 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 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 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 | 24,718 | 0 | N/A | 0 | N/A | 24,718 |
| Test Planning & Operations | Various | Various APL-JHU/MITLL/Sandia/WSMR/NSWC | 11,836 | 0 | N/A | 0 | N/A | 11,836 |
| TA&R/JAT | Various | Various including USASMDC/USAMCOM | 6,900 | 0 | N/A | 0 | N/A | 6,900 |
| **Ground Tests** | | | | | | | | |
| MDIE | Various | JNIC, Colorado Springs, CO | 22,626 | 0 | N/A | 0 | N/A | 22,626 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Exercise Overlays | Various | JNIC, Colorado Springs, CO | 13,034 | 0 | N/A | 0 | N/A | 13,034 |
| **Measurements Tests** | | | | | | | | |
| FT 04-2 & FT 04-4 | Various | Various/ including USASMDC | 100,420 | 0 | N/A | 0 | N/A | 100,420 |
| Subtotal Test and Evaluation | | | 179,534 | 0 | | 0 | | 179534 |

**Remarks** Funding for OTA Participation is reflected in Budget Project 0304.

## IV. Management Services Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 | | | 179,534 | 0 | | 0 | | 179,534 |

**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 2006**

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

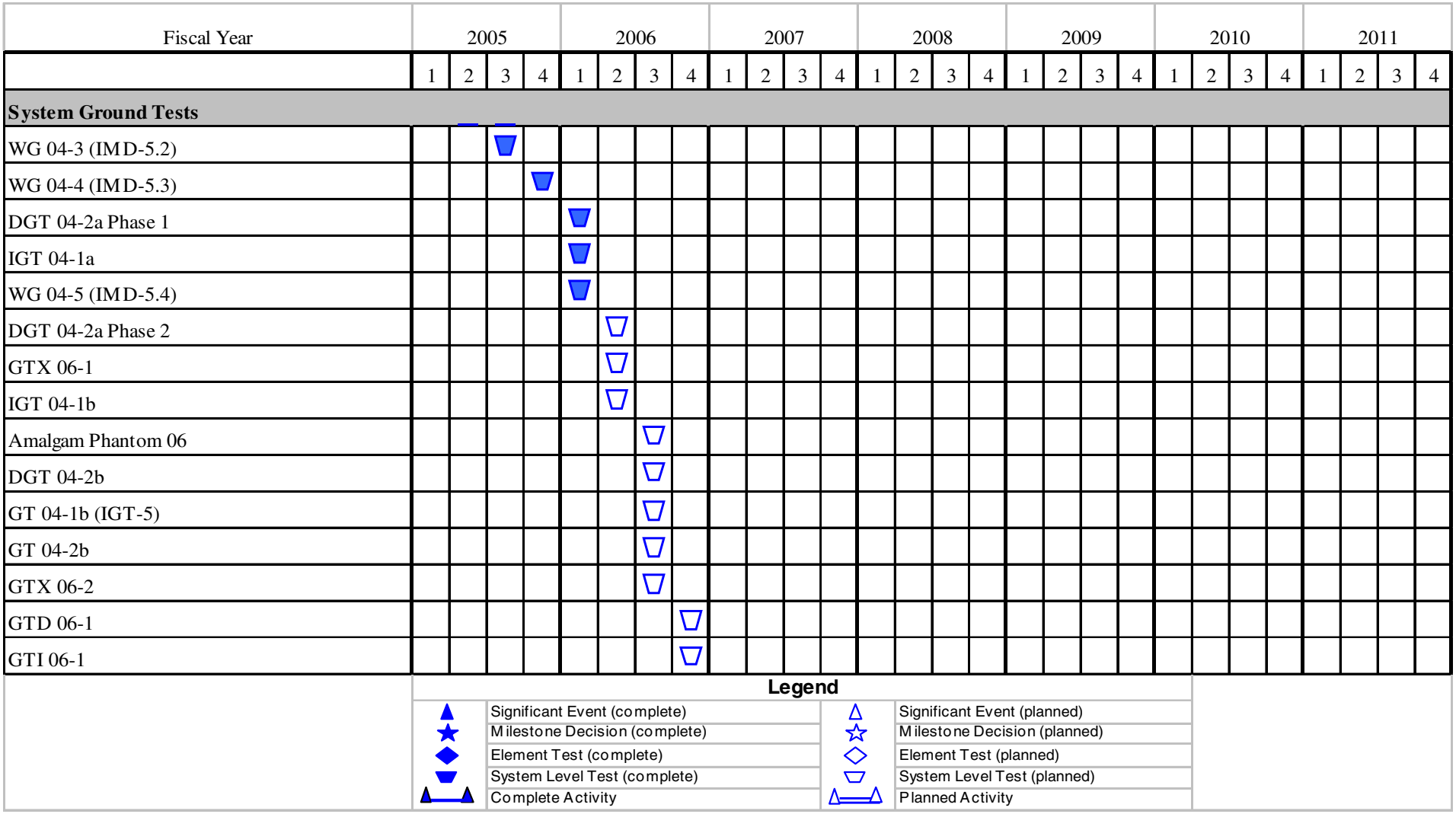
R-1 NOMENCLATURE: **0603888C Ballistic Missile Defense Test and Targets**

| Fiscal Year | 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 |
| **Aegis BMD Cooperative Research Program** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| JCTV-1 | | | | | | ◇ | | | | | | | | | | | | | | | | | | | | | | |
| **ARROW System Improvement Program** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AST-10 | | | | | ◆ | | | | | | | | | | | | | | | | | | | | | | | |
| AST-11 | | | | | | | ◇ | | | | | | | | | | | | | | | | | | | | | |
| AST-12 | | | | | | | | ◇ | | | | | | | | | | | | | | | | | | | | |
| **ABL** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| First Flight | ◆ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| First Light | ◆ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **System Ground Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IGT-3 | ▼ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IGT-4b | ▼ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| WG 04-1 (IMD-04.5) | ▼ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GT 04-1a (IGT-5) | | ▼ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GT 04-2 (DGT-1) | | ▼ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GT 04-5 (MDIE 05a) | | | ▼ | | | | | | | | | | | | | | | | | | | | | | | | | |
| WG 04-2 (IMD 5-1) | | | ▼ | | | | | | | | | | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲—▲ | Complete Activity | △—△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603888C Ballistic Missile Defense Test and Targets |

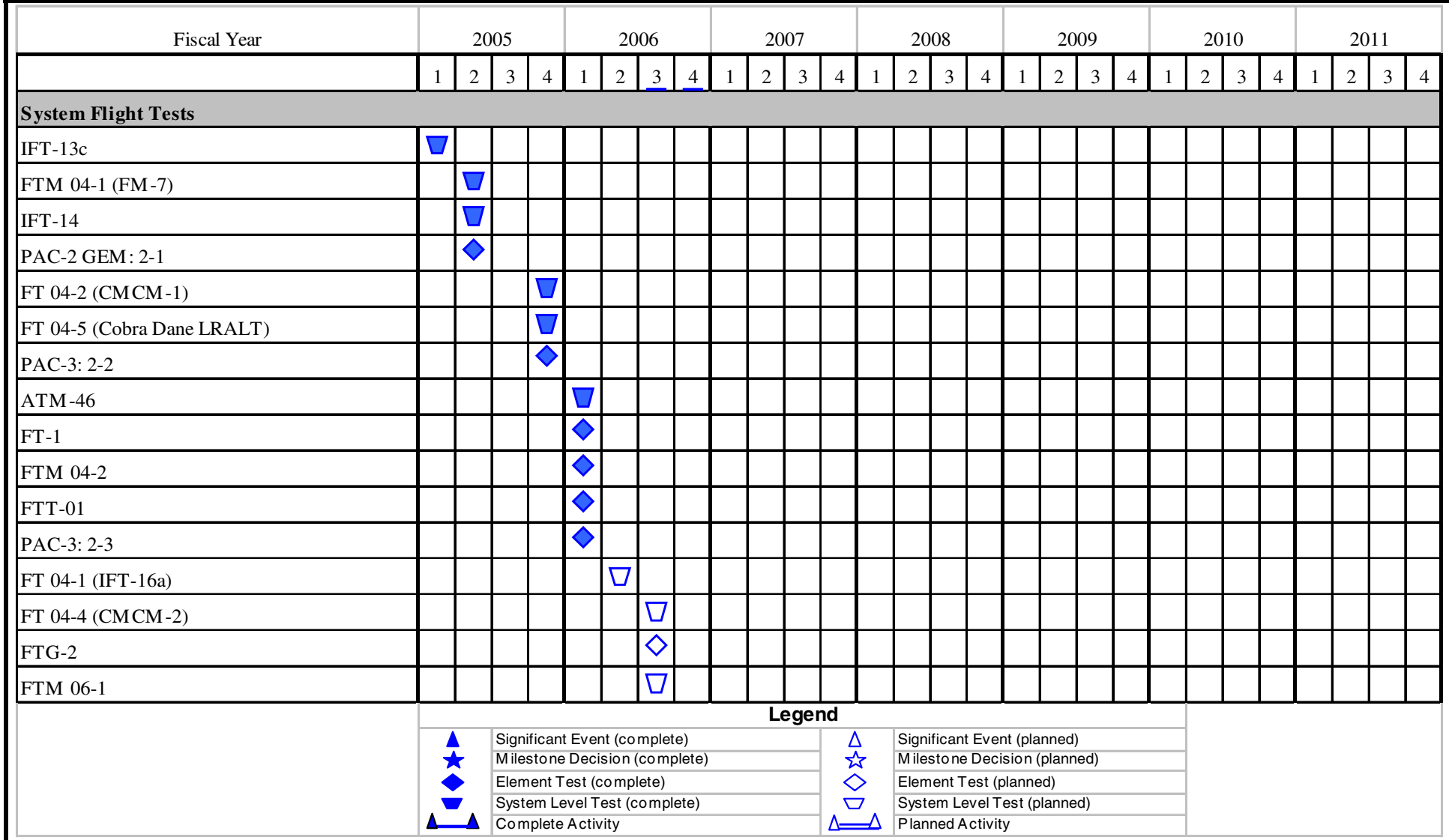


**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date: **February 2006**

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 2006**

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 | 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 |
| **System Flight Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FTT-02 | | | | | | | ◇ | | | | | | | | | | | | | | | | | | | | | |
| FTT-03 | | | | | | | ◇ | | | | | | | | | | | | | | | | | | | | | |
| P6-2 | | | | | | | ◇ | | | | | | | | | | | | | | | | | | | | | |
| P6-4 | | | | | | | ◇ | | | | | | | | | | | | | | | | | | | | | |
| FT 06-1 | | | | | | | | ▽ | | | | | | | | | | | | | | | | | | | | |
| FTG-3 | | | | | | | | ▽ | | | | | | | | | | | | | | | | | | | | |
| FTT 04 | | | | | | | | ▽ | | | | | | | | | | | | | | | | | | | | |
| N FIRE-2A | | | | | | | | ◇ | | | | | | | | | | | | | | | | | | | | |
| FTG 06-1 | | | | | | | | | ◇ | | | | | | | | | | | | | | | | | | | |
| **Glory Trips (USAF Operational)/Potential BMDS Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GT-188 | | ▼ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GT-187 | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | |
| GT-189 | | | | ▼ | | | | | | | | | | | | | | | | | | | | | | | | |
| SERV-2 | | | | ▼ | | | | | | | | | | | | | | | | | | | | | | | | |
| SERV-3 | | | | | | △ | | | | | | | | | | | | | | | | | | | | | | |
| GT-190 | | | | | | | △ | | | | | | | | | | | | | | | | | | | | | |
| GT-191 | | | | | | | △ | | | | | | | | | | | | | | | | | | | | | |
| GT-192 | | | | | | | | △ | | | | | | | | | | | | | | | | | | | | |
| SERV-4 | | | | | | | | △ | | | | | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲▲ | Complete Activity | △△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Aegis BMD Cooperative Research Program** | | | | | | | |
| JCTV-1 | | 2Q | | | | | |
| **ARROW System Improvement Program** | | | | | | | |
| AST-10 | | 1Q | | | | | |
| AST-11 | | 3Q | | | | | |
| AST-12 | | 4Q | | | | | |
| **ABL** | | | | | | | |
| First Flight | 1Q | | | | | | |
| First Light | 1Q | | | | | | |
| **System Ground Tests** | | | | | | | |
| IGT-3 | 1Q | | | | | | |
| IGT-4b | 1Q | | | | | | |
| WG 04-1 (IMD-04.5) | 1Q | | | | | | |
| GT 04-1a (IGT-5) | 2Q | | | | | | |
| GT 04-2 (DGT-1) | 2Q | | | | | | |
| GT 04-5 (MDIE 05a) | 3Q | | | | | | |
| WG 04-2 (IMD 5-1) | 3Q | | | | | | |
| WG 04-3 (IMD-5.2) | 3Q | | | | | | |
| WG 04-4 (IMD-5.3) | 4Q | | | | | | |
| DGT 04-2a Phase 1 | | 1Q | | | | | |
| IGT 04-1a | | 1Q | | | | | |
| WG 04-5 (IMD-5.4) | | 1Q | | | | | |
| DGT 04-2a Phase 2 | | 2Q | | | | | |
| GTX 06-1 | | 2Q | | | | | |
| IGT 04-1b | | 2Q | | | | | |
| Amalgam Phantom 06 | | 3Q | | | | | |
| DGT 04-2b | | 3Q | | | | | |
| GT 04-1b (IGT-5) | | 3Q | | | | | |
| GT 04-2b | | 3Q | | | | | |
| GTX 06-2 | | 3Q | | | | | |
| GTD 06-1 | | 4Q | | | | | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| GTI 06-1 | | 4Q | | | | | |
| **System Flight Tests** | | | | | | | |
| IFT-13c | 1Q | | | | | | |
| FTM 04-1 (FM-7) | 2Q | | | | | | |
| IFT-14 | 2Q | | | | | | |
| PAC-2 GEM: 2-1 | 2Q | | | | | | |
| FT 04-2 (CMCM-1) | 4Q | | | | | | |
| FT 04-5 (Cobra Dane LRALT) | 4Q | | | | | | |
| PAC-3: 2-2 | 4Q | | | | | | |
| ATM-46 | | 1Q | | | | | |
| FT-1 | | 1Q | | | | | |
| FTM 04-2 | | 1Q | | | | | |
| FTT-01 | | 1Q | | | | | |
| PAC-3: 2-3 | | 1Q | | | | | |
| FT 04-1 (IFT-16a) | | 2Q | | | | | |
| FT 04-4 (CMCM-2) | | 3Q | | | | | |
| FTG-2 | | 3Q | | | | | |
| FTM 06-1 | | 3Q | | | | | |
| FTT-02 | | 3Q | | | | | |
| FTT-03 | | 3Q | | | | | |
| P6-2 | | 3Q | | | | | |
| P6-4 | | 3Q | | | | | |
| FT 06-1 | | 4Q | | | | | |
| FTG-3 | | 4Q | | | | | |
| FTT 04 | | 4Q | | | | | |
| N FIRE-2A | | 4Q | | | | | |
| FTG 06-1 | | | 1Q | | | | |
| **Glory Trips (USAF Operational)/Potential BMDS Tests** | | | | | | | |
| GT-188 | 2Q | | | | | | |
| GT-187 | 4Q | | | | | | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| GT-189 | 4Q | | | | | | |
| SERV-2 | 4Q | | | | | | |
| SERV-3 | | 2Q | | | | | |
| GT-190 | | 3Q | | | | | |
| GT-191 | | 3Q | | | | | |
| GT-192 | | 4Q | | | | | |
| SERV-4 | | 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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0804 Test & Evaluation Block 2006 | 9,769 | 133,972 | 128,760 | 0 | 0 | 0 | 0 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: FY07 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**

As indicated in the MDA Integrated Master Test Plan (IMTP), the MDA T&E program has six primary objectives: 1) collect system verification and assessment data that demonstrates BMDS effectiveness; 2) verify Block design capability; 3) identify areas where technology can increase overall system performance; 4) identify system vulnerabilities, 5) provide anchoring and validation data for modeling and simulation tools, and 6) to support early capability readiness review board and potential decision memorandum No. 5 fielding decision. To achieve these objectives, the BMDS CTF Block 06 Test and Evaluation project funds system-level a) Flight Tests (BMDS FTs), b) Ground Tests (BMDS GTs) that include exercise overlays (i.e. Wargames) associated with Combatant Command (COCOM) exercises, and c) Critical Measurements and Countermeasure (CMCM) Tests. These test events will be executed from Jan 06 through Dec 07.

a) System Flight Tests. FTs will examine the capability of the BMDS to detect, track, and engage targets. In Block 06, more advanced tests are planned that will provide data to support verification of more complex Engagement Sequence Groups (ESGs). Test scenario highlights during this period include: Demonstration of Aegis BMD providing sensor data for launch and engagement support (FTM 06-2), GMD return to flight events FTGs 1-4; multiple target engagements by Aegis BMD (FTM 06-4); GMD Engaging on a Sea-based X-Band (SBX) radar cue (FTG 06-2) and a Forward Based X-Band -Transportable (FBX-T) radar cue (FTG 06-3). This project will also provide analysis of each system test event through the Joint Analysis Team (JAT).

b) Ground Tests. A vigorous GT program brings together a variety of controllable and flexible testing venues to include high fidelity hardware in the loop tests and nondestructive tests performed in a controlled repeatable environment. The exercise overlays to COCOM exercises (Wargaming) portion of GTs is the best venue to provide Operator-in-the-Loop (OITL) interactions and to gain an understanding of how the system performs during conditions in which OITL performance is measured as well as that of the system hardware and software. BMDS ground testing consists of 1) BMDS Integrated Ground Tests (GTI) ¿ Integrated Exercises that use a lab test environment to the determine the impact of specific threats on a wide variety of proposed engagement scenarios; 2) BMDS Distributed Ground Tests (GTD) ¿ Exercises that combine the fielded hardware and software of most of the most of the BMDS elements to exercise the BMDS communications networks and communication links; and 3) BMDS Ground Tests Other (GTX) ¿ Shorter integration exercises that offer ground testing flexibility configured to meet specific Engagement Sequence Groups (ESGs).

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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) CMCM Flight Tests. CMCM FTs provide a venue for risk reduction for BMDS Block Testing, addressing phenomenology (understanding the physics of what was observed during a test event and its effects on BMDS sensors), countermeasures, and counter-countermeasures requirements, and providing critical measurements to support development and validation of algorithms, modeling and simulation, discrimination, and new technology demonstrations. CMCM FTs augment various MDA and Elements test programs. FY06 includes preliminary planning for FT 06-4(CMCM-4). This test will provide risk reduction for the Miniature Kill Vehicle Program, continue to characterize advanced countermeasures, and demonstrate new technologies. CMCM Program being realigned to focus on MDA Priorities.

**B. Accomplishments/Planned Program**

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Flight Tests | 3,152 | 54,068 | 41,693 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Flight Testing (FT) is planned and executed to provide anchoring data for Modeling and Simulation (M&S) tools, to collect test data to further characterize the BMDS, and to demonstrate BMDS operational capability in whole or in part. Even though FTs are conducted in realistic operational environments and are critical to achieving system verification requirements, they only examine a single scenario/vignette and parts of Engagement Sequence Groups (ESGs) and do have environmental and safety constraints.

FY05 Accomplishments:

- Conducted preliminary planning for Block 2006 Flight Tests.

FY06 Planned Program:

- Plan and execute FY 06 system flight tests and conduct post test analysis: Aegis BMD FTM 06-1; GMD FTG-3, FT 04-1, and FT 06-1; THAAD FTT 04; CMCM FT 04-4; SERV-3; Glory Trip (GT) 191.
- Support Element FY 06 Test Execution: Aegis BMD JCTV-1; PATRIOT 2-3, P6-2, P6-4, GMD FTG-2 and 3; THAAD FTT-01, FTT-02, and FTT-03; and FTM 06-1.
- Conduct test planning for FY 07 system events: PATRIOT ATM-48; GMD FTG-4 and FTG 06-2; THAAD FTT 06-2 and FTT 06-5; Aegis BMD FTM 06-1 and 06-2 and FTM 06-5; GT-194 and GT-196.
- 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 ESGs identified in the BMDS IMTP.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 to populate the BMDS Test Database 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.

FY07 Planned Program:

- Support and coordinate Block 08 target development including target systems requirements, integration, and component testing requirements.
- Continue Development of Block 08 scenario designs for BMDS Flight Tests to support Block 08 ESGs identified in the Block 08 TBDD.
- Continue to populate the BMDS Test Database with the latest test data inputs to support capability assessments by Systems Engineering, JTAMDO/STRATCOM, and OTAs; and provide validation data for models and simulations.
- Plan and acquire long lead items for systems test and plan system execution and reporting.
- Plan and execute the following FY 07 System Flight Tests: PATRIOT ATM-48; GMD FTG-4 and FTG 06-2; THAAD FTT 06-2 and FTT 06-5; Aegis BMD FTM 06-1, FTM 06-2 and FTM 06-5; GT-194 and GT-196.
- Support Elements in planning and execution of the following Block 06 FY 07 Flight Tests: GMD FTG 06-1; PATRIOT P6L-2, P6L-3, 16-2, 16-3, 7-2; THAAD FT 06-2, FTT-05, FTT 06-1, FTT 06-3, FTT 06-4; Aegis BMD FTM 06-3.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Ground Tests | 3,776 | 46,126 | 49,567 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Ground Testing (GT), using Modeling and Simulations (M&Ss) that have been validated using anchoring data from flight tests, is the primary method for verifying and validating functional Block capability. Ground testing is used to collect data for BMDS characterization and assessment, component and element integration, and exploration of scenarios where flight testing is either impractical or impossible. GT allows examination of mature designs and identification and efficient correction of performance anomalies based on the capability to test all Engagement Sequence Groups (ESGs) using digital representations of realistic threat types, trajectories, geometries, and raid sizes that would be cost prohibitive to do in flight testing.

FY05 Accomplishments:

- Performed initial test planning for GTI 06-1.
- Performed initial test planning for GTX 06-1.
- Conducted planning for Block 2006 Exercise Overlays.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603888C Ballistic Missile Defense Test and Targets |

FY06 Planned Program:

- Execute and perform post-test analysis of GTX 06-1, GTX 06-2 and GTI 06-1.
- Test Planning and conduct of the PATRIOT PDB-6 Limited User Test (LUT).
- Provide support for a Ground Test Laboratory build-out to provide a BMDS Integration and Test Center (BITC) capability dedicated to Ground Test activities. This will alleviate a major issue with scheduling and conducting integrated Ground Tests.
- Plan for GTD 06-1 and initial test planning for GTX 06-3, GTI 06-2 and GTD 06-2.
- Plan and execute Exercise Overlay associated with the Amalgam Phantom 06 COCOM exercises and perform post-test analysis of data to support BMDS system engineering.

FY07 Planned Program:

- Execute GTD 06-1 and perform post-test analysis.
- Plan, execute and perform post-test analysis of GTX 06-3, GTI 06-2, GTX 06-4 and GTX 06-5.
- Initiate test planning for GTI 06-3.
- Plan and execute exercise overlays associated with the Vigilant Shield 07 and Terminal Fury 07 COCOM exercises and perform post test analysis.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Measurements Tests | 2,841 | 33,778 | 37,500 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The BMDS CTF plans and executes the BMDS measurements program to provide data products that support block characterization, modeling and simulation validation, phenomenology, algorithm development, and new technology developments. These critical measurements are conducted for block development and to characterize system vulnerabilities from threats and countermeasures.

FY05 Accomplishments:

- Initiated test planning, sensor planning, range integration and design reviews for FT 06-4 (CMCM-4).

FY06 Planned Program:

- Conduct test & sensor planning, range integration efforts and design reviews in support of FT 06-4 (CMCM-4); an unguided, short range, two-shot campaign.
- Conduct post-mission analysis on FT 04-2 (CMCM-2).
- Initiate efforts for test & sensor planning and range integration for FT 08-2 (CMCM-6).

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603888C Ballistic Missile Defense Test and Targets |

FY07 Planned Program:

- Complete planning for the FT 06-4 (CMCM-4) to provide critical BMDS measurements, BMDS characterization against countermeasures and reduce the risk for future BMDS blocks.
- Prepare to execute the FT 06-4 test campaign in early FY08.
- Begin test & sensor planning, range integration, design reviews, and long lead for FT 08-5 (CMCM-8).

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 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 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## 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 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Subtotal Product Development | | | | | | | | |

## II. Support Costs Cost ( $ in Thousands )

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

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Flight Tests** | | | | | | | | |
| BMDS FT | Various | USASMDC, WSMR, MITLL, JNIC & VAFB/ AL, NM, MA, HI & CA | 5,614 | 28,894 | 1Q | 29,795 | 1Q | 64,303 |
| TA&R/JAT | Various | USASMDC & USACOM SED/ Huntsville & Redstone AL, | 300 | 15,283 | 1Q | 6,758 | 1Q | 22,341 |
| Test Planning & Operations | Various | Boeing/ Huntsville, AL | 0 | 7,673 | 1Q | 5,140 | 1Q | 12,813 |
| BMDS Risk/ECPS | Various | Various | 0 | 2,218 | 1/4Q | 0 | N/A | 2,218 |
| **Ground Tests** | | | | | | | | |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| BMDS GT/MDIE | Various | JNIC/ Colorado Springs, CO | 6,623 | 42,872 | 1Q | 41,660 | 1Q | 91,155 |
| Exercise Overlays | Various | JNIC/ Colorado Springs, CO | 3,245 | 3,254 | 1Q | 7,907 | 1Q | 14,406 |
| **Measurements Tests** | | | | | | | | |
| FT 06-4 | Various | USASMDC / Huntsville, AL | 9,494 | 1,251 | 1Q | 12,500 | 1Q | 23,245 |
| Targets | Various | MDA & USASMDC / Washington, D.C. & Huntsville, AL | 0 | 32,527 | 1Q | 25,000 | 1Q | 57,527 |
| Subtotal Test and Evaluation | | | 25,276 | 133,972 | | 128,760 | | 288008 |

## IV. Management Services Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Subtotal Management Services | | | | | | | | |
| Project Total Cost | | | 25,276 | 133,972 | | 128,760 | | 288,008 |

**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 2006**

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 | 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 |
| **System Ground Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DGT 04-2a Phase 1 | | | | | ▼ | | | | | | | | | | | | | | | | | | | | | | | |
| IGT 04-1a | | | | | ▼ | | | | | | | | | | | | | | | | | | | | | | | |
| WG 04-5 (IMD-5.4) | | | | | ▼ | | | | | | | | | | | | | | | | | | | | | | | |
| GTX 06-1 | | | | | | ▽ | | | | | | | | | | | | | | | | | | | | | | |
| Amalgam Phantom 06 | | | | | | | ▽ | | | | | | | | | | | | | | | | | | | | | |
| DGT 04-2b | | | | | | | ▽ | | | | | | | | | | | | | | | | | | | | | |
| GT 04-1b (IGT-5) | | | | | | | ▽ | | | | | | | | | | | | | | | | | | | | | |
| GTD 06-1 | | | | | | | | ▽ | | | | | | | | | | | | | | | | | | | | |
| GTI 06-1 | | | | | | | | ▽ | | | | | | | | | | | | | | | | | | | | |
| GTX 06-3 | | | | | | | | | ▽ | | | | | | | | | | | | | | | | | | | |
| Terminal Fury | | | | | | | | | ▽ | | | | | | | | | | | | | | | | | | | |
| Vigilant Shield 06 | | | | | | | | | ▽ | | | | | | | | | | | | | | | | | | | |
| GTI 06-2 | | | | | | | | | | ▽ | | | | | | | | | | | | | | | | | | |
| Amalgam Phantom 07 | | | | | | | | | | | ▽ | | | | | | | | | | | | | | | | | |
| GTD 06-2 | | | | | | | | | | | ▽ | | | | | | | | | | | | | | | | | |
| GTX 06-4 | | | | | | | | | | | ▽ | | | | | | | | | | | | | | | | | |
| GTX 06-5 | | | | | | | | | | | | ▼ | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲▬▲ | Complete Activity | △▬△ | Planned Activity |

**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date: **February 2006**

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 | 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 |
| **System Flight Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AST-10 | | | | | ◆ | | | | | | | | | | | | | | | | | | | | | | | |
| ATM-46 | | | | | ▼ | | | | | | | | | | | | | | | | | | | | | | | |
| FT-1 | | | | | ◆ | | | | | | | | | | | | | | | | | | | | | | | |
| FTM 04-2 | | | | | ◆ | | | | | | | | | | | | | | | | | | | | | | | |
| FTT-01 | | | | | ◆ | | | | | | | | | | | | | | | | | | | | | | | |
| PAC-3: 2-3 | | | | | ◆ | | | | | | | | | | | | | | | | | | | | | | | |
| FT 04-1 | | | | | | ▽ | | | | | | | | | | | | | | | | | | | | | | |
| JCTV-1 | | | | | | ◇ | | | | | | | | | | | | | | | | | | | | | | |
| AST-11 | | | | | | | ◇ | | | | | | | | | | | | | | | | | | | | | |
| FT 04-4 (CMCM-2) | | | | | | | ▽ | | | | | | | | | | | | | | | | | | | | | |
| FTG-2 | | | | | | | ◇ | | | | | | | | | | | | | | | | | | | | | |
| FTM 06-1 | | | | | | | ▽ | | | | | | | | | | | | | | | | | | | | | |
| FTT-02 | | | | | | | ◇ | | | | | | | | | | | | | | | | | | | | | |
| FTT-03 | | | | | | | ◇ | | | | | | | | | | | | | | | | | | | | | |
| P6-2 | | | | | | | ◇ | | | | | | | | | | | | | | | | | | | | | |
| P6-4 | | | | | | | ◇ | | | | | | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲—▲ | Complete Activity | △—△ | Planned Activity |

**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date: **February 2006**

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 | 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 |
| **System Flight Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AST-12 | | | | | | | | ◇ | | | | | | | | | | | | | | | | | | | | |
| FT 06-1 | | | | | | | | ▽ | | | | | | | | | | | | | | | | | | | | |
| FTG-3 | | | | | | | | ▽ | | | | | | | | | | | | | | | | | | | | |
| FTT-04 | | | | | | | | ▽ | | | | | | | | | | | | | | | | | | | | |
| N FIRE-2A | | | | | | | | ◇ | | | | | | | | | | | | | | | | | | | | |
| 16-2 | | | | | | | | | ◇ | | | | | | | | | | | | | | | | | | | |
| ATM-48 | | | | | | | | | ◇ | | | | | | | | | | | | | | | | | | | |
| FT 06-2 | | | | | | | | | ◇ | | | | | | | | | | | | | | | | | | | |
| FTG-4 | | | | | | | | | ▽ | | | | | | | | | | | | | | | | | | | |
| FTM 06-2 | | | | | | | | | ▽ | | | | | | | | | | | | | | | | | | | |
| FTT-05 | | | | | | | | | ◇ | | | | | | | | | | | | | | | | | | | |
| P6L-2 | | | | | | | | | ◇ | | | | | | | | | | | | | | | | | | | |
| P6L-3 | | | | | | | | | ◇ | | | | | | | | | | | | | | | | | | | |
| 16-3 | | | | | | | | | | ◇ | | | | | | | | | | | | | | | | | | |
| FTG 06-1 | | | | | | | | | | ◇ | | | | | | | | | | | | | | | | | | |
| FTM 06-5 | | | | | | | | | | ▽ | | | | | | | | | | | | | | | | | | |
| FTT 06-1 | | | | | | | | | | ◇ | | | | | | | | | | | | | | | | | | |
| (PAC) 7-2 | | | | | | | | | | | ◇ | | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲▲ | Complete Activity | △— | Planned Activity |

**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date: **February 2006**

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 | 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 |
| **System Flight Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FTM 06-3 | | | | | | | | | | | ◇ | | | | | | | | | | | | | | | | | |
| FTT 06-2 | | | | | | | | | | | ▽ | | | | | | | | | | | | | | | | | |
| AST-13 | | | | | | | | | | | | ◇ | | | | | | | | | | | | | | | | |
| FTT 06-3 | | | | | | | | | | | | ◇ | | | | | | | | | | | | | | | | |
| FTT 06-4 | | | | | | | | | | | | ◇ | | | | | | | | | | | | | | | | |
| FTT 06-5 | | | | | | | | | | | | | ▽ | | | | | | | | | | | | | | | |
| **Measurement Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FT 04-4 (CMCM-2) | | | | | | | ▽ | | | | | | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲——▲ | Complete Activity | △——△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **System Ground Tests** | | | | | | | |
| DGT 04-2a Phase 1 | | 1Q | | | | | |
| IGT 04-1a | | 1Q | | | | | |
| WG 04-5 (IMD-5.4) | | 1Q | | | | | |
| GTX 06-1 | | 2Q | | | | | |
| Amalgam Phantom 06 | | 3Q | | | | | |
| DGT 04-2b | | 3Q | | | | | |
| GT 04-1b (IGT-5) | | 3Q | | | | | |
| GTX 06-2 | | 3Q | | | | | |
| GTD 06-1 | | 4Q | | | | | |
| GTI 06-1 | | 4Q | | | | | |
| GTX 06-3 | | | 1Q | | | | |
| Terminal Fury | | | 1Q | | | | |
| Vigilant Shield 06 | | | 1Q | | | | |
| GTI 06-2 | | | 2Q | | | | |
| Amalgam Phantom 07 | | | 3Q | | | | |
| GTD 06-2 | | | 3Q | | | | |
| GTX 06-4 | | | 3Q | | | | |
| GTX 06-5 | | | 4Q | | | | |
| **System Flight Tests** | | | | | | | |
| AST-10 | | 1Q | | | | | |
| ATM-46 | | 1Q | | | | | |
| FT-1 | | 1Q | | | | | |
| FTM 04-2 | | 1Q | | | | | |
| FTT-01 | | 1Q | | | | | |
| PAC-3: 2-3 | | 1Q | | | | | |
| FT 04-1 | | 2Q | | | | | |
| JCTV-1 | | 2Q | | | | | |
| AST-11 | | 3Q | | | | | |
| FT 04-4 (CMCM-2) | | 3Q | | | | | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| FTG-2 | | 3Q | | | | | |
| FTM 06-1 | | 3Q | | | | | |
| FTT-02 | | 3Q | | | | | |
| FTT-03 | | 3Q | | | | | |
| P6-2 | | 3Q | | | | | |
| P6-4 | | 3Q | | | | | |
| AST-12 | | 4Q | | | | | |
| FT 06-1 | | 4Q | | | | | |
| FTG-3 | | 4Q | | | | | |
| FTT-04 | | 4Q | | | | | |
| N FIRE-2A | | 4Q | | | | | |
| 16-2 | | | 1Q | | | | |
| ATM-48 | | | 1Q | | | | |
| FT 06-2 | | | 1Q | | | | |
| FTG-4 | | | 1Q | | | | |
| FTM 06-2 | | | 1Q | | | | |
| FTT-05 | | | 1Q | | | | |
| P6L-2 | | | 1Q | | | | |
| P6L-3 | | | 1Q | | | | |
| 16-3 | | | 2Q | | | | |
| FTG 06-1 | | | 2Q | | | | |
| FTM 06-5 | | | 2Q | | | | |
| FTT 06-1 | | | 2Q | | | | |
| (PAC) 7-2 | | | 3Q | | | | |
| FTM 06-3 | | | 3Q | | | | |
| FTT 06-2 | | | 3Q | | | | |
| AST-13 | | | 4Q | | | | |
| FT 06-4 (CMCM-4) | | | 4Q | | | | |
| FTT 06-3 | | | 4Q | | | | |
| FTT 06-4 | | | 4Q | | | | |
| FTT 06-5 | | | | 1Q | | | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Measurement Tests** | | | | | | | |
| FT 04-4 (CMCM-2) | | 3Q | | | | | |
| FT 06-4 (CMCM-4) | | | 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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0904 Test & Evaluation Block 2008 | 0 | 0 | 45,184 | 127,791 | 132,309 | 0 | 3,625 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 1 | 0 | 0 |

*Note: FY09 RDT&E Test Articles: Integrate Launch Vehicle and Payload to produce test article for FT 08-4 (CMCM-8).*

## A. Mission Description and Budget Item Justification

As indicated in the MDA Integrated Master Test Plan (IMTP), the MDA T&E program has five primary objectives: 1) collect system verification and assessment data that demonstrates BMDS effectiveness, 2) verify Block design capability, 3) identify areas where technology can increase overall system performance, 4) identify system vulnerabilities, 5) provide anchoring and validation data for modeling and simulation tools, and 6) to support the capability readiness review decision for the technical review board and potential decision memorandum No. 5 fielding decision. To achieve these objectives, the BMDS CTF Block 2008 Test and Evaluation funds system-level flight tests (BMDS FTs), Critical Measurements and Countermeasure (CMCM) Tests, Ground Tests (BMDS GTs) and Exercise overlays associated with Combatant Command (COCOM) exercises that will be executed from Jan 2008 through Dec 2009. This project will conduct BMD System Tests to support verification of achieved BMDS block capability of Engagement Sequence Groups (ESGs) available in Block 2008. 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 2008 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 08-4* is scheduled for 2QFY09. CMCM Program being realigned to focus on MDA Priorities.

*Note: FT 06-4 was originally funded under Project 0904 (Block 2008) 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 2006) and FT 08-4 is now in Project 0904 (Block 2008). CMCM-5, CMCM-6, CMCM-7 and CMCM-9 have been canceled.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Flight Tests | 0 | 0 | 10,706 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Flight Testing (FT) is planned and executed to provide anchoring data for Modeling and Simulation (M&S) tools, to collect test data to further characterize the BMDS, and to demonstrate BMDS operational capability in whole or in part. Even though FTs are conducted in realistic operational environments and are critical to achieving system verification requirements, they only examine a single scenario/vignette and parts of ESGs and do have environmental and safety constraints.

FY07 Planned Program:

- All FY07 funds are for 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 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Ground Tests | 0 | 0 | 3,975 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Ground Testing (GT), using Modeling and Simulations (M&Ss) that have been validated using anchoring data from flight tests, is the primary method for verifying and validating functional Block capability. Ground testing is used to collect data for BMDS characterization and assessment, component and element integration, and exploration of scenarios where flight testing is either impractical or impossible. GT allows examination of mature designs and identification and efficient correction of performance anomalies based on the capability to test all Engagement Sequence Groups (ESGs) using digital representations of realistic threat types, trajectories, geometries, and raid sizes that would be cost prohibitive to do in flight testing.

FY07 Planned Program:

- All FY07 funds are for planning activities and long lead procurement to support BMDS Block 2008 Ground Tests that are operationally representative of the software and hardware versions of the BMDS system.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603888C Ballistic Missile Defense Test and Targets** |

- Conduct test planning for BMDS Block 2008 Ground Tests.
- Conduct Test Planning for BMDS Block 2008 Exercise Overlays.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Measurements Test | 0 | 0 | 30,503 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The BMDS CTF plans and executes the BMDS measurements program by providing data products that support block characterization, modeling and simulation validation, phenomenology, algorithm development, and new technology developments. These critical measurements are conducted for block development and to characterize threats and countermeasures. Block 2008 requirements in FY07 include long lead procurement items for CMCM flight tests.

FY07 Planned Program:

- FY07 funds are for CMCM flight test planning and long lead procurement for Block 2008 CMCM flight tests and analysis.
- Continue to determine Target and Interceptor requirements for FT 08-2 and FT 08-5.
- Complete analysis of FT 06-4 (CMCM-4).

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## 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 2006 |
|---|---|
| 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 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 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Flight Tests** | | | | | | | | |
| BMDS FT | | | 0 | 0 | N/A | 6,237 | 1Q | 6,237 |
| TA&R/JAT | | | 0 | 0 | N/A | 2,384 | 1Q | 2,384 |
| Test Planning & Operations | | Boeing/ Huntsville, AL | 0 | 0 | N/A | 2,085 | 1Q | 2,085 |
| **Ground Tests** | | | | | | | | |
| BMDS GT/MDIE | | JNIC/ Colorado Springs, CO | 0 | 0 | N/A | 3,294 | 1Q | 3,294 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Exercise Overlays | | JNIC/ Colorado Springs, CO | 0 | 0 | N/A | 681 | 1Q | 681 |
| **Measurements Test** | | | | | | | | |
| FT 08-2 & FT 08-4 | Various | Various including USASMDC/ Huntsville, AL | 0 | 0 | 1Q | 10,313 | 1Q | 10,313 |
| Targets | Various | MDA/ Washington, D.C. | 0 | 0 | N/A | 20,190 | 1Q | 20,190 |
| Subtotal Test and Evaluation | | | 0 | 0 | | 45,184 | | 45184 |

**Remarks**

## IV. Management Services Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 | | 45,184 | | 45,184 |
|---|---|---|---|---|---|---|---|---|

**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 2006**

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

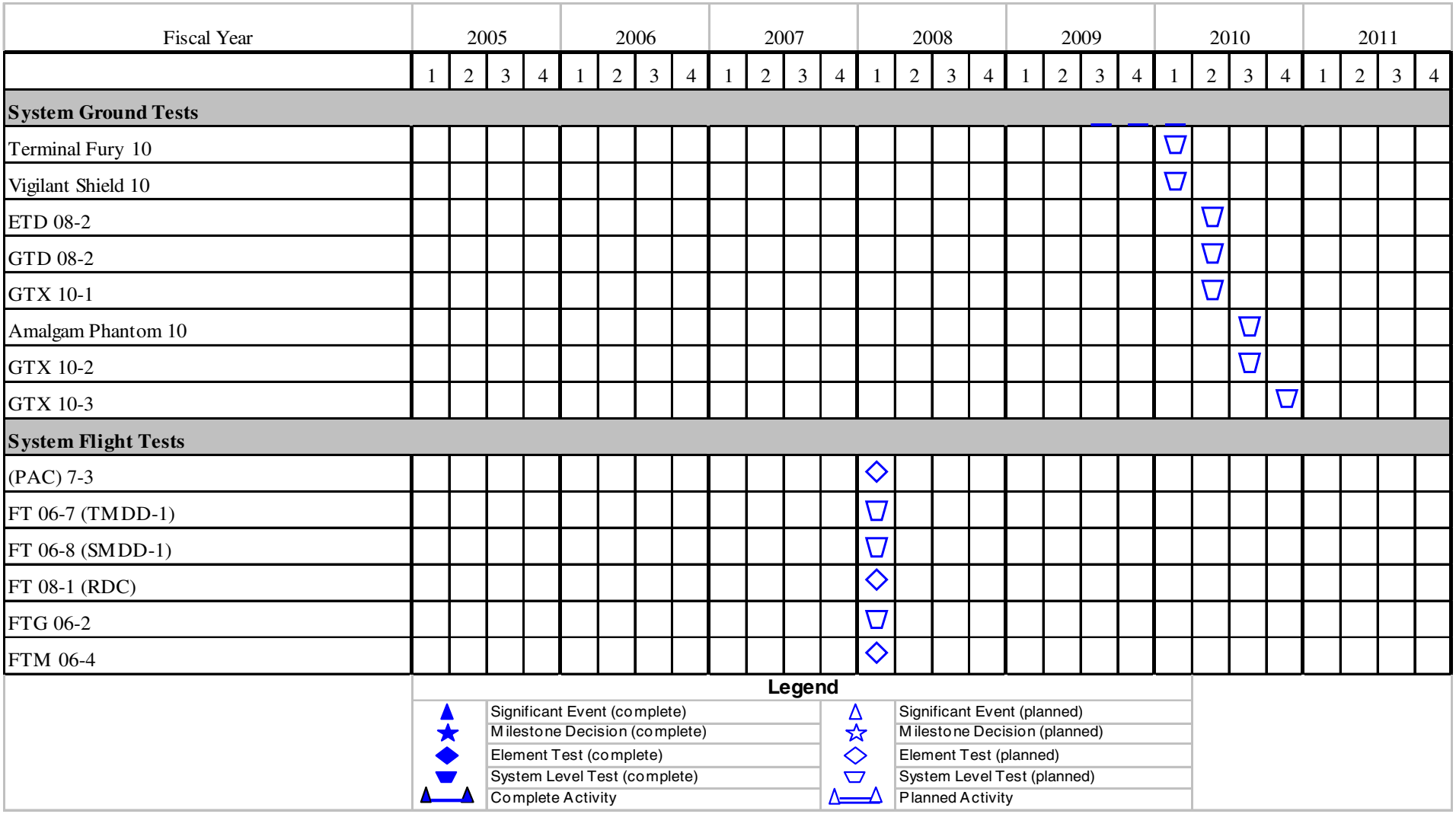
R-1 NOMENCLATURE: **0603888C Ballistic Missile Defense Test and Targets**

| Fiscal Year | 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 |
| **System Ground Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GTD 06-3 | | | | | | | | | | | | | ▽ | | | | | | | | | | | | | | | |
| GTI 06-3 | | | | | | | | | | | | | ▽ | | | | | | | | | | | | | | | |
| Terminal Fury 08 | | | | | | | | | | | | | ▽ | | | | | | | | | | | | | | | |
| Vigilant Shield 08 | | | | | | | | | | | | | ▽ | | | | | | | | | | | | | | | |
| GTX 08-1 | | | | | | | | | | | | | | ▽ | | | | | | | | | | | | | | |
| Amalgam Phantom 08 | | | | | | | | | | | | | | | ▽ | | | | | | | | | | | | | |
| GTX 08-2 | | | | | | | | | | | | | | | ▽ | | | | | | | | | | | | | |
| GTX 08-3 | | | | | | | | | | | | | | | | ▽ | | | | | | | | | | | | |
| GTI 08-1 | | | | | | | | | | | | | | | | | ▽ | | | | | | | | | | | |
| Terminal Fury 09 | | | | | | | | | | | | | | | | | ▽ | | | | | | | | | | | |
| Vigilant Shield 09 | | | | | | | | | | | | | | | | | ▽ | | | | | | | | | | | |
| GTD 08-1 | | | | | | | | | | | | | | | | | | ▽ | | | | | | | | | | |
| GTX 08-4 | | | | | | | | | | | | | | | | | | ▽ | | | | | | | | | | |
| Amalgam Phantom 09 | | | | | | | | | | | | | | | | | | | ▽ | | | | | | | | | |
| GTX 08-5 | | | | | | | | | | | | | | | | | | | ▽ | | | | | | | | | |
| GTX 08-6 | | | | | | | | | | | | | | | | | | | | ▽ | | | | | | | | |
| GTI 08-2 | | | | | | | | | | | | | | | | | | | | | ▽ | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲▲ | Complete Activity | △△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 2006**

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 | 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 |
| **System Flight Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| JBMD-1 | | | | | | | | | | | | | ◇ | | | | | | | | | | | | | | | |
| P6X-2 | | | | | | | | | | | | | ▽ | | | | | | | | | | | | | | | |
| P6X-4 | | | | | | | | | | | | | ◇ | | | | | | | | | | | | | | | |
| FT 08-2 (TMDD-2) | | | | | | | | | | | | | | ▽ | | | | | | | | | | | | | | |
| FT 08-3 (SMDD-2) | | | | | | | | | | | | | | | ▽ | | | | | | | | | | | | | |
| FTG 08-1 | | | | | | | | | | | | | | | ▽ | | | | | | | | | | | | | |
| FTM 08-1 | | | | | | | | | | | | | | | ▽ | | | | | | | | | | | | | |
| FTT 06-6 | | | | | | | | | | | | | | | ▽ | | | | | | | | | | | | | |
| FT 08-4 (RDC) | | | | | | | | | | | | | | | | ▽ | | | | | | | | | | | | |
| FTL 08-1 | | | | | | | | | | | | | | | | ▽ | | | | | | | | | | | | |
| FTT 08-1 | | | | | | | | | | | | | | | | ▽ | | | | | | | | | | | | |
| FTG 08-3 | | | | | | | | | | | | | | | | | ▽ | | | | | | | | | | | |
| FTT 08-2 | | | | | | | | | | | | | | | | | ▽ | | | | | | | | | | | |
| FT 08-5 (CMCM) | | | | | | | | | | | | | | | | | | ▽ | | | | | | | | | | |
| FT 08-6 (RDC) | | | | | | | | | | | | | | | | | | ▽ | | | | | | | | | | |
| FTT 08-3 | | | | | | | | | | | | | | | | | | ▽ | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲▲ | Complete Activity | △△ | Planned Activity |

**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date: **February 2006**

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 | 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 |
| **System Flight Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FTG 08-4 | | | | | | | | | | | | | | | | | | | ▽ | | | | | | | | | |
| FTL 08-2 | | | | | | | | | | | | | | | | | | | ▽ | | | | | | | | | |
| FTM 08-2 | | | | | | | | | | | | | | | | | | | ▽ | | | | | | | | | |
| FT 08-7 (RDC) | | | | | | | | | | | | | | | | | | | | ▽ | | | | | | | | |
| FTG 08-5 | | | | | | | | | | | | | | | | | | | | ▽ | | | | | | | | |
| FTT 08-4 | | | | | | | | | | | | | | | | | | | | ▽ | | | | | | | | |
| FT 08-8 (STSS) | | | | | | | | | | | | | | | | | | | | | ▽ | | | | | | | |
| FTG 10-1 | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | | | |
| FTL 10-1 | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | | | |
| FTT 10-1 | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | | | |
| FT 10-1 (RDC) | | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | | |
| FT 10-2 (STSS) | | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | | |
| FTM 10-1 | | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | | |
| FTG 10-2 | | | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | |
| FTL 10-2 | | | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | |
| FTT 10-2 | | | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | |
| **Measurement Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FT 08-5 (CMCM-8) | | | | | | | | | | | | | | | | | | ▽ | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲▲ | Complete Activity | △△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **System Ground Tests** | | | | | | | |
| GTD 06-3 | | | | 1Q | | | |
| GTI 06-3 | | | | 1Q | | | |
| Terminal Fury 08 | | | | 1Q | | | |
| Vigilant Shield 08 | | | | 1Q | | | |
| GTX 08-1 | | | | 2Q | | | |
| Amalgam Phantom 08 | | | | 3Q | | | |
| GTX 08-2 | | | | 3Q | | | |
| GTX 08-3 | | | | 4Q | | | |
| GTI 08-1 | | | | | 1Q | | |
| Terminal Fury 09 | | | | | 1Q | | |
| Vigilant Shield 09 | | | | | 1Q | | |
| GTD 08-1 | | | | | 2Q | | |
| GTX 08-4 | | | | | 2Q | | |
| Amalgam Phantom 09 | | | | | 3Q | | |
| GTX 08-5 | | | | | 3Q | | |
| GTX 08-6 | | | | | 4Q | | |
| GTI 08-2 | | | | | | 1Q | |
| Terminal Fury 10 | | | | | | 1Q | |
| Vigilant Shield 10 | | | | | | 1Q | |
| ETD 08-2 | | | | | | 2Q | |
| GTD 08-2 | | | | | | 2Q | |
| GTX 10-1 | | | | | | 2Q | |
| Amalgam Phantom 10 | | | | | | 3Q | |
| GTX 10-2 | | | | | | 3Q | |
| GTX 10-3 | | | | | | 4Q | |
| **System Flight Tests** | | | | | | | |
| (PAC) 7-3 | | | | 1Q | | | |
| FT 06-7 (TMDD-1) | | | | 1Q | | | |
| FT 06-8 (SMDD-1) | | | | 1Q | | | |
| FT 08-1 (RDC) | | | | 1Q | | | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| FTG 06-2 | | | | 1Q | | | |
| FTM 06-4 | | | | 1Q | | | |
| JBMD-1 | | | | 1Q | | | |
| P6X-2 | | | | 1Q | | | |
| P6X-4 | | | | 1Q | | | |
| FT 08-2 (TMDD-2) | | | | 2Q | | | |
| FT 08-3 (SMDD-2) | | | | 3Q | | | |
| FTG 08-1 | | | | 3Q | | | |
| FTM 08-1 | | | | 3Q | | | |
| FTT 06-6 | | | | 3Q | | | |
| FT 08-4 (RDC) | | | | 4Q | | | |
| FTL 08-1 | | | | 4Q | | | |
| FTT 08-1 | | | | 4Q | | | |
| FTG 08-3 | | | | | 1Q | | |
| FTT 08-2 | | | | | 1Q | | |
| FT 08-5 (CMCM) | | | | | 2Q | | |
| FT 08-6 (RDC) | | | | | 2Q | | |
| FTT 08-3 | | | | | 2Q | | |
| FTG 08-4 | | | | | 3Q | | |
| FTL 08-2 | | | | | 3Q | | |
| FTM 08-2 | | | | | 3Q | | |
| FT 08-7 (RDC) | | | | | 4Q | | |
| FTG 08-5 | | | | | 4Q | | |
| FTT 08-4 | | | | | 4Q | | |
| FT 08-8 (STSS) | | | | | | 1Q | |
| FTG 10-1 | | | | | | 2Q | |
| FTL 10-1 | | | | | | 2Q | |
| FTT 10-1 | | | | | | 2Q | |
| FT 10-1 (RDC) | | | | | | 3Q | |
| FT 10-2 (STSS) | | | | | | 3Q | |
| FTM 10-1 | | | | | | 3Q | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| FTG 10-2 | | | | | | 4Q | |
| FTL 10-2 | | | | | | 4Q | |
| FTT 10-2 | | | | | | 4Q | |
| **Measurement Tests** | | | | | | | |
| FT 08-5 (CMCM-8) | | | | | 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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0004 Test & Evaluation Block 2010 | 0 | 0 | 0 | 35,157 | 39,815 | 119,011 | 110,446 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

*Note: RDT&E Test Articles: FY11 - Integrate Launch Vehicle and Payload to produce test article for FT 10-4 (CMCM-12).*

## A. Mission Description and Budget Item Justification

The BMDS CTF Block 2010 Test and Evaluation funds system-level flight tests (BMDS FTs), Ground Tests (BMDS GTs), and Exercise Overlays to Combatant Commander (COCOM) Exercises 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 2010 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.

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## 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 2006**

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 | 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 |
| **System Flight Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FT 08-8 (STSS) | | | | | | | | | | | | | | | | | | | | | ▽ | | | | | | | |
| FTG 10-1 | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | | | |
| FTL 10-1 | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | | | |
| FTT 10-1 | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | | | |
| FT 10-1 (RDC) | | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | | |
| FT 10-2 (STSS) | | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | | |
| FTM 10-1 | | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | | |
| FTG 10-2 | | | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | |
| FTL 10-2 | | | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | |
| FTT 10-2 | | | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | |
| FTG 10-3 | | | | | | | | | | | | | | | | | | | | | | | | | ▽ | | | |
| FTL 10-3 | | | | | | | | | | | | | | | | | | | | | | | | | ▽ | | | |
| FT 10-4 (STSS) | | | | | | | | | | | | | | | | | | | | | | | | | | ▽ | | |
| FTT 10-3 | | | | | | | | | | | | | | | | | | | | | | | | | | ▽ | | |
| FTG 10-4 | | | | | | | | | | | | | | | | | | | | | | | | | | | ▽ | |
| FTL 10-4 | | | | | | | | | | | | | | | | | | | | | | | | | | | ▽ | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲——▲ | Complete Activity | △——△ | Planned Activity |

**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date: **February 2006**

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 | 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 |
| **System Flight Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FTM 10-2 | | | | | | | | | | | | | | | | | | | | | | | | | | | ▽ | |
| FT 10-5 (RDC) | | | | | | | | | | | | | | | | | | | | | | | | | | | | ▽ |
| FTG 10-5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | ▽ |
| FTT 10-4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | ▽ |
| **System Ground Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GTI 08-2 | | | | | | | | | | | | | | | | | | | | | ▽ | | | | | | | |
| Terminal Fury 10 | | | | | | | | | | | | | | | | | | | | | ▽ | | | | | | | |
| Vigilant Shield 10 | | | | | | | | | | | | | | | | | | | | | ▽ | | | | | | | |
| GTD 08-2 | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | | | |
| GTX 10-1 | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | | | |
| Amalgam Phantom 10 | | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | | |
| GTX 10-2 | | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | | |
| GTX 10-3 | | | | | | | | | | | | | | | | | | | | | | | | ▽ | | | | |
| GTI 10-1 | | | | | | | | | | | | | | | | | | | | | | | | | ▽ | | | |
| Terminal Fury 11 | | | | | | | | | | | | | | | | | | | | | | | | | ▽ | | | |
| Vigilant Shield 11 | | | | | | | | | | | | | | | | | | | | | | | | | ▽ | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲——▲ | Complete Activity | △——△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 | 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 |
| **System Ground Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GTD 10-1 | | | | | | | | | | | | | | | | | | | | | | | | | | ▽ | | |
| GTX 10-4 | | | | | | | | | | | | | | | | | | | | | | | | | | ▽ | | |
| Amalgam Phantom 11 | | | | | | | | | | | | | | | | | | | | | | | | | | | ▽ | |
| GTX 10-5 | | | | | | | | | | | | | | | | | | | | | | | | | | | ▽ | |
| GTX 10-6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | ▽ |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲—▲ | Complete Activity | △—△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **System Flight Tests** | | | | | | | |
| FT 08-8 (STSS) | | | | | | 1Q | |
| FTG 10-1 | | | | | | 2Q | |
| FTL 10-1 | | | | | | 2Q | |
| FTT 10-1 | | | | | | 2Q | |
| FT 10-1 (RDC) | | | | | | 3Q | |
| FT 10-2 (STSS) | | | | | | 3Q | |
| FTM 10-1 | | | | | | 3Q | |
| FTG 10-2 | | | | | | 4Q | |
| FTL 10-2 | | | | | | 4Q | |
| FTT 10-2 | | | | | | 4Q | |
| FTG 10-3 | | | | | | | 1Q |
| FTL 10-3 | | | | | | | 1Q |
| FT 10-4 (STSS) | | | | | | | 2Q |
| FTT 10-3 | | | | | | | 2Q |
| FTG 10-4 | | | | | | | 3Q |
| FTL 10-4 | | | | | | | 3Q |
| FTM 10-2 | | | | | | | 3Q |
| FT 10-5 (RDC) | | | | | | | 4Q |
| FTG 10-5 | | | | | | | 4Q |
| FTT 10-4 | | | | | | | 4Q |
| **System Ground Tests** | | | | | | | |
| GTI 08-2 | | | | | | 1Q | |
| Terminal Fury 10 | | | | | | 1Q | |
| Vigilant Shield 10 | | | | | | 1Q | |
| GTD 08-2 | | | | | | 2Q | |
| GTX 10-1 | | | | | | 2Q | |
| Amalgam Phantom 10 | | | | | | 3Q | |
| GTX 10-2 | | | | | | 3Q | |
| GTX 10-3 | | | | | | 4Q | |
| GTI 10-1 | | | | | | | 1Q |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| Terminal Fury 11 | | | | | | | 1Q |
| Vigilant Shield 11 | | | | | | | 1Q |
| GTD 10-1 | | | | | | | 2Q |
| GTX 10-4 | | | | | | | 2Q |
| Amalgam Phantom 11 | | | | | | | 3Q |
| GTX 10-5 | | | | | | | 3Q |
| GTX 10-6 | | | | | | | 4Q |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| R104 Test & Evaluation Block 2012 | 0 | 0 | 0 | 0 | 0 | 56,161 | 75,884 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## A. Mission Description and Budget Item Justification

The BMDS CTF Block 2012 Test and Evaluation funds system-level flight tests (BMDS FTs), Ground Tests (BMDS GTs) and Exercise Overlays to Combatant Commanders (COCOM) Exercises 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 2012 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.

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## 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-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0305 Targets & Countermeasures Core | 22,697 | 19,868 | 20,209 | 20,719 | 21,075 | 21,609 | 21,979 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: The decrease in Project 0305 funding from FY05 to FY06 and out is due to a realignment of funds to the Integration Product Line in Projects 0805, 0905, and 0005.*

## 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.

The Accomplishments and Planned Program efforts identified below in Targets Support and Personnel Support are on-going level of effort activities. Efforts are cyclical and occur every year.

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Targets Support | 15,372 | 12,319 | 12,422 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

FY05 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.

FY06 Planned Program:

- 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.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603888C Ballistic Missile Defense Test and Targets** |

FY07 Planned Program:

- 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.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Personnel Support | 7,325 | 7,549 | 7,787 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

FY05 Accomplishments:

- Funded government personnel salaries for program management, project support, project costs, and travel.

FY06 Planned Program:

- Funds government personnel salaries for program management, project support, project costs, and travel.

FY07 Planned Program:

- Funds government personnel salaries for program management, project support, project costs, and travel.

**C. Other Program Funding Summary**

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## 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 2006 |
|---|---|
| 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 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 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 | 7,989 | 3,651 | 1Q | 3,239 | 1/4Q | 14,879 |
| Field Activity Support | C/Various | Various/ Huntsville, AL | 15,304 | 8,668 | 1Q | 9,183 | 1/4Q | 33,155 |
| Subtotal Support Costs | | | 23,293 | 12,319 | | 12,422 | | 48034 |

**Remarks**

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Personnel Support** | | | | | | | | |
| Government Personnel | | Wash., DC | 5,333 | 2,899 | 1/4Q | 2,935 | 1/4Q | 11,167 |
| Government Travel | | Wash., DC | 360 | 450 | 1/4Q | 474 | 1/4Q | 1,284 |
| Government Support | C/FFP | SPARTA/ Wash., DC | 7,830 | 4,200 | 1Q | 4,378 | 1Q | 16,408 |
| Subtotal Management Services | | | 13,523 | 7,549 | | 7,787 | | 28859 |

**Remarks**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 36,816 | 19,868 | | 20,209 | | 76,893 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0705 Targets & Countermeasures Block 2004 | 250,077 | 0 | 0 | 0 | 0 | 0 | 0 |
| RDT&E Articles Qty | 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 2004 integrated and layered Ballistic Missile Defense System (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).

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Systems Engineering | 132,028 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort provides the Missile Defense Agency (MDA)with Target Program Technical Direction and analyzes of target requirements cost, schedule, and technical performance of target systems development. This effort utilizes the spiral development process for long-range plans initiating new developments. Conducts functional allocation to product lines, product line specifications/interfaces and establishes guidelines for the conductibility of design reviews. Performs target system analysis with new concepts to verify system performance. Defines target program baseline, controls flight

test configuration, and conducts pre and post-flight analysis and documentation. Identifies treaty and environmental issues and develops plans for issue resolution. Development of the Flexible Target Family (FTF) is an initiative that emphasis commonality and modularity of components that span across target system representations within the family of target sets that can be rapidly integrated to support MDA flight tests. Accordingly, FTF will be composed of Target Sets that exhibit various degrees of threat emulation and have a broad range of performance characteristics and features that present flexible target behavior to test the multiple Ballistic Missile Defense System capabilities.

FY05 Accomplishments:

Spiral 1 - FTF Launch Vehicle Development:

- Completed Development of the Spiral-1 Flexible Target Family System Specification
- Continued Spiral 1 Development of Enhanced Capability Products
  - Development of the Launch Vehicle 2 Two-Stage Strategic Target System
  - Development of the Common Avionics System
  - Development of the Common Support Equipment
  - Development of the Common Transporter Erector
  - Development of the Universal Payload Deployment Module
  - Development of a new suite of Countermeasures
  - Development of the Flexible Target Family Long Range Air-Launched Target System
- Completed System Requirement Review and Preliminary Design Review for the Flexible Target Family Spiral 1
- Completed FTF Spiral-1 Functional Allocation and Interface Definition

Spiral 2 - FTF Re-Entry Vehicle Design:

- Initiated Development of the Spiral-2 Flexible Target Family System Specification
- Development of a new Small Re-entry Vehicle to be deployed with all standard-service launch vehicles in the Flexible Target Family.
- Development of a modular dynamic control system and a multi-band Re-entry Vehicle antenna system with Radar Cross Section signature reduction to be employed on a Modified Ballistic Re-entry Vehicle and the Small Re-entry Vehicle.
- Design of a Launch Vehicle second stage thrust termination system.
- Development a Cold Gas Attitude Control System.
- Completed FTF Spiral 2 Functional Allocation and Interface Definition II.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603888C Ballistic Missile Defense Test and Targets** |

- Developed a Technology Transfer Plan from Sandia National Laboratory to Industry for sensor platform and countermeasure designs
- Completed Rolling Wave II Integrated Baseline Review
- Provided Target Systems Analysis of flight test for the following target missions:
  - Critical Measurements Program (CMP)-4b
  - PAC-3 DT/OT 12a
  - GMD IFT 13-C, IFT-14
  - Aegis FTM 04-1
  - Medium Range Target Demo FT 04-3
  - CMCM-1 FT 04-2a/b
  - LRALT/Cobra Dane FT-04-5

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Launch Vehicles | 14,273 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort provides MDA with all launch delivery vehicles including boosters, interstages, and avionics (guidance and flight computers). This task includes conducting decomposition for booster, inter-stage and avionics requirements, characterizing and qualifying boosters, interstages, and avionics. Conducts necessary design reviews and supports other design reviews to ensure mission assurance. Ensures boosters, interstages and avionics adhere to interface specifications.

FY05 Accomplishments:

- Procured three (3) SR-19, one (1) M56 and one (1) M57 deactivated government boosters for the BMDS targets
- Procured two (2) Castor IVB commercial motors for the BMDS targets and risk reduction flights (AEGIS Medium Range Target)
- Supported the development of common equipment and vehicles for the Flexible Targets Family
- Researched, designed, and built one (1) replacement for the air transporter of the grounded C-141 aircraft
- Provided program management support for following successful launches;
  - PAC DT/OT12a (18 Nov 04)
  - AEGIS BMD TTV-8 (24 Feb 05)
  - CMCM-1 a/b (8/18 Aug 05)
  - Long Range Air Launch Target Cobra Dane (26 Sep 05)

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 |
|---|---|---|---|
| Data and Instrumentation | 21,091 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort provides program management and development of: 1) unique target instrumentation as well as optical on-board target data collection instrumentation used for algorithm development/evaluation and payload characterization; 2) advanced instrumentation systems/techniques to include data collection and transmission techniques. Develops and delivers all on-board and target-deployed instrumentation products including sensors and telemetry systems. Performs requirements decomposition for instrumentation systems and products, provides mission support, and verification of specified data products. Conducts and supports design reviews to ensure mission assurance. Provides for standardization and interfaces with Test and Assessment on all range interface activities.

FY05 Accomplishments:

- Completed optical characterization of M-FASP (Mid Course Fly Away Sensor Package) TCOS (Target and Countermeasures Observation System platform)
- Performed P-3 Cast Glance enhancements for real time data transfer and analysis during flight
- Procured TGRS (Translated Global Positioning System Range System) for future BMDS flight tests
  - Procured 3 Ground Translator Processor's (GTP's) ground stations for future BMDS flight tests
  - Procured 25 Digital Global Transmitters (DGT's) flight hardware for future missions BMDS flight tests
- Development and procurement of Tracking and Data Relay Satellite Systems (TDRSS) transmitter for future direct to satellite Telemetry transmission capability

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Re-entry Vehicles | 24,025 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort provides MDA with the design, development, build, and delivery of all Reentry Vehicle (RV) and Payload Deployment Module (PDM) products for MDA and the Ballistic Missile Defense System (BMDS). Includes RV and PDM requirements decomposition and analysis; RV and PDM characterization, qualification, and performance measurements; mission support; and pre-and post-mission data analysis. Provides interface standardization and ensures product adherence to interface specifications for successful integration and launch of RV and PDM products. Conducts RV and PDM design reviews and supports other product design reviews to provide product and mission assurance.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603888C Ballistic Missile Defense Test and Targets** |

FY05 Accomplishments:

- Completed buildup and delivery of one Maneuvering Tactical Target Vehicle (MTTV) for DT/OT-12 mission; one Tactical Target Vehicle for FTM-04-1 mission; one Modified Ballistic Reentry Vehicle-2 (MBRV-2) for Medium Range Target Risk Reduction Flight (MRT RRF); one Modified Ballistic Reentry Vehicle-4 (MBRV-4) for FT-04-5 mission; and four Generic Rest of World (GROW) RVs with four PDMs for FT-13C, FT-14, and FT-04-2a/b missions to support BMDS testing
- Upgrade/enhanced three GROW RVs and three PDMs to support Ground Based Midcourse (GMD) testing Developed acquisition strategy and initiated contractual actions for adaptive engineering of four inventory MBRV-1s to support Lower Tier Project Office (LTPO) and Theater High Altitude Area Defense (THAAD) testing with one option for a Bulk Chemical Experiment for LTPO
- Began development of three MBRV-2s with Bulk Chemical Lethality Front Section (BCLFS) tanks to support Aegis Ballistic Missile Defense (BMD) and Japanese cooperative testing
- Began development of four build-to-print and nine technologically enhanced new design MBRV-2s to support Aegis BMD, GMD, Space and Tracking Surveillance System (STSS), THAAD, Arrow Program Office (APO), and Japanese cooperative testing with two options for up to 15 new design MBRV-2s to support Aegis BMD, Airborne Laser (ABL), Kinetic Energy Interceptor (KEI), and STSS testing
- Developed acquisition strategy and initiated contractual actions for two build-to-print MBRV-3s to support THAAD testing with two options for up to seven new-build multi-purpose MBRV-3s to support LTPO testing and, if required, future BMDS testing
- Supported efforts for procurement of Flexible Target Family (FTF) PDMs to support GMD testing
- Provided input to FTF System Specifications, FTF Payload Standard Interface Document, and common instrumentation approach in support of Spiral Development activities
- Collected “in-situ” optical measurements of IBIS VEER (IV) Original Equipment Manufacturer (OEM) hardware and conducted Radar Cross Section (RCS) and materials characterization
- Supported Endo IR Option discussions to determine requirement for characterizing RV Infrared (IR) signatures below 80km vs. current requirement of 100/80km
- Conducted analysis to determine if existing RV designs will meet Small RV (SRV) requirements for GMD
- Conducted IR signature assessment of GROW RV and MBRV-2 as flown on C-4 Hybrid launch vehicle on west coast trajectory from Kodiak Launch Complex
- Assessed ability of MBRV-2 to survive boost and flight environments of C-4 and Minuteman II (MMII) launch vehicles

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 |
|---|---|---|---|
| Logistics | 7,495 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort provides MDA with all required inventory, launch support equipment, and transportation of targets and countermeasures hardware in support of BMDS testing. These efforts are essential in providing a dependable and accurate target system that BMDS has come to and continues to relay on for the success of their interceptor program. The continued success of these programs is vital for continued national security. This task includes integrated logistics support for all targets and countermeasure material, including facilities, inventory maintenance, spare parts, aging and surveillance, as well as special testing for target rocket motor propellants and other hazardous material handling. This task provides for the management and execution of the Consolidated Missile Asset Reuse for Targets (CMART) Program and provides all required facilities and monitoring for explosive storage and Foreign Military Asset (FMA) fuel calibration and storage.

FY05 Accomplishments:

- Buildup, integration, and delivery of (1) IFT-14 Strategic Target System (STARS) vehicle to Kodiak Launch Complex (KLC)
- Refurbishment and assembly of two (2) SR-19 motors and associated equipment and deliver for Long Range Air Launched Target (LRALT) Risk Reduction Flight (RRF)
- Refurbishment, assembly, and delivery of;
  - Four (4) Castor IVB motors and associated equipment for test flights
  - One (1) High Explosive Rocket Assisted (Hera) target and associated equipment for test flight
  - One (1) Lance rocket motor and associated equipment for test flight
- Storage, maintenance, and aging and surveillance program for, 84 Pershing II Reentry Vehicles and other components, 103 Lance Missiles, 17 Polaris A-3 motors, 6 Orbus Motors, Minuteman motors, 14 FMAs, and 7 Castor IVBs
- Maintenance of existing support equipment and facilities at Redstone Arsenal, White Sands Missile Range, Kodiak Launch Complex, and Pacific Missile Range Facility
- Procurement of (2) assembled Castor IV motors using Government Furnished Equipment (GFE) cases to support future Medium Range Target (MRT) missions
- Procured Trident C-4 non-motor assets for future use as targets
- Refurbished and assembled one (1) Castor IVB motor and associated support equipment for the MRT RRF
- Initiated procurement of Trident motors for future use as targets. Quantity TBD based upon negotiations with the Navy
- Initiated procurement of additional FMA's to support future target flight tests
- Refurbishment and assembly of three (3) Castor IVB motors and associated support equipment for FY06 Aegis flight tests

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 |
|---|---|---|---|
| Mission Management | 39,325 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort provides MDA with target mission management and execution for overall mission assurance. Conducts mission planning, documentation, development of scenario plans in accordance with mission requirements. Controls target management (scheduling, configuration modifications) in support of BMDS and Element testing. Conduct safety operations specific to the mission and in conjunction with ranges. Plans and conducts target Mission readiness reviews and monitors environmental execution.

FY05 Actual Accomplishments:

- Prepared for, conducted, and analyzed the results of the following successful missions:
  - CMP 4b mission (06 Oct 04)
  - PAC-3 DT/OT-12a mission (18 Nov 04)
  - GMD IFT-13C target mission (15 Dec 04)
  - GMD IFT-14 target mission (13 Feb 05)
  - THAAD Radar Orion mission (17 Feb 05)
  - Aegis FTM-04-1 mission (24 Feb 05)
  - MRT-1 RRF mission (08 Apr 05)
  - ABL LANCE RRF mission (15 Jun 05)
  - GMD Long Range Air Launch Target (LRALT) Cobra Dane mission (26 Sep 05)
  - FT-04-2-a/b mission (06 Aug 05)
- Provided inputs to support the target certification process for future missions
- Designed, installed and integrated a target control center at Joint Operation Center (JTOC) for LRALT mission that will be used for future operations
- Developed Communications Security (COMSEC) and Operational Security (OPSEC) procedures and support for all missions due to change in Security Classification Guidelines

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 |
|---|---|---|---|
| Countermeasures | 11,840 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort provides program management and development of various Countermeasure (CM) systems for BMDS flight testing, including characterization and ground testing of those countermeasure systems.

FY05 Accomplishments:

- Initiated design and development of several new CM's
- Conducted studies on legacy countermeasures to down-select designs for transition-to-limited production. Developed techniques, materials, and processes for new prototype CM's
- Initiated transition of legacy countermeasure designs due to limited production from the National Laboratory's (MIT/Lincoln Laboratory and Sandia National Laboratory) to the Targets and Countermeasures Prime Contractor (Lockheed Martin Space Systems Company). First article to be flown in FY06 is FT-04-04 (CMCM-2)
- Completed designs, integration, and flight tested countermeasures in support of FT04-2 (CMCM-1)
- Completed CM designs in support of FT04-04 (CMCM-2) to be flown in FY06
- Built and characterized countermeasure objects for BMDS flight tests
- Conducted design studies to bring CM designs to the Preliminary Design Review-level

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 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 added 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 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. 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 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Systems Engineering** | | | | | | | | |
| Systems Engineering | C/CPAF | Lockheed Martin/ Denver, CO | 90,368 | 0 | N/A | 0 | N/A | 90,368 |
| Systems Engineering Support | C/FFRDC | John Hopkins Applied Research Lab/ Maryland | 2,427 | 0 | N/A | 0 | N/A | 2,427 |
| Systems Engineering Support | C/CPFF | SAIC/ San Diego, CA | 400 | 0 | N/A | 0 | N/A | 400 |
| **Launch Vehicles** | | | | | | | | |
| Launch Vehicles | C/CPFF | Aerojet/ Rancho Cordova, CA | 2,493 | 0 | N/A | 0 | N/A | 2,493 |
| Launch Vehicles | C/CPAF | Northrop Grumman/ Albuquerque, NM | 749 | 0 | N/A | 0 | N/A | 749 |
| Launch Vehicles | C/CPIF | Orbital/ Chandler, AZ | 174 | 0 | N/A | 0 | N/A | 174 |
| Launch Vehicles | C/CPAF | Lockheed Martin Space Systems/ Denver, CO | 10,341 | 0 | N/A | 0 | N/A | 10,341 |
| Launch Vehicles | C/MIPR | OO-AL/ Hill AFB, UT | 504 | 0 | N/A | 0 | N/A | 504 |
| | | | 0 | 0 | N/A | 0 | N/A | |
| **Data and Instrumentation** | | | | | | | | |
| Data & Instrumentation | C/MIPR | DoD/WHS/ Washington, DC | 258 | 0 | N/A | 0 | N/A | 258 |
| Data & Instrumentation | C/MIPR | NAWC/ Point Magu, CA | 592 | 0 | N/A | 0 | N/A | 592 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Data & Instrumentation | C/CPFF | Interstate Electronics Corp/ Anaheim, CA | 1,881 | 0 | N/A | 0 | N/A | 1,881 |
| Data & Instrumentation | C/CPIF | Orbital/ Chandler, AZ | 100 | 0 | N/A | 0 | N/A | 100 |
| Data & Instrumentation | C/FFRDC | Sandia National Lab/ Albuquerque, NM | 12,278 | 0 | N/A | 0 | N/A | 12,278 |
| Data & Instrumentation | C/FFRDC | MIT/Lincoln Lab/ Boston, MA | 4,242 | 0 | N/A | 0 | N/A | 4,242 |
| Data & Instrumentation | C/CPFF | Fibertek/ Herndon, VA | 1,380 | 0 | N/A | 0 | N/A | 1,380 |
| Data & Instrumentation | C/Various | Various/ Albuquerque, NM | 180 | 0 | N/A | 0 | N/A | 180 |
| Data & Instrumentation | C/FFP | Mayflower Incorporated/ Reading, MA | 180 | 0 | N/A | 0 | N/A | 180 |
| **Re-entry Vehicles** | | | | | | | | |
| Re-Entry Vehicles | C/FP | Teledyne Solutions, Inc./ Huntsville, AL | 3,496 | 0 | N/A | 0 | N/A | 3,496 |
| Re-Entry Vehicles | C/CPAF | Lockheed Martin/ Denver, CO | 20,850 | 0 | N/A | 0 | N/A | 20,850 |
| Re-Entry Vehicles | C/Various | Sandia National Lab/ Albuquerque, NM | 715 | 0 | N/A | 0 | N/A | 715 |
| **Logistics** | | | | | | | | |
| Logistics | C/CPFF | Battelle/ Kennesaw, GA | 2,834 | 0 | N/A | 0 | N/A | 2,834 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Logistics | SS/CPFF | Alliant Techsystems / Magna, UT | 908 | 0 | N/A | 0 | N/A | 908 |
| Logistics | SS/CPFF | Physical Science Laboratory/ Las Cruces, NM | 806 | 0 | N/A | 0 | N/A | 806 |
| Logistics | C/FP | Teledyne Solutions, Inc./ Huntsville, AL | 4,205 | 0 | N/A | 0 | N/A | 4,205 |
| Logistics | MIPR | Various/ Various | 4,438 | 0 | N/A | 0 | N/A | 4,438 |
| **Mission Management** | | | | | | | | |
| Mission Management | C/CPFF | Orbital Sciences Corp/ Chandler, AZ | 5,825 | 0 | N/A | 0 | N/A | 5,825 |
| Mission Management | C/CPFF | Interstate Electronics Corp/ Anaheim, CA | 30 | 0 | N/A | 0 | N/A | 30 |
| Mission Management | C/CPFF | Boeing/ Canoga Park, CA | 18 | 0 | N/A | 0 | N/A | 18 |
| Mission Management | C/FP | Teledyne Solutions/ Huntsville, AL | 9,559 | 0 | N/A | 0 | N/A | 9,559 |
| Mission Management | MIPR | Various/ Various | 7,010 | 0 | N/A | 0 | N/A | 7,010 |
| Mission Management | C/FFP | AAR/ Elk Grove Village, IL | 65 | 0 | N/A | 0 | N/A | 65 |
| Mission Management | C/CPFF | Lockheed Martin/ Huntsville, AL | 600 | 0 | N/A | 0 | N/A | 600 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Mission Management | C/FP | Teledyne Solutions/ Huntsville, AL | 58 | 0 | N/A | 0 | N/A | 58 |
| Mission Management | MIPR | Various/ Various | 6,694 | 0 | N/A | 0 | N/A | 6,694 |
| Mission Assurance | C/Various | Northrop Grumman/ California | 9,310 | 0 | N/A | 0 | N/A | 9,310 |
| **Countermeasures** | | | | | | | | |
| Countermeasure Inventory | C/CPAF | Lockheed Martin/ Denver, Co | 3,330 | 0 | N/A | 0 | N/A | 3,330 |
| Countermeasure Development | C/FFRDC | MIT/LL/ Boston, MA | 2,145 | 0 | N/A | 0 | N/A | 2,145 |
| Countermeasure Development | C/Various | Sandia National Lab/ New Mexico | 3,694 | 0 | N/A | 0 | N/A | 3,694 |
| Countermeasure Development | C/Various | Various/ Various | 2,937 | 0 | N/A | 0 | N/A | 2,937 |
| Subtotal Product Development | | | 218,074 | 0 | | 0 | | 218074 |

**Remarks**

Systems Engineering includes $3 million (FY05) for a Congressional Add which is Earmarked for Scorpius.

Under Logistics and Re-Entry Vehicles, the Teledyne Solutions, Inc. contract is a Command-wide SETA contract.

Under Data and Instrumentation, there is a $180 thousand effort where performer is identified as various. Three companies are included, Signature Research Associates, National Security Agency, and Teledyne Solutions, Inc.

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 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 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Subtotal Management Services | | | | | | | | |

**Remarks**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 218,074 | 0 | | 0 | | 218,074 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 | 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 |
| **Production Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GMD Target Development | | ▲ | — | ▲ | | | | | | | | | | | | | | | | | | | | | | | | |
| Medium Range Target | ▲ | — | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | |
| **CDR** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CMCM - 2 | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Testing Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Medium Range Target - RRF Air | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GMD IFT-13c | ◆ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aegis FTM 04-1 | | ◆ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GMD IFT-14 | | ◆ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CMCM-1 FT 04-2 | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | |
| LRALT CD FT 04-5 | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | |
| Aegis FTM 04-2 | | | | | ◆ | | | | | | | | | | | | | | | | | | | | | | | |
| THAAD FT-1 | | | | | ◆ | | | | | | | | | | | | | | | | | | | | | | | |
| CMCM-2 FT 04-4 | | | | | | △ | | | | | | | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲—▲ | Complete Activity | △—△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Production Milestones** | | | | | | | |
| GMD Target Development | 2Q-4Q | | | | | | |
| Medium Range Target | 1Q-2Q | | | | | | |
| **CDR** | | | | | | | |
| CMCM - 2 | 2Q | | | | | | |
| **Testing Milestones** | | | | | | | |
| Medium Range Target - RRF Air | 2Q | | | | | | |
| GMD IFT-13c | 1Q | | | | | | |
| GMD Target (FT-06-1) | 1Q | | | | | | |
| Test Bed | 1Q-4Q | 1Q-3Q | | | | | |
| Aegis FTM 04-1 | 2Q | | | | | | |
| GMD IFT-14 | 2Q | | | | | | |
| CMCM-1 FT 04-2 | 4Q | | | | | | |
| LRALT CD FT 04-5 | 4Q | | | | | | |
| Aegis FTM 04-2 | | 1Q | | | | | |
| THAAD FT-1 | | 1Q | | | | | |
| CMCM-2 FT 04-4 | | 2Q | | | | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0805 Targets & Countermeasures Block 2006 | 24,765 | 224,387 | 158,987 | 0 | 0 | 0 | 0 |
| RDT&E Articles Qty | 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 2006 integrated and layered Ballistic Missile Defense System (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 targets prime contractor, Lockheed Martin Space Systems Company (LMSSC) will develop all future target configurations with an emphasis on developing product lines of common target components, rather than full-blown individual target systems. LMSSC 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. LMSSC 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.

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Systems Engineering | 5,625 | 164,606 | 98,863 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort provides the Missile Defense Agency with Target Program Technical Direction and analyzes of target requirements cost, schedule, and technical performance of target systems development. This effort utilizes the spiral development process for long-range plans initiating new developments. Conducts functional allocation to product lines, product line specifications/interfaces and establishes guidelines for the conductibility of design reviews. Performs target system analysis with new concepts to verify system performance. Defines target program baseline, controls flight test configuration, and conducts pre and post-flight analysis and documentation. Identifies treaty and environmental issues and develops plans for

issue resolution. Development of the Flexible Target Family (FTF) is an initiative that emphasis commonality and modularity of components that span across target system representations within the family of target sets that can be rapidly integrated to support MDA flight tests. Accordingly, FTF to be composed of Target Sets that exhibit various degrees of threat emulation and have a broad range of performance characteristics and features that present flexible target behavior to test the multiple Ballistic Missile Defense System capabilities.

FY05 Accomplishments:

Spiral 1 - FTF Launch Vehicle Development
- Development of the Launch Vehicle (LV) 2 Two-Stage Strategic Target System Development of Common Avionics System (CAS)
- Development of the Common Support Equipment (CSE)
- Development of the Common Transporter Erector (CTE)
- Development of the Universal Payload Deployment Module (UPDM)
- Development of a new suite of Countermeasures (CM)
- Development of the Flexible Target Family (FTF) Long Range Air-Launched Target System (LRALT)

FY06 Planned Program:

Spiral 1- FTF Launch Vehicle Development:
- Complete development of the LV 2 Two-Stage Strategic Target System
- Complete development of the CAS
- Complete development of the CSE
- Complete development of the CTE
- Complete development of the UPDM
- Complete the Spiral 1 FTF LRALT System Critical Design Review (CDR)

Spiral 2 - FTF Re-Entry Vehicle Design (System Specifications)
- Complete development of the Spiral 2 FTF System Specifications
- Spiral 2 Development of Enhanced Capability Products consisting of;
  - Develop new Small Re-Entry Vehicle (RV) to be deployed with LV's in the FTF

- Develop modular dynamic control system and a multi-band RV antenna system with Radar Cross Section signature reduction to be employed on a Modified Ballistic RV and the Small RV
- Conduct engineering design development of a LV second stage thrust termination system.
- Develop a Cold Gas Attitude Control System

- Complete Spiral 2 System Requirement Review (SRR) and Preliminary Design Review (PDR)

Spiral 3 - FTF Enhanced Studies

- Initiate development of the Spiral 3 FTF System Specification
- Initiate Spiral 3 development of Enhanced Capability Products consisting of;
  - Modification of Infrared and Radar Cross Section for RV endo and last stage
  - Technology transfer of CM's, sensors, and advanced instrumentation
  - Small RV instrumentation module
- Complete Spiral 3 SRR
- Complete Spiral 3 Functional Allocation and Interface Definition
- Complete Rolling Wave III Integrated Baseline Review
- Support FTF contractual acquisition actions with the Target and Countermeasures Prime Contractor Lockheed Martin Space Systems Company (LMSSC)
- Provide Target Systems Analysis of BMDS Block 06 flight tests

FY07 Planned Program:

Spiral 2 - FTF Re-Entry Vehicle Design (System Specifications)

- Complete Spiral 2 Development of Enhanced Capability Products
  - Complete development of new Small Re-Entry Vehicle to be deployed with all LV's in the FTF
  - Complete development modular dynamic control system and a multi-band RV antenna system with Radar Cross Section signature reduction to be employed on a Modified Ballistic RV and the Small RV
  - Complete design of a LV second stage thrust termination system
  - Complete development of a Cold Gas Attitude Control System
- Complete Spiral 2 CDR

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603888C Ballistic Missile Defense Test and Targets |

Spiral 3 - FTF Enhanced Studies

- Complete development of the Spiral 3 FTF System Specification
- Continue Spiral 3 Development of Enhanced Capability Products;
  - Continued development of modification of Infrared and Radar Cross Section for RV in endo and last stage
  - Continued development of technology transfer of countermeasure, sensors, and advanced instrumentation
  - Continued development of Small RV instrumentation module
- Complete Rolling Wave IV Integrated Baseline Review
- Complete Spiral 3 PDR
- Complete Spiral 3 Functional Allocation and Interface Definition
- Continue to support FTF acquisition actions with the Target and Countermeasures Prime Contractor (LMSSC)
- Provide Target Systems Analysis of Block 06 flight tests

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Launch Vehicles | 2,375 | 3,500 | 13,202 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort provides MDA with all launch delivery vehicles including boosters, interstages and avionics (guidance and flight computers). This task includes conducting decomposition for booster, inter-stage and avionics requirements, characterizing and qualifying boosters, interstages, and avionics.

FY05 Accomplishments:

- Developed and definitized Launch Vehicle common equipment and common vehicles for the Flexible Targets Family (FTF)
- Procurement of two (2) Flex Seal Nozzles

FY06 Planned Program:

- Support contractual procurement actions with the Targets and Countermeasures (TC) Prime Contractor, Lockheed Martin Space Systems Company (LMSSC)

FY07 Planned Program:

- Procurement of five (5) SR-73 boosters for the BMDS flight missions NFIRE 2a / 2b
- Provide acquisition support for booster procurement
- Support contractual procurement actions with TC's Prime Contractor, LMSSC

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 |
|---|---|---|---|
| Data and Instrumentation | 885 | 7,914 | 3,147 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort provides funding for program management and development of: 1) unique target instrumentation as well as optical on-target data collection instrumentation used for algorithm development/evaluation, intercept viewing and payload characterization; 2) development of Midcourse Fly Along Sensor Package (M-FASP) flight units for BMDS testing; and 3) development of advanced instrumentation systems/techniques to include data collection and transmission techniques.

FY05 Accomplishments:

- Completed 1 M-FASP qualification unit and flew 1 M-FASP flight unit
- Completed development of auxiliary sensor unit, ILC Aug 05
- Development of advanced sensors for integration into M-FASPs (High Speed Camera, auxiliary sensor)
- Completed development of an early prototype Wireless LAN system for initial testing
- Initiated development of direct to satellite telemetry
- Initiated development of Sensor Pointing Platform (SPP) (Target and Countermeasures Observation System (TCOS) PDM Pointer)
- Initiated development of advanced instrumentation and telemetry concepts.
- Analyzed antenna technologies for providing multi-band capabilities with minimal Infrared (IR) and Radio Frequency (RF) signature effects on reentry vehicles

FY06 Planned Program:

- Fly early prototype Wireless LAN system on CMCM-2 for operational testing
- Complete development and implement new techniques data telemetry during flight tests
- Continue development of SPP
- Continue development of advanced instrumentation and telemetry concepts.
- Analyze miniaturized guidance navigation control technologies for size and weight reduction needs
- Complete development of advanced Wireless LAN and fly risk reduction flight (CMCM-2)
- Continue development of direct to satellite telemetry
- Standardize instrumentation across Product Lines for Telemetry, avionics, Flight Termination/Command Destruct Systems, and GPS

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603888C Ballistic Missile Defense Test and Targets |

FY07 Planned Program:
- Complete development of SPP
- Produce two SPP units; one for qualification testing, second for risk reduction flight in FY07
- Continue development of advanced instrumentation and telemetry concepts
- Pursue new technologies for data compression and bandwidth reductions in telemetry links

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Countermeasures | 8,420 | 3,780 | 1,750 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort provides: 1) Program management and development of prototype countermeasure systems used to test the capability space of the BMDS; 2) Integration of countermeasure systems on BMDS flight tests; and 3) Characterization and ground testing of countermeasure systems. Supports requirements decomposition and analysis as applicable for the countermeasures activities. Conducts and supports necessary design reviews to ensure mission assurance while ensuring all Countermeasure (CM) hardware adhere to interface specifications. Also the funding goes to support pre- and post-mission data analysis regarding countermeasures.

FY05 Accomplishments:
- Initiated development of a countermeasure inventory in support of BMDS Flight Tests

FY06 Planned Program:
- Transition-to-limited-production several countermeasure designs from the National Labs to the Targets and Countermeasures Prime Contractor Lockheed Martin Space Systems Company (LMSSC)
- Develop techniques, materials, and processes for new prototype countermeasures.
- Conduct studies to enable countermeasures engineering designs to be brought to the Critical Design Review-level
- Develop a countermeasure inventory in support of BMDS flight tests
- Develop prototype, build, and characterize countermeasure objects in support of BMDS system testing

FY07 Planned Program:
- Transition-to-limited-production several countermeasure designs from the National Labs to the Targets and Countermeasures Prime Contractor LMSSC
- Continue to develop techniques, materials and processes for new prototype countermeasures.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603888C Ballistic Missile Defense Test and Targets** |

- Conduct design studies to bring countermeasures designs to the Critical Design Review-level
- Continue the development of a countermeasure inventory in support of BMDS flight tests
- Develop, prototype, build and characterize countermeasure objects in support of BMDS system testing

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Logistics | 2,460 | 11,151 | 10,013 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort provides MDA with all required inventory, launch support equipment, and transportation of targets and countermeasures hardware in support of BMDS testing. These efforts are essential in providing a dependable and accurate target system that BMDS has come to and continues to rely on for the success of their interceptor program. The continued success of these programs is vital for continued national security. This task includes integrated logistics support for all targets and countermeasure material, including facilities, inventory maintenance, spare parts, aging and surveillance, as well as special testing for target rocket motor propellants and other hazardous material handling. This task provides for the management and execution of the Consolidated Missile Asset Reuse for Targets (CMART) Program and provides all required facilities and monitoring for explosive storage and Foreign Military Assets fuel calibration and storage.

FY05 Accomplishments:

- Initiated design and development efforts for the Common Transporter Erector System (CTES)
- Performed design modifications for C-4 processing

FY06 Planned Program:

- Storage, maintenance, and aging and surveillance program for 84 Pershing II Reentry Vehicles and other components, 103 Lance Missiles, 17 Polaris A-3 motors, 12 Orbus motors, Minuteman motors, 14 FMA's and 7 Castor IVB motors
- Maintenance of existing support equipment and facilities at Redstone Arsenal, White Sands Missile Range, Kodiak Launch Complex, and Pacific Missile Range Facility
- Procurement of (4) assembled Castor IV motors using GFE cases to support future MRT missions
- Procurement of Trident C-4 motors for future use as targets: (144) 1st stage; (72) 2nd stage; (36) 3rd stage
- Refurbish, assemble, and delivery of;
  - Two (2) SR-19 motors and associated equipment and deliver for test flight
  - Three (3) Castor IVB motors and associated equipment for test flights
  - Two (2) Hera targets and associated equipment for test flights

- Five (5) Lance Missiles and associated equipment for test flights
- Three (3) FMA Missiles and associated equipment for test flights.
- Three (3) Strategic Target System (STARS) targets and associated equipment for test flights

- Procurement of additional Foreign Military Assets to support future target flight tests
- Procure domestic Inhibited Red Fuming Nitric Acid (IRFNA) for the FMA target program

FY07 Planned Program:

- 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
- Maintenance of existing support equipment and facilities at Redstone Arsenal, White Sands Missile Range, Kodiak Launch Complex, and Pacific Missile Range Facility
- Store and maintain Trident C-4 motors for future use as targets
- Refurbish, assemble, and delivery of;
  - Two (2) TLV motor sets and associated equipment and deliver for test flight
  - Four (4) Castor IVB motors and associated equipment for test flights
  - Three (3) Hera targets and associated equipment for test flights
  - Two (2) FMA Missiles and associated equipment for test flights
  - Four (4) STARS targets and associated equipment for test flights
  - Five (5) LV2 targets and associated equipment for test flights
- Initiate procurement of assembled Castor IV motors using GFE cases to support future MRT missions

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Integration | 5,000 | 11,500 | 12,056 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort provides MDA with all target configuration, integration, launch services and mission assurance in support of BMDS testing. This task includes developing of flight safety documentation, conducting trajectory flyout analysis, supporting environmental studies and reviews. Integrates product line components into designated target configuration and tests systems. Provides schedule status, final target checkout, target launch services for mission assurance.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603888C Ballistic Missile Defense Test and Targets** |

FY05 Accomplishments:

- Initiated and identified requirements of a single common integration facility for integration of all targets for the BMDS

FY06 Planned Program:

- Provide mission assurance for hardware integration for BMDS element targets in support of FY06 tests
- Integrate product line components into designated target configuration and tests systems to support FY06 tests
- Manage target development on legacy contracts
- Manage integration services of the TC Prime contract, Lockheed Martin Space Systems Company (LMSSC)
- Provide development efforts on the single central integration facility

FY07 Planned Program:

- Provide mission assurance for hardware integration for all BMDS element targets in support of FY07 tests
- Manage integration services of the TC Prime contract with LMSSC
- Provide support for the single central integration facility
- Manage target integration services on older legacy contracts

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Mission Management | 0 | 10,078 | 12,449 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort provides MDA with target mission management and execution for overall mission assurance. Conducts mission planning , documentation, development of scenario plans in accordance with mission requirements. Controls target management (scheduling, configuration modifications) in support of BMDS and Element testing. Conduct safety operations specific to the mission and in conjunction with ranges. Plans and conducts target Mission readiness reviews and monitors environmental execution.

FY06 Planned Program:

- Conduct any remaining retrograde or analysis activities associated with the GMD LRALT mission
- Prepare for, conduct, and analyze;
  - ABL Lance Target Missile System (LTMS) launch
  - Aegis-BMD target missions (FTM-04-2 (1Qtr), FTM-04-3 (2Qtr), FTM 06-1a/b (3Qtr)
  - GMD target missions (FT -04-1 (2Qtr), FT-3 (2Qtr), FT-4 (4Qtr)

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603888C Ballistic Missile Defense Test and Targets** |

- NFIRE-2a mission
- THAAD target missions (FT-3 (2Qtr), FT-4 (3Qtr)
- CMCM 2a (3Qtr) and CMCM 2b (3Qtr)
- TLV5 (2Qtr)

- Prepare for and analyze pre-mission activities NFIRE-2a and NFIRE 2b

FY07 Planned Program:

- Prepare for, conduct and analyze tests as shown in attached R-4 and R-4A.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Re-entry Vehicles | 0 | 11,858 | 7,507 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort provides MDA with the design, development, build, and delivery of all Reentry Vehicle (RV) and Payload Deployment Module (PDM) products for MDA and the Ballistic Missile Defense System (BMDS). Includes RV and PDM requirements decomposition and analysis; RV and PDM characterization, qualification, and performance measurements; mission support; and pre-and post-mission data analysis. Provides interface standardization and ensures product adherence to interface specifications for successful integration and launch of RV and PDM products. Conducts RV and PDM design reviews and supports other product design reviews to provide product and mission assurance.

FY06 Planned Program:

- Complete buildup and delivery of: Two (2) Ballistic Reentry Vehicles (BRVs) for FTT-3 and FTT-4 missions One (1) MBRV-1 for ATM-48 mission with one (1) BCE Six (6) MBRV-2s for FTM-04-2, FT-04-4a/b, FTM-06-1, FT-4, and FT-5 missions, including two (2) with BCLFS and three (3) with PDMs Four (4) MBRV-3s for FTT-06-1, FTT-06-2, FTT-06-3, FT-16-2, missions, plus one (1) rolling spare for THAAD One (1) Tactical Target Vehicle (TTV) for FTM-06-2 mission Three (3) GROW RVs with three (3) PDMs for FT-04-1, FT-2, and FT-3 missions to support BMDS testing
- Exercise contractual actions for procurement of three (3) new-build MBRV-3s to support LPTO testing and one (1) new-build MBRV-3 to support future BMDS testing Develop and initiate acquisition strategy for procurement of six (6) SRVs and six (6) PDMs to support GMD testing Support Spiral Development activities

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603888C Ballistic Missile Defense Test and Targets** |

FY07 Planned Program:

- Complete buildup and delivery of: Three (3) MBRV-1s for FTT-08-1, FTT-08-2, and FTT-08-4 missions Seven (7) MBRV-2s for FTM-06-3, FT-6, JBMD-1, FTT-06-4, FTT-06-5, FTT-06-6, and SPT-06 missions Two (2) MBRV-3s for FT-7-2 and FT-7-3 missions to support BMDS testing
- Initiate contractual actions for: Delivery of five (5) OEM RVs to support ABL testing Procurement of ten (10) new-design MBRV-2s to support ABL, Aegis BMD, KEI, STSS, and THAAD testing Procurement of three (3) new-build MBRV-3s to support BMDS testing Procurement of three (3) MBRV-4s to support THAAD testing
- Support Spiral Development activities

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## 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 2004), the prime contractor will optimize target designs and developments completed for Block 2004 and incorporate them as necessary to support Block 2006 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 2004), 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 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Systems Engineering** | | | | | | | | |
| System Engineering | C/CPAF | Lockheed Martin/ Denver, CO | 5,625 | 143,406 | 1/4Q | 91,541 | 1/4Q | 240,572 |
| System Engineering Support | C/FFRDC | John Hopkins Applied Research Lab/ Maryland | 0 | 2,200 | 1/4Q | 2,322 | 1/4Q | 4,522 |
| System Engineering Support | C/Various | Various/ Various | 0 | 19,000 | 1/4Q | 5,000 | 1/4Q | 24,000 |
| **Launch Vehicles** | | | | | | | | |
| Launch Vehicles | C/CPAF | Lockheed Martin Space Systems/ Denver, CO | 2,375 | 0 | N/A | 0 | N/A | 2,375 |
| Launch Vehicles | C/CPAF | Northrop Grumman/ Albuquerque, NM | 0 | 2,500 | 1/2Q | 3,685 | 1/2Q | 6,185 |
| Launch Vehicles | C/CPAF | Northrop Grumman/ Ogden, UT | 0 | 1,000 | 1/2Q | 0 | N/A | 1,000 |
| Launch Vehicles | C/MIPR | AFSPCOM/ Peterson AFB, CO | 0 | 0 | N/A | 9,517 | 1/2Q | 9,517 |
| **Data and Instrumentation** | | | | | | | | |
| Data & Instrumentation | C/CPFF | Fibertek/ Herndon, VA | 0 | 242 | 2Q | 0 | N/A | 242 |
| Data & Instrumentation | C/MIPR | DoD/WHS/ Washington, DC | 0 | 200 | 2/4Q | 327 | 2/4Q | 527 |
| Data & Instrumentation | C/CPFF | SRA/ Huntsville, AL | 800 | 0 | N/A | 0 | N/A | 800 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Data & Instrumentation | C | Colorado Springs, CO | 85 | 0 | N/A | 0 | N/A | 85 |
| Data & Instrumentation | C/FFRDC | Sandia National Lab/ Albuquerque, NM | 0 | 7,472 | 2/3Q | 2,820 | 1/3Q | 10,292 |
| **Countermeasures** | | | | | | | | |
| Countermeasures Development | C/FFRDC | MIT/LL/ Boston, MA | 0 | 650 | 1/4Q | 500 | 1/4Q | 1,150 |
| Countermeasures Development | C/Various | Sandia National Lab/ New Mexico | 5,775 | 500 | 1/4Q | 500 | 1/4Q | 6,775 |
| Countermeasures Development | C/Various | Various/ Various | 2,645 | 2,630 | 1/4Q | 750 | 1/4Q | 6,025 |
| **Logistics** | | | | | | | | |
| Logistics | C/CPFF | Battelle/ Kennesaw, GA | 0 | 1,950 | 1Q | 2,955 | 1Q | 4,905 |
| Logistics | SS/CPFF | Alliant Techsystems/ Magna, UT | 0 | 300 | 1Q | 317 | 1Q | 617 |
| Logistics | SS/CPFF | Physical Science Laboratory/ Las Cruces, NM | 0 | 438 | 1Q | 536 | 1Q | 974 |
| Logistics | C/FP | Teledyne Solutions, Inc./ Huntsville, AL | 0 | 2,682 | 1/2Q | 2,955 | 1/2Q | 5,637 |
| Logistics | MIPR | Various/ Various | 0 | 1,781 | 1/3Q | 357 | 1/3Q | 2,138 |
| Logistics | C/Various | Various/ Albuquerque, NM | 0 | 4,000 | 1/2Q | 2,893 | 1/2Q | 6,893 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Logistics | C/CPAF | Lockheed Martin/ Denver, CO | 1,850 | 0 | N/A | 0 | N/A | 1,850 |
| Logistics | MIPR | SWFPAC/ Bangor, WA | 610 | 0 | N/A | 0 | N/A | 610 |
| **Integration** | | | | | | | | |
| Integration | Various | Integration Facility/ Albuquerque, NM | 5,000 | 0 | N/A | 0 | N/A | 5,000 |
| Integration | C/CPAF | Northrop Grumman/ Albuquerque, NM | 0 | 11,500 | 1/2Q | 12,056 | 1/2Q | 23,556 |
| **Mission Management** | | | | | | | | |
| Mission Management | C/FP | Teledyne Solutions/ Huntsville, AL | 0 | 9,703 | 1/2Q | 12,053 | 1/2Q | 21,756 |
| Mission Management | MIPR | Various/ Various | 0 | 375 | 1/2Q | 396 | N/A | 771 |
| **Re-entry Vehicles** | | | | | | | | |
| Re-Entry Vehicles | C/FP | Teledyne Solutions, Inc./ Huntsville, AL | 0 | 2,150 | 1/2Q | 1,795 | 1/2Q | 3,945 |
| Re-Entry Vehicles | C/FFRDC | Sandia National Lab/ Albuquerque, NM | 0 | 2,500 | 1/2Q | 0 | N/A | 2,500 |
| Re-Entry Vehicles | C/CPAF | Lockheed Martin/ Denver, CO | 0 | 7,208 | 1/2Q | 5,712 | 1/2Q | 12,920 |
| Subtotal Product Development | | | 24,765 | 224,387 | | 158,987 | | 408139 |

**Remarks**

Under Logistics and Re-Entry Vehicles, the Teledyne Solutions, Inc., contract is a Command-wide SETA contract.

**II. Support Costs Cost ( $ in Thousands )**

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 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 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 )

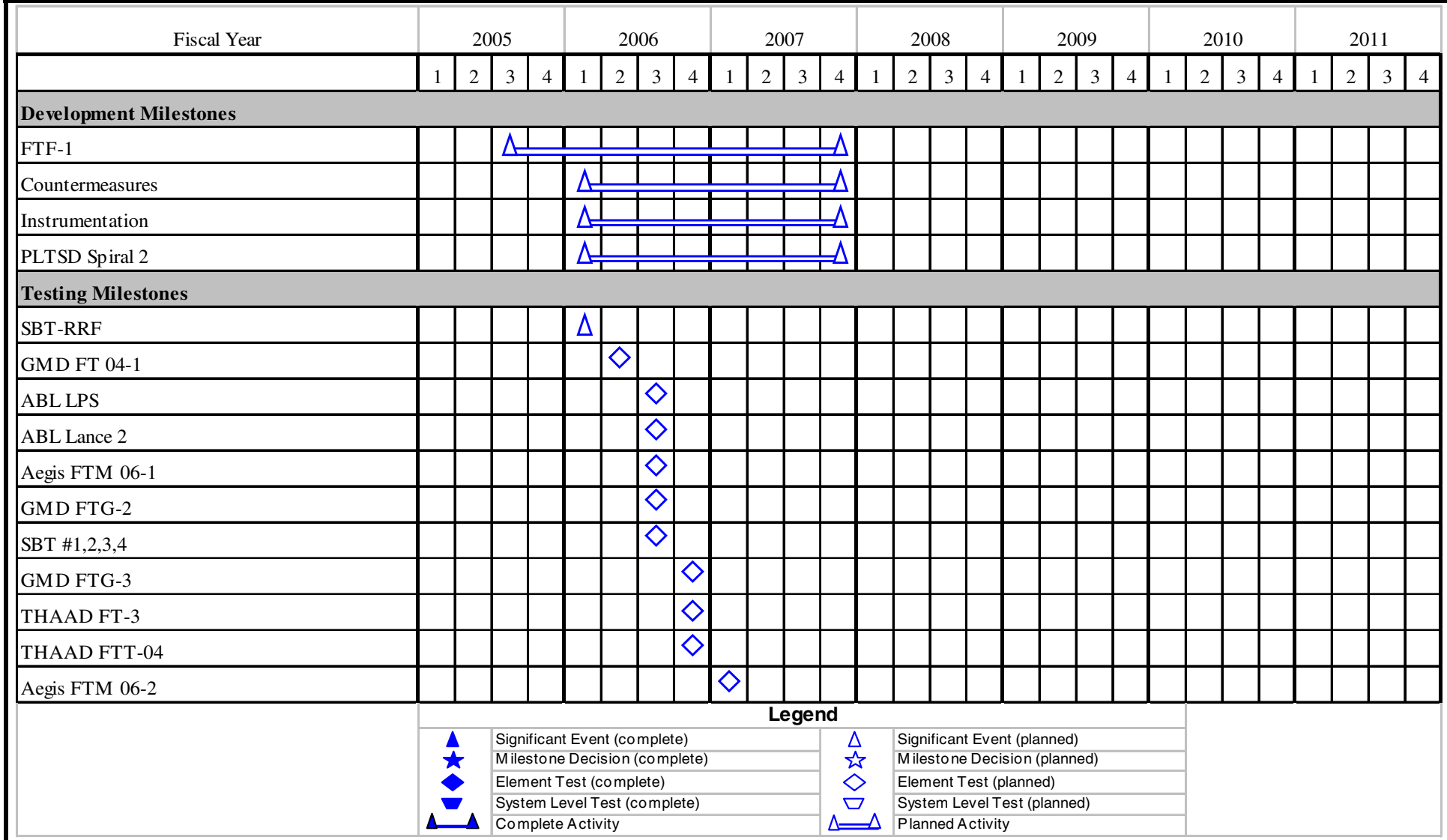
| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Subtotal Management Services | | | | | | | | |

**Remarks**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 24,765 | 224,387 | | 158,987 | | 408,139 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 2006 |
|---|---|
| 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 | 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 |
| **Testing Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GMD FTG-4 | | | | | | | | | ◇ | | | | | | | | | | | | | | | | | | | |
| THAAD FTT 06-1 | | | | | | | | | ◇ | | | | | | | | | | | | | | | | | | | |
| GMD FTG-6 | | | | | | | | | | ◇ | | | | | | | | | | | | | | | | | | |
| THAAD FTT 06-2 | | | | | | | | | | ◇ | | | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲——▲ | Complete Activity | △——△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Development Milestones** | | | | | | | |
| FTF-1 | 3Q-4Q | 1Q-4Q | 1Q-4Q | | | | |
| Countermeasures | | 1Q-4Q | 1Q-4Q | | | | |
| Instrumentation | | 1Q-4Q | 1Q-4Q | | | | |
| PLTSD Spiral 2 | | 1Q-4Q | 1Q-4Q | | | | |
| **Testing Milestones** | | | | | | | |
| SBT-RRF | | 1Q | | | | | |
| GMD FT 04-1 | | 2Q | | | | | |
| ABL LPS | | 3Q | | | | | |
| ABL Lance 2 | | 3Q | | | | | |
| Aegis FTM 06-1 | | 3Q | | | | | |
| GMD FTG-2 | | 3Q | | | | | |
| SBT #1,2,3,4 | | 3Q | | | | | |
| GMD FTG-3 | | 4Q | | | | | |
| THAAD FT-3 | | 4Q | | | | | |
| THAAD FTT-04 | | 4Q | | | | | |
| Aegis FTM 06-2 | | | 1Q | | | | |
| GMD FTG-4 | | | 1Q | | | | |
| THAAD FTT 06-1 | | | 1Q | | | | |
| GMD FTG-6 | | | 2Q | | | | |
| THAAD FTT 06-2 | | | 2Q | | | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0905 Targets & Countermeasures Block 2008 | 0 | 4,226 | 20,533 | 173,533 | 151,327 | 0 | 0 |
| RDT&E Articles Qty | 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 Ballistic Missile Defense Systems (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, Lockheed Martin Space Systems Company (LMSSC) 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.

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Systems Engineering | 0 | 0 | 7,930 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort provides the Missile Defense Agency with Target Program Technical Direction and analyze of target requirements cost, schedule, technical performance of target systems development. This effort utilizes the spiral development process for long-range plans initiating new developments. Conducts functional allocation to product lines, product line specifications/interfaces and establishes guidelines for conductibility of design reviews. Performs target system analysis with new concepts to verify system performance. Defines target program baseline, control flight test configuration, and conduct pre and post-flight analysis and documentation. Identifies treaty and environmental issues and develops plans for issue resolution. The Flexible Targets Family (FTF) will be composed of Target Sets that exhibit various degrees of threat emulation and have a broad range of performance characteristics and features that present flexible target behavior to test the multiple Ballistic Missile Defense System capabilities.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603888C Ballistic Missile Defense Test and Targets** |

FY07 Planned Program:

Spiral 3 - FTF Enhanced Studies (Development of Enhanced Capability Products)
- Develop modification of Infrared and Radar Cross Section for Re-Entry Vehicles in endo and last stage
- Develop technology transfer of countermeasures, sensors, and advanced instrumentation
- Develop Small Re-Entry Vehicle instrumentation module
- Provide contract acquisition support for the FTF

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Data and Instrumentation | 0 | 976 | 6,853 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort provides funding for program management and development of: 1) unique target instrumentation as well as optical on-target data collection instrumentation used for algorithm development/evaluation and payload characterization; 2) development of Spatially Diverse Sensor (SDS) flight units for BMDS testing; and 3) and development of advanced instrumentation systems/techniques to include data collection and transmission techniques.

FY06 Planned Program:
- Initiate development of SDS platform (next generation M-FASP (Mid Course Fly Along Sensor Package))

FY07 Planned Program:
- Complete engineering development of SDS
- Initiate production of SDS
- Demonstration flight for direct to Satellite Telemetry capability
- Develop Communications Security (COMSEC) procedures for inventory encryption

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 |
|---|---|---|---|
| Countermeasures | 0 | 3,250 | 5,750 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort provides program management and development of various countermeasure systems for BMDS flight testing, including characterization and ground testing of those countermeasure systems.

FY06 Planned Program:

- Transition-to-limited-production several countermeasure designs from the National Labs to the Targets and Countermeasures Prime Contractor Lockheed Martin Space Systems Command (LMSSC)
- Develop techniques, materials, and processes for new prototype countermeasures
- Conduct design studies to bring countermeasures designs to the Critical Design Review-level
- Develop prototype, build and characterize countermeasure objects in support of BMDS system testing

FY07 Planned Program:

- Continue the transition-to-limited-production for several countermeasure designs from the National Labs to the Targets and Countermeasures Prime Contractor LMSSC
- Follow on developmental techniques for new prototype countermeasures performed in conjunction with developmental testing of prototypes
- Evolve countermeasure prototypes towards flight qualification based on considerable flight qualification test activities (based on FTF environments)
- Build variety of engineering countermeasure prototypes in support of BMDS system testing

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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, 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 2006), 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 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Systems Engineering** | | | | | | | | |
| System Engineering | C/CPAF | Lockheed Martin Space Systems/ Denver, CO | 0 | 0 | N/A | 7,930 | 1/4Q | 7,930 |
| **Data and Instrumentation** | | | | | | | | |
| Data & Instrumentation | C/CPAF | Lockheed Martin Space Systems/ Denver, CO | 0 | 976 | 1/4Q | 5,827 | 1/4Q | 6,803 |
| Data & Instrumentation | C/FFRDC | Sandia National Lab/ Albuquerque, NM | 0 | 0 | N/A | 127 | 2Q | 127 |
| Data & Instrumentation | C/Various | Various/ Various | 0 | 0 | N/A | 370 | N/A | 370 |
| Data & Instrumentation | C/MIPR | NSA/ Ft. Meade, MD | 0 | 0 | N/A | 529 | N/A | 529 |
| **Countermeasures** | | | | | | | | |
| Countermeasures Development | C/FFRDC | MIT/LL/ Boston, MA | 0 | 0 | N/A | 500 | 1/4Q | 500 |
| Countermeasures Development | C/Various | Sandia National Lab/ New Mexico | 0 | 3,250 | N/A | 3,750 | 1/4Q | 7,000 |
| Various | C/Various | Various/ Various | 0 | 0 | 1/4Q | 1,500 | 1/4Q | 1,500 |
| Subtotal Product Development | | | 0 | 4,226 | | 20,533 | | 24759 |

## Remarks

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 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 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 )

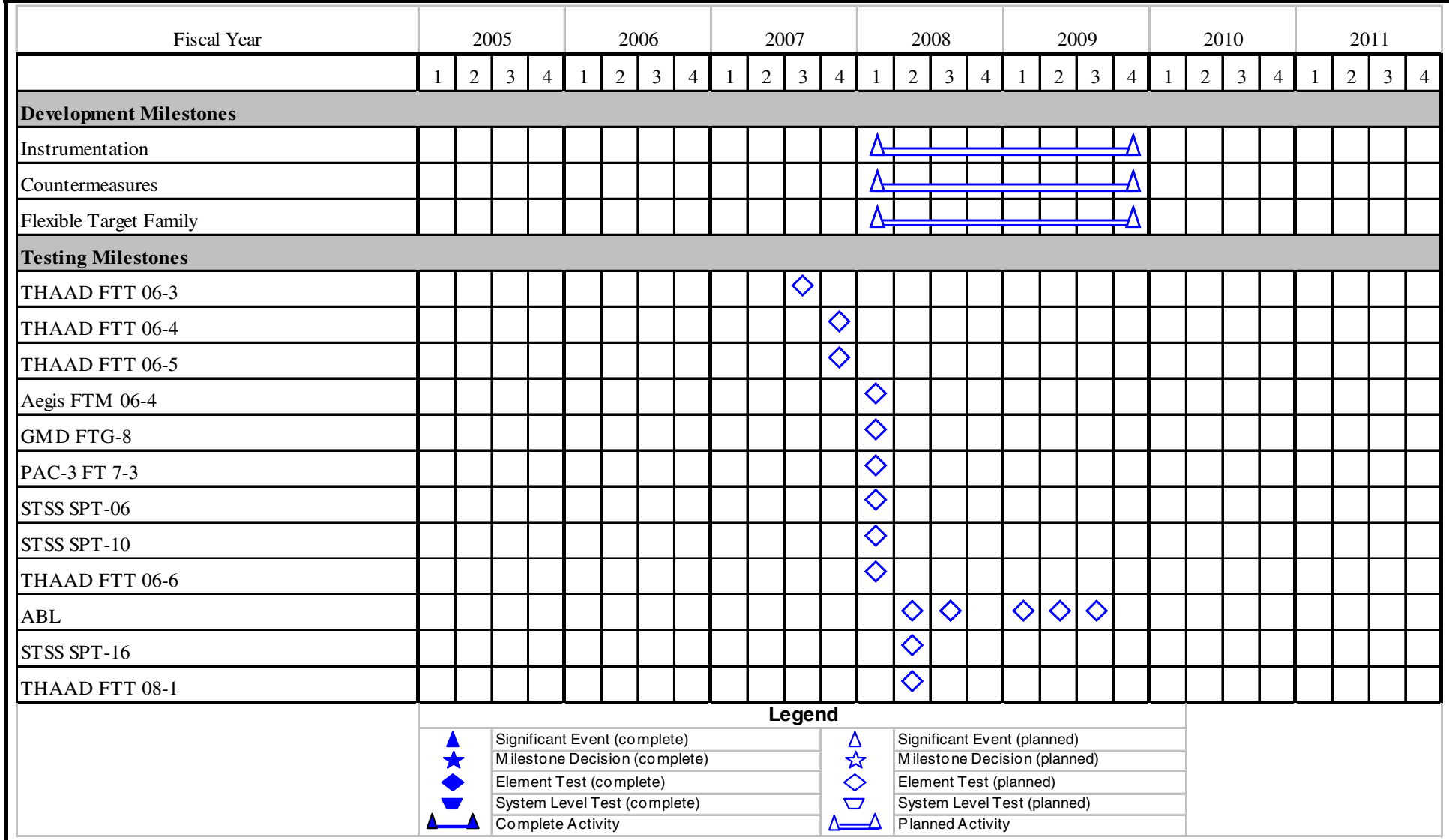
| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Subtotal Management Services | | | | | | | | |

**Remarks**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 0 | 4,226 | | 20,533 | | 24,759 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 2006**

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 | 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 |
| **Testing Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aegis FTM 08-1 | | | | | | | | | | | | | | | ◇ | | | | | | | | | | | | | |
| Arrow USFT-3 | | | | | | | | | | | | | | | ◇ | | | | | | | | | | | | | |
| Arrow USFT-4 | | | | | | | | | | | | | | | ◇ | | | | | | | | | | | | | |
| CMCM-6 | | | | | | | | | | | | | | | ◇ | | | | | | | | | | | | | |
| GMD FTG 08-4 | | | | | | | | | | | | | | | ◇ | | | | | | | | | | | | | |
| THAAD FTT 08-2 | | | | | | | | | | | | | | | | ◇ | | | | | | | | | | | | |
| PAC-3 FT-16-2 | | | | | | | | | | | | | | | | | ◇ | | | | | | | | | | | |
| THAAD FTT 08-3 | | | | | | | | | | | | | | | | | | ◇ | | | | | | | | | | |
| Aegis FTM 08-2 | | | | | | | | | | | | | | | | | | | ◇ | | | | | | | | | |
| Aegis FTM 08-3 | | | | | | | | | | | | | | | | | | | ◇ | | | | | | | | | |
| GMD FTG 08-5A/B | | | | | | | | | | | | | | | | | | | | ◇ | | | | | | | | |
| GMD FTG 10-1 | | | | | | | | | | | | | | | | | | | | ◇ | | | | | | | | |
| THAAD FTT 08-4 | | | | | | | | | | | | | | | | | | | | ◇ | | | | | | | | |
| STSS 08-8 | | | | | | | | | | | | | | | | | | | | | ◇ | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲——▲ | Complete Activity | △——△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Development Milestones** | | | | | | | |
| Instrumentation | | | | 1Q-4Q | 1Q-4Q | | |
| Countermeasures | | | | 1Q-4Q | 1Q-4Q | | |
| Flexible Target Family | | | | 1Q-4Q | 1Q-4Q | | |
| **Testing Milestones** | | | | | | | |
| THAAD FTT 06-3 | | | 3Q | | | | |
| THAAD FTT 06-4 | | | 4Q | | | | |
| THAAD FTT 06-5 | | | 4Q | | | | |
| Aegis FTM 06-4 | | | | 1Q | | | |
| GMD FTG-8 | | | | 1Q | | | |
| PAC-3 FT 7-3 | | | | 1Q | | | |
| STSS SPT-06 | | | | 1Q | | | |
| STSS SPT-10 | | | | 1Q | | | |
| THAAD FTT 06-6 | | | | 1Q | | | |
| ABL | | | | 2Q,3Q,3Q | 1Q,2Q,3Q | | |
| STSS SPT-16 | | | | 2Q | | | |
| THAAD FTT 08-1 | | | | 2Q | | | |
| Aegis FTM 08-1 | | | | 3Q | | | |
| Arrow USFT-3 | | | | 3Q | | | |
| Arrow USFT-4 | | | | 3Q | | | |
| CMCM-6 | | | | 3Q | | | |
| GMD FTG 08-4 | | | | 3Q | | | |
| THAAD FTT 08-2 | | | | 4Q | | | |
| PAC-3 FT-16-2 | | | | | 1Q | | |
| THAAD FTT 08-3 | | | | | 2Q | | |
| Aegis FTM 08-2 | | | | | 3Q | | |
| Aegis FTM 08-3 | | | | | 3Q | | |
| GMD FTG 08-5A/B | | | | | 4Q | | |
| GMD FTG 10-1 | | | | | 4Q | | |
| THAAD FTT 08-4 | | | | | 4Q | | |
| STSS 08-8 | | | | | | 1Q | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0005 Targets & Countermeasures Block 2010 | 0 | 500 | 2,500 | 5,353 | 41,721 | 191,425 | 162,878 |
| RDT&E Articles Qty | 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 Ballistic Missile Defense System (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 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 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.

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Countermeasures | 0 | 500 | 2,500 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort provides funding for program management and development of countermeasure systems for BMDS flight testing, including characterization and ground testing of those countermeasure systems.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603888C Ballistic Missile Defense Test and Targets** |

FY06 Planned Program

- Develop and characterize countermeasure objects in support of BMDS system testing.

FY07 Planned Program:

- Increase engineering development and prototyping builds of advanced countermeasure objects
- Significant developmental and flight qualification testing of countermeasures in support of CMCM-4

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## 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 2006) and 0905 (Block 2008), 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 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Countermeasures** | | | | | | | | |
| Countermeasures Development | C/FFRDC | MIT/LL/ Boston, MA | 0 | 500 | 1/4Q | 2,500 | 1/4Q | 3,000 |
| Subtotal Product Development | | | 0 | 500 | | 2,500 | | 3000 |

**Remarks**

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 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 2006 |
|---|---|
| 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 )

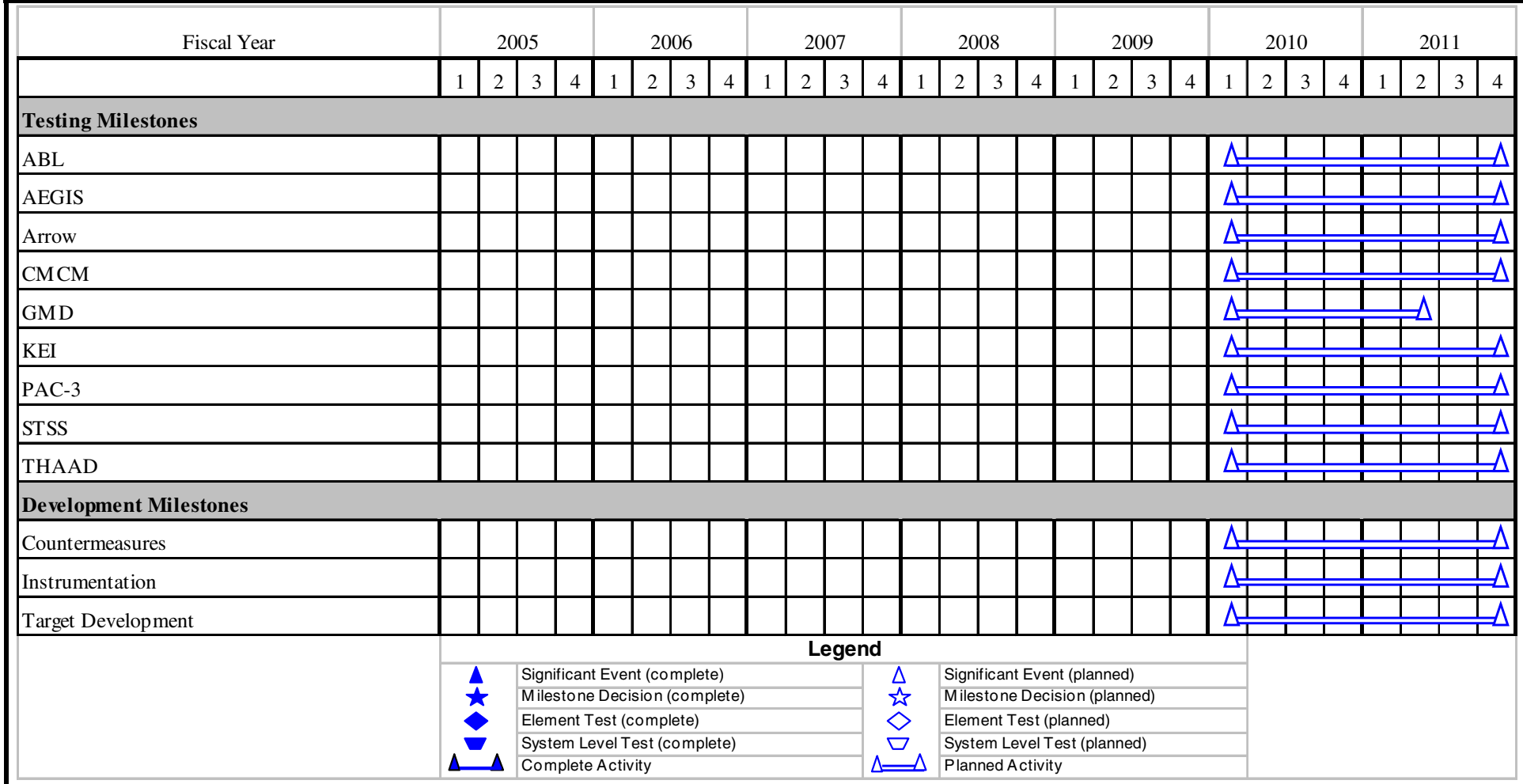
| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Subtotal Management Services | | | | | | | | |

**Remarks**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 0 | 500 | | 2,500 | | 3,000 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 2006 |
|---|---|
| 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 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 |
| Instrumentation | | | | | | 1Q-4Q | 1Q-4Q |
| Target Development | | | | | | 1Q-4Q | 1Q-4Q |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| R105 Targets & Countermeasures Block 2012 | 0 | 0 | 0 | 0 | 0 | 6,000 | 39,181 |
| RDT&E Articles Qty | 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 2012 integrated and layered Ballistic Missile Defense System (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 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 2012 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 0005 (Block 2010), this Project (R105) 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.

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0602 Program-Wide Support | 4,456 | 6,543 | 7,525 | 6,706 | 5,894 | 11,226 | 5,838 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## A. Mission Description and Budget Item Justification

Program-Wide Support provides funding for common non-headquarters support functions across the entire program such as strategic planning, program integration, business management, 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 outside services and support contractors that augment government staff in these areas. Many of these costs reside within the Missile Defense Agency 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, although some functions and costs within this program element are performed by MDA employees assigned within the National Capital Region (NCR). Other costs included herein provide facility capabilities for MDA Executing Agent locations, such as physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses. Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Civilian Salaries and Support | 4,456 | 6,543 | 7,525 |
| RDT&E Articles (Quantity) | 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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| Total PE Cost | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 |
| 0701 Command and Control, Battle Management and Communications (C2BMC) Block 2004 | 152,217 | 65,524 | 53,526 | 292 | 0 | 0 | 0 |
| 0801 Command and Control, Battle Management and Communications (C2BMC) Block 2006 | 26,791 | 136,282 | 176,735 | 102,687 | 56,703 | 283 | 0 |
| 0901 Command and Control, Battle Management and Communications (C2BMC) Block 2008 | 6,122 | 5,576 | 33,645 | 158,764 | 179,883 | 106,889 | 64,310 |
| 0001 Command and Control, Battle Management and Communications (C2BMC) Block 2010 | 0 | 0 | 0 | 1,247 | 35,393 | 161,466 | 206,404 |
| 0802 Hercules Block 2006 | 22,730 | 19,645 | 0 | 0 | 0 | 0 | 0 |
| 0902 Hercules Block 2008 | 58,798 | 38,179 | 0 | 0 | 0 | 0 | 0 |
| 0002 Hercules Block 2010 | 0 | 6,304 | 0 | 0 | 0 | 0 | 0 |
| 0505 Hercules | 0 | 0 | 50,562 | 50,881 | 50,319 | 50,071 | 50,856 |
| 0703 Joint Warfighter Support Block 2004 | 37,844 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0803 Joint Warfighter Support Block 2006 | 0 | 31,044 | 53,350 | 0 | 0 | 0 | 0 |
| 0903 Joint Warfighter Support Block 2008 | 0 | 0 | 0 | 49,687 | 50,912 | 0 | 0 |
| 0003 Joint Warfighter Support Block 2010 | 0 | 0 | 0 | 0 | 0 | 52,322 | 55,519 |
| 0204 Joint National Integration Center (JNIC) | 71,631 | 75,728 | 99,461 | 106,611 | 107,560 | 109,325 | 110,581 |
| 0817 Concurrent Test & Operations (CTO) - Distributed Multi-Echelon Training System (DMETS) Block 2006 | 0 | 0 | 22,500 | 0 | 0 | 0 | 0 |
| 0917 Concurrent Test & Operations (CTO) - Distributed Multi-Echelon Training System (DMETS) Block 2008 | 0 | 0 | 0 | 13,800 | 11,100 | 0 | 0 |
| 0017 Concurrent Test & Operations (CTO) - Distributed Multi-Echelon Training System (DMETS) Block 2010 | 0 | 0 | 0 | 0 | 0 | 9,300 | 9,600 |
| 0602 Program-Wide Support | 8,802 | 10,548 | 17,061 | 22,383 | 18,114 | 17,061 | 15,312 |

*Note: Beginning in FY07, Concurrent Test and Operations (CTO) Distributed Multi-Echelon Training System (DMETS) efforts, previously included in Projects 0803, 0903, and 0003 within the BMDS Training area, are addressed in dedicated CTO-DMETS Projects 0817 (Block 2006), 0917 (Block 2008) and 0017 (Block 2010).*

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603889C Ballistic Missile Defense Products |

**A. Mission Description and Budget Item Justification**

Intelligence sources indicate the ballistic missile threat to the United States, its Friends and Allies consists of a progressive attack of short, medium, intermediate-range (SRBMs, MRBMs, IRBMs) and long-range ballistic missiles (LRBMs). Potential adversaries can use such an attack to initiate a great amount of situational confusion resulting in either a delayed response or, at worst, defense paralysis due to overlap of existing command structures and individual capabilities of existing and future Ballistic Missile Defense (BMD) weapon systems. To protect U.S. cities, population, and territory, as well as our deployed forces and other critical assets from this growing threat requires an integrated, layered defense. BMD Products program element efforts provide the glue that binds constituent BMD elements together into such a defense.

BMD Products program element efforts enable coordinated, real-time decision-making by Warfighters and leaders across the globe up to and including the Secretary of Defense and the President of the United States. This program element consists of five complementary mission essential projects with efforts spanning Blocks 2004, 2006, 2008, and 2010. These programs are Command and Control, Battle Management, and Communications (C2BMC), Project Hercules, Joint Warfighter Support Program, Concurrent Test & Operations Distributed Multi-Echelon Training System (CTO-DMETS), and the Joint National Integration Center.

COMMAND AND CONTROL, BATTLE MANAGEMENT, AND COMMUNICATIONS (C2BMC)

C2BMC Program Description: The backbone of an integrated, layered missile defense is global Command, Control, Battle Management, and Communications (C2BMC) that spans the existing US Combatant Command structure and allows the warfighter to orchestrate and optimize United States ballistic missile defense (BMD) response on a worldwide level. As such, the C2BMC program is a force multiplier, without which the BMD System (BMDS) would require many more sensors and interceptors to achieve equivalent protection from ballistic missile threats to our homeland, friends and allies.

The C2BMC Program uses spiral development (incremental development, test, and fielding) to produce the hardware and software required to provide a system-wide integrated BMD capability. As C2BMC products mature they are engineered and integrated into either of two major fielded Spirals in each two year BMDS Block.

To provide BMDS operations, the C2BMC program delivers Spiral hardware and software capabilities to Combatant Commands and national command authorities. Hardware capabilities consist of Enterprise Workstations Stations (warfighter display monitors and access to C2BMC planner, situation awareness and battle manager capabilities), servers, processors, and communications racks and equipment, situational awareness web browsers, and video distribution equipment. Software capabilities evolve through the four C2BMC product lines: BMD Planner, Situation

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

Awareness, Battle Management, and Networks. Delivered Spirals enable progressively increased abilities to plan ballistic missile defense, see the battle unfold on common situational awareness displays, control -in real-time- sensors worldwide, and optimally pair them with BMD weapons systems (such as Ground Based Missile Defense, Theater High Altitude Air Defense, Patriot, and Aegis BMD) across a global-grid communications network to defeat an adversary's attack.

C2BMC Program Budget Justification and Contribution to the Ballistic Missile Defense System (BMDS): The C2BMC program contributes to the Ballistic Missile Defense System (BMDS) by delivering:

- deliberate and collaborative planning and analysis capability among all Combatant Commands (COCOMs) and their service components so that warfighters have the capability to explore the effectiveness of potential BMD courses of action;
- clear, accurate, and consistent display of the BMD battlespace (situational awareness) to warfighters at the tactical, operational, and strategic levels of command permitting key decision makers the ability to render command and control decisions of global importance in real time
- a network tying together sensors and weapons systems via the Global Integrated Fire Control/Battle Management to enable system-wide detection, tracking, and decision tools for optimal engagement of ballistic missile threats across all flight regimes.

C2BMC enables improved system performance of all BMDS elements by improving missile detection, tracking, discrimination, and network distribution of threat information and provides the Warfighter the ability to: rapidly identify and concurrently track multiple ballistic missile threats; dynamically adjust BMD system resources to engage multiple ballistic missile threats in the BMD kill zone through all phases of flight; and, globally direct engagement against multiple ballistic missile threats in any area of responsibility, at any time.

The C2BMC program further contributes to an integrated, layered Ballistic Missile Defense by synergistically planning and operating complementary existing and new theater and strategic ballistic missile defense weapon systems across theaters and continents for the highest probability of defeating threats of any type and range; these systems include Patriot, Theater High Altitude Area Defense (THAAD), Ground-based Midcourse Defense (GMD), and Aegis BMD, and sensors such as the Forward Based X-Band Radar - Transportable (FBX-T ), Sea-Based X-Band Radar (SBX), and Space-Based Infrared System (SBIRS).

C2BMC Major Program Goals:

Block 2004 ( Initial Defense Against Rogue Threat)

- Basic Deliberative/Crisis Action Planning
- Common Situational Awareness at Combatant Commands (COCOMs) and National Military Command Center (NMCC)

- Redundant communication paths and connections to Ground Based Missile Defense (GMD) System and Aegis Ballistic Missile Defense (BMD)
- Initial Sensor Management of Forward Based X-Band Radar - Transportable (FBX-T ) Redundant communications.

Block 2006 ( Integrated Defense Against Rogue Threat)

- Improved system reliability and availability
- Initial fielding of Global Integrated Fire Control (GIFC) capability at an Air Operations Center - founded on dependable, trustworthy software development
- Continued fielding of enhanced situational awareness and command and control at COCOM Headquarters

Block 2008 ( Coordinated Defense Against Medium Size Raids and Asymmetric Threat)

- Fully integrated Planner and Situation Awareness displays with integrated intelligence information and defended asset priority schemes
- Initial type interfaces between weapons and sensors compatible with DoD network-centric service-oriented architecture
- GIFC coordination and optimization of increased Launch-on and Engage-on networked capability

Block 2010 ( Mature and Expand Integrated Layered BMD)

- Incorporate new sensors and weapons systems into a global, integrated C2BMC network
- Command and Control decision aids to re-direct coordinated engagements
- BMDS system level discrimination for boost/early ascent and expanded engagement coordination to include intelligence projections

PROJECT HERCULES

Project Hercules Program Description: Project Hercules is a national effort to develop robust, physics-based detection, tracking, and discrimination algorithms to counter known/expected and unknown/unexpected missiles with planned or unplanned countermeasures in all phases of their flight. These algorithms improve sensor and weapon element discrimination, improve integration of sensor data within C2BMC, and expand integrated battle management capability.

Project Hercules develops advanced discrimination and tracking concepts into prototype software (algorithms) that improves the capability of the BMDS C2BMC, sensor, and weapon elements. Hercules then transitions algorithms to BMDS elements for integration and provides technical assistance during the algorithm integration. These algorithms support existing BMDS Engagement Sequence Groups and enable new Engagement Sequence Groups.

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

Hercules projects include boost-phase engagement algorithms, discrimination algorithms for forward based sensors, discrimination algorithms and architectures for midcourse sensors, countermeasure mitigation algorithms, terminal discrimination algorithms, and an integrating Decision Architecture concept that provides advanced decision theory for BMDS C2BMC data fusion and global integrated fire control.

Project Hercules Budget Justification and Contribution to the Ballistic Missile Defense System (BMDS): Project Hercules contributes to the BMDS by conceiving and maturing technical concepts into prototype software (algorithms) and then transitioning these algorithms to all relevant BMDS elements, thus enabling improved BMDS system element performance. Project Hercules further provides technical assistance during the integration of the algorithms into the element component to insure that knowledge gained during the development process also assists the integration process. Hercules focuses on algorithms that improve missile detection, tracking and discrimination and algorithms that support global integrated fire control (GIFC).

Additionally, Project Hercules generates advanced ballistic missile threat signatures [Threat Data Packages (TDPs)] for use in its algorithm development to enable better advanced threat representation across the BMDS.

Project Hercules also contributes to the BMDS by developing non-intrusive real-time test capability on BMDS sensors to collect data and demonstrate the performance of Hercules algorithms during actual BMDS flight tests. This capability is called the BMDS Fusion Toolbox (BFT) which is used to support the MDA Battle management Command and Control program test efforts.

Project Hercules also contributes with the development of the forward based discrimination algorithms being integrated by the MDA Sensors program into the BMDS Deployable X-Band Radar (FBX-T)

Project Hercules Major Program Goals:

- Develop and support integration of algorithms that expand the capability of or enable currently identified Engagement Sequence Groups (ESGs).
- Develop and support integration of algorithms that enable BMDS elements to meet capability identified in the BMDS Test Bed System Specification or in the element specific specifications. Examples of algorithms for element enhancement include C2BMC Global Integrated Fire Control, Space Tracking and Surveillance System (STSS) tracking algorithms and AEGIS discrimination concepts.
- Develop new concepts that enable the definition of new ESGs. Examples of new capability include feature hand-over and clutter mitigation.
- Assess algorithm needs and begin development of concepts that support emerging technology, such as Multiple Kill Vehicle (MKV) and Discrimination Augmentation Devices (DADs).

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

JOINT WARFIGHTER SUPPORT PROGRAM

As a part of the total Ballistic Missile Defense System (BMDS), the Joint Warfighter Support Program (JWSP) is critical to enable Warfighters to work with MDA to define, test, deploy and employ new missile defense Block capabilities; maintain proficiency with current Block capabilities; and provide feedback to the MDA BMDS development process. The JWSP consists of a core set of consistent processes, tailored to the new BMDS capabilities to be deployed in each Block. The JWSP is divided into two-year Blocks to match the evolutionary capability Blocks of the BMDS. The JWSP builds COCOM proficiency in fielded missile defense capabilities, and provides critical operational level feedback directly to MDA development efforts. The JWSP consists of seven primary processes, tailored in scope to the current BMDS Block capabilities as they transition, or near transition to the user.

- BMDS Exercise and Wargames
- Concepts & Plans required to address evolving, emerging and projected Ballistic Missile technology (both defensive and threat oriented).
- BMDS Transition and Logistics planning and development.
- Direct support to the Geographic Combatant Commanders (GCCs).
- BMDS Sustainment & Operations coordination and control through the Missile Defense Operations Center (MOC)
- BMDS Training development for the warfighters
- BMDS System Manager

Ballistic Missile Defense System Manager. Block 2006 will see numerous BMDS capabilities and or asset quantity increases during the FY06-2007 time-frame. These capabilities will be added to each JWSP activity to ensure the Joint Warfighter is properly trained to employ and integrate these capabilities to address the evolving Ballistic Missile threat environments. Among the planned increase scope of the BMDS Block capabilities that will be addressed by the JWSP are:

- Increased numbers of Ground-Base Interceptors at Fort Greely.
- Upgraded Early Warning Radar at Thule, Greenland.
- Additional Forward Based X-Band Radar.
- Additional SM-3 sea-based interceptors and upgraded Aegis cruisers and destroyers.
- Theater High Altitude Area Defense (THAAD) interceptors
- Expanded Link-16 data engagement data sharing between THAAD, PATRIOT, and AEGIS BMDS Elements.

- Implications from the expanded Engagement Sequence Group scope, as new elements and capability is added.
- Expanded upgrades to the BMDS C2BMC planning capabilities.

The JWSP ensures the warfighter and the developer are working together to establish coordinated warfighter and developer system definition, warfighter input to BMDS development and product improvement, required logistics support, and new capability/sustainment training support. It therefore enables the effective introduction of new BMDS capabilities and sustainment, and improved operations of BMDS capabilities previously fielded

Joint Warfighter Support Program Budget Justification and Contribution to the Ballistic Missile Defense System (BMDS) : The Joint Warfighter Support Program contributes to the BMDS by providing the means to integrate the Combatant Commands (COCOMs), the Services, and the Joint Chief of Staff inputs into the plans and processes necessary to define, develop, test, field, operate, and sustain operational BMDS Block capabilities. Further, it enhances warfighter efficiency and the overall effectiveness of the BMDS by building COCOM proficiency in fielded missile defense capabilities, by preparing the COCOMs for near-term Block delivery enhancements and by providing the means for operational level feedback to MDA developers. Additionally, the JWSP provides the only means for the COCOMS to rehearse for and validate all aspects of their BMD missions with both fielded and emerging capabilities.

Joint Warfighter Support Program Major Goals:

- Develop and maintain system level BMDS Training and Education activities not currently performed by the Services
- Produce Concepts and Plans that examine evolving and predicted BMDS capabilities to ensure the BMDS keeps pace with the evolving technical and strategic environment
- Conduct Exercises and Wargames for current and emerging BMDS capabilities that allow user training and feedback to the developer
- Create, develop and coordinate BMDS-wide Integrated Logistics Support policies and procedures for each new BMDS Block
- Provide direct support to the Geographic Combatant Commanders (GCCs) to ensure warfighter participation in applicable exercises, wargaming and training activities
- Provide Ballistic Missile Defense System Manager functions, to ensure proper integration of BMDS capabilities within the Services and Warfighting components. These activities include:
  - Prepare BMDS transfer/transition plans
  - Prepare and update BMDS Activation Plans and Emergency Activation Plan annexes
  - Prepare and update Integrated Service Support Agreements
  - Perform BMDS Operations & Support monitoring and reporting through the MDA Operations Center (MOC) and BMDS Watch Officers.

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

JOINT NATIONAL INTEGRATION CENTER (JNIC)

Joint National Integration Center (JNIC) Program Description: The JNIC is MDA's field operating activity in Colorado Springs, CO. It is both a facility and an organization that supports the execution of Agency missions related to the development and test of the BMDS, and that system's operation by designated COCOMs. The JNIC consists of a highly secure research and development complex and a mission support facility located within a military installation (Schriever AFB) that is adjacent to USNORTHCOM and NORAD.

As a facility supporting MDA efforts, the JNIC hosts and supports the Ground-based Midcourse Defense (GMD)'s Mission Control Center Facility (MCCF) that is utilized for both flight and distributed ground tests; the C2BMC's Integration and Test Centers (BITCs) and Experimentation Laboratories (X-Labs); the Space Tracking and Surveillance System (STSS)'s Missile Defense Space Experimentation Center (MDSEC); the Targets & Countermeasure's JNIC Target Operations Center (JTOC); and the Enterprise Network Operations and Support Center for the Agency's Chief Information Officer (CIO). For the COCOMs, the JNIC provides infrastructure support for USNORTHCOM's C2BMC Support Center (NCSC); USSTRATCOM's Joint Functional Component Command-Integrated Missile Defense (JFCC-IMD); and the Missile Defense Element manned by the 100th Missile Defense Brigade.

As an organization, the JNIC directly supports the execution of the Joint Warfighter Support Program, the Combined Test Force, and MDA's BMDS modeling and simulation effort to develop applications vital to BMDS wargaming and system testing. The JNIC 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 for Engagement Sequence Group (ESG) execution and homeland defense.

The JNIC also provides assured worldwide secure communications connectivity, network health and status monitoring, mission critical restoral capability, and technical expertise for all MDA directed activities and events performed on-site. Additionally, the JNIC functions (within MDA's capabilities-based acquisition strategy) as the only system-level integration and interoperability facility for BMDS fire control; and it provides the physical interface between the developers and the COCOMs.

Joint National Integration Center (JNIC) Program Budget Justification and Contribution to the Ballistic Missile Defense System (BMDS): The JNIC contributes to the BMDS by directly supporting the concept of Concurrent Test and Operations for the BMDS. The JNIC accomplishes this by providing both MDA-level technical/horizontal integration and BMDS-level operational integration.

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

The JNIC provides MDA-level technical/horizontal integration by: developing and operating the models and simulations used to support missile defense planning seminars, wargames, exercises, tests, and analyses; planning and executing the only end-to-end operator-in-the-loop/element-in-the-loop missile defense wargames in support of the Joint Warfighter Support Program; supporting BMDS Engagement Sequence Group (ESG) testing and analysis by operating the Test Execution Control (TEC) for distributed BMDS ground tests as part of the Combined Test Force (CTF)-JNIC; and, providing network operations and information assurance for all on-site integration activities.

The JNIC provides BMDS-level operational integration by: integrating and sustaining the enabling infrastructure, services, and processes that support the operation of designated elements of the BMDS and resident COCOM operations and/or support centers; operating the MDA Technical Support Center (MTSC), which provides technical support for the BMDS Watch Officers (BWOs), BMDS Safety Officers (BSOs), and Information Assurance Officers in their efforts to monitor and assess the health and status of the networks and elements that impact BMDS test and operations; operating the Joint Early Warning Laboratory (JEWL) for anomaly resolution; and supporting the Intelligence Support Center (ISC) for critical situational awareness intelligence on worldwide ballistic missile developments that could affect the development and/or operation of the BMDS.

Joint National Integration Center (JNIC) Major Program Goals:

- Provide the capabilities and services necessary to support the horizontal integration of on-site activities
- Ensure around the clock support and restoral of designated on-site operational activities
- Improve integration/interface with designated COCOM missile defense activities; host/support the headquarters and operations center for USSTRATCOM's Joint Functional Component Command - Integrated Missile Defense (JFCC-IMD)
- Achieve cost effectiveness and efficiencies through the leveraging of existing JNIC infrastructure, services, processes, and expertise to support assigned missions
- Maintain the reliability, availability, and maintainability of mission critical systems

CONCURRENT TEST AND OPERATIONS-DISTRIBUTED MULTI-ECHELON TRAINING SYSTEM (CTO-DMETS)

CTO-DMETS Program Description: The CTO-DMETS consists of live, virtual and constructive training environments for proficiency training, operator certification, wargames and exercises, and Tactics, Techniques and Procedures (TTPs) development, review, testing and revision. The CTO-DMETS will create a wargame-like environment for units to gain training task coverage and achieve other learning objectives by presenting standardized, technically accurate threat scenarios and other problems, faults, and situations that elicit the performance of individual and collective tasks. As MDA continues to develop the BMDS to defend the United States, deployed forces, friends and allies, the spiral development of CTO-

DMETS will keep pace in meeting the continuing need to effectively train the crews, elements, staffs and commanders who execute the evolving BMDS mission.

CTO-DMETS Budget Justification and Contribution to the Ballistic Missile Defense System (BMDS): CTO-DMETS contributes to the BMDS by tying geographically dispersed forces together without the need to co-locate those forces at a central training facility, thus providing both cost savings for the exercise conduct and the added advantage of training how and where the operators would conduct a real-world event.

CTO-DMETS Major Program Goals:

- Provide a training venue separate from the operational system that imitates the operational environment with high fidelity
- Enable the warfighter to train where he fights
- Provide a scaleable system such that training can be conducted encompassing the entire BMDS (National Military Command Center (NMCC) to the Theater), or down to a single COCOM
- Support the development and evaluation of Tactics, Techniques, and Procedures (TTPs) at the BMDS level.

## A.4 Major Events Schedule and Description

| Major Event | Project | Timeframe | Description |
|---|---|---|---|
| **Flight Test** | | | |
| **Hercules** | | | |
| Conduct Real-time flight events | 0902 | 1Q FY 2006 | |
| Conduct Real-time flight events | 0902 | 2Q FY 2006 | |
| Conduct Real-time flight events | 0902 | 3Q FY 2006 | |
| Conduct Real-time flight events | 0902 | 4Q FY 2006 | |
| **Critical Design Review** | | | |
| **Hercules** | | | |
| Conduct CaT and ATT reviews | 0802 | 1Q FY 2006 | |
| Conduct CaT and ATT reviews | 0802 | 2Q FY 2006 | |
| Conduct CaT and ATT reviews | 0802 | 3Q FY 2006 | |
| Conduct CaT and ATT reviews | 0802 | 4Q FY 2006 | |
| Conduct CaT and ATT reviews | 0505 | 1Q FY 2007 | • Conduct at least four (4) ATT and CaT algorithm technical reviews |
| Conduct CaT and ATT reviews | 0505 | 2Q FY 2007 | • Conduct at least four (4) ATT and CaT algorithm technical reviews |
| Conduct CaT and ATT reviews | 0505 | 3Q FY 2007 | • Conduct at least four (4) ATT and CaT algorithm technical reviews |
| Conduct CaT and ATT reviews | 0505 | 4Q FY 2007 | • Conduct at least four (4) ATT and CaT algorithm technical reviews |
| **Other** | | | |

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

| Major Event | Project | Timeframe | Description |
|---|---|---|---|
| **C2BMC Element** | | | |
| Spiral 4.4 Cycle 2 Testing | 0701 | 2Q FY 2005 - 3Q FY 2005 | • Simulation-Based Verification |
| Spiral 4.4 Cycle 5 Testing | 0701 | 3Q FY 2005 - 4Q FY 2005 | • Site Activation Testing |
| Spiral 4.5 Cycle 2 Testing | 0701 | 3Q FY 2005 - 2Q FY 2006 | • Simulation-Based Verification |
| Spiral 4.5 Cycle 5 Testing | 0701 | 1Q FY 2006 - 3Q FY 2006 | • Site Activation Testing |
| Spiral 6.1 Cycle 2 Testing | 0801 | 2Q FY 2006 - 3Q FY 2006 | • Simulation-Based Verification |
| Spiral 6.2 Cycle 2 Testing | 0801 | 1Q FY 2007 - 2Q FY 2007 | • Simulation-Based Verification |
| Spiral 6.2 Cycle 5 Testing | 0801 | 2Q FY 2007 - 3Q FY 2007 | • Site Activation Testing |
| Spiral 6.4 Cycle 2 Testing | 0801 | 3Q FY 2007 - 4Q FY 2007 | • Simulation-Based Verification |
| Spiral 6.4 Cycle 5 Testing | 0801 | 1Q FY 2008 - 2Q FY 2008 | • Site Activation Testing |
| Spiral 8.2 Cycle 2 Testing | 0901 | 3Q FY 2008 - 4Q FY 2008 | • Simulation - Based Verification |
| Spiral 8.2 Cycle 5 Testing | 0901 | 4Q FY 2008 - 1Q FY 2009 | • Site Activation Testing |
| Spiral 8.4 Cycle 2 Testing | 0901 | 3Q FY 2009 - 4Q FY 2009 | • Simulation-Based Verification |
| Spiral 8.4 Cycle 5 Testing | 0901 | 4Q FY 2009 - 1Q FY 2010 | • Site Activation Testing |
| Spiral 10.2 Cycle 2 Testing | 0001 | 3Q FY 2010 - 4Q FY 2010 | • Simulation-Based Verification |
| Spiral 10.2 Cycle 5 Testing | 0001 | 4Q FY 2010 - 1Q FY 2011 | • Site Activation Testing |
| Spiral 10.4 Cycle 2 Testing | 0001 | 3Q FY 2011 - 4Q FY 2011 | • Simulation-Based Verification |
| **Hercules** | | | |
| Integration of algorithms to GMD | 0505 | 1Q FY 2007 - 4Q FY 2007 | • Support integration of Hercules algorithms that support the Target Designation Concept Description that will improve the GMD system capability in the presence of countermeasures.<br>• These algorithms include discrimination, target handover and kill vehicle enhancement algorithms. |

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

| B. Program Change Summary | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Previous President's Budget (FY 2006 PB) | 383,830 | 455,152 | 509,982 |
| Current President's Budget (FY 2007 PB) | 384,935 | 388,830 | 506,840 |
| Total Adjustments | 1,105 | -66,322 | -3,142 |
| Congressional Specific Program Adjustments | 0 | -60,500 | 0 |
| Congressional Undistributed Adjustments | 0 | -5,822 | 0 |
| Reprogrammings | 7,152 | 0 | 0 |
| SBIR/STTR Transfer | -6,047 | 0 | 0 |
| Adjustments to Budget Years | 0 | 0 | -3,142 |

The FY05 budget request for Ballistic Missile Defense Products was increased by $1.105M from FY06 PB to FY07 PB. This was a result of $6.047M reduction for the SBIR/STTR Transfer and a $7.152M increase in support of Reprogrammings based on Agency priorities.

The FY06 budget request for Ballistic Missile Defense Products was reduced by $66.322M from FY06 PB to FY07 PB. This was a result of a $60.5M reduction for Congressional Specific Program Adjustments; $30M for C2BMC National Team Unjustified Program Growth; $25M for Joint Warfighter Unjustified Program Growth; and $5.5M for Hercules Premature Request for Block 2010. The FY06 budget request was also reduced by $5.822M as a result of Congressional Undistributed Adjustments.

The FY07 budget request was reduced by $3.142M from FY06 PB to FY07 PB includes adjustments to accommodate current MDA priorities and achieve overhead/infrastructure reductions.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0701 Command and Control, Battle Management and Communications (C2BMC) Block 2004 | 152,217 | 65,524 | 53,526 | 292 | 0 | 0 | 0 |
| RDT&E Articles Qty | 9 | 2 | 0 | 0 | 0 | 0 | 0 |

*Note: RDT&E Articles: FY05 - Spiral 4.4; 3 Full C2BMC Suites; 2 Web Browsers; 3 Laptop Planners. FY06 - Spiral 4.5; Forward Based X-Band Radar-Transportable (FBX-T) C2BMC Shelter/Equipment (Communications Node)*

**A. Mission Description and Budget Item Justification**

In collaboration with the Missile Defense Agency's Systems Engineering and Integration defined Ballistic Missile Defense System (BMDS) 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 potential ballistic missile threats; directing weapons to engage via a distributed network; and, pairing appropriate sensor with the appropriate weapon system to defeat ballistic missile threats at any range, in any phase of flight, in all theaters, and with coalition partners. The C2BMC Program delivers continually increasing capabilities via hardware, software, and operations and sustainment support in two-year Blocks.

The Block 2004 C2BMC Program delivers the rudimentary foundation for integrated, layered defense for initial defense against a rogue threat or accidental ballistic missile launch. Block goals are to deliver:

- Basic deliberative/crisis action planning capability
- Common situational awareness capability/displays at the Combatant Commands (COCOMS) and National Military Command Center (NMCC)
- Initial sensor management of the Forward Based X-Band Radar - Transportable (FBX-T)
- Redundant communication/data paths and connections to Ground Based Missile Defense (GMD) and Aegis BMD
- Engagement Sequence Groups (ESG) involving Ground Based Interceptor (GBI), Standard Missile 3 (SM-3), Cobra Dane Upgraded Early Warning Radar, SPY-1 Sensor, and FBX-T.

C2BMC ELEMENT

The C2BMC Element includes program management and the hardware/software engineering necessary to accomplish Block objectives by balancing the development of its four product lines: Situational Awareness, BMD Planner, Battle Management, and Network. This approach ensures that mature capabilities can be integrated and incrementally delivered to the warfighter. Multiple incremental deliveries, or Spirals, are planned in Block

2004. Each spiral represents an improvement in capability and functionality over the previous spiral. The delivery of these Spirals includes the software, hardware, network connectivity, and operations and sustainment support 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. The C2BMC Element also includes development and post analysis support for BMDS-level wargames and tests of fielded Spirals.

The BMD Planner and Situational Awareness architecture is based on several design features emphasizing scalability and interoperability. The architecture is designed to utilize an open system approach. This approach also provides an evolution path for technology upgrades. This architecture is also designed to be scalable and utilizes a multi-vendor enterprise. The BMD Planner emphasizes planning for both theater and global missile defense through all planning phases: deliberate, crisis and execution. It will provide the capability to coordinate with all weapon system elements in a collaborative 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 in future Blocks to a network-centric (vice point to point) planner to ensure both vertical and horizontal collaboration. Block 2004 development includes the following BMD Planner and Situational Awareness capabilities: basic force level BMD planning capability; planning load robustness that protects against incomplete/inaccurate planning data; initial external Extensible Machine Language (XML) interface with Air and Missile Defense Work Station (AMDWS) planner; sensor management display (FBX-T Sensor), Integrated Ballistic Missile Picture (IBMP), BMDS Summary Screen (SS), and Executive Displays (displays all BMDS track and status data). Situational Awareness capability is further enhanced with the introduction of initial Protection Capability (PROCAP) which allows the operator to visually see status and capabilities of BMD assets, and integrates missile warning and missile defense information eliminating the need for the operator to mentally merge data. Remote situational awareness is also provided to the United Kingdom.

Battle Management comprises the decisions and actions executed in direct response to the activities of enemy forces. In Block 2004, the battle management portion of C2BMC is focused at the Combatant Commands (COCOMs) Headquarters and 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. In addition, track data management capability is improved to include forwarding of FBX-T tracks to Ground Based Missile Defense Fire Control (GFC) via fiber and satellite and to Aegis BMD via Link 16 using the Air Defense System Integrator (ADSI), and track filtering and launch event association improving the battlespace depiction and targeting information for BMDS weapon systems.

The Network Communications portion of C2BMC ensures all components of the BMDS are operating on the BMD network. 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 and GMD ESGs, Joint Range Extension to convert Satellite Communications (SATCOM) formatted messages to land line messages to interface with the rest of the BMDS, initial network monitoring and management, Communications Network Equipment (CNE) auto-failover to prevent system outages, network operations and security center (NOSC) at the Joint Functional Component Command for Integrated Missile Defense (JFCC IMD) in Colorado Springs, CO for remote monitoring of the network, and support of dual redundant suites.

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. The key test event for development is completion of Cycle 2, Simulation-Based Verification, when software completes internal C2MBC development and begins integration testing with other BMDS elements. Block 2004 matured products are integrated in Spirals 4.1 through 4.5 and delivered to the field for concurrent developmental testing and operational use in conjunction with the schedules and guidance of MDA's Responsible Test organization/Responsible Engineering Organization (REO/RTO). Completion of Cycle 5 testing, Site Activation Testing, signals delivery of fully functioning operational software. 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 focused on developing the Initial Defensive Operations (IDO) capability, and is updated with Spiral 4.4 which incorporates high priority user fixes. Block 2004 is completed with the development and delivery of Spiral 4.5, which aligns with the GMD Block 4B configuration.

SITE ACTIVATION

The C2BMC program delivers both Spiral software and operational hardware/capabilities to the Combatant Commands at NORTHCOM, STRATCOM and PACOM, and within the National Capital Region to provide BMDS operations. Hardware/capabilities consist of Enterprise Workstations Stations (warfighter display monitors and access to C2BMC planner, situation awareness and battle manager capabilities), servers, processors, and communications racks and equipment (up to 8 racks of equipment per C2BMC suite in Block 2004), situational awareness web browsers, and video distribution equipment. Additionally, Block 2004 site activation includes the procurement and deployment of a C2BMC FBX-T shelter (with 9 racks of equipment) in Japan, as well as extending situational awareness screens to the United Kingdom. These international deployments enable BMDS global reach.

INTEGRATION AND TEST ENVIRONMENT

The C2BMC Program developed and maintains an Element Test Environment at the Joint National Integration Center (JNIC) on Schriever AFB, CO for software integration testing and verification, system exercises, and operational support. The JNIC hosts four C2BMC integration and testing

centers (BITC), and the C2BMC-Experimental Laboratory (C2BMC X-Lab). 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; wargaming and BMDS-level ground and flight tests; and C2BMC operations and maintenance, licenses and upgrades for the BITC and C2BMC-X laboratories. The use of these facilities is essential to testing the integration of C2BMC products with other BMDS elements and to enable the warfighter to make input into their use.

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; Daily network operations and security support for the C2BMC system as part of a transition plan; and prime contractor “Over-the-shoulder” support to users when requested, or alternatively, via the Help Desk. The Help Desk is located in Colorado Springs, CO and 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. Maintenance of the C2BMC includes both software and hardware maintenance and sustaining engineering. Sustaining engineering consists of network and development engineering in support of system anomalies. Operations and Support also includes the procurement of communications lines from the Defense Information Service Agency (DISA), as well as fielding and maintaining, Communications Nodal Equipment (CNE), to include the Joint Range Extension (JRE) equipment, which enables a global network grid.

**B. Accomplishments/Planned Program**

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| C2BMC Element | 101,376 | 24,612 | 3,010 |
| RDT&E Articles (Quantity) | 1 | 1 | 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, and development support of fielded hardware and software.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

FY05 Accomplishments:
FY05 RDT&E Articles: Spiral 4.4

- Delivered, through Cycle 5 Fielding and Test, Spiral 4.4 (RDT&E Article) providing high priority fixes to Spiral 4.3 based on warfighter feedback and operational experience
- Completed Spiral 4.5 Cycle 2, Simulation Based Verification Testing

FY06 Planned Program:
FY06 RDT&E Articles: Spiral 4.5

- Deliver Spiral 4.5 (RDT&E article) providing:
  - Situational Awareness
    - Forward Based X-Band Radar - Transportable (FBX-T) Sensor Management Display
    - FBX-T added to Integrated Ballistic Missile Picture (IBMP), Summary Screen (SS), and Executive Screens
    - Protection Capability (PROCAP) Display
    - Missile Warning/Missile Defense Integrated Display
    - Situational Awareness to United Kingdom
  - Ballistic Missile Defense (BMD) Planner
    - Improved User Interface
    - Performance Enhancements
  - Battle Management
    - FBX-T Sensor Control/Monitor
    - Sensor Tasking for FBX-T
    - Track Forwarding FBX-T data to Ground-based Midcourse Defense (GMD) Fire Control/Ground Based Interceptor (GFC/GBI)
    - Track Forwarding FBX-T data via Link 16 Reporting Responsibility (R2) messages
  - Network
    - Communications Nodal Equipment (CNE) Auto Failover
    - Move of the Network Operations and Security Center (NOSC) to Joint Functional Component Command - Integrated Missile Defense (JFCC-IMD) at the Joint National Integration Center (JNIC)
    - Remote connectivity of situational awareness to the United Kingdom

- Link 16 messages to Aegis and other Link-16 enabled and connected systems via Air Defense System Integrator (ADSI)
- 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 System Modification Requests (SMR's)
- Support BMDS-level tests and post analyses involving Spiral 4.5

FY07 Planned Program

- Design, develop, and test fixes to resolve SMRs
- Support BMDS-level tests and post analyses involving Spiral 4.5

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| C2BMC Site Activation | 9,100 | 8,505 | 0 |
| RDT&E Articles (Quantity) | 8 | 1 | 0 |

Site Activation efforts address fielding of the C2BMC capabilities (both full and remote suite configurations), Communications Gateways, and 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 preparing Site Activation Plans and Site Installation Documents. The second task is to provide activation support, including equipment procurement, staging and inventory control.

FY05 Accomplishments:
FY05 RDT&E Articles: 3 Full C2BMC Suites, 2 Web Browser, 3 Laptop Planners

- Installed second full STRATCOM Suite (RDT&E Article)
- Installed second full NORTHCOM Suite (RDT&E Article)
- Installed first full PACOM Suite (RDT&E Article)
- Installed National Capital Region Browser (RDT&E Article)
- Provided BMDS Situational Awareness capability to the United Kingdom
- Delivered FBX-T C2BMC capability/shelter (Communications Node) to Vandenberg AFB for FBX-T testing
- Installed 14th Air Force Web Browser (RDT&E Article)
- Provided CENTCOM, JFCC-IMD, and 7th Fleet Laptop Planners (RDT&E Articles)

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

FY06 Planned Program
FY06 RDT&E Article: FBX-T C2BMC Shelter/Equipment (Communications Node)

- Deliver and Install FBX-T C2BMC Shelter/Equipment (Communications Node) in Japan (RDT&E Article)
- Field Air Defense System Integrator (ADSI) enabling passage of BMD threat tracks to via Link 16

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Integration and Test Environment | 24,670 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The Joint National Integration Center (JNIC) is host to four C2BMC Integration and Testing Centers (BITC) and the C2BMC-Experimental Laboratory (C2BMC X-Lab). 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; C2BMC support of BMDS level wargames, ground tests, and flight tests; C2BMC Operations & Maintenance, Licenses and Upgrades for the BITC and C2BMC-X laboratories.

FY05 Accomplishments:

- Spiral 4.4 and Spiral 4.5 Cycle 3, Integration testing
- Upgraded Test Environment and the C2BMC Test Article Simulation Environment
- Continued support in development of C2BMC Concept of Operations
- Upgraded Communication Network Equipment (CNE) for BITC Lab Spiral 4.3
- Continued full schedule of C2BMC-X Events and Experimentation
- Began build-out of BITC-4 to increase testing capacity
- Added new Communications and Connectivity, C4I Tools
- Completed 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

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
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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** |

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Operations and Support | 17,071 | 32,407 | 50,516 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Operations and Support procedures are in place for all fielded Block 2004 hardware and software. 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.

FY05 Accomplishments:

- Established on-site support team at PACOM
- Provided on-site C2BMC operations and sustainment support of Fielded Sites at STRATCOM and NORTHCOM
- Maintained Help Desk at JNIC
- Provided C2BMC Operator training
- Updated Integrated Logistic Support Plan (ILSP) and Contractor Logistics Support Plan (CLSP)
- Initiated movement of Network Operations and Security Center from STRATCOM to JFCC-IMD
- Provided communications circuits for fielded C2BMC locations
- Provided sustaining engineering support for fielded hardware and software
- Identified and addressed data latency issues

FY06 Planned Program:

- Establish on-site support for FBX-T C2BMC shelter/capability and communications in Japan
- Continue on-site C2BMC Support of Fielded Sites (NORTHCOM, STRATCOM, PACOM, JNIC, National Capital Region) for Block 2004 fielded capabilities
- Continue to maintain Help Desk at JNIC for Block 2004 fielded capabilities
- Continue C2BMC Operator training for Block 2004 fielded capabilities
- Continue Support of Network Operations Security Center at JFCC-IMD
- Continue to provide and support communications circuits for fielded C2BMC locations
- Continue to provided sustaining engineering support for Block 2004 fielded hardware and software

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
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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** |

FY07 Planned Program:

- Continue on-site C2BMC Support of Fielded Sites for Block 2004 fielded hardware and software
- Continue to maintain Help Desk at JNIC for Block 2004 fielded capabilities
- Continue C2BMC Operator training for Block 2004 fielded capabilities
- Continue to provide and support communications circuits for fielded C2BMC locations
- Continue to provided sustaining engineering support for fielded hardware and software

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
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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 |

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## D. Acquisition Strategy

The Command and Control Battle Management and Communications (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 operations and sustainment support of the C2BMC prototype. They perform development and testing of C2BMC products in Arlington VA, Huntsville AL, and Colorado Springs CO and provide on-site operations and maintenance support, as well as Defense Information Systems Agency (DISA), for fielded C2BMC capabilities in Nebraska, Colorado, Hawaii, Virginia and Japan. C2BMC Program Office government, Federally Funded Research Development Center/University Affiliated Research Centers (FFRDC/UARC), and Scientific Engineering and Technical Assistance (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 2006 |
|---|---|
| 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 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(I)/ Col. Springs, Co | 26,293 | 8,122 | 1/2Q | 993 | 1Q | 35,408 |
| C2BMC HW/SW Development, I&T | SS/CPAF | MDNTB(I)/ Huntsville, AL | 8,022 | 1,231 | 1/2Q | 151 | 1Q | 9,404 |
| C2BMC Product Engineering & Development | SS/CPAF | MDNTB(I)/ Arlington, VA | 41,548 | 15,259 | 1/2Q | 1,866 | 1Q | 58,673 |
| EW/CEW; GCCS; JDP; JRE; ISC2; SBIRS-DSP; PATRIOT-JTAGS | | Services, DISA, Agencies/ Various | 50,609 | 0 | N/A | 0 | N/A | 50,609 |
| Federally Funded Research Development Center | SS/CPAF | MITRE, IDA, ORNL, MIT/LL/ Washington, DC | 13,419 | 0 | N/A | 0 | N/A | 13,419 |
| Scientific Engineering and Technical Assistance | SS/CPFF | Sparta/CSC/ MDA HQ, Arlington, VA | 12,369 | 0 | N/A | 0 | N/A | 12,369 |
| Scientific Engineering and Technical Assistance | SS/CPFF | Booze Allen Hamilton/ MDA HQ, Arlington, VA | 737 | 0 | N/A | 0 | N/A | 737 |
| **C2BMC Site Activation** | | | | | | | | |
| Suites and Comms Gateways | SS/CPAF | MDNTB(I)/ Various COCOMS | 23,044 | 8,505 | 1/2Q | 0 | N/A | 31,549 |
| **Integration and Test Environment** | | | | | | | | |
| Integration & Test | C/FFP | Northrop Grumman Mission Sys/ Colorado Springs, CO | 33,790 | 0 | N/A | 0 | N/A | 33,790 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Lab Development | SS/CPAF | MDNTB(I)/ Washington, DC | 8,030 | 0 | N/A | 0 | N/A | 8,030 |
| **Operations and Support** | | | | | | | | |
| Unit Personnel, Cont System Improv, Sustaining Suppt | SS/CPAF | MDNTB(I) | 16,848 | 23,962 | 1/2Q | 41,780 | 1Q | 82,590 |
| Indirect Support | MIPR | Various COCOMS | 9,965 | 3,645 | 1/2Q | 3,715 | 1Q | 17,325 |
| Unit Operations - Circuit Costs | MIPR | DISA | 0 | 4,800 | 2Q | 5,021 | 1Q | 9,821 |
| Subtotal Product Development | | | 244,674 | 65,524 | | 53,526 | | 363724 |

**Remarks**

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 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<br>**February 2006** |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>**RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE<br>**0603889C Ballistic Missile Defense Products** |

## IV. Management Services Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 | | | 244,674 | 65,524 | | 53,526 | | 363,724 |

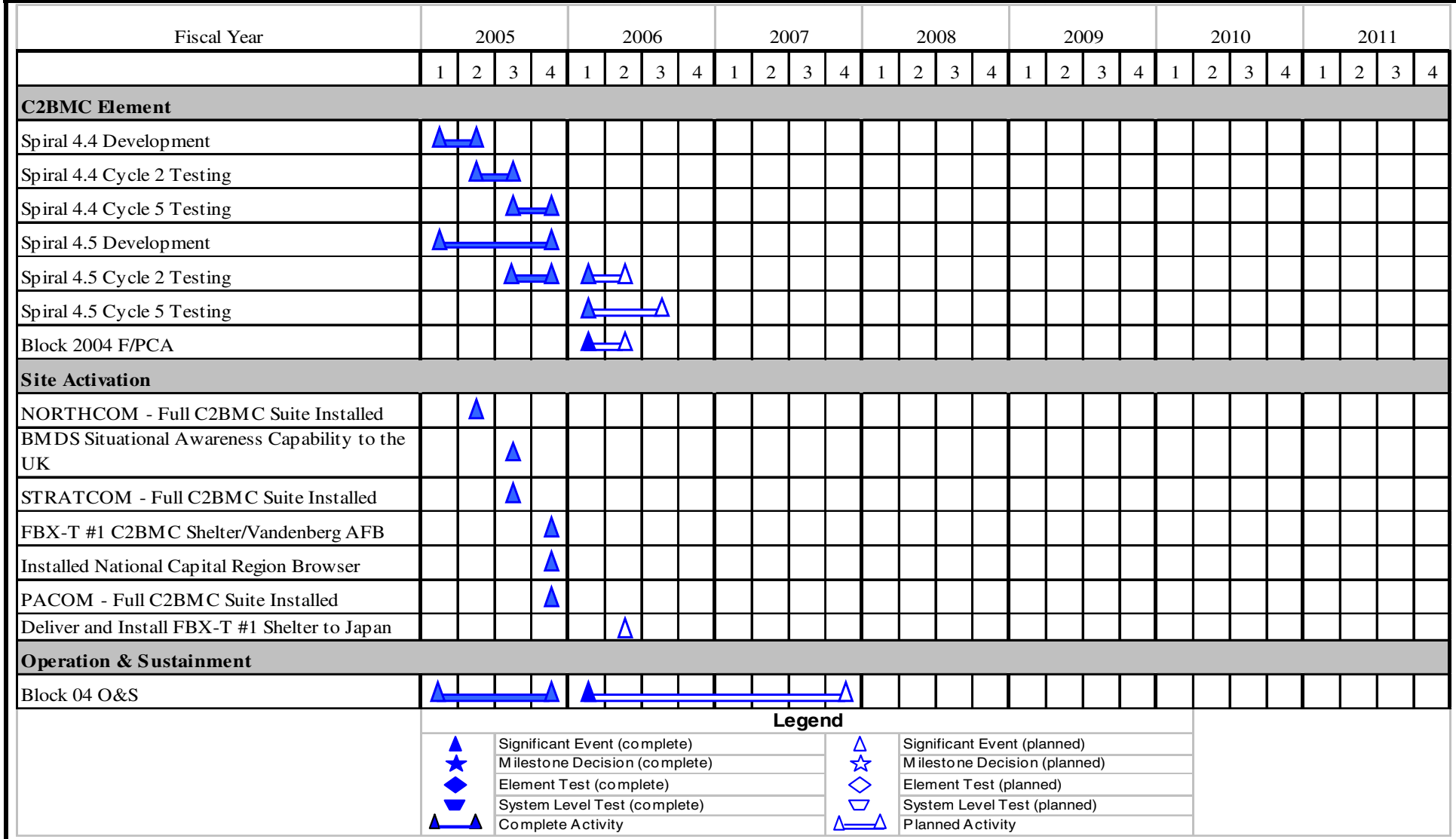
**Remarks**

**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date: **February 2006**

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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **C2BMC Element** | | | | | | | |
| Spiral 4.4 Development | 1Q-2Q | | | | | | |
| Spiral 4.4 Cycle 2 Testing | 2Q-3Q | | | | | | |
| Spiral 4.4 Cycle 5 Testing | 3Q-4Q | | | | | | |
| Spiral 4.5 Development | 1Q-4Q | | | | | | |
| Spiral 4.5 Cycle 2 Testing | 3Q-4Q | 1Q-2Q | | | | | |
| Spiral 4.5 Cycle 5 Testing | | 1Q-3Q | | | | | |
| Block 2004 F/PCA | | 1Q-2Q | | | | | |
| **Site Activation** | | | | | | | |
| NORTHCOM - Full C2BMC Suite Installed | 2Q | | | | | | |
| Provided 7th Fleet Laptop Planner | 2Q | | | | | | |
| BMDS Situational Awareness Capability to the UK | 3Q | | | | | | |
| NCR - Web Browser Installed | 3Q | | | | | | |
| STRATCOM - Full C2BMC Suite Installed | 3Q | | | | | | |
| FBX-T #1 C2BMC Shelter/Vandenberg AFB | 4Q | | | | | | |
| Installed National Capital Region Browser | 4Q | | | | | | |
| PACOM - Full C2BMC Suite Installed | 4Q | | | | | | |
| Provided CENTCOM and JFCC-IMD Laptop Planner | 4Q | | | | | | |
| Deliver and Install FBX-T #1 Shelter to Japan | | 2Q | | | | | |
| **Operation & Sustainment** | | | | | | | |
| Block 04 O&S | 1Q-4Q | 1Q-4Q | 1Q-4Q | | | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0801 Command and Control, Battle Management and Communications (C2BMC) Block 2006 | 26,791 | 136,282 | 176,735 | 102,687 | 56,703 | 283 | 0 |
| RDT&E Articles Qty | 0 | 8 | 7 | 1 | 0 | 0 | 0 |

*Note: RDT&E Articles: FY06 - 3 Web Browsers; 2 Enterprise Workstations (EWS); 1 Communications Node; 2 C2BMC Laptop Planners. FY07 - Spiral 6.2; 1 Full C2BMC Suite; 1 Communications Node; 3 Upgraded C2BMC Suites; GIFC at PACOM FY08 - Spiral 6.4*

## 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 (Ballistic Missile Defense [BMD] Planner), see it unfold (Situation Awareness), and dynamically direct/adjust BMD 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 by combining the best sensor information with the most efficient weapon from complimentary weapons systems, which, individually, provide only limited area protection.

Today, the center of gravity for C2BMC is at the Combatant Command (COCOM) Headquarters, where BMD mission planning and situational awareness is focused. All processing is performed at STRATCOM, NORTHCOM, and PACOM, and users of the system are either collocated with, or directly connected to the equipment suites at these COCOMs. As the system evolves from Block 2004 through Block 2006 to Block 2008, the center of gravity will shift from the COCOMs to the Air Operations Centers (AOCs) and supporting Service Components, where real-time automated battle management will be introduced and deployed. Development of this Area of Operational Responsibility (AOR)-centric enterprise architecture will allow C2BMC workload to be focused on the Battle in front of the Warfighter, through the deployment of Global Integrated Fire Control(GIFC)/Advanced Battle Management (ABM) functions within the Area Air Defense Commander's staff while also providing global situational awareness at the COCOM Headquarters. Together, these separate capabilities enable integrated support of prioritized theater, regional, and homeland defense missions. To accomplish this shift in the center of gravity and meet the C2BMC mission objective of any sensor, any weapon, any threat, in any phase of flight, the C2BMC program of work in Block 2006 includes concentrated effort on developing complimentary C2BMC system capabilities (global BMD planning and situational awareness at the COCOM Headquarters and GIFC, based on dependable, trusted software at the AOC) for initial deployment by the end of the Block.

In Block 2006, the C2BMC program will deliver to the warfighters the foundation for an integrated, layered defense against a rogue threat or accidental ballistic missile launch. Block goals are to deliver:

- Improved C2BMC system reliability and availability
- Initial GIFC capability at the Air Operations Center - founded on dependable, trustworthy software development
- Enhanced situational awareness and command and control at the COCOM headquarters
- High availability, redundant communications
- Engagement Sequence Groups (ESG) that involve the Ground Based Missile Defense Interceptor, Aegis BMD, Standard Missile 3 (SM-3) and Army/Navy/Surfaced phased array system (AN/SPY-1) Radar, Terminal High Altitude Area Defense (THAAD) Interceptors, Forward Based X-Band Radar - Transportable (FBX-T), and Space Based Infrared Sensor (SBIRS)

C2BMC ELEMENT

The C2BMC Element accomplishes Block objectives by designing, developing, and delivering enhanced and new capabilities from its four product lines: BMD Planner, Situational Awareness, GIFC/Battle Manager, and the BMDS Network. Two major deliveries, or Spirals, are planned in Block 2006. Each spiral, 6.2 and 6.4, represents an improvement in capability and functionality over their predecessor spiral. The delivery of these Spirals includes the software, and the hardware and network connectivity, needed to operate an integrated BMDS. The C2BMC Element also includes development support and post analysis for BMDS-level wargames and tests with fielded Spirals.

The BMD Planner and Situational Awareness (SA) 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 BMD Planner 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 BMD Planner will provide strategic and theater commanders 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 theater 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. Situational Awareness emphasizes a common, Single Integrated Ballistic Missile Picture (IBMP) 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. Block 2006 BMD Planner enhancements include reengineering the Priority Defense Accession List from the Spiral 4.5 Planner to improve efficiency and usability, and, providing the ability to create planning sequels and branches, as well as planning merge and unmerge functions to improve warfighter ability to create or improve positioning of BMD assets. Situational Awareness improvements include executive summary screen enhancements to include GIFC situational awareness interaction with COCOM Headquarters, additional critical

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battlespace information, and, improved ability to organize and mange information for the National Military Command Center (NMCC) and senior civilian leadership.

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Battle Management, consisting of the Global Integrated Fire Control (GIFC) for the Air Operations Center (AOC) or service component, provides the user the ability to dynamically adjust BMD sensors and weapon systems to meet real-time threats. GIFC focuses on both the theater battle and the strategic battle and, in the Block 2006 timeframe, allows the warfighter to optimally use the FBX-T in conjunction with Aegis BMD in the PACOM area of Operations. GIFC, based on advanced battle management software development exhibits highly predictable system behavior, is fault -tolerant of runtime errors, and provides trustworthy battle-management operations. The GIFC 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 GIFC, based on dependable and trusted software development, offers the following benefits: (1) predictable battle management behavior for those weapon systems and sensors interfaced, (2) rapid insertion of new or updated capabilities due to component-based software engineering, (3) software that meets real-time deadlines in the BMD battlespace and (4) automated test oracles and continuous test processes that increase specification testing coverage, reduce software coding rework, and streamline element integration and fielding. By the end of Block 2006, the GIFC will provide FBX-T resource management, evaluate/merge tracks from FBX-T, SPY-1, and a single source early warning sensors, and provide weapons system - target assignment for high probability of defeating ballistic missile threats.

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 equipment platforms, interfaces with other DoD communications systems and existing/evolving information standards and capabilities. In Block 2006 the Network aspect of C2BMC will: provide initial Network Centric Enterprise Services (NCES) capabilities, starting with centralized detailed network performance monitoring and cryptographic device management, which will evolve to full Quality of Service (QoS) network monitor to ensure messages and communications are properly routed to avoid bottlenecks. Network development also includes development and fielding of a Parallel Staging Network (PSN) which allows new software Spirals to be developed, tested, and operationally checked out on fielded communications and C2BMC equipment prior to switching over operational use. The PSN assures the operator higher availability of the operational system while continuing development on the parallel system. Once the warfighter accepts the developmental system, with new spiral software, as being operationally ready, it is switched over to operational use and old operational software is turned over to development for the next generation of software. This capability enables concurrent operations and test and seamless transition of new C2BMC capabilities to the warfighter.

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 deliver the hardware and software required to provide a system-wide integrated BMD capability. The key test event for development is completion of Cycle 2, Simulation-Based Verification, when software completes internal C2MBC development and begins

integration testing with other BMDS elements. Block 2006 matured products are integrated in Spirals 6.2 and 6.4 then delivered to the field for concurrent development testing and operational use in conjunction with Responsible Test Organization (RTO), Responsible Engineering Organization (REO), and Aegis BMD and Ground-based Midcourse Defense (GMD) schedules and guidance. Completion of Cycle 5 testing, Site Activation Testing, signals delivery of fully functioning operational software. Spiral 6.2 is the initial delivery of Block 2006 capability with the primary focus on improved reliability and availability. Spiral 6.4 delivers complete Block 2006 capability with a focus on the initial fielding of a Global Integrated Fire Control (GIFC) at the PACOM AOC.

SITE ACTIVATION

In addition to Block 2006 spiral software, fielding capability also includes installation and activation of C2BMC capabilities at United States Forces Korea (USFK), United States Forces Japan (USFJ), EUCOM, Cheyenne Mountain Operations Center (CMOC), and PACOM Air Operations Center, as well as equipment upgrades at STRATCOM, NORTHCOM and PACOM. Additionally, PACOM will receive a second C2BMC equipment suite. C2BMC fielding at these locations results in improved capability of the BMDS to meet global threats.

INTEGRATION AND TEST ENVIRONMENT

The C2BMC Program developed and maintains an Element Test Environment at the Joint National Integration Center (JNIC) on Schriever AFB, CO for software integration, testing and verification, system exercises, and operational support. The JNIC hosts four 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; participation in BMDS wargames and ground and flight tests; and, C2BMC operations and maintenance, licenses and upgrades for the BITC and C2BMC-X laboratories. The use of these facilities is essential to testing the integration of C2BMC products with other BMDS elements and involving the warfighter in fleshing out operational techniques and issues.

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; Daily network operations and security support for the

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C2BMC system as part of a transition plan; Prime contractor "Over-the-shoulder" support to users when requested, or alternatively, when they contact the Help Desk. The Help Desk is located in Colorado Springs, CO and 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. Maintenance of the C2BMC includes both software and hardware maintenance and sustaining engineering. Sustaining engineering consists of network and development engineering in support of system anomalies. Operations and Support also includes the procurement of communications lines from the Defense Information Service Agency (DISA), as well as fielding and maintaining, Communications Nodal Equipment (CNE), to include the Joint Range Extension (JRE) equipment, which enables a global network grid.

**B. Accomplishments/Planned Program**

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| C2BMC Element | 26,791 | 118,345 | 148,764 |
| RDT&E Articles (Quantity) | 0 | 0 | 1 |

The C2BMC Element accomplishes block objectives by balancing the development of the four principle product lines (Situational Awareness, Ballistic Missile Defense (BMD) Planner, Global Integrated Fire Control (GIFC)/Battle Management, and Network) so that mature capabilities can be integrated and incrementally delivered to the warfighter. Two incremental deliveries, or Spirals, are planned in Block 2006.

FY05 Accomplishments:

- Approved Spiral 6.1 (A minor maintenance spiral which will be incorporated into Spiral 6.2) and Spiral 6.2 Content Agreement
- Completed GIFC/Advance Battle Management Increment 0 as proof of concept for dependable, trustworthy software development process
- Began Spiral 6.1 and 6.2 design and development
- Began Spiral 6.4 definition

FY06 Planned Program:

- Complete GIFC/Advanced Battle Management Increment 1
- Approve Spiral 6.4 Content Agreement
- Begin Spiral 6.4 design and engineering development
- Complete Spiral 6.1 Development and Cycle 2 (Simulation Based Verification) Testing
- Conduct Spiral 6.2 Verification Readiness Review (VRR)
- Begin Spiral 6.2 Software Development

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FY07 Planned Program:
FY07 RDT&E Articles: Spiral 6.2

- Deliver Spiral 6.2 (RDT&E article) with the following capabilities:
  - BMD Planner
    - Reengineer Priority Defense Accession List (PDAL) from Spiral 4.5
    - Planning sequels and branches
    - Plan merge/unmerge
  - Battle Management
    - Forward Based X-Band Radar - Transportable (FBX-T) Sensor Management
    - Limited Cross-Network Correlation (includes FBX-T)
  - Situation Awareness
    - Executive Summary Screen Enhancements
    - Initial use of Multi-Hypothesis Correlator (MHC)/BMDS Launch Event Association -Global Vision (BLEA-GV)
  - Network
    - Auto CNE Failover
    - Synchronized Data between Combatant Commands (COCOMs) (includes Operations Capability or OPSCAP)
    - Initial Network Quality of Service (QoS)
    - AEGIS Extremely High Frequency (EHF), United States Forces Japan (USFJ), United States Forces Korea (USFK) Connectivity
    - Initial Network Centric Enterprise System (NCES)
- Begin engineering and complete Cycle 2 (Simulation Based Verification) of Spiral 6.4 with focus on reliability and availability, GIFC and BMDS System Specification capabilities.
  - Spiral 6.4 capabilities include:
    - BMD Planner
      - Use of PDAL for planner information
    - Situational Awareness
      - GIFC Situation Awareness interaction with COCOM BMD Planner and Situational Awareness Suites
    - Global Integrated Fire Control/Battle Management
      - Deliver Increments 1 and 2
      - Initial GIFC at PACOM Air Operations Center (AOC)

- FBX-T CR-1/CR-2 Interface Capability
- Limited sensor netting
- Weapons/Target pairing with Aegis BMD
- Weapons/Target handover with GMD Fire Control

- Network
  - Full Quality of Service Network Monitoring
  - Improved system monitoring
  - Improved message handling reliability, throughput with degraded network

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Site Activation | 0 | 2,816 | 27,971 |
| RDT&E Articles (Quantity) | 0 | 8 | 6 |

Block 2006 Site Activation efforts will continue to address the fielding and upgrade of all C2BMC associated hardware and software (Suites, Enterprise Workstations (EWS), Web Browsers, and Communications Equipment) which enable the warfighter to plan, see, and manage the ballistic missile defense battle.

FY06 Planned Program:
FY06 RDT&E Articles: 3 Web Browsers, 2 EWS, 1 Communications Node; 2 C2BMC Laptop Planners

- USFK, USFJ and EUCOM Web Browsers (RDT&E Articles)
- PACOM and CMOC AOC Enterprise Work Stations (RDT&E Articles)
- Communications Node (routers, crypto, communications equipment) for EHF and DCSC in Hawaii (RDT&E Article)
- EUCOM and JFCC-IMD Laptop Planners (RDT&E Articles)

FY07 Planned Program:
FY07 RDT&E Articles: Full C2BMC Suite, 3 Upgraded C2BMC Suites, 1 Communications Node, GIFC at PACOM

- PACOM second full C2BMC equipment suite (RDT&E Article)
- C2BMC suite, gateway, and remote workstation upgrades (increased capacity processors) at STRATCOM, PACOM and NORTHCOM (RDT&E Articles)

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- Second Communications Node (routers, crypto, communications equipment) in Japan (RDT&E Article)
- GIFC hardware at PACOM AOC (RDT&E Article)

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Integration and Test Environment | 0 | 15,121 | 0 |
| RDT&E Articles (Quantity) | 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; support conduct of BMDS level wargames and ground and flight tests; C2BMC Operations & Maintenance, Licenses; and, Upgrades for the BITC and C2BMC-X laboratories.

FY06 Planned Program:

- Complete BITC-4 build-out to increase BMDS level and systems integration test capacity
- Support continued Block 04 BMDS-level tests, wargames, and exercises
  - Missile Defense Integration Exercises (MDIE) GT 04-1a, GT 04-1b, GT 04-2b
  - Integrated Missile Defense War Games (IMD WG) 04-5
  - Distributed Ground Test (DGT) GT 04-2a,
  - GMD Flight Test FTG-2
  - Aegis Flight Test FTM 04-3
  - Patriot Flight Test PAC 2 GEM ATM-46
- C2BMC-X Events and Experimentation for Block 06 including support of :
  - Integrated Missile Defense War Games (IMD WG) 06-1, and 06-2
  - Integrated Ground Test (IGT) 06-1Distributed Ground Test (DGT) DGT 06-1
  - GMD Flight Test FTG-3
  - Aegis Flight Test FTM 06-1
  - Patriot Flight Test PAC 2 GEM P6-4
  - 6.2 Cycle 3 Testing
- Upgrade Test Environment and the C2BMC Test Article Simulation Environment
- Continue support of C2BMC Concept of Operations
- Upgrade Communication Network Equipment (CNE) for C2BMC Integration and Test Center (BITC) Lab Spiral 6.2

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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 |

- Continue C2BMC-X Events and Experimentation

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603889C Ballistic Missile Defense Products |

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

**D. Acquisition Strategy**

The Command and Control, Battle Management and Communications (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 operations and sustainment support of the C2BMC prototype. They perform development and testing of C2BMC products in Arlington VA, Huntsville AL, and Colorado Springs CO and provide on-site operations and maintenance support for fielded C2BMC capabilities in Nebraska, Colorado, Hawaii, Virginia, Florida, Germany and Japan. C2BMC element government, Federally Funded Research and Development Center/University Affiliated Research Center (FFRDC/UARC), and Scientific Engineering and Technical Assistance (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 2006 |
|---|---|
| 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 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 | 24,696 | 22,081 | 1/2Q | 36,008 | 1Q | 82,785 |
| C2BMC HW/SW Development/I&T | SS/CPAF | MDNTB/ Huntsville, CO | 15,403 | 3,346 | 1/2Q | 5,456 | 1Q | 24,205 |
| C2BMC Product Engineering & Development | SS/CPAF | MDNTB/ Arlington, VA | 23,967 | 43,565 | 1/2Q | 67,651 | 1Q | 135,183 |
| EW/CEW; GCCS; JDP; JRE; ISC2; ECPs | Various | Services, DISA, Agencies/ Various | 3,776 | 24,882 | 1/2Q | 20,358 | 1Q | 49,016 |
| Federally Funded Research Development Centers | SS/CPAF | MITRE, IDA, ORNL, MIT/LL/ Washington, DC | 5,766 | 11,271 | 1/2Q | 8,982 | 1Q | 26,019 |
| Scientific Engineering Technical Assistance | SS/CPFF | Sparta/CSC/ Arlington, VA | 1,166 | 0 | N/A | 0 | N/A | 1,166 |
| Scientific Engineering Technical Assistance | SS/FFP | Sparta/ Arlington, VA | 4,544 | 12,720 | 1/2Q | 9,829 | 1Q | 27,093 |
| Scientific Engineering Technical Assistance | SS/FFP | Booze Allen Hamilton/ MDA HQ, Arlington, VA | 0 | 480 | 2Q | 480 | 2Q | 960 |
| **Site Activation** | | | | | | | | |
| Suites and Comms Gateways | SS/CPAF | MDNTB(I)/ Various COCOMS | 0 | 2,816 | 1/2Q | 27,971 | 1Q | 30,787 |
| **Integration and Test Environment** | | | | | | | | |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Integration & Test Personnel | C/FFP | IDA,SRS Technologies/ Colorado Springs, CO | 0 | 1,550 | 1/2Q | 0 | N/A | 1,550 |
| Integration & Test | C/FFP | Northrop Grumman Mission Sys/ Colorado Springs, CO | 0 | 13,571 | 1/2Q | 0 | N/A | 13,571 |
| Subtotal Product Development | | | 79,318 | 136,282 | | 176,735 | | 392335 |

**Remarks**

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 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<br>**February 2006** |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>**RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE<br>**0603889C Ballistic Missile Defense Products** |

## IV. Management Services Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 | | | 79,318 | 136,282 | | 176,735 | | 392,335 |

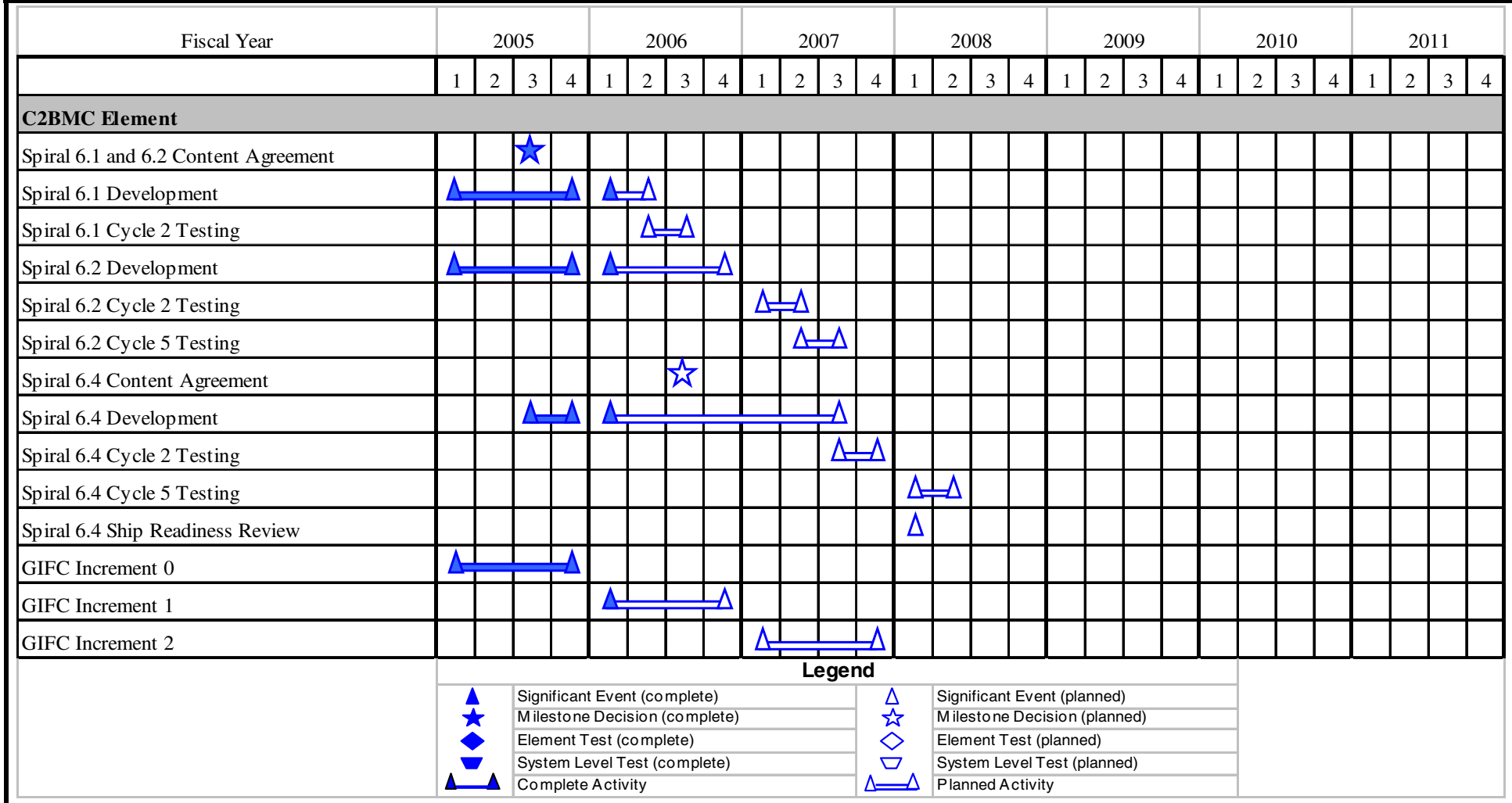
**Remarks**

**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date: **February 2006**

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 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

| Fiscal Year | 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 |
| **Site Activation** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EUCOM Web Browser | | | | | | △ | | | | | | | | | | | | | | | | | | | | | | |
| USFK and USFJ Web Browsers | | | | | | △ | | | | | | | | | | | | | | | | | | | | | | |
| PACOM and CMOC AOC Enterprise Work Stations | | | | | | | | △ | | | | | | | | | | | | | | | | | | | | |
| C2BMC suite upgrades at STRATCOM, PACOM, NORTHCOM | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| GIFC Hardware at PACOM AOC | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| Second full C2BMC suite installed at PACOM | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| **Operation & Sustainment** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Block 06 O&S | | | | | | | | | | | | | △ | | | | | | | △ | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲—▲ | Complete Activity | △—△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **C2BMC Element** | | | | | | | |
| Spiral 6.1 and 6.2 Content Agreement | 3Q | | | | | | |
| Spiral 6.1 Development | 1Q-4Q | 1Q-2Q | | | | | |
| Spiral 6.1 Cycle 2 Testing | | 2Q-3Q | | | | | |
| Spiral 6.2 Development | 1Q-4Q | 1Q-4Q | | | | | |
| Spiral 6.2 Cycle 2 Testing | | | 1Q-2Q | | | | |
| Spiral 6.2 Cycle 5 Testing | | | 2Q-3Q | | | | |
| Spiral 6.4 Content Agreement | | 3Q | | | | | |
| Spiral 6.4 Development | 3Q-4Q | 1Q-4Q | 1Q-3Q | | | | |
| Spiral 6.4 Cycle 2 Testing | | | 3Q-4Q | | | | |
| Spiral 6.4 Cycle 5 Testing | | | | 1Q-2Q | | | |
| Spiral 6.4 Ship Readiness Review | | | | 1Q | | | |
| Block 2006 System Requirement Review | 1Q | | | | | | |
| Block 2006 F/PCA | | | | 1Q-2Q | | | |
| GIFC Increment 0 | 1Q-4Q | | | | | | |
| GIFC Increment 1 | | 1Q-4Q | | | | | |
| GIFC Increment 2 | | | 1Q-4Q | | | | |
| **Site Activation** | | | | | | | |
| EUCOM Web Browser | | 2Q | | | | | |
| EUCOM and JFCC-IMD Laptop Planners | | 2Q | | | | | |
| USFK and USFJ Web Browsers | | 2Q | | | | | |
| C2BMC Communications Node in Hawaii | | 4Q | | | | | |
| PACOM and CMOC AOC Enterprise Work Stations | | 4Q | | | | | |
| C2BMC suite upgrades at STRATCOM, PACOM, NORTHCOM | | | 4Q | | | | |
| GIFC Hardware at PACOM AOC | | | 4Q | | | | |
| Second full C2BMC suite installed at PACOM | | | 4Q | | | | |
| **C2BMC** | | | | | | | |
| Block 06 Contract Award | | 2Q | | | | | |
| **Operation & Sustainment** | | | | | | | |
| Block 06 O&S | | | | 1Q-4Q | 1Q-4Q | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0901 Command and Control, Battle Management and Communications (C2BMC) Block 2008 | 6,122 | 5,576 | 33,645 | 158,764 | 179,883 | 106,889 | 64,310 |
| RDT&E Articles Qty | 0 | 0 | 0 | 5 | 5 | 0 | 0 |

*Note: RDT&E Articles: FY08 - Spiral 8.2; 1 Full C2BMC Suite; 3 Upgraded C2BMC Suites. FY09 - Spiral 8.4; 1 Full C2BC Suite; 3 Upgraded C2BMC Suites*

## 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 pairing any sensor with any shooter to defeat ballistic missile threats at any range, in any phase, in all theaters, with coalition partners increase capabilities via hardware, software, and operations and sustainment support in two-year blocks.

The C2BMC Block 2008 program enables a coordinated BMD against medium size raids and asymmetric threats (as would occur from non-traditional threat trajectories from the south or ship-based). Specific Block goals are to deliver:

- Enhanced system reliability and availability
- Fully integrated planner and situational awareness displays with integrated intelligence information and defended asset priority schemes
- Initial type interfaces between weapons and sensors compatible with DoD network-centric service-oriented architecture
- Global Integrated Fire Control (GIFC) coordination and optimization of increased Launch-on and Engage-on networked capability
- Communication capability supporting Internet Protocol Version 6 (IPv6) which will extend BMDS mission success by providing information management and quality of service to the individual user
- Expanded C2BMC, hence BMDS, global coverage with activation of EUCOM and CENTCOM C2BMC capability

C2BMC ELEMENT

The C2BMC Element accomplishes block objectives by demonstrating and operationalizing advancements in four product lines -- Situational Awareness, BMD Planner, GIFC/Battle Manager, and BMDS Network -- so that mature capabilities can be integrated and incrementally delivered to the warfighter. Two software Spirals are delivered in Block 2008. The delivery of these Spiral 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 this spiral will enable BMDS Block 2008 engagement sequences by delivering the key interfaces, planning, and coordination to allow System Elements and components to work together more effectively by extending the range and reach of the weapon systems.

The Block 2008 BMD Planner and Situational Awareness product lines continue the development of a flexible, interoperable and open system architecture. BMD Planner enhancements include a network centric planner with Joint Defense Planner (JDP)-JDP Engineering for Defense Analysis (JEDA) re-architecting, tactical planner enhancements for Ground-based Midcourse Defense (GMD), integrated intelligence information, and defended asset priority schemes that expand the warfighter's ability to optimize BMDS asset lay-downs. Situational Awareness consists of offensive/defensive integration (ODI), consequence management, and weapon flyout displays, further enabling the warfighter to see the evolution of threats and quickly make decisions.

In Block 2008, a fully capable GIFC is deployed to PACOM and EUCOM areas of operation. These GIFC capabilities 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. GIFC 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 GIFC 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 GIFC 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 types of ballistic missiles in all phases of flight, the GIFC includes development of weapon-system assignment software as real-time software to handle a large number of concurrent engagements.

The BMDS Network product features a more redundant high availability network with diverse paths and increased communications support to the BMDS elements to include added sensors and weapons to the overall BMDS. Capabilities such as dynamic 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 chain and push a correction back down. Additionally, an expanded network centric (worldwide connectivity of separately developed sensors and weapon systems) capability supporting Internet Protocol Version 6 (IPv6) will extend BMDS mission success by providing information management and quality of service to the individual user.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

As 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. The key test event for development is completion of Cycle 2, Simulation-Based Verification, when software completes internal C2MBC development and begins integration testing with other BMDS elements. Block 2008 matured products are integrated in Spirals 8.2 and 8.4, 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. Completion of Cycle 5 testing, Site Activation Testing, signals delivery of fully functioning operational software.

SITE ACTIVATION

C2BMC capabilities (hardware and software) will be deployed to EUCOM and CENTCOM with existing sites receiving upgrades as needed. Deployment to these combatant commands continues to expand BMDS on a global scale providing increased protection to the U.S., Friends, and Allies.

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; Daily network operations; security support for the C2BMC system as part of a transition plan; and, Prime contractor “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. Maintenance of the C2BMC includes both software and hardware maintenance and sustaining engineering. Sustaining engineering consists of network and development engineering in support of system anomalies. Operations and Support also includes the procurement of communications lines from the Defense Information Service Agency (DISA), as well as fielding and maintaining, Communications Nodal Equipment (CNE), to include the Joint Range Extension (JRE) equipment, which enables a global network grid.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| C2BMC Element | 6,122 | 5,576 | 33,645 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The C2BMC Element accomplishes block objectives by balancing the development of the four principle product lines (BMD Planner, Situational Awareness, Global Integrated Fire Control (GIFC)/Battle Management, and Network) so that mature capabilities can be integrated and incrementally delivered to the warfighter via Spirals. Two Spirals are planned in Block 2008.

FY05 Planned Program:

- Block 2008 Capabilities defined
- Identified risk areas

FY06 Planned Program:

- Continued identification of risk areas
- Continued definition of potential capabilities

FY07 Planned Program:

- Continued identification of risk areas and risk reduction activity
- Begin identification of interfaces to support defense of friends and allies
- Begin initial systems definition and systems engineering 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 displays
    - Offense/Defense Integration (ODI) displays
  - BMD Planner
    - Joint Defense Planner-BMD Engine for Defense Analysis (JDP-JEDA) re-architect
    - Integrated air and missile defense planning information
    - Element status on planner displays
    - Tactical planner enhancements for Ground-based Midcourse Defense GMD

- Consolidated planner ensuring data from various elements is available immediately to the operator

- Global Integrated Fire Control
  - Sensor Management of BMDS radars
  - Expanded weapon-system coordination/direction with BMD priority scheme
- Network
  - Develop strategies to migrate to Internet Protocol Version 6 (IPV 6) with no impact to operational capability
  - Define and develop requirements by user for classification and accountability of information
  - Design and develop architecture to support new Command and Control nodes, sensors, and weapon systems

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603889C Ballistic Missile Defense Products |

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## 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 operations and sustainment support of the C2BMC prototype. They perform development and testing of C2BMC products in Arlington VA, Huntsville AL, and Colorado Springs CO and provide on-site operations and maintenance support for fielded C2BMC capabilities in Nebraska, Colorado, Hawaii, Virginia, Florida, Germany and Japan. 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 2006 |
|---|---|
| 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 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 | 2,081 | 1,524 | 1/2Q | 8,981 | 1Q | 12,586 |
| C2BMC HW/SW Development/I&T | SS/CPAF | MDNTB/ Huntsville, AL | 551 | 231 | 1/2Q | 1,361 | 1Q | 2,143 |
| C2BMC Product Engineering & Development | SS/CPAF | MDNTB/ Arlington, VA | 3,490 | 3,821 | 1/2Q | 16,872 | 1Q | 24,183 |
| EW/CEW; GCCS; JDP; JRE; ISC2; ECPs | Various | Services, DISA, Agencies/ Various | 0 | 0 | N/A | 0 | N/A | |
| Federally Funded Research Development Centers | SS/CPAF | MITRE, IDA, ORNL, MIT/LL/ Washington, DC | 687 | 0 | N/A | 2,994 | 1Q | 3,681 |
| Scientific Engineering and Technical Assistance | SS/CPFF | Sparta/CSC/ Arlington, VA | 0 | 0 | N/A | 3,437 | 1Q | 3,437 |
| Subtotal Product Development | | | 6,809 | 5,576 | | 33,645 | | 46030 |

**Remarks**

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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<br>**February 2006** |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>**RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE<br>**0603889C Ballistic Missile Defense Products** |

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

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

**Remarks**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 6,809 | 5,576 | | 33,645 | | 46,030 |

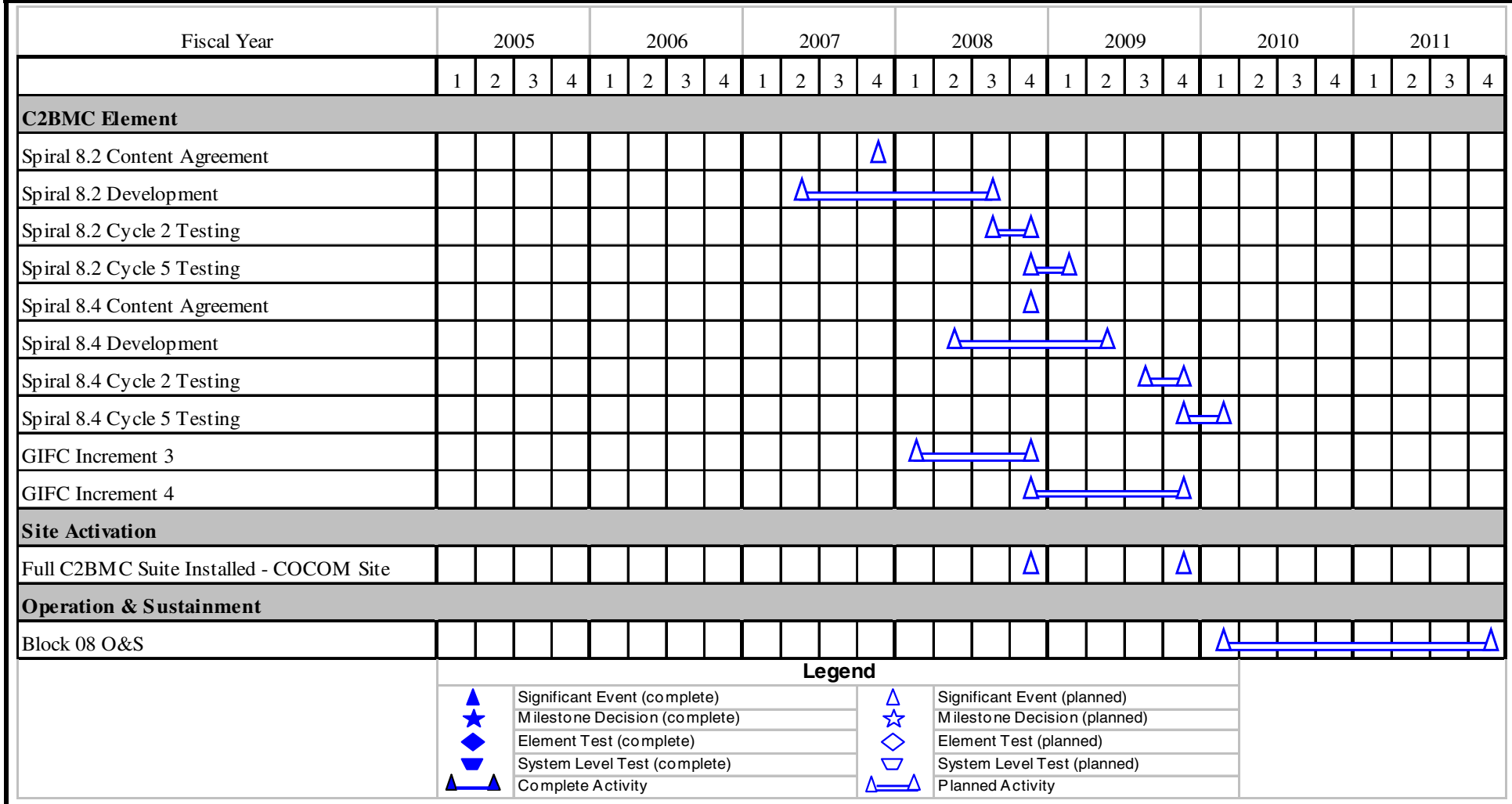
**Remarks**

**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date: **February 2006**

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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **C2BMC Element** | | | | | | | |
| Spiral 8.2 VRR | | | | 1Q | | | |
| Block 2008 BMDSS | | 4Q | | | | | |
| Block 2008 ECR | | 4Q | | | | | |
| Block 2008 SRR | | | 1Q | | | | |
| Block 2008 F/PCA | | | | | | 1Q | |
| Spiral 8.2 Content Agreement | | | 4Q | | | | |
| Spiral 8.2 Development | | | 2Q-4Q | 1Q-3Q | | | |
| Spiral 8.2 Cycle 2 Testing | | | | 3Q-4Q | | | |
| Spiral 8.2 Cycle 5 Testing | | | | 4Q | 1Q | | |
| Spiral 8.4 Content Agreement | | | | 4Q | | | |
| Spiral 8.4 Development | | | | 2Q-4Q | 1Q-2Q | | |
| Spiral 8.4 Cycle 2 Testing | | | | | 3Q-4Q | | |
| Spiral 8.4 Cycle 5 Testing | | | | | 4Q | 1Q | |
| GIFC Increment 3 | | | | 1Q-4Q | | | |
| GIFC Increment 4 | | | | 4Q | 1Q-4Q | | |
| **Site Activation** | | | | | | | |
| Upgrade Three C2BMC Sites | | | | 3Q-4Q | 3Q-4Q | | |
| Full C2BMC Suite Installed - COCOM Site | | | | 4Q | 4Q | | |
| **Operation & Sustainment** | | | | | | | |
| Block 08 O&S | | | | | | 1Q-4Q | 1Q-4Q |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 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 | 1,247 | 35,393 | 161,466 | 206,404 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 5 | 5 |

*Note: RDT&E Articles: FY10 - Spiral 10.2; 1 Full C2BMC Suites; 3 Upgraded Suites. FY11 - Spiral 10.4; 1 Full C2BMC Suites; 3 Upgraded Suites.*

**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. Block goals are to deliver:

- Capability to easily and quickly incorporate new sensors and weapons systems into a global, integrated C2BMC network
- Command and control decision aids to re-direct coordinated engagements
- BMDS system level discrimination for boost/early ascent and expanded engagement coordination to include intelligence projections
- Continued BMDS global expansion with additional C2BMC deployed locations

C2BMC ELEMENT

The C2BMC Element accomplishes block objectives by balancing the development of its four product lines -- Situational Awareness, BMD Planner, Global Interface Fire Control (GIFC), and Network -- so that mature capabilities can be integrated and incrementally delivered to the warfighter. Two 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 Engagement Sequence Groups (ESGs) by providing the proper interfaces, planning and coordination to allow the system elements and components to work together effectively. The C2BMC Element also includes development support and post analysis for BMDS-level wargames and tests with fielded Spirals.

Situational Awareness, BMD Planner, GIFC, and Network will all be enhanced to include additional BMDS sensors and weapons. The C2BMC GIFC 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 and incorporating BMDS level discrimination for target boost/early ascent and expanded engagement coordination to include intelligence projections. The BMD Planner and Situation Awareness functions are also matured, supporting operators in rapid battle plan adjustments with incorporation of improved wargaming/modeling tools to improve "what-if" assessments of the battlespace; and, command and control decision aids to re-direct coordinated engagements. 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.

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. The key test event for development is completion of Cycle 2, Simulation-Based Verification, when software completes internal C2MBC development and begins integration testing with other BMDS elements. Block 2010 matured products are integrated in 10.2 and 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. Completion of Cycle 5 testing, Site Activation Testing, signals delivery of fully functioning operational software.

SITE ACTIVATION

In addition to Block 2010 spiral software, fielding capability also includes installation and activation of C2BMC Suites at Air Operations Centers and Combatant Command 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.

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; Daily network operations and security support for the C2BMC system as part of a transition plan; and, Prime contractor "Over-the-shoulder" support to users when requested, or alternatively, when they 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; Maintenance of the Help Desk

website. Maintenance of the C2BMC includes both software and hardware maintenance and sustaining engineering. Sustaining engineering consists of network and development engineering in support of system anomalies. Operations and Support also includes the procurement of communications lines from the Defense Information Service Agency (DISA), as well as fielding and maintaining, Communications Nodal Equipment (CNE), to include the Joint Range Extension (JRE) equipment, which enables a global network grid.

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |

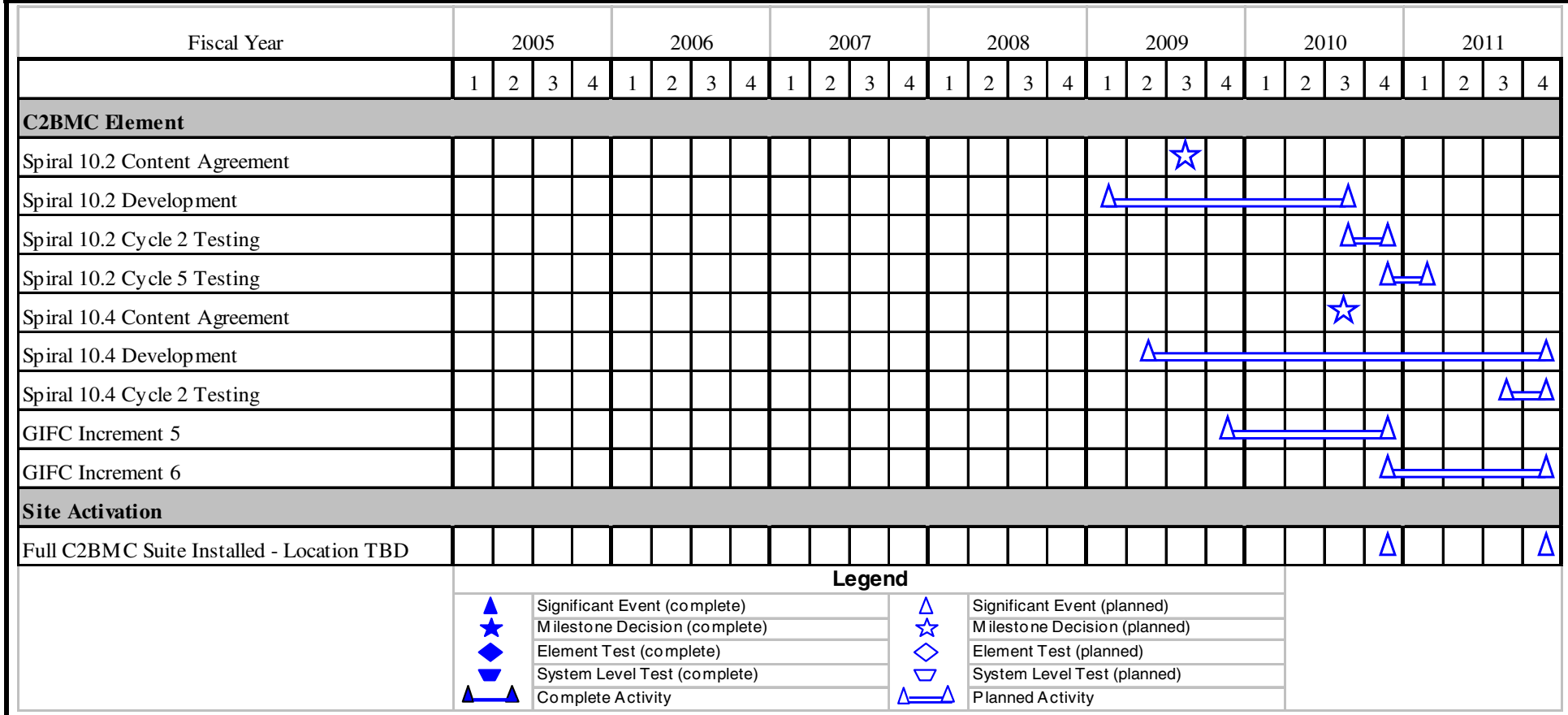
| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## D. Acquisition Strategy

The Command and Control Battle Management Communications (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 operations and sustainment support of the C2BMC prototype. They perform development and testing of C2BMC products in Arlington VA, Huntsville AL, and Colorado Springs CO and provide on-site operations and maintenance support for fielded C2BMC capabilities in Nebraska, Colorado, Hawaii, Virginia, Florida, Germany and Japan. C2BMC element government, Federally Funded Research and Development Center/University Affiliated Research Center (FFRDC/UARC), and Scientific Engineering and Technical Assistance (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-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **C2BMC Element** | | | | | | | |
| Spiral 10.2 Content Agreement | | | | | 3Q | | |
| Spiral 10.2 Development | | | | | 1Q-4Q | 1Q-3Q | |
| Spiral 10.2 Cycle 2 Testing | | | | | | 3Q-4Q | |
| Spiral 10.2 Cycle 5 Testing | | | | | | 4Q | 1Q |
| Spiral 10.2 VRR | | | | | | 1Q | |
| Spiral 10.4 Content Agreement | | | | | | 3Q | |
| Spiral 10.4 Development | | | | | 2Q-4Q | 1Q-4Q | 1Q-4Q |
| Spiral 10.4 Cycle 2 Testing | | | | | | | 3Q-4Q |
| Block 2010 BMDSS | | | | 4Q | | | |
| Block 2010 ECR | | | | 4Q | | | |
| Block 2010 SRR | | | | | 1Q | | |
| Block 2010 F/PCA | | | | | | 1Q | |
| GIFC Increment 5 | | | | | 4Q | 1Q-4Q | |
| GIFC Increment 6 | | | | | | 4Q | 1Q-4Q |
| **Site Activation** | | | | | | | |
| Upgrade Three C2BMC Sites | | | | | | 3Q-4Q | 3Q-4Q |
| Full C2BMC Suite Installed - Location TBD | | | | | | 4Q | 4Q |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0802 Hercules Block 2006 | 22,730 | 19,645 | 0 | 0 | 0 | 0 | 0 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: FY07 funding for this project moves to Project 0505, Hercules.*

## A. Mission Description and Budget Item Justification

Hercules develops advanced discrimination and tracking concepts into prototype software (algorithms) that improves the capability of the BMDS C2BMC, sensor, and weapon elements. Hercules then transitions algorithms to BMDS elements for integration and provides technical assistance during the algorithm integration. These algorithms support existing BMDS Engagement Sequence Groups and enable new Engagement Sequence Groups.

In particular, Project 0802, Hercules Block 2006 supports near-term Hercules efforts to mature algorithms in support of Block 2006. This effort includes the development, digital and BMDS Fusion Toolbox testing of algorithms that provide forward based discrimination capability. These algorithms enable the FBX-T Mod Suite 1 Engagement Sequence Group. This effort supports tracking algorithm enhancements that support the Block 2006 C2BMC Situational Awareness display capability. This effort includes the initial prototype development of Decision Architecture components.

Hercules Project 0802 also supports technical algorithm reviews of these algorithms that provide an assessment of algorithm maturity and capability to the program manager. These reviews are called Algorithm-to-Test reviews (ATT) and Characterization and Transition Reviews (CaT).

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Project Hercules | 22,730 | 19,645 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

FY05 Accomplishments:

- Continued algorithm maturation of Forward Based Sensors RF Suite 1 Discrimination Algorithms in support of MDA Sensor program for integration of the algorithms into the BMDS Deployable X-Band Radar.
- Delivered developmental prototype Decision Architecture decision tool for evaluation in C2BMC.
- Conducted five CaT and ATT reviews.

- Conducted real-time testing and demonstration of nine algorithms on eight BMDS flight events, including real-time testing of forward based radar algorithms, prototype Decision Architecture C2BM decision tool, and multi-radar track fusion concept.
- Conducted algorithm testing for C2BMC Block 2006 tracking algorithms.

FY06 Planned Program:

- Continue algorithm maturation of Hercules Forward Based Sensor Suite 1 algorithms.
- Continue development of Decision Architecture capability supporting Global Integrated Fire Control.
- Continue development and prototype evaluation of Decision Architecture decision tool.
- Conduct at least four ATT and CaT algorithm technical reviews.

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603889C Ballistic Missile Defense Products |

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## 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 will 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 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Project Hercules** | | | | | | | | |
| Boeing | CPAF | Arlington, VA | 4,144 | 0 | N/A | 0 | N/A | 4,144 |
| Lockheed Martin | CPFF | Sunnyvale, CA | 4,111 | 0 | N/A | 0 | N/A | 4,111 |
| Raytheon | CPFF | Boston, MA | 5,231 | 5,000 | N/A | 0 | N/A | 10,231 |
| Sparta | CPFF | Arlington, VA | 10,889 | 5,239 | N/A | 0 | N/A | 16,128 |
| Various | MIPR | Various | 447 | 0 | 1Q | 0 | N/A | 447 |
| Office of Naval Research | MIPR | Arlington, VA | 528 | 0 | N/A | 0 | N/A | 528 |
| Massachusetts Institute of Technology/Lincoln Laboratory | FFRDC | Lexington, MA | 8,528 | 7,406 | 1Q | 0 | N/A | 15,934 |
| Northrop Grumman | CPFF | Van Nuys, CA | 3,047 | 2,000 | N/A | 0 | N/A | 5,047 |
| Space and Missile Defense Command | MIPR | Various | 2,913 | 0 | 1Q | 0 | N/A | 2,913 |
| Photon Research Associates | CPFF | Arlington, VA | 1,000 | 0 | N/A | 0 | N/A | 1,000 |
| Subtotal Product Development | | | 40,838 | 19,645 | | 0 | | 60483 |

**Remarks**

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Project Hercules** | | | | | | | | |
| Space and Missile Defense Command | MIPR | Huntsville, AL | 1,297 | 0 | N/A | 0 | N/A | 1,297 |
| Air Force Research Lab - Eglin Air Force Base | MIPR | Eglin AFB, FL | 990 | 0 | N/A | 0 | N/A | 990 |
| Massachusetts Institute of Technology/Lincoln Laboratory | CPFF | Lexington, MA | 9,019 | 0 | N/A | 0 | N/A | 9,019 |
| Northrop Grumman | CPFF | Van Nuys, CA | 5,987 | 0 | N/A | 0 | N/A | 5,987 |
| Decibel Research | CPFF | Huntsville, AL | 687 | 0 | N/A | 0 | N/A | 687 |
| Joint National Integration Center | MIPR | Colorado Springs, CO | 278 | 0 | N/A | 0 | N/A | 278 |
| Subtotal Test and Evaluation | | | 18,258 | 0 | | 0 | | 18258 |

**Remarks**

## IV. Management Services Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Project Hercules** | | | | | | | | |
| Various | MIPR | Various | 2,073 | 0 | N/A | 0 | N/A | 2,073 |
| Space and Missile Defense Command | MIPR | Huntsville, AL | 2,948 | 0 | N/A | 0 | N/A | 2,948 |
| Subtotal Management Services | | | 5,021 | 0 | | 0 | | 5021 |

**Remarks**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 64,117 | 19,645 | | 0 | | 83,762 |

**Remarks**

**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date: **February 2006**

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

R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products**

| Fiscal Year | 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 |
| **Hercules** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Conduct CaT and ATT reviews | ▲ | ▲ | ▲ | ▲ | ▲ | △ | △ | △ | | | | | | | | | | | | | | | | | | | | |
| Conduct real-time demonstration of algorithms | ▲ | — | — | ▲ | | | | | | | | | | | | | | | | | | | | | | | | |
| Conduct testing of C2BMC Tracking algorithms | ▲ | — | — | ▲ | | | | | | | | | | | | | | | | | | | | | | | | |
| Support SN Integration of FBS Suite 1 | ▲ | — | — | ▲ | ▲ | — | △ | | | | | | | | | | | | | | | | | | | | | |
| Deliver developmental Decision Architecture Protot | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Evaluate and Improve DA prototype | | | | | ▲ | — | — | △ | | | | | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲— | Complete Activity | △— | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Hercules** | | | | | | | |
| Conduct CaT and ATT reviews | 1Q,2Q,3Q,4Q | 1Q,2Q,3Q,4Q | | | | | |
| Conduct real-time demonstration of algorithms | 1Q-4Q | | | | | | |
| Conduct testing of C2BMC Tracking algorithms | 1Q-4Q | | | | | | |
| Support SN Integration of FBS Suite 1 | 1Q-4Q | 1Q-3Q | | | | | |
| Deliver developmental Decision Architecture Protot | 2Q | | | | | | |
| Evaluate and Improve DA prototype | | 1Q-4Q | | | | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0902 Hercules Block 2008 | 58,798 | 38,179 | 0 | 0 | 0 | 0 | 0 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: FY07 funding for this project moves to Project 0505, Hercules.*

## A. Mission Description and Budget Item Justification

Hercules develops advanced discrimination and tracking concepts into prototype software (algorithms) that improves the capability of the BMDS C2BMC, sensor, and weapon elements. Hercules then transitions algorithms to BMDS elements for integration and provides technical assistance during the algorithm integration. These algorithms support existing BMDS Engagement Sequence Groups and enable new Engagement Sequence Groups.

In particular, Project 0902, Hercules Block 2008 supports near-term Hercules efforts to mature algorithms in support of Block 2008. More complex algorithms such as the Decision Architecture and counter-countermeasure efforts require multi-year development and rigorous testing to increase maturity sufficiently that there is minimal risk when an element integrates the algorithm into the BMDS.

Project 0902 supports the development of additional capability for forward based sensor discrimination, an initial capability to enhance sensor tracking and discrimination in the presence of radar degrading countermeasures, and additional capability for advanced multi-sensor fusion and resource management in the Decision Architecture. This effort also supports development of algorithms supporting Space Tracking and Surveillance System and Kinetic Energy Interceptor programs that will have developmental test capability in 2008-2009.

Project 0902 also supports technical algorithm reviews that provide an assessment of algorithm maturity and capability to the Hercules program manager. These reviews are called Algorithm-to-Test reviews (ATT) and Characterization and Transition Reviews (CaT).

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Project Hercules | 58,798 | 38,179 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

FY05 Accomplishments:

- Continued Decision Architecture development to enable multi-sensor discrimination fusion to support C2BMC Situational Awareness and Global Integrated Fire Control, and coordinated sensor and weapons management in support of C2BMC Global Integrated Fire Control. Completed several interim program milestones, including ATT and CaT reviews.
- Continued development of additional forward based discrimination algorithms to further enhance the capability of the FBX-T and SBX radars in support of the FBX-T and SBX Mod Hercules Suite 2 Engagement Sequence Groups.
- Continued development of core radar clutter mitigation efforts. Completed several interim program milestones, including technical review and ATT and CaT meetings.
- Continued development of target handover algorithms that enhance the capability of weapon systems to engage discriminated RVs in a countermeasure environment.
- Continued development of algorithms to improve kill vehicle and EO/IR surveillance sensor target detection of closely spaced objects.
- Continued development of tracking and discrimination algorithms to support Space Tracking and Surveillance System (STSS).
- Provided algorithm description and developmental test results to the MDA Battle Management Command and Control, Airborne Laser, STSS and GMD elements to support evaluation and subsequent integration planning.
- Conducted Project Hercules Kinetic Interceptor Integration Planning (PKIP) task to identify high priority Hercules algorithm development activities that will support initial Kinetic Energy Interceptor (KEI) capability.
- Developed initial operational simulation workbench to integrate and demonstrate Hercules algorithms that will support KEI.
- Upgraded BMDS Fusion Toolbox (BFT) to enable flight test demonstration of algorithms that can enhance the Cobra Dane radar.
- Conducted joint integration studies with Cobra Dane Program Office, EKV Program Office and AEGIS Program Office to identify Hercules algorithm contributions to these programs.
- Completed development of two Threat Data Packages (TDPs) to support algorithm development, and commenced effort on three additional threat data packages.
- Completed four (4) Special Data Packages (SDPs) that focus on specific target object signature properties required to mature Hercules algorithms.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603889C Ballistic Missile Defense Products |

FY06 Planned Program:

- Deliver prototype Decision Architecture capability to the C2BMC element. The overall Decision Architecture applies advanced decision theory for a real-time BMDS C2BM decision tool that integrates information from multiple sensors throughout a layered BMDS from Boost through Midcourse to provide decision aids in sensor resource allocation and weapon magazine management.
- Continue development and initiate transition of additional forward based discrimination algorithms to further enhance the capability of the FBX-T and SBX radars in support of the FBX-T and SBX Mod Hercules Suite 2 Engagement Sequence Groups.
- Transition initial forward based Passive Optics discrimination algorithms to the MDA Sensor program for concurrent development using the Airborne Infrared System (AIRS) capability.
- Continue development of Hercules algorithms that support the Target Designation Concept Description that will improve the GMD system capability in the presence of countermeasures. These algorithms include discrimination, target handover and kill vehicle enhancement algorithms.
- Support prototype development of radar clutter mitigation algorithms to increase algorithm maturity and confidence.
- Continue demonstration of Hercules algorithms in real-time flight events and support planning for future flight tests.
- Complete development of additional Threat Data Packages (TDPs) to support algorithm development, and provide updates to existing TDPs to include additional advanced threat countermeasures for algorithm development and testing.
- Complete additional Special Data Packages (SDPs) for Hercules algorithm development.

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603889C Ballistic Missile Defense Products |

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## 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 will 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 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Project Hercules** | | | | | | | | |
| Lockheed Martin | CPFF | Sunnyvale, CA | 4,698 | 4,313 | 1Q | 0 | N/A | 9,011 |
| Raytheon | CPFF | Boston, MA | 5,782 | 4,709 | 1Q | 0 | N/A | 10,491 |
| Sparta | CPFF | Arlington, VA | 8,775 | 2,915 | 1Q | 0 | N/A | 11,690 |
| Various | MIPR | Various | 1,731 | 1,245 | 1Q | 0 | N/A | 2,976 |
| Office of Naval Research | MIPR | Arlington, VA | 590 | 600 | 1Q | 0 | N/A | 1,190 |
| Air Force Research Lab - Eglin Air Force Base | MIPR | Eglin AFB, FL | 3,124 | 650 | 1Q | 0 | N/A | 3,774 |
| Photon Research Associates | CPFF | Arlington, VA | 3,564 | 3,249 | 1Q | 0 | N/A | 6,813 |
| Massachusetts Institute of Technology/Lincoln Laboratory | CPFF | Lexington, MA | 14,540 | 3,220 | 1Q | 0 | N/A | 17,760 |
| Northrop Grumman | CPFF | Van Nuys, CA | 13,590 | 2,549 | 1Q | 0 | N/A | 16,139 |
| Space and Missile Defense Command | MIPR | Huntsville, AL | 1,474 | 6,071 | N/A | 0 | N/A | 7,545 |
| Subtotal Product Development | | | 57,868 | 29,521 | | 0 | | 87389 |

**Remarks**

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Project Hercules** | | | | | | | | |
| Subtotal Support Costs | | | 0 | 0 | | 0 | | 0 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Project Hercules** | | | | | | | | |
| Air Force Research Lab - Eglin Air Force Base | MIPR | Eglin AFB, FL | 1,398 | 1,000 | 1Q | 0 | N/A | 2,398 |
| Computer Sciences Corporation | CPFF | Fairfax, VA | 1,019 | 858 | 1/2Q | 0 | N/A | 1,877 |
| Massachusetts Institute of Technology/Lincoln Laboratory | FFRDC | Lexington, MA | 2,153 | 0 | N/A | 0 | N/A | 2,153 |
| Decibel Research | MIPR | Huntsville, AL | 851 | 800 | 1Q | 0 | N/A | 1,651 |
| Various | MIPR | Various | 0 | 3,000 | 1/3Q | 0 | N/A | 3,000 |
| Subtotal Test and Evaluation | | | 5,421 | 5,658 | | 0 | | 11079 |

**Remarks**

## IV. Management Services Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Project Hercules** | | | | | | | | |
| Computer Sciences Corporation | FFP | Fairfax, VA | 1,334 | 1,000 | 1Q | 0 | N/A | 2,334 |
| Sparta | FFP | Arlington, VA | 1,221 | 1,000 | 1Q | 0 | N/A | 2,221 |
| Various | MIPR | Various | 929 | 0 | N/A | 0 | N/A | 929 |
| Space and Missile Defense Command | MIPR | Huntsville, AL | 1,854 | 1,000 | 1Q | 0 | N/A | 2,854 |
| Subtotal Management Services | | | 5,338 | 3,000 | | 0 | | 8338 |

**Remarks**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 68,627 | 38,179 | | 0 | | 106,806 |

**Remarks**

**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date: **February 2006**

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

R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products**

| Fiscal Year | 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 |
| **Hercules** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Deliver Threat Data Packages and Special Data Pack | ▲ | ▲ | ▲ | ▲ | ▲ | △ | △ | △ | | | | | | | | | | | | | | | | | | | | |
| Develop EO/IR detection of closely spaced objects | ▲ | — | — | ▲ | ▲ | — | — | △ | | | | | | | | | | | | | | | | | | | | |
| Develop STSS Tracking and discrimination | ▲ | — | — | ▲ | ▲ | — | — | △ | | | | | | | | | | | | | | | | | | | | |
| Develop algorithms for target handover | ▲ | — | — | ▲ | | | | | | | | | | | | | | | | | | | | | | | | |
| Develop algorithms to support boost intercept | ▲ | — | — | ▲ | | | | | | | | | | | | | | | | | | | | | | | | |
| Develop and integrate Decision Architecture GIFC | ▲ | — | — | ▲ | ▲ | — | — | △ | | | | | | | | | | | | | | | | | | | | |
| Develop core radar clutter mitigation effort | ▲ | — | — | ▲ | ▲ | — | — | △ | | | | | | | | | | | | | | | | | | | | |
| Develop follow-on FBS Suite (Suite 2) | ▲ | — | — | ▲ | ▲ | — | — | △ | | | | | | | | | | | | | | | | | | | | |
| Develop passive optics FBS algorithms | ▲ | — | — | ▲ | ▲ | — | — | △ | | | | | | | | | | | | | | | | | | | | |
| Interface with System Engineering and Elements | ▲ | — | — | ▲ | ▲ | — | — | △ | | | | | | | | | | | | | | | | | | | | |
| Upgrade BMDS Fusion Toolbox | ▲ | — | — | ▲ | ▲ | — | — | △ | | | | | | | | | | | | | | | | | | | | |
| Conduct Real-time flight events | | | | | ▲ | △ | △ | △ | | | | | | | | | | | | | | | | | | | | |
| Develop Algorithm for target designation CD | | | | | ▲ | — | — | △ | | | | | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲— | Complete Activity | △— | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Hercules** | | | | | | | |
| Deliver Threat Data Packages and Special Data Pack | 1Q,2Q,3Q,4Q | 1Q,2Q,3Q,4Q | | | | | |
| Develop EO/IR detection of closely spaced objects | 1Q-4Q | 1Q-4Q | | | | | |
| Develop STSS Tracking and discrimination | 1Q-4Q | 1Q-4Q | | | | | |
| Develop algorithms for target handover | 1Q-4Q | | | | | | |
| Develop algorithms to support boost intercept | 1Q-4Q | | | | | | |
| Develop and integrate Decision Architecture GIFC | 1Q-4Q | 1Q-4Q | | | | | |
| Develop core radar clutter mitigation effort | 1Q-4Q | 1Q-4Q | | | | | |
| Develop follow-on FBS Suite (Suite 2) | 1Q-4Q | 1Q-4Q | | | | | |
| Develop passive optics FBS algorithms | 1Q-4Q | 1Q-4Q | | | | | |
| Interface with System Engineering and Elements | 1Q-4Q | 1Q-4Q | | | | | |
| Upgrade BMDS Fusion Toolbox | 1Q-4Q | 1Q-4Q | | | | | |
| Conduct Real-time flight events | | 1Q,2Q,3Q,4Q | | | | | |
| Develop Algorithm for target designation CD | | 1Q-4Q | | | | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0002 Hercules Block 2010 | 0 | 6,304 | 0 | 0 | 0 | 0 | 0 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: FY07 funding for this project moves to Project 0505, Hercules.*

## A. Mission Description and Budget Item Justification

Hercules develops advanced discrimination and tracking concepts into prototype software (algorithms) that improves the capability of the BMDS C2BMC, sensor, and weapon elements. Hercules then transitions algorithms to BMDS elements for integration and provides technical assistance during the algorithm integration. These algorithms support existing BMDS Engagement Sequence Groups and enable new Engagement Sequence Groups.

In particular, Project 0002, Hercules Block 2010 supports near-term Hercules efforts to mature algorithms in support of Block 2010. With algorithm development activity in 2006, Hercules will mature and develop capability for transition to Multiple Kill Vehicle (MKV) and Kinetic Energy Interceptor (KEI) programs in 2007-2009 to enhance the initial deployment capabilities of the MKV and KEI systems. This will support Engagement Sequence Groups that use the MKV and KEI systems. In particular, Hercules will develop target handover and assignment algorithms that leverages current Hercules algorithm development work in these areas.

Additionally, Hercules will develop algorithms in support of boost fire control, and integrate this effort with Hercules efforts that support the Global Integrated Fire Control. This also supports the initial spiral development of the Decision Architecture to include the new capability.

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Project Hercules | 0 | 6,304 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

FY06 Planned Program:

- Support algorithm development efforts with an emphasis on MKV and KEI, and the spiral development of the Decision Architecture that integrates the capabilities of the new systems.
- Participate in BMDS flight tests using the BMDS Fusion Toolbox to support development of these algorithms.

- Conduct technical and management reviews of the algorithm development process, to include an annual Program Review, development team reviews and peer group reviews.
- Develop Threat Data Packages required to develop discrimination and tracking algorithms to address advanced ballistic missile threats.
- Review capability of existing discrimination algorithms in conjunction with the use of other discrimination augmentation devices (DADS), and develop new algorithm capabilities that enhance the use of these DADS.

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 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 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603889C Ballistic Missile Defense Products |

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## 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 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Project Hercules** | | | | | | | | |
| Hercules | MIPR | Various | 0 | 3,500 | 1Q | 0 | N/A | 3,500 |
| Subtotal Product Development | | | 0 | 3,500 | | 0 | | 3500 |

**Remarks**

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Project Hercules** | | | | | | | | |
| Hercules | MIPR | Various | 0 | 1,389 | 1Q | 0 | N/A | 1,389 |
| Subtotal Support Costs | | | 0 | 1,389 | | 0 | | 1389 |

**Remarks**

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Project Hercules** | | | | | | | | |
| Hercules | MIPR | Various | 0 | 915 | 1Q | 0 | N/A | 915 |
| Subtotal Test and Evaluation | | | 0 | 915 | | 0 | | 915 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Project Hercules** | | | | | | | | |
| Hercules | MIPR | Arlington, VA | 0 | 500 | 1Q | 0 | N/A | 500 |
| Subtotal Management Services | | | 0 | 500 | | 0 | | 500 |

**Remarks**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 0 | 6,304 | | 0 | | 6,304 |

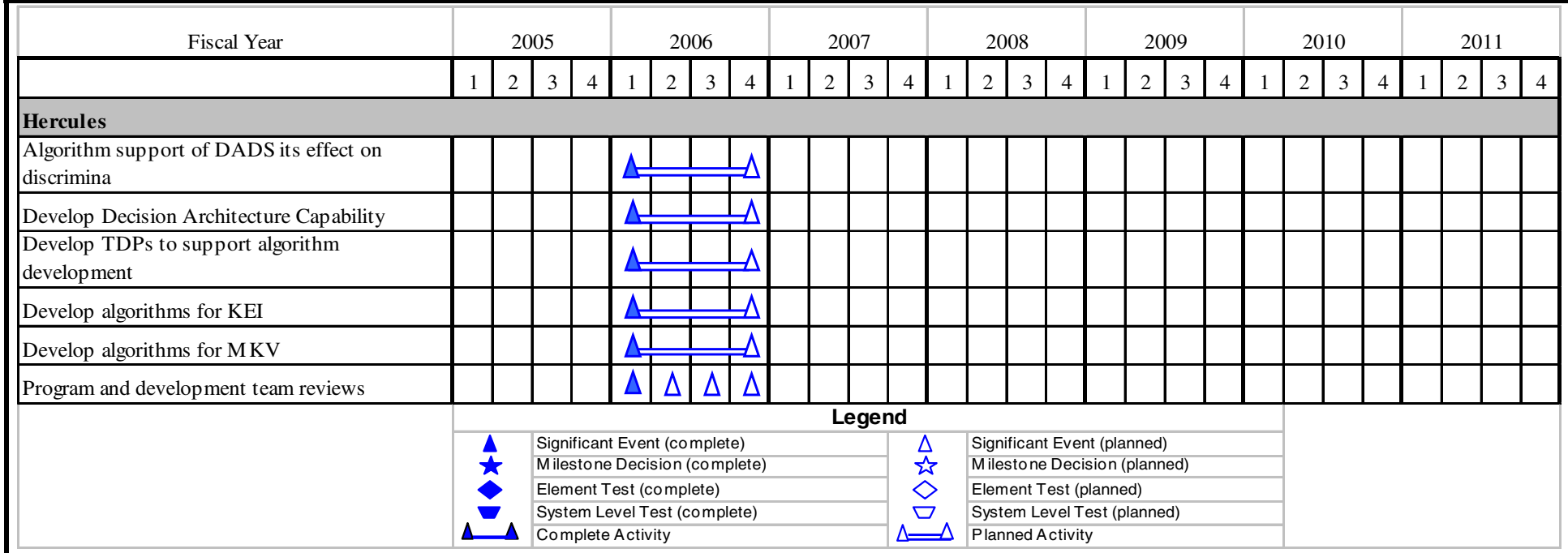
**Remarks**

**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date
**February 2006**

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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Hercules** | | | | | | | |
| Algorithm support of DADS its effect on discrimina | | 1Q-4Q | | | | | |
| Develop Decision Architecture Capability | | 1Q-4Q | | | | | |
| Develop TDPs to support algorithm development | | 1Q-4Q | | | | | |
| Develop algorithms for KEI | | 1Q-4Q | | | | | |
| Develop algorithms for MKV | | 1Q-4Q | | | | | |
| Program and development team reviews | | 1Q,2Q,3Q,4Q | | | | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0505 Hercules | 0 | 0 | 50,562 | 50,881 | 50,319 | 50,071 | 50,856 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: Prior to FY07, funding for this project was previously contained in Projects 0802, 0902 and 0002.*

## A. Mission Description and Budget Item Justification

Hercules develops advanced discrimination and tracking concepts into prototype software (algorithms) that improves the capability of the BMDS C2BMC, sensor, and weapon elements. Hercules then transitions algorithms to BMDS elements for integration and provides technical assistance during the algorithm integration. These algorithms support existing BMDS Engagement Sequence Groups (ESG) and enable new Engagement Sequence Groups. In particular, Hercules develops algorithms that improve sensor and weapon element discrimination, improve integration of sensor data within C2BMC, and expand integrated battle management capability. This is a national effort to develop robust, physics-based detection, tracking, and discrimination algorithms to counter known/expected and unknown/unexpected missiles with planned or unplanned countermeasures in all phases of their flight.

Specific Hercules projects include boost-phase engagement algorithms, discrimination algorithms for forward based sensors, discrimination algorithms and architectures for midcourse sensors, countermeasure mitigation algorithms, terminal discrimination algorithms, and a Decision Architecture concept that provides advanced decision theory to integrate the individual sensor information for BMDS C2BMC data fusion and global integrated fire control.

Hercules has four major goals. These goals are the following:

- One, develop and support integration of algorithms that expand the capability of or enable currently identified Engagement Sequence groups. Currently five ESGs directly reference Hercules algorithms.
- Two, develop and support integration of algorithms that enable BMDS elements to meet capability identified in the BMDS Test Bed System Specification or in the element specific specifications. Examples of algorithms for element enhancement include C2BMC Global Integrated Fire Control, STSS tracking algorithms and AEGIS discrimination concepts.
- Three, develop new concepts that enable the definition of new ESGs. Examples of new capability include feature hand-over and clutter mitigation.
- Four, assess algorithm needs and begin development of concepts that support emerging technology, such as Multiple Kill Vehicle (MKV) and Discrimination Augmentation Devices (DADs).

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603889C Ballistic Missile Defense Products |

Starting in FY07, Project 0505 represents the entire Hercules development effort to mature algorithms for transition to BMDS elements. Hercules algorithm development typically takes several years with several phases of development. The phases are concept exploration, concept development and concept test. Hercules conducts both digital testing and flight testing of its algorithms as part of the development process. At any particular time, the Hercules portfolio contains algorithms that are in each phase of development. The algorithms that are in test support near-term capability for the BMDS, while algorithms in development and exploration meet the requirements of the next and future blocks.

For management purposes, Hercules consists of five main line items. The first line item, Engineering and Integration, aids the development and the transition efforts. The remaining four line items are algorithm development tasks focused on particular functions as described in the following sections.

**B. Accomplishments/Planned Program**

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Engineering and Integration | 0 | 0 | 23,350 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Engineering and Integration aids all Hercules development, provides an independent test capability within Hercules, and performs system engineering functions with the BMDS elements to enable algorithm transition. Engineering and Integration contains the following: the threat engineering group that generates realistic simulated data for algorithm development. The threat engineering group provides the data to Hercules developers and BMDS elements in the form of Threat Data Packages (TDPs); the digital test group conducts capability testing of developed algorithms to verify algorithm robustness and identify functions that require improvement prior to integration in operational systems; the flight test group enables Hercules algorithm testing during flight events using the BMDS Fusion Toolbox (BFT); the integration and systems engineering group reviews technical progress of the algorithms, provides recommendations to the algorithm developers for improvements during the development process, and provides technical details to engineers in Missile Defense Agency (MDA) System Engineering and the elements to aid in system benefit analysis and integration of Hercules algorithms into the BMDS. Technical progress reviews occur at Algorithm-to-Test transition meetings (ATT) where developers present their algorithms and at Characterization and Transition meetings (CaT) where the test team presents results of digital testing.

FY07 Planned Program:

- Complete development of additional Threat Data Packages (TDPs) to support algorithm development.
- Provide updates to existing TDPs to include additional advanced threat countermeasures for algorithm development and testing.
- Participate in BMDS flight tests using the BFT to support algorithm development.

- Support planning for future flight tests.
- Conduct digital characterization testing of algorithms.
- Continue identification and discussion of potential new Engagement Sequence Groups with MDA System Engineering.
- Conduct at least four ATT and CaT algorithm technical reviews.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Decision Architecture | 0 | 0 | 5,105 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Decision Architecture applies advanced decision theory technology to improve real-time BMDS command, control, and battle management (C2BM) capability. The Decision Architecture concept describes a method to integrate individual sensors into a BMDS system with coordinated control of sensor and weapon assets. The Decision Architecture group within Hercules develops multi-sensor discrimination algorithms that use the output of other Hercules development efforts and uses advanced decision theory to develop resource management algorithms that coordinate the use of weapons and sensors. Multi-sensor discrimination permits target selection based on information gained from multiple sensors. Since sensors observe different characteristics of potential objects, this information combination provides a better picture of the missile engagement. The coordinated sensor and weapon management provides decision aids to the missile defense commander that will help insure that different sensors or weapons are engaging the same target objects. This capability will lead to better situational awareness, sensor resource allocation and weapon magazine management options for integration into the Global Integrated Fire Control.

FY07 Planned Program:

- Continue development and BFT flight test demonstration of Decision Architecture components.
- Support the MDA Battle Management Command and Control program with integration of Decision Architecture capability into C2BMC.
- Decision Architecture enhancements to include emerging capabilities, such as Multiple Kill Vehicles and DADs.
- Extend the Decision Architecture to distributed operations.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Forward Based Sensors | 0 | 0 | 3,524 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Forward Based Sensors (FBS) develops discrimination algorithms that take advantage of unique FBS observables to provide a robust discrimination solution. FBS develops algorithms for both radar sensors and electro-optical sensors. The initial Hercules radar discrimination algorithms enable the FBX-T Mod Hercules Suite 1 Engagement Sequence Group (ESG). Additional Hercules radar discrimination algorithms enable the FBX-T Mod

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

Hercules Suite 2 and the SBX Mod Hercules Suite 1 and 2 ESGs. Hercules plans to work with the MDA Sensor program to integrate the initial passive optics algorithms into an airborne asset.

FY07 Planned Program:

- Support integration of additional forward based discrimination algorithms to further enhance the capability of the FBX-T and SBX radars in support of the FBX-T and SBX Mod Hercules Suite 2 Engagement Sequence Groups.
- Modify FBS algorithms for operation on AEGIS Spy-1 sensor.
- Support the MDA Sensor program with test and integration of initial forward based Passive Optics discrimination algorithms.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Blue Team | 0 | 0 | 12,677 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The Blue Team leads advanced algorithm development efforts over a range of technology areas. The Blue Team develops fire control, tracking, discrimination, and control algorithms with a primary focus on single sensor or kill vehicle applications, and track management among sensors and weapons. These algorithms support both surveillance sensors, like the Sea-Based X-Band radar, kill vehicles like the Exoatmospheric Kill Vehicle (EKV), THAAD kill vehicle or Multiple Kill Vehicle (MKV), and weapon systems like AEGIS and Kinetic Energy Interceptor (KEI). Blue Team efforts enabled the Battle Management Command and Control program to test demonstration of a Sensor Registration Monitoring capability in 2005 and supported the fielding of a track correlator that will enable FBX-T participation on Link-16.

FY07 Planned Program:

- Support engineering integration of algorithms that enable the Target Designation Concept Description that will improve the GMD system capability in the presence of countermeasures. These algorithms include discrimination, target handover and kill vehicle enhancement algorithms.
- Support AEGIS discrimination enhancements.
- Support tracking and discrimination algorithm transition and integration with Space Surveillance Tracking System.
- Review capability of existing discrimination algorithms in conjunction with the use of other discrimination augmentation devices (DADS), and develop new algorithm capabilities that enhance the use of these DADS.
- Continue algorithm development efforts for MKV and KEI.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Corporate Clutter Working Group | 0 | 0 | 5,906 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The Corporate Clutter Working Group develops algorithms to mitigate the effects of threat countermeasures used to reduce the effectiveness of fielded and anticipated BMDS sensors used for enemy missile surveillance or engagement. In many cases, this is the only such effort within MDA. The algorithms support tracking and discrimination in the presence of the countermeasures.

FY07 Planned Program:

- Continue prototype development and flight test of radar sensor countermeasure Initial Mitigation Capability (IMC) algorithms.
- Support engineering planning for FY08/FY09 transition and integration of IMC.
- Continue development of electro-optical sensor counter-countermeasure algorithms.
- Develop enhancements to IMC.

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603889C Ballistic Missile Defense Products |

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## 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 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Decision Architecture** | | | | | | | | |
| Sparta | CPFF | Arlington, VA | 0 | 0 | N/A | 4,105 | 1Q | 4,105 |
| **Forward Based Sensors** | | | | | | | | |
| Hercules | MIPR | Arlington, Huntsville | 0 | 0 | N/A | 3,524 | 1Q | 3,524 |
| **Corporate Clutter Working Group** | | | | | | | | |
| Northrop Grumman | C/CPFF | Van Nuys, CA | 0 | 0 | N/A | 5,906 | 1/2Q | 5,906 |
| Subtotal Product Development | | | 0 | 0 | | 13,535 | | 13535 |

## Remarks

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Engineering and Integration** | | | | | | | | |
| Boeing | CPAF | Arlington, VA | 0 | 0 | N/A | 2,000 | 1/3Q | 2,000 |
| Lockheed Martin | CPFF | Sunnyvale, CA | 0 | 0 | N/A | 5,000 | 1/4Q | 5,000 |
| Raytheon | CPFF | Boston, MA | 0 | 0 | N/A | 3,000 | 1/3Q | 3,000 |
| Sparta | CPFF | Arlington, VA | 0 | 0 | N/A | 3,000 | 1/3Q | 3,000 |
| Massachusetts Institute of Technology/Lincoln Laboratory | FFRDC | Hanscom, AFB | 0 | 0 | N/A | 6,000 | 1/3Q | 6,000 |
| Northrop Grumman | CPFF | Van Nuys, CA | 0 | 0 | N/A | 3,000 | 1/3Q | 3,000 |
| Space and Missile Defense Command | MIPR | Various | 0 | 0 | N/A | 1,350 | 1/3Q | 1,350 |
| **Decision Architecture** | | | | | | | | |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Massachusetts Institute of Technology/Lincoln Laboratory | CPFF | Boston, MA | 0 | 0 | N/A | 500 | 1Q | 500 |
| **Blue Team** | | | | | | | | |
| Massachusetts Institute of Technology/Lincoln Laboratory | C/FFRDC | | 0 | 0 | N/A | 12,677 | 1/2Q | 12,677 |
| Subtotal Support Costs | | | 0 | 0 | | 36,527 | | 36527 |

**Remarks**

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Decision Architecture** | | | | | | | | |
| CSC-SETA | FFP | Fairfax, VA | 0 | 0 | N/A | 500 | 1Q | 500 |
| Subtotal Management Services | | | 0 | 0 | | 500 | | 500 |

**Remarks**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 0 | 0 | | 50,562 | | 50,562 |

**Remarks** Prior to FY07, funding for this project was previously contained in Projects 0802, 0902 and 0002.

**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date: **February 2006**

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

R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products**

| Fiscal Year | 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 |
| **Hercules** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Algorithm Testing and Transition for STSS | | | | | | | | | △ | | | △ | | | | | | | | | | | | | | | | |
| Conduct CaT and ATT reviews | | | | | | | | | △ | △ | △ | △ | | | | | | | | | | | | | | | | |
| Cont. Discrimination Capability Integration C2BMC | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| Continue BFT Flight Test demo | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| Develop and Transition FBS algorithms | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| Development of EO/SC algorithms | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| Development of additional TDPs | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| Development of algorithm to MKV | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| Enhancement of algorithm to DADs | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| Flight tests using BFT to support algorithm development | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| Identify and discuss potential ESGs with SE | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| Integration of DA capability GIFC | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| Integration of FBS passive optics algorithms | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| Integration of algorithms to GMD | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| Prototype demonstration mitigation algorithms | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| Support SN Integration of FBS Suite 1 | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| Support AEGIS discrimination enhancements | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| Updates to existing TDPs | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| △ | Significant Event (complete) | △ | Significant Event (planned) |
| ☆ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◇ | Element Test (complete) | ◇ | Element Test (planned) |
| ▽ | System Level Test (complete) | ▽ | System Level Test (planned) |
| △——△ | Complete Activity | △——△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Hercules** | | | | | | | |
| Algorithm Testing and Transition for STSS | | | 1Q-4Q | | | | |
| Conduct CaT and ATT reviews | | | 1Q,2Q,3Q,4Q | | | | |
| Cont. Discrimination Capability Integration C2BMC | | | 1Q-4Q | | | | |
| Continue BFT Flight Test demo | | | 1Q-4Q | | | | |
| Develop and Transition FBS algorithms | | | 1Q-4Q | | | | |
| Development of EO/SC algorithms | | | 1Q-4Q | | | | |
| Development of additional TDPs | | | 1Q-4Q | | | | |
| Development of algorithm to MKV | | | 1Q-4Q | | | | |
| Enhancement of algorithm to DADs | | | 1Q-4Q | | | | |
| Flight tests using BFT to support algorithm development | | | 1Q-4Q | | | | |
| Identify and discuss potential ESGs with SE | | | 1Q-4Q | | | | |
| Integration of DA capability GIFC | | | 1Q-4Q | | | | |
| Integration of FBS passive optics algorithms | | | 1Q-4Q | | | | |
| Integration of algorithms to GMD | | | 1Q-4Q | | | | |
| Prototype demonstration mitigation algorithms | | | 1Q-4Q | | | | |
| Support SN Integration of FBS Suite 1 | | | 1Q-4Q | | | | |
| Support AEGIS discrimination enhancements | | | 1Q-4Q | | | | |
| Updates to existing TDPs | | | 1Q-4Q | | | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0703 Joint Warfighter Support Block 2004 | 37,844 | 0 | 0 | 0 | 0 | 0 | 0 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## A. Mission Description and Budget Item Justification

As part of the total Ballistic Missile Defense System (BMDS), the Joint Warfighter Support Program (JWSP) is critical to enable Warfighters to work with MDA to define, test, deploy and employ new missile defense Block capabilities; maintain proficiency with current Block capabilities; and provide feedback to the MDA BMDS development process.

The JWSP consists of six core processes which are tailored to enable Block 04 BMDS capabilities transitioning to the user:

- Concepts and Plans that address emerging and future BMDS material capabilities and technologies
- BMDS-wide Integrated Logistics Support policies and procedures for the BMDS.
- "Above-Element" level Training and Education programs for the Joint Warfighters, and an ability to "Train As You Fight".
- Geographical Combatant Commander (GCC) Support to enable Combatant Commander COCOM and Service participation in MDA BMDS development activities.
- BMDS Sustainment & Operations through the MDA Missile Defense Operations Center (MOC) and the BMDS Watch Officers.
- Exercises and Wargames to enable end-user mission training, qualification, certification and rehearsal of BMDS operations and provide feedback to MDA in the BMDS development process.

Block 2004 will see the fielding of several planned BMDS capabilities and/or asset quantity increases. These capabilities will be addressed in each JWSP activity to ensure the Joint Warfighter is properly trained to employ and integrate these capabilities and allow feedback to flow into MDA developmental efforts. Included in the planned Block 04 capabilities are:

- Sea Based X-Band Radar (SBX)
- Beale UEWR Forward Deployed X-Band Radar, Transportable (FBX-T) Aegis SPY-1 Radar, Long Range Surveillance and Track GBI interceptors
- PAC-3 interceptors
- Planning and Situational Awareness capabilities in Command, Control, Battle Management and Communications (C2BMC).

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Exercises and Wargames | 26,339 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Exercises and Wargames enable end-user mission training, qualification, certification and rehearsal of BMDS operations, and strengthen user confidence in the current system and shape development of the future BMDS. By involving all participating COCOMs in building coherent missile defense plans and tactics, techniques and procedures for the near term BMDS, and then testing cohesive execution of those plans via high fidelity simulations, this effort optimizes BMDS operational effectiveness. It also leverages activities MDA system engineering events and interoperability tests by providing real-world training to operators. Finally, exercises and wargames create the conditions for continued, in-depth foreign and/or international participation in BMDS operations and development. Near-term efforts focus on increased integration of regional missile defense exercises into the Integrated Missile Defense War Game (IMD/WG) construct. The IMD/ WG series addresses the full spectrum of the Short-Range, Medium-Range, and Long-Range Ballistic Missile threats, 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 program consists of events with specific objectives tailored to MDA developmental and interoperability testing and COCOM's operational and training needs.

FY05 Accomplishments:

Integrated Missile Defense War Game IMD/WG, in five increments:

- IMD/WG - Exercise Juniper Cobra - Rehearsed EUCOM War Plan against Southwest Asia (SWA) Shorter-Range Ballistic Missile Threats. Enabled 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 provided risk reduction for US multi-layer (Patriot-THAAD) CONOPS and technical issues.
- IMD/WG - System Engineering-Simulation - Supported MDA Development Testing of BMDS Block 04/06 capabilities. This effort also allowed COCOM development of BMDS Block 04 procedures/training.
- IMD/WG - Planning Exercise - Supported 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 supported an evaluation of C2BMC technical and operational interoperability.
- IMD/WG - BMDS Exercise - Supported COCOM mission rehearsal / certification/ training in BMDS Block 04, for NEA potential threats.
- IMD/WG - Senior Leader Seminar - Reviewed results, accomplishments, lessons learned, and action items from the above described events.
- Completed Exercise Roving Sands with Theater High Altitude Area Defense (THAAD) assets.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

- Conducted the first BMDS Warfighter Conference to review activities in FY05 and to document lessons learned from all exercises and wargame events.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Concepts and Plans | 200 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Concepts and Plans looks at evolving BMDS capabilities and addresses their impact on the Joint Warfighter's employment of the BMDS. By understanding emerging and future BMDS material capabilities and technologies, Joint Warfighters will be in a position to develop new, more effective employment constructs, Concepts of Operations (CONOPS) and tactics. This activity enables them, via low fidelity simulations and tabletop exercises to efficiently investigate alternative ways of operating the future BMDS. It also serves MDA as a prime vehicle for the Warfighter Involvement Process (WIP) which seeks user feedback and guidance to shape future Block development of the BMDS.

FY05 Accomplishments:

- Developed operational concepts and conducted feasibility studies for emerging BMDS capabilities, such as the Sea Based and Forward Based X-Band Deployable Radars.
- Publication of the BMDS Handbook

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| BMDS Logistics | 120 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

A pre-condition for an effective BMDS is having a solidly supported logistics system. The BMDS Logistics activity develops transition plans addressing Doctrine, Organization, Training, Material, Leadership, Personnel, and Facilities (DOTMLPF) efforts to improve planning and predictability for Military departments and COCOMs. The plans include not only historical precedent, but also provide a forward look to the Services and COCOMs on what capabilities they may be getting, when they may be getting them, and what their support responsibilities may be. This activity also creates, develops, and coordinates BMDS-wide Integrated Logistics Support policies and procedures and provides funding to ensure that the requisite DOTMLPF will be in place to sustain the deployed BMDS Block capabilities.

FY05 Accomplishments:

- Developed BMDS logistic support polices, procedures and Inter Service Support Agreements to enable fielding and sustainment of the initial BMDS (e.g. the Upgraded Early Warning Radar at Eareckson Air Station on Shemya Island, Alaska).

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

- Developed the BMDS Block 04 Activation Plan to guide COCOM and Service logistical readiness for the initial BMDS capability.
- Developed BMDS Logistics Policies, Plans and Procedures and support capabilities and agreements to enable fielding and sustainment of the BMDS (e.g. Contractor Logistics Support contract modification for the BMDS when in an operational, vice developmental, status).
- Led the Joint BMD community in a series of logistics reporting exercises.
- Developed the Block 2004 Activation Plan to guide COCOM and Service logistical readiness for the initial BMDS capability.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| GCC Support | 2,138 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Geographical Combatant Commander (GCC) Support enables COCOM and Service participation in MDA activities such as wargames, exercises, table tops, flight tests, ground tests, resource planning meetings and other conferences and interchanges where securing user input is critical for an effective outcome. This activity also supports the Warfighter Involvement Process (WIP) by enabling operators, users, and other BMDS stakeholders to travel and participate in missile defense related exercises, tests, activities and other fora. User involvement ensures that MDA, the Joint Warfighters and Services will work together to define, field, and operationalize current BMDS capabilities and develop subsequent new Block capabilities in an efficient and effective manner.

FY05 Accomplishments:

- Ensured that all relevant COCOMs participated in MDA activities related to their preparation for, employment and sustainment of the emergent BMDS capabilities.
- Staffed the JWSP with highly qualified and productive contractor support personnel.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Sustainment - MOC Operations | 3,844 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The MDA Operations Center (MOC), through the BMDS Watch Officer (BWO) in Colorado Springs, serves as the Agency's central node for monitoring BMDS operational activities providing the conduit for information flow between MDA and the Combatant Commanders. By facilitating communications between the MDA and operational activities, maintaining situational awareness on the status of the BMDS, and coordinating the activities required to return it to a specified status when necessary, the BWO and MOC help assure the BMDS is best configured to support operational and developmental requirements. The BWO and MOC also coordinate MDA's schedule requirements, ensuring BMDS asset availability

for developmental, test, operational, and training activities. The BWO/MOC team also contributes to assuring that the operational BMDS is provided with timely and effective logistics support on an ongoing basis.

FY05 Accomplishments:

- Provided BMDS situational awareness and status to MDA and COCOM leadership.
- Scheduled BMDS asset availability for key BMDS ground testing, tracking/reporting on ballistic targets of opportunity, and participation in wargames/exercises/and unit level training efforts.
- Accomplished Operation Center equipment upgrades.
- Staffed the Operations Center with highly qualified and productive government civilian and contractor personnel.
- Established the operational community interface with U.S. Strategic Command's (STRATCOM's) Joint Functional Component Commander for Integrated Missile Defense (JFCC-IMD).

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| BMDS Training | 5,203 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

BMDS Training focuses on maintaining, developing and providing “Above-Element” Training for the Joint Warfighters, Defense officials and the Services to provide stakeholders with critical knowledge on BMD capabilities and system operation. The end result is to provide BMDS operators, staffs and defense officials with a better understanding of the BMDS, enabling them to use that knowledge to achieve a more efficient and effective missile defense. Key activities include System-level educational courses, instructional capabilities within Service/Joint Schools and conducting education and training of select BMDS stakeholders, staffs and organizations on emerging BMDS Block deployment capabilities. An additional high priority demand of the Warfighting community is the ability to “Train As You Fight”. Part of this effort will produce a Distributed, Multi-Echelon, Training System (DMETS) to satisfy that need. The resulting virtual network will enable users across the globe at geographically separated BMDS warfighting nodes to routinely engage in missile defense exercises at their actual duty stations. The DMETS is thus both a training enabler and a cost saver by eliminating the need to transport and sustain BMDS forces at a centralized training venue.

FY05 Accomplishments:

- Procured equipment, including dedicated servers, for the Distributed Multi Echelon Education and Training System (DMETS) start-up.
- Established an interim DMETS capability that supported the Integrated Missile Defense wargame effort.
- Refined the definition and programmatic mechanism to continue the disciplined and timely development of the objective.
- Conducted system level BMDS education for selected National Command Authority and Combatant Command personnel and staffs.

- Established initial BMD Training and Education Program facilities in Colorado Springs, CO.

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## 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 2006 |
|---|---|
| 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 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 | 1,404 | 0 | N/A | 0 | N/A | 1,404 |
| IMD WG - System Engineering - Simulation | CPAF | JNIC/GM BOEING/PEO ASMD/ Denver CO/Huntsville AL | 4,664 | 0 | N/A | 0 | N/A | 4,664 |
| IMD WG - PLANEX | CPAF | JNIC/ Denver CO | 1,400 | 0 | N/A | 0 | N/A | 1,400 |
| IMD WG - Senior Leader Seminar | CPAF | JNIC/ Denver CO | 457 | 0 | N/A | 0 | N/A | 457 |
| Technical Support | CPAF | SPARTA/ Arlington,VA | 8,897 | 0 | N/A | 0 | N/A | 8,897 |
| Eareckson Security | MIPR | Eareckson AFB/ AS | 3,632 | 0 | N/A | 0 | N/A | 3,632 |
| Exercise Roving Sands | MIPR | PEO THAAD/ Arlington, VA | 216 | 0 | N/A | 0 | N/A | 216 |
| IMD WG - PLANNEX | CPAF | JNIC/GMBOEING /PEOASMD/ Denver CO/Huntsville CO | 5,672 | 0 | N/A | 0 | N/A | 5,672 |
| **Concepts and Plans** | | | | | | | | |
| Concept of Operations Studies | MIPR | THAAD/Huntsville AL | 200 | 0 | N/A | 0 | N/A | 200 |
| **BMDS Logistics** | | | | | | | | |
| Develop Initial BMDS Logistics Support Policies | CPAF | JNIC/Denver CO | 120 | 0 | N/A | 0 | N/A | 120 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **GCC Support** | | | | | | | | |
| Travel and Shipping Support For GCCs | MIPR | USPACOM/Camp Smith HI & USSTRATCOM/San Diego, CA | 378 | 0 | N/A | 0 | N/A | 378 |
| MDA Staff Travel | TM | MDA / Arlington, VA | 462 | 0 | N/A | 0 | N/A | 462 |
| MDA Staff Salaries | TM | MDA/ Arlington, VA | 1,295 | 0 | N/A | 0 | N/A | 1,295 |
| **Sustainment - MOC Operations** | | | | | | | | |
| Sustainment & Operations - MOC | CPAF | JNIC/ Colorado Springs, CO | 501 | 0 | N/A | 0 | N/A | 501 |
| Technical Support | TM | SPARTA/ Rosslyn, VA | 2,287 | 0 | N/A | 0 | N/A | 2,287 |
| Sustainment & Operations | CPAF | JNIC/ Colorado Springs, CO | 27 | 0 | N/A | 0 | N/A | 27 |
| MOC Staff & Travel | TM | MDA/ Arlington, VA | 1,029 | 0 | N/A | 0 | N/A | 1,029 |
| **BMDS Training** | | | | | | | | |
| Preliminary Distributed Multi-Echelon Training System Study | CPAF | JNIC/ Colorado Springs, CO | 5,167 | 0 | N/A | 0 | N/A | 5,167 |
| Initial BMDS Training Development | TM | MDA/ Arlington, VA | 36 | 0 | N/A | 0 | N/A | 36 |
| Subtotal Product Development | | | 37,844 | 0 | | 0 | | 37844 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 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 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Subtotal Management Services | | | | | | | | |

**Remarks**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 37,844 | 0 | | 0 | | 37,844 |

**Remarks**

**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date: **February 2006**

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

R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products**

| Fiscal Year | 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 |
| **BLOCK 2004** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IMD WG - Juniper Cobra | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | |
| IMD WG - System Engineering Simulation | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | |
| IMD WG - Planning Exercise | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | |
| IMD WG - BMDS Exercise | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | |
| IMD WG - Senior Leader Seminar | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲▬▲ | Complete Activity | △▬△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **BLOCK 2004** | | | | | | | |
| IMD WG - Juniper Cobra | 3Q | | | | | | |
| IMD WG - System Engineering Simulation | 3Q | | | | | | |
| IMD WG - Planning Exercise | 3Q | | | | | | |
| IMD WG - BMDS Exercise | 4Q | | | | | | |
| IMD WG - Senior Leader Seminar | 4Q | | | | | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0803 Joint Warfighter Support Block 2006 | 0 | 31,044 | 53,350 | 0 | 0 | 0 | 0 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: Starting in FY06 the Ballistic Missile Defense System Manager effort was transferred from Ballistic Midcourse Defense PE 0603882C (Project 0808) to Ballistic Missile Defense Products PE 0603889C (Project 0803).*

**A. Mission Description and Budget Item Justification**

As part of the total Ballistic Missile Defense System (BMDS), the Joint Warfighter Support Program (JWSP) is critical to enable Warfighters to work with MDA to define, test, deploy and employ new missile defense Block capabilities; maintain proficiency with current Block capabilities; and provide feedback to the MDA BMDS development process. The JWSP consists of a core set of consistent processes, tailored to the new BMDS capabilities to be deployed in each Block. The JWSP is divided into two-year Blocks to match the evolutionary capability Blocks of the BMDS. The JWSP builds Combatant Commander (COCOM) proficiency in fielded missile defense capabilities, and provides critical operational level feedback directly to MDA development efforts. The JWSP consists of seven primary processes, tailored in scope to the current BMDS Block capabilities as they transition, or near transition, to the user.

- BMDS Exercises and Wargames.
- Concepts & Plans required to address evolving, emerging and projected Ballistic Missile technology (both defensive and threat oriented).
- BMDS Logistics Transition and Logistics Planning and Development.
- Geographic Combatant Commanders (GCCs) Support.
- BMDS Sustainment & Operations Coordination and Control through the Missile Defense Operations Center (MOC).
- BMDS Training Development for the Warfighters.
- Ballistic Missile Defense System Manager.

Block 2006 will see numerous BMDS capabilities and or asset quantity increases during the FY06-2007 time-frame. These capabilities will be added to each JWSP activity to ensure the Joint Warfighter is properly trained to employ and integrate these capabilities to address the evolving Ballistic Missile threat environments. Among the planned increase scope of the BMDS Block capabilities that will be addressed by the JWSP are:

- Increased numbers of Ground-Base Interceptors at Fort Greely.
- Upgraded Early Warning Radar at Thule, Greenland.
- Additional Forward Based X-Band Radar.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

- Additional SM-3 sea-based interceptors and upgraded Aegis cruisers and destroyers.
- Theater High Altitude Area Defense (THAAD) interceptors.
- Expanded Link-16 data engagement data sharing between THAAD, PATRIOT, and AEGIS BMDS Elements.
- Implications from the expanded Engagement Sequence Group scope, as new elements and capability is added.
- Expanded upgrades to the BMDS C2BMC planning capabilities.

**B. Accomplishments/Planned Program**

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Exercises and Wargames | 0 | 19,115 | 32,789 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

BMDS overlays are incorporated into Combatant Command Tier 1 Exercises to enable end-user mission rehearsal and sustainment training, qualification, certification of BMDS operations, and strengthen user confidence in the current system and shape development of the future BMDS. By involving participating COCOMs in building coherent missile defense plans and Tactics, Techniques and Procedures (TTPs) for the near term BMDS, and then testing cohesive execution of those plans via high fidelity simulations, this effort optimizes BMDS operational effectiveness. It also leverages activities MDA system engineering events and interoperability tests by providing real-world training to operators. Finally, exercises and wargames create the conditions for continued, in-depth foreign and/or international participation in BMDS operations and development. Near-term efforts focus on increased integration of regional exercises into a more global BMDS construct. The BMDS exercise and wargame overlays addresses the full spectrum of the Short-Range, Medium-Range, and Long-Range Ballistic Missile threats, from launch to impact, and involve the integrated planning and execution of all participating COCOMs with the goal of improving performance and validating BMDS capabilities.

FY06 Planned Program:

- BMDS overlay to Keen Edge 06. This will overlay a 5th Air Force, PACOM exercise with a Japanese theater exercise to support Northeast Asia (NEA) Warplan Rehearsal.
- Exercise Joint Project Optic Windmill IX - A semi-annual combined-joint U.S. European Command (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 threats from South-West Asia (SWA).
- BMDS overlay to the North American Aerospace Defense Command (NORAD) Exercise Amalgam Phantom 06. This overlay will enable development of BMDS TTPs, war plans, and Concepts of Operations (CONOPS); and allow for insertion of new/emerging MDA developed BMDS capabilities, to include C2BMC soft ware builds, to be field tested by the joint Warfighter communities.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

- BMDS Exercise Terminal Fury 07 will be planned and most preparatory work accomplished in FY06 with an early FY07 execution date. This exercise will to overlay U.S. Northern Command's (NORTHCOM's) Vigilant Shield 07 (VS07). Vigilant Shield and Terminal Fury will fully integrate Command, Control, Battle Management and Communications (C2BMC) fully into Exercise Terminal Fury 07 (TF07) as part of a JTF certification exercise. This exercise will fully integrate C2BMC from the National Capital Region through every COCOM (pending their participation) down to the regional fight as a Situation Awareness and Battle Manager; allow warfighters to interact with the FBX-T radar; obtain user feedback from the FBX-T on operator actions; and use C2BMC's Battle Manager to control 700+ Theater/Regional ballistic missile shots, a space launch vehicle and a missile with potential Strategic implications.
- Distributed Exercises - Follow-on exercises to BMDS ground and flight tests allowing the operations community to develop new TTPs using the latest test and developmental system configurations.

FY07 Planned Program:

- Exercise Juniper Cobra 07 - A semi-annual 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 SWA. The exercise involves participation of live U.S. and host nation forces, in a multi-layered/Link 16/Joint Requirements Exercise environment. It also permits study of multi- system technical and operational issues for Block 2006/2008 capabilities.
- BMDS overlay to NORAD Exercise Amalgam Phantom 07. This overlay will enable development of BMDS TTPs, war plans, and CONOPS; and allow for insertion of new/emerging MDA developed BMDS capabilities, to include C2BMC soft ware builds, to be field tested by the joint Warfighter communities.
- BMDS overlay NORTHCOM Exercise Vigilant Shield 07, and PACOM Exercise Terminal Fury 07. Logically, Terminal Fury 07 final execution and 08 Planning will be accomplished here. This overlay will enable development of BMDS TTPs, war plans, and CONOPS, allow for testing and certifying warfighters, and permit analysis of the operation and the integration of C2BMC to control Ballistic Missile operations effectiveness. This Final exercise report will analyze the integration of C2BMC from the National Capital Region down to the regional fight as a Situation Awareness and Battle Manager; assess warfighters, interactions with the FBX-T radar, obtain document user feedback from the FBX-7 on operator actions, examine C2BMC's Battle Manager effectiveness to control BMDS operations, and will evaluate the integration and effectiveness of the C2BMC to provide effective BMDS Situation Awareness and Battle Management.
- Distributed Exercises - Follow-on exercises to BMDS ground and flight tests allowing the operations community to develop new TTPs using the latest test and developmental system configurations.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Concepts and Plans | 0 | 648 | 1,805 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Concepts and Plans looks at evolving BMDS capabilities and addresses their impact on the Joint Warfighter's employment of the BMDS. By understanding emerging and future BMDS material capabilities and technologies, Joint Warfighters will be in a position to develop new, more effective employment constructs, CONOPS and tactics. This activity enables them, via low fidelity simulations and tabletop exercises, to efficiently investigate alternative ways of operating the future BMDS. It also serves MDA as a prime vehicle for the Warfighter Involvement Process (WIP) which seeks user feedback and guidance to shape future Block development of the BMDS.

FY06 Planned Program:

- Conduct JNIC BMDS Exercise Planning throughout FY06 to integrate users, testers and exercise participants.
- Conduct BMDS Table Top Exercises to intellectually wargame BMDS problems and systematically examine and analyze multiple, alternative, courses of action in support of emerging BMDS Block capabilities.
- Conduct System Capability Reviews (Rock Drills) to demonstrate BMDS concepts and capabilities in new or evolving environments and situations, or as a Capability Demonstration, by looking at new ways to employ BMDS elements.
- Conduct Studies and Analyses, as required, to examine emergent BMDS technology impacts on Joint Warfighter requirements for Block development efforts.
- Work with the US Strategic Command STRATCOM) to document, validate, and prioritize new Ballistic Missile Defense capabilities desired by the COCOMS, as well as enhancements to the characteristics of fielded capabilities in a new Warfighter Involvement Process (WIP).
- Generate a BMDS prioritized capability list reflecting COCOM priorities for needed BMDS enhancements.
- Generate BMDS modification requests reflecting COCOM priorities for modifications needed to existing systems or capabilities.

FY07 Planned Program:

- Continue JNIC BMDS Exercise Planning throughout FY07 to integrate users, testers an exercise participants.
- Continue BMDS Table Top Exercise(s) to intellectually wargame BMDS problems and systematically examine and analyze multiple, alternative, courses of action. Conduct System Capability Reviews (Rock Drills) to demonstrate BMDS concepts and capabilities in new or evolving environments and situations, or as a Capability Demonstration, by looking at new ways to employ BMDS elements.
- Continue Studies and Analyses, as required, to examine emergent BMDS technology impacts on Joint Warfighter requirements for Block development efforts.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

- Continue to work with the STRATCOM to document, validate, and prioritize new Ballistic Missile Defense capabilities desired by the COCOMS, as well as enhancements to the characteristics of fielded capabilities through the WIP.
- Update the annual BMDS prioritized capability list reflecting COCOM priorities for needed BMDS enhancements.
- Update or generate new BMDS modification requests reflecting COCOM priorities for modifications needed to existing systems or capabilities

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| BMDS Logistics | 0 | 1,087 | 959 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

A pre-condition for an effective BMDS is having a solidly supported logistics system. The BMDS Logistics activity develops transition plans addressing Doctrine, Organization, Training, Material, Leadership, Personnel, and Facilities (DOTMLPF) and provides funding to improve planning and predictability for Military departments and COCOMs. The plans include not only historical precedent, but also provide a forward look to the Services and COCOMs on what capabilities they may be getting, when they may be getting them, and what their support responsibilities may be. This activity also creates, develops and coordinates BMDS-wide Integrated Logistics Support policies and procedures to ensure that the requisite DOTMLPF and associated funding will be in place to sustain the deployed BMDS Block capabilities.

FY06 Planned Program:

- Plan BMDS-wide Integrated Logistics Support and Block contingency deployments for emerging Block capabilities.
- Support BMDS exercises and wargames with the Services and COCOMs through logistics overlays in order to evolve BMDS Block sustainment policies, directives and procedures and to keep pace with new BMDS Block capabilities.
- Update the BMDS Handbook to document new operational and technical characteristics for combatant commanders, staffs, operators, and other key personnel.

FY07 Planned Program:

- Update planned BMDS-wide Integrated Logistics Support and Block contingency.
- Continue to support BMDS exercises and wargames with the Services and COCOMs through logistics overlays to those exercises in order to evolve BMDS Block sustainment policies, directives and procedures and to keep pace with new BMDS Block capabilities.
- Update the BMDS Handbook to document new operational and technical characteristics for combatant commanders, staffs, operators, and other key personnel.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603889C Ballistic Missile Defense Products |

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Geographic Combatant Commander (GCC) Support | 0 | 2,638 | 2,947 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Geographical Combatant Commander (GCC) Support enables COCOM and Service participation in MDA activities such as wargames, exercises, table tops, flight tests, ground tests, resource planning meetings and other conferences and interchanges where securing user input is critical for an effective outcome. This activity also supports the Warfighter Involvement Process (WIP) by enabling operators, users, and other BMDS stakeholders to travel and participate in missile defense related exercises, tests, activities and other fora. User involvement ensures that MDA, the Joint Warfighters and Services will work together to define, field, and operationalize current BMDS capabilities and develop subsequent new Block capabilities in an efficient and effective manner.

FY06 Planned Program:

- Support COCOM participation in MDA activities, such as wargames, exercises, table tops, and conferences.
- Provide Headquarters staff functions to oversee all JWSP functions.

FY07 Planned Program:

- Continue to support COCOM participation in MDA activities, such as wargames, exercises, table tops, and conferences.
- Continue to provide Headquarters staff functions to oversee all JWSP functions.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Sustainment & Operations - MOC | 0 | 4,274 | 4,697 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The MDA Operations Center (MOC),through the BMDS Watch Officer (BWO) in Colorado Springs, serves as the Agency's central node for monitoring BMDS operational activities, providing the conduit for information flow between MDA and the Combatant Commanders. By facilitating communications between the MDA and operational activities, maintaining situational awareness on the status of the BMDS, and coordinating the activities required to return it to a specified status when necessary, the BWO/MOC team helps assure the BMDS is best configured to support operational and developmental requirements. The BWO/MOC team also coordinates MDA's schedule requirements, ensuring BMDS asset availability for developmental, test, operational, and training activities. The BWO/MOC contributes to assuring that the operational BMDS is provided with timely and effective logistics support on an ongoing basis.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
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FY06 Planned Program:

- Improve situational awareness and decision support tools.
- Streamline the BMDS scheduling/asset management process to deconflict operational and developmental BMDS activities by improving tools, process flows, and training for key users.
- Increase fidelity and technical detail in configuration specifications needed to support transition activities.
- Conduct initial and sustainment training, education, and qualification for watch personnel.
- Continue to man the MOC/BWO on a 7-day per week/24-hours per day/365 days a year basis.
- Replace or upgrade MOC/BWO equipment as required to keep pace with new BMDS Block capabilities.

FY07 Planned Program:

- Continue to man the MOC/BWO on a 7-day per week/24-hours per day/365 days a year basis.
- Conduct initial and sustainment training, education, and qualification for watch personnel.
- Replace or upgrade MOC equipment as required to keep pace with new BMDS Block capabilities.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| BMDS Training | 0 | 2,882 | 5,153 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

BMDS Training focuses on maintaining, developing and providing "Above-Element" Training for the Joint Warfighters, Defense officials and the Services to provide stakeholders with critical knowledge on BMD capabilities and system operation. The end result is to provide BMDS operators, staffs and defense officials with a better understanding of the BMDS, enabling them to use that knowledge to achieve a more efficient and effective missile defense. Key activities include System-level educational courses, instructional capabilities within Service/Joint Schools and conducting education and training of select BMDS stakeholders, staffs and organizations on emerging BMDS Block deployment capabilities. An additional high priority demand of the Warfighting community is the ability to "Train As You Fight." Part of this effort will produce a Combined Test & Operations (CTO) Distributed, Multi-Echelon, Training System (CTO-DMETS) to satisfy that need. The resulting virtual network will enable users across the globe at geographically separated BMDS warfighting nodes to routinely engage in missile defense exercises at their actual duty stations. The CTO-DMETS is thus both a training enabler and a cost saver by eliminating the need to transport and sustain BMDS forces at a centralized training venue.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

FY06 Planned Program:

- Operate the BMDS Training Center and provide "Above Element" training for the Joint Warfighters, Defense Officials and Services.
- Provide Training Transition to the Services.
- Host a Training Conference
- Complete the design for CTO-DMETS dedicated network bandwidth. The CTO-DMETS network must parallel the operational network but remain separate (not mixing training and real data). In addition, it requires a network to support the coordinated Simulation/Stimulation function so that all players are able to see the same threat picture as it plays out. In FY06 the design for the CTO-DMETS network will be completed. As part of this activity existing networks will be examined in a trade study to determine their applicability to CTO-DMETS.
- Continue to provide Operations and Support (O&S) to daily warfighter training.
- Provide AGEIS Pier-side connection utilizing the Battle Force Tactical Trainer, the Joint Training & Experimentation Network migrating to the Advance Combat Simulator, theater exercise driving global exercise (e.g., Joint Project Optic Windmill IX), enhancement of the U. S. Pacific Command (PACOM) enclave and initial installation of a U.S. European Command (EUCOM) enclave.
- Conduct an annual worldwide Missile Defense Training and Education Conference in order to develop policy and strategies and updates for the BMDS.

FY07 Planned Program:

- Operate the BMDS Training Center and provide "Above Element" training for the Joint Warfighters, Defense Officials and Services.
- Provide Training Transition to the Services.
- Host a Training Conference
- CTO-DMETS activities will transition to Project 0817 beginning in FY07.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Ballistic Missile Defense System Manager | 0 | 400 | 5,000 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The BMD System Manager monitors and synchronizes all aspects of vertical/element oriented BMDS development, testing and evaluation, corrective actions, acquisition, materiel release, and fielding, to include direct interaction with the materiel developers, test community, combatant commands and the gaining command to ensure effective and efficient Doctrine, Organization, Training, Material, Leadership, Personnel, and Facilities integration with the Joint Warfighter is achieved.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603889C Ballistic Missile Defense Products |

FY06 Planned Program:

- Update BMDS user technical requirements documentation based on program changes, engineering change packages and design reviews.
- Maintain a BMDS Operations and Integration Center to support Ground Based Missile Defense (GMD) element spiral development and integration into the BMDS through each Block capability upgrade.
- Monitor current and emerging threats to ground based elements of the BMDS.

FY07 Planned Program:

- Provide user laboratory operations to assess, develop and validate BMDS operational procedures and TTPs, and to provide BMDS exercise data analysis.
- Update BMDS user technical requirements documentation based on program changes, engineering change packages and design reviews.
- Maintain a BMDS Operations and Integration Center to support GMD spiral development and integration into the BMDS through each Block capability upgrade.
- Continue to monitor current and emerging threats to the ground based elements of the BMDS.

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603889C Ballistic Missile Defense Products |

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## 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 accomplishes this by development and vetting of Operational Concepts through the Joint Theater Air and Missile Defense Office, the Joint National Integration Center, the COCOMS and the Services utilizing seminars, workshops, table top exercises, wargames and simulation exercises that also support Military Utility Assessment updates.

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Exercises and Wargames** | | | | | | | | |
| Distributed Exercise 06-1 | CPAF | GM/ Huntsville AL | 0 | 500 | 1/2Q | 0 | N/A | 500 |
| Technical Support | CPAF | SPARTA/ Arlington, VA | 0 | 6,963 | 1/2Q | 10,824 | 1/2Q | 17,787 |
| BMDS Overlay - JUNIPER COBRA | CPAF | JNIC/BOEING/PEO AMSD/ Colorado Springs CO, Huntsville AL | 0 | 500 | 1/4Q | 2,000 | N/A | 2,500 |
| BMDS Overlay - Keen Edge | CPAF | JNIC/ Colorado Springs CO | 0 | 300 | 1/2Q | 1,000 | 1/2Q | 1,300 |
| BMDS Overlay - Amalgam Phantom | CPAF | JNIC/GM/ASMDP EO/ Colorado Springs CO | 0 | 2,200 | 3/4Q | 5,000 | 3/4Q | 7,200 |
| BMDS Overlay - Joint Project Optic Windmill IX | CPAF | JNIC/GM/ASMDP EO/ Colorado Springs CO,Arlington VA, Huntsville AL | 0 | 2,000 | 1/2Q | 0 | N/A | 2,000 |
| BMDS Overlay - Vigilant Shield | CPAF | JNIC/GM/ASMDP EO/ Colorado Springs CO, Huntsville AL | 0 | 2,200 | 3/4Q | 5,000 | 3/4Q | 7,200 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| BMDS Overlay - Planning Terminal Fury | CPAF | JNIC/GM/ASMDP EO/ Colorado Springs,CO/Arlingt onVA,Huntsville, AL | 0 | 2,100 | 3/4Q | 2,447 | 3/4Q | 4,547 |
| Distributed Exercise 07-1 | CPAF | GM/ Huntsville, AL | 0 | 0 | 1/2Q | 1,769 | 1/2Q | 1,769 |
| Distributed Exercise 07-2 | CPAF | GM/ Huntsville, AL | 0 | 500 | 2/3Q | 1,700 | 2/3Q | 2,200 |
| Other Exercises and Data Analyses | CPAF | JNIC/GM/ Colorado Spring CO, Huntsville AL | 0 | 1,552 | 1/4Q | 2,749 | 1/4Q | 4,301 |
| JNIC BMDS Exercise Planning | CPAF | GM/ Huntsville AL | 0 | 300 | 1/2Q | 300 | 1/2Q | 600 |
| **Concepts and Plans** | | | | | | | | |
| Studies & Analysis | MIPR | JNIC/ARMYPEO/ NAVSEA/ Colorado Springs CO & Arlington, VA/Huntsville AL | 0 | 648 | 1/4Q | 1,805 | 1/4Q | 2,453 |
| **BMDS Logistics** | | | | | | | | |
| BMDS Logistics | CPAF | JNIC/ Denver, CO | 0 | 1,087 | 1/4Q | 959 | 1/4Q | 2,046 |
| **Geographic Combatant Commander (GCC) Support** | | | | | | | | |
| Civilian Staff Support | TM | MDA/ Arlington, VA | 0 | 2,118 | 2Q | 2,312 | 1/4Q | 4,430 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| USSTRATCOM,USECOM,USPACECOM & USNORTHCOM | MIPR | San Diego, CA/Colorado Springs CO/Huntsville AL | 0 | 520 | 1/4Q | 635 | 1/4Q | 1,155 |
| **Sustainment & Operations - MOC** | | | | | | | | |
| MOC Operations | CPAF | JNIC/ Colorado Springs, CO | 0 | 1,354 | 1/4Q | 1,579 | 1/4Q | 2,933 |
| Technical Support | CPAF | SPARTA/ Rosslyn, VA | 0 | 2,920 | 1/2Q | 3,118 | 1/2Q | 6,038 |
| **BMDS Training** | | | | | | | | |
| BMDS Training Center | CPAF | JNIC/ Denver, CO | 0 | 1,523 | 1/3Q | 4,244 | 1/3Q | 5,767 |
| Studies & Analyses | CPAF | SPARTA/ Arlington, VA | 0 | 240 | 2Q | 247 | 2Q | 487 |
| Training Transition to Services | CPAF | MDA/ Arlington, VA | 0 | 643 | 1Q | 662 | 1Q | 1,305 |
| CTO-Distributed Multi-Echelon Training System | C/CPAF | MDNT/B / Arlington, VA | 0 | 476 | 2Q | 0 | N/A | 476 |
| **Ballistic Missile Defense System Manager** | | | | | | | | |
| Technical Support | CPAF | TSM | 0 | 400 | 1/3Q | 5,000 | 1/4Q | 5,400 |
| Subtotal Product Development | | | 0 | 31,044 | | 53,350 | | 84394 |

**Remarks**

Prior year costs (FY 2004-2005) are discussed in Project 0703.

Funding for CTO/DMETS transitions to a new Project (0817) in FY07.

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 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 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 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 | 31,044 | | 53,350 | | 84,394 |

**Remarks**

**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date: **February 2006**

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

R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products**

| Fiscal Year | 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 |
| **BLOCK 2006** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| JNIC BMDS Exercise Planning | | | | | ▲ | ▲ | | | | | | | | | | | | | | | | | | | | | | |
| BMDS Overlay 06 - Keen Edge 06 | | | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | |
| CTO-DMETS Interface w/Aegis FBX/Theater Elements | | | | | | ▲ | — | ▲ | | | | | | | | | | | | | | | | | | | | |
| Complete CTO-DMETS Network Design | | | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | |
| Distributed Exercise 06-1 | | | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | |
| Stand-up CTO-DMETS Red Cell Capability | | | | | | ▲ | — | ▲ | | | | | | | | | | | | | | | | | | | | |
| BMDS Overlay 06 - Amalgam Phantom 06 | | | | | | | ▲ | | | | | | | | | | | | | | | | | | | | | |
| BMDS Overlay 06 - Joint Project Optic Windmill IX | | | | | | | ▲ | | | | | | | | | | | | | | | | | | | | | |
| Distributed Exercise 06-2 | | | | | | | ▲ | | | | | | | | | | | | | | | | | | | | | |
| Preliminary CTO-DMETS Network Stand-up | | | | | | | | ▲ | | | | | | | | | | | | | | | | | | | | |
| BMDS Overlay 07 - Terminal Fury 07 | | | | | | | | | ▲ | | | | | | | | | | | | | | | | | | | |
| BMDS Overlay 07 - Vigilant Shield 07 | | | | | | | | | ▲ | | | | | | | | | | | | | | | | | | | |
| Distributed Exercise 07-1 | | | | | | | | | ▲ | | | | | | | | | | | | | | | | | | | |
| BMDS Overlay 07 - Juniper Cobra 07 | | | | | | | | | | | | ▲ | | | | | | | | | | | | | | | | |
| Distributed Exercise 07-2 | | | | | | | | | | | | ▲ | | | | | | | | | | | | | | | | |
| Distributive Exercise 07-3 | | | | | | | | | | | | ▲ | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲—▲ | Complete Activity | △—△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **BLOCK 2006** | | | | | | | |
| JNIC BMDS Exercise Planning | | 1Q-2Q | | | | | |
| BMDS Overlay 06 - Keen Edge 06 | | 2Q | | | | | |
| CTO-DMETS Interface w/Aegis FBX/Theater Elements | | 2Q-4Q | | | | | |
| Complete CTO-DMETS Network Design | | 2Q | | | | | |
| Distributed Exercise 06-1 | | 2Q | | | | | |
| PACOM Exercise Set 06 | | 2Q-3Q | | | | | |
| Stand-up CTO-DMETS Red Cell Capability | | 2Q-4Q | | | | | |
| BMDS Overlay 06 - Amalgam Phantom 06 | | 3Q | | | | | |
| BMDS Overlay 06 - Joint Project Optic Windmill IX | | 3Q | | | | | |
| Distributed Exercise 06-2 | | 3Q | | | | | |
| Preliminary CTO-DMETS Network Stand-up | | 4Q | | | | | |
| BMDS Overlay 07 - Terminal Fury 07 | | | 1Q | | | | |
| BMDS Overlay 07 - Vigilant Shield 07 | | | 1Q | | | | |
| Distributed Exercise 07-1 | | | 1Q | | | | |
| BMDS Overlay 07 - Juniper Cobra 07 | | | 4Q | | | | |
| Distributed Exercise 07-2 | | | 4Q | | | | |
| Distributive Exercise 07-3 | | | 4Q | | | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0903 Joint Warfighter Support Block 2008 | 0 | 0 | 0 | 49,687 | 50,912 | 0 | 0 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## A. Mission Description and Budget Item Justification

As part of the total Ballistic Missile Defense System (BMDS), the Joint Warfighter Support Program (JWSP) is the key vehicle which enables MDA to work directly and collaboratively with the Combatant Commanders (COCOMs) and Services to define, test, deploy and employ missile defense Block capabilities. The JWSP consists of a core set of consistent, repeatable processes, divided into two-year Blocks tailored to the evolutionary capability Blocks of the BMDS. Block 2008 will see numerous BMDS capabilities and or asset quantity increases during the FY08-2009 time-frame. These capabilities will be added to each JWSP activity to ensure the Joint Warfighter is properly trained to employ and integrate these capabilities to address the evolving Ballistic Missile threat environments.

The JWSP consists of seven primary activities, tailored in scope to the current BMDS Block capabilities as they transition, or near transition, to the user. These seven areas are:

Conducting Exercises and Wargames to enable end-user mission training, qualification, certification and rehearsal of BMDS operations, strengthen user confidence in the current system and shape development of the future BMDS. This activity involves all participating COCOMs in building coherent missile defense plans and tactics, techniques and procedures for the near term BMDS, and then testing cohesive execution of those plans via high fidelity simulations. It also incorporates BMD system engineering and interoperability test activities when possible to leverage MDA material development events by providing real-world training to operators. Finally, exercises and wargames create the conditions for continued, in-depth foreign and/or international participation in BMDS operations and development.

Providing “Above-Element” level Training and Education. This activity develops and maintains programs for the Joint Warfighters, Defense officials and the Services to provide stakeholders with critical knowledge on BMD capabilities and system operation. A key part of this activity includes developing BMDS educational courses, establishing training facilities and capabilities within Service/Joint Schools and conducting education and training of select BMDS stakeholders, staffs and organizations on emerging BMDS Block deployment capabilities. As new BMDS capabilities are transitioned to the field, upgrades and improvements will be incorporated to maintain the requisite level of training service.

Developing Concepts and Plans that explain emerging and future BMDS material capabilities and technologies to the warfighter. This activity addresses potential impacts to current BMDS operations and results in Joint Warfighter development of new BMDS employment constructs

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

/Concepts of Operations (CONOPs). It introduces far term, emerging BMD technologies and capabilities to the Combatant Commanders and enables them via low fidelity simulations and tabletop exercises to investigate alternative ways of operating the BMDS. It also serves MDA as a prime vehicle for the Warfighter Involvement Process (WIP) which seeks user feedback and guidance to shape future Block development of the BMDS.

Creating, developing and coordinating BMDS-wide Integrated Logistics Support policies and procedures to ensure that the requisite Doctrine, Organization, Training, Material, Leadership, Personnel, Facilities (DOTMLPF) and funding will be in place to sustain the deployed BMDS Block capabilities. A pre-condition for effective missile defense is having a solidly supported logistics system. This effort develops transition plans and policy to improve logistics planning and predictability for the Military departments and COCOMs. The plans include not only historical precedent, but also provide a forward look to the Services and COCOMs on what capabilities they may be getting, when they may be getting them, and what their support responsibilities may be.

Providing Geographical Combatant Commander (GCC) Support to enable COCOM and Service participation in MDA activities such as wargames, exercises, table tops, flight tests, ground tests, resource planning meetings and other conferences and interchanges where getting user input is critical for an effective outcome. This activity supports the WIP enabling operators, users, and other BMDS stakeholders to travel and participate in missile defense related exercises, tests, activities and other events. User involvement ensures that MDA, the Joint Warfighters and Services will work together to define, field, and operationalize the initial BMDS capability and subsequent new Block capabilities in an efficient and effective manner.

Delivering BMDS Sustainment & Operations through the MDA Missile Defense Operations Center (MOC) and the BMDS Watch Officers. The MOC serves as the MDA's central node for BMDS operations, situational monitoring and information collection in support of the Combatant Commanders' mission to conduct missile defense. This activity facilitates communications between the MDA and operational activities, maintains situational awareness on the status of the BMDS, and coordinates the activities required to return it to a specified status when necessary. It also schedules BMDS asset availability for testing, developmental, and operational/training activities. In sum, the MOC is a key hub in assuring that the operational BMDS is provided with timely and effective logistics support on an ongoing basis.

Supporting the BMD System Manager (BMDSM) function. The Joint Functional Component Command Integrated Missile Defense has been designated by MDA and US Strategic Command as the lead for this function. The MDA funds a portion of this function through the JWSP. The BMDSM monitors and synchronizes all aspects of BMDS development, testing and evaluation, corrective actions, acquisition, materiel release, and fielding, to include direct interaction with the materiel developers, test community, combatant commands and the gaining command. The BMDSM is authorized to integrate Service activities and functions related to the BMDS, and to coordinate directly with the applicable Services, MDA offices, Combatant Commands, and other activities as appropriate. The BMDSM also serves as the Joint User Community's centralized manager and

integrator of DOTMLPF considerations and products, and provides a framework for Joint integration and problem resolution as DOD's Lead for Ground-based Missile Defense (GMD).

Among the planned increased scope of the BMDS Block capabilities that will be addressed by the JWSP are:

- Additional BMDS interceptor inventories.
- Additional Forward Based X-Band Radar-Transportable (FBX-T) .
- Upgrades to X-Band Dish Radars to Augment FBX-T.
- Upgrades to existing sensors for asymmetric threat coverage.
- Implementing additional sensor netting and improved discrimination via data fusion, with improved threat tracking.
- Expanded Engagement Sequence Group scope, as new elements and capability is added. Expanded C2BMC capabilities and scope, including new decision aids and data displays encompassing all of the above.

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603889C Ballistic Missile Defense Products |

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## D. Acquisition Strategy

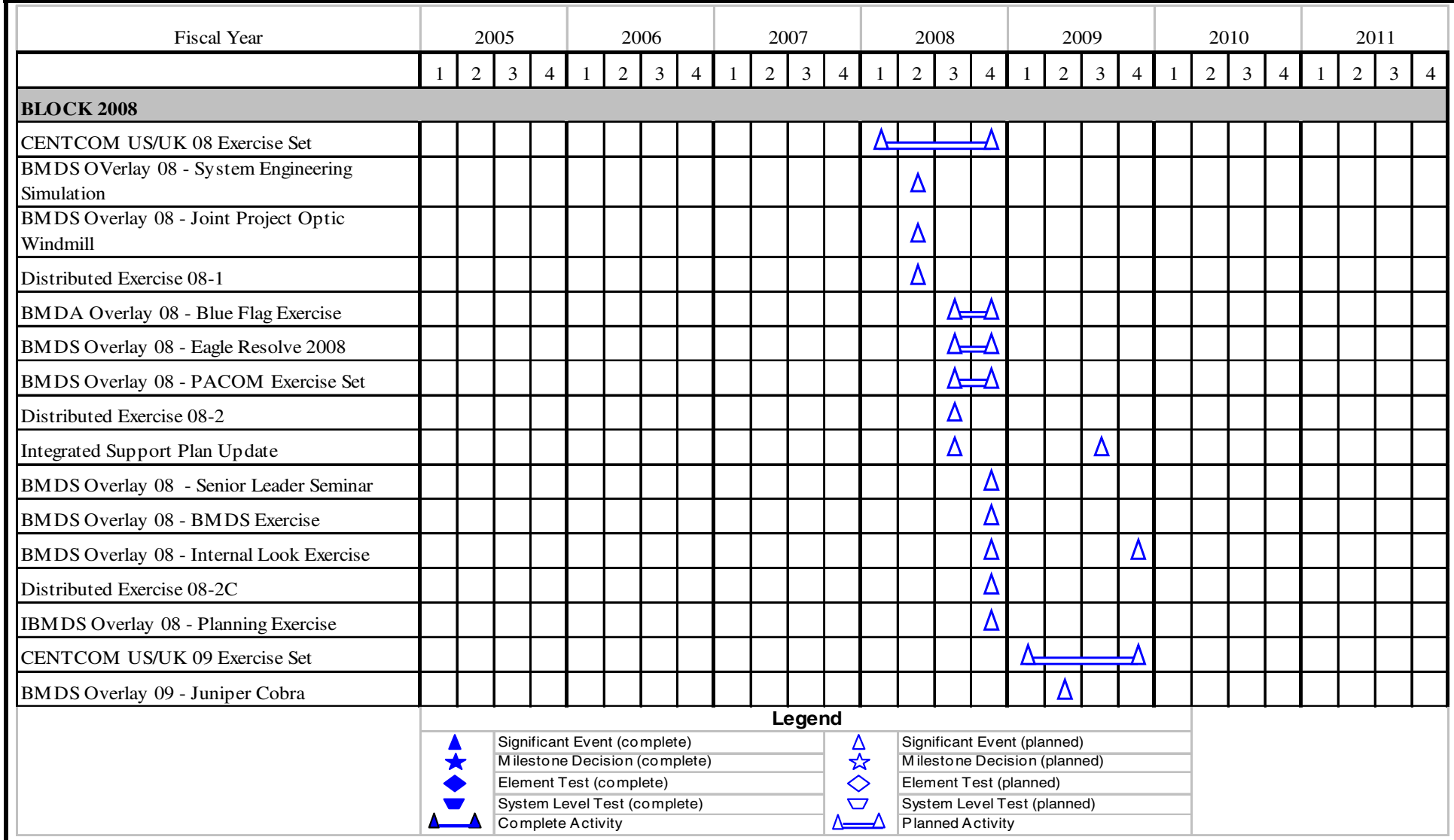
Joint Warfighter Support will continue to follow the MDA's capability-based acquisition strategy that emphasizes assessment, spiral-development testing and evolutionary acquisition through the definition of two-year capability blocks. The JWSP accomplishes this by development and vetting of Operational Concepts through the Joint Theater Air and Missile Defense Office, the Joint National Integration Center, the COCOMS and the Services utilizing seminars, workshops, table top exercises, wargames and simulation exercises that also support Military Utility Assessment updates.

**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

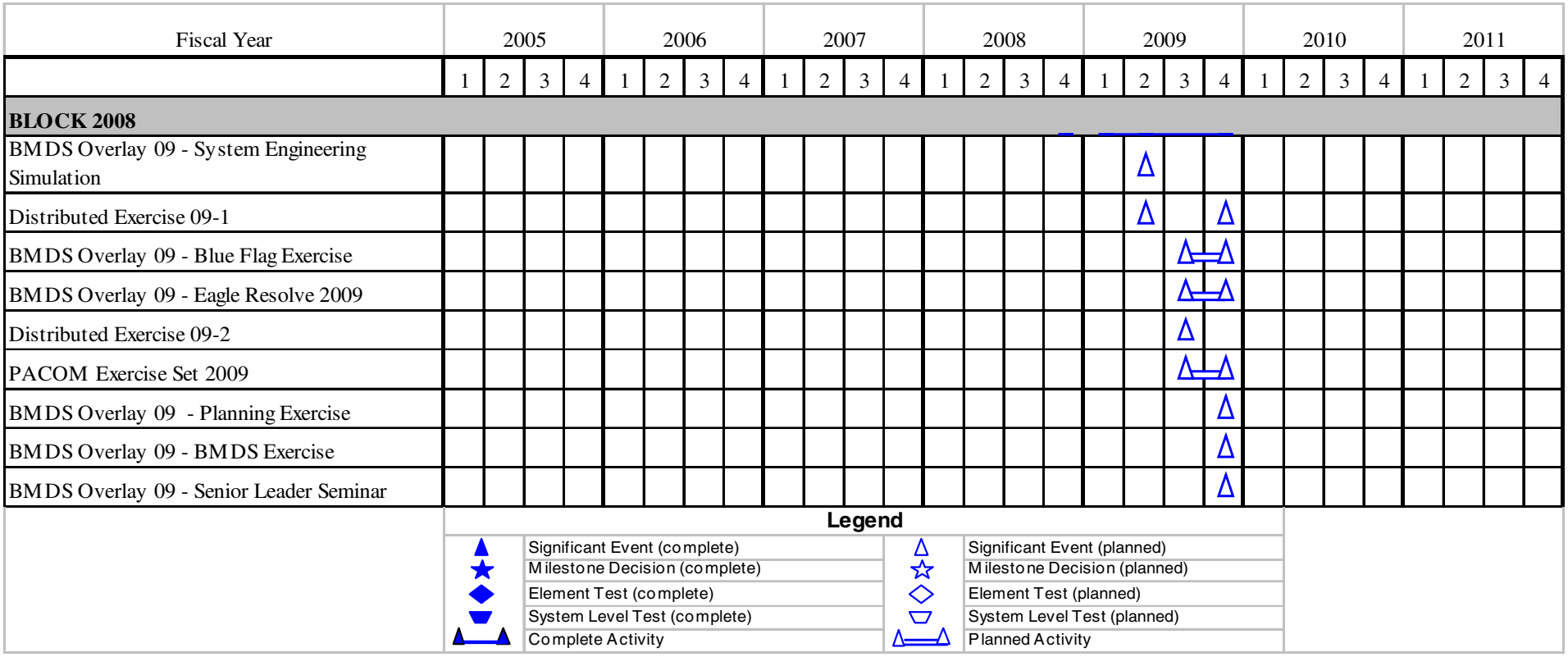
Date: **February 2006**

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 2006 |
|---|---|
| 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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **BLOCK 2008** | | | | | | | |
| CENTCOM US/UK 08 Exercise Set | | | | 1Q-4Q | | | |
| BMDS Overlay 08 - System Engineering Simulation | | | | 2Q | | | |
| BMDS Overlay 08 - Joint Project Optic Windmill | | | | 2Q | | | |
| Distributed Exercise 08-1 | | | | 2Q | | | |
| BMDA Overlay 08 - Blue Flag Exercise | | | | 3Q-4Q | | | |
| BMDS Overlay 08 - Eagle Resolve 2008 | | | | 3Q-4Q | | | |
| BMDS Overlay 08 - PACOM Exercise Set | | | | 3Q-4Q | | | |
| Distributed Exercise 08-2 | | | | 3Q | | | |
| Integrated Support Plan Update | | | | 3Q | 3Q | | |
| BMDS Overlay 08 - Senior Leader Seminar | | | | 4Q | | | |
| BMDS Overlay 08 - BMDS Exercise | | | | 4Q | | | |
| BMDS Overlay 08 - Internal Look Exercise | | | | 4Q | 4Q | | |
| Distributed Exercise 08-2C | | | | 4Q | | | |
| IBMDS Overlay 08 - Planning Exercise | | | | 4Q | | | |
| CENTCOM US/UK 09 Exercise Set | | | | | 1Q-4Q | | |
| BMDS Overlay 09 - Juniper Cobra | | | | | 2Q | | |
| BMDS Overlay 09 - System Engineering Simulation | | | | | 2Q | | |
| Distributed Exercise 09-1 | | | | | 2Q,4Q | | |
| BMDS Overlay 09 - Blue Flag Exercise | | | | | 3Q-4Q | | |
| BMDS Overlay 09 - Eagle Resolve 2009 | | | | | 3Q-4Q | | |
| Distributed Exercise 09-2 | | | | | 3Q | | |
| PACOM Exercise Set 2009 | | | | | 3Q-4Q | | |
| BMDS Overlay 09 - Planning Exercise | | | | | 4Q | | |
| BMDS Overlay 09 - BMDS Exercise | | | | | 4Q | | |
| BMDS Overlay 09 - Senior Leader Seminar | | | | | 4Q | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0003 Joint Warfighter Support Block 2010 | 0 | 0 | 0 | 0 | 0 | 52,322 | 55,519 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## A. Mission Description and Budget Item Justification

As part of the total Ballistic Missile Defense System (BMDS), the Joint Warfighter Support Program (JWSP) is the key vehicle which enables MDA to work directly and collaboratively with the Combatant Commanders (COCOMs) and Services to define, test, deploy and employ missile defense Block capabilities. The JWSP is divided into two-year Blocks to match the evolutionary capability Blocks of the BMDS. During every Block the JWSP will perform similar functions and activities as the previous Block, but with ever expanding BMDS capabilities incorporated into those activities.

Block 2010 will see numerous BMDS capabilities and or asset quantity increases during the FY10-2011 time-frame. These capabilities will be added to each JWSP activity to ensure the Joint Warfighter is properly trained to employ and integrate these capabilities to address the evolving Ballistic Missile threat environments. Among the increased scope of the BMDS Block capabilities that will be addressed by the JWSP are:

- Additional SM-3 sea-based interceptors and upgraded Aegis cruisers and destroyers.
- Additional Ground-Based Interceptors.
- A second Theater High Altitude Area Defense (THAAD) Fire Unit including 3 launchers, 1 radar, and 24 missiles.
- Improved THAAD booster for increased performance against long range threats.
- Engage on Remote sensor capability for THAAD.
- Add X-Band Dish Radar #2, in conjunction with Forward-Based X-Band Radar-Transportable, for extended tracking and discrimination.
- Implement sensor netting to improve threat tracking and discrimination.
- Expanded Engagement Sequence Group scope, as new elements and capabilities are added.
- Expanded Command, Control, Battle Management and Communications capabilities and scope including new decision aids and data displays encompassing all of the above.

The JWSP consists of seven primary activities, tailored in scope to the current BMDS Block capabilities as they transition, or near transition, to the user. These seven areas are:

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

Conducting Exercises and Wargames to enable end-user mission training, qualification, certification and rehearsal of BMDS operations, strengthen user confidence in the current system and shape development of the future BMDS. This activity involves all participating COCOMs in building coherent missile defense plans and tactics, techniques and procedures for the near term BMDS, and then testing cohesive execution of those plans via high fidelity simulations. It also incorporates BMD system engineering and interoperability test activities when possible to leverage MDA material development events by providing real-world training to operators. Finally, exercises and wargames create the conditions for continued, in-depth foreign and/or international participation in BMDS operations and development.

Providing "Above-Element" level Training and Education. This activity develops and maintains programs for the Joint Warfighters, Defense officials and the Services to provide stakeholders with critical knowledge on BMD capabilities and system operation. A key part of this activity includes developing BMDS educational courses, establishing training facilities and capabilities within Service/Joint Schools and conducting education and training of select BMDS stakeholders, staffs and organizations on emerging BMDS Block deployment capabilities. As new BMDS capabilities are transitioned to the field, upgrades and improvements will be incorporated to maintain the requisite level of training service.

Developing Concepts and Plans that explain emerging and future BMDS material capabilities and technologies to the warfighter. This activity addresses potential impacts to current BMDS operations and results in Joint Warfighter development of new BMDS employment constructs /Concepts of Operations (CONOPs). It introduces far term, emerging BMD technologies and capabilities to the Combatant Commanders and enables them via low fidelity simulations and tabletop exercises to investigate alternative ways of operating the BMDS. It also serves MDA as a prime vehicle for the Warfighter Involvement Process (WIP) which seeks user feedback and guidance to shape future Block development of the BMDS.

Creating, developing and coordinating BMDS-wide Integrated Logistics Support policies and procedures to ensure that the requisite Doctrine, Organization, Training, Material, Leadership, Personnel, Facilities (DOTMLPF) and funding will be in place to sustain the deployed BMDS Block capabilities. A pre-condition for effective missile defense is having a solidly supported logistics system. This effort develops transition plans and policy to improve logistics planning and predictability for the Military departments and COCOMs. The plans include not only historical precedent, but also provide a forward look to the Services and COCOMs on what capabilities they may be getting, when they may be getting them, and what their support responsibilities may be.

Providing Geographical Combatant Commander (GCC) Support to enable COCOM and Service participation in MDA activities such as wargames, exercises, table tops, flight tests, ground tests, resource planning meetings and other conferences and interchanges where getting user input is critical for an effective outcome. This activity supports the WIP enabling operators, users, and other BMDS stakeholders to travel and participate in missile

defense related exercises, tests, activities and other events. User involvement ensures that MDA, the Joint Warfighters and Services will work together to define, field, and operationalize the initial BMDS capability and subsequent new Block capabilities in an efficient and effective manner.

Delivering BMDS Sustainment & Operations through the MDA Missile Defense Operations Center (MOC) and the BMDS Watch Officers. The MOC serves as the MDA's central node for BMDS operations, situational monitoring and information collection in support of the Combatant Commanders' mission to conduct missile defense. This activity facilitates communications between the MDA and operational activities, maintains situational awareness on the status of the BMDS, and coordinates the activities required to return it to a specified status when necessary. It also schedules BMDS asset availability for testing, developmental, and operational/training activities. In sum, the MOC is a key hub in assuring that the operational BMDS is provided with timely and effective logistics support on an ongoing basis.

Supporting the BMDS Manager (BMDSM) function. The Joint Functional Component Command Integrated Missile Defense has been designated by MDA and the Strategic Command as the lead for this function. The MDA funds a portion of this function through the JWSP. The BMDSM monitors and synchronizes all aspects of BMDS development, testing and evaluation, corrective actions, acquisition, materiel release, and fielding, to include direct interaction with the materiel developers, test community, combatant commands and the gaining command. The BMDSM is authorized to integrate Service activities and functions related to the BMDS, and to coordinate directly with the applicable Services, MDA offices, Combatant Commands, and other activities as appropriate. The BMDSM also serves as the Joint User Community's centralized manager and integrator of DOTMLPF considerations and products, and provides a framework for Joint integration and problem resolution as DOD's Lead for Ground-based Missile Defense (GMD).

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603889C Ballistic Missile Defense Products |

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## 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 and support the Military Utility Assessment through development and vetting of Operational Concepts through the Joint Theater Air and Missile Defense Office, the COCOMs and the Services utilizing seminars, workshops, table top exercises, wargames and simulation exercises.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0204 Joint National Integration Center (JNIC) | 71,631 | 75,728 | 99,461 | 106,611 | 107,560 | 109,325 | 110,581 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## A. Mission Description and Budget Item Justification

The mission of the JNIC is to help develop and support the operation of a robust suite of missile defense wargaming, 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 accomplishes this mission of providing MDA with Agency-level technical integration and BMDS-level operational integration products and services by:

- Supporting the definition, development, and test & evaluation of integrated missile defense Engagement Sequence Group capabilities;
- Planning and executing the implementation of BMDS-level modeling and simulation;
- Supporting BMDS developers and warfighters by exercising missile defense readiness, and wargaming command and control procedures, operational concepts, and doctrinal requirements; and
- Providing BMDS operational support and technical reachback to designated program elements and Combatant Commands (COCOMs).

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.

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| BMDS Operational Security | 1,291 | 1,262 | 746 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Provides increased reliability, availability and maintainability of the JNIC Electronic Security System as well as improved physical security/anti-terrorism provisions.

FY05 Accomplishments:

- BMDS Operational Security maintained, operated/monitored, and began the upgrade of the JNIC's Electronic Security System (ESS).
- Provided support for around the clock security of designated Protection Level 1 (PL 1) resources/System Security Level-A (SSL-A) areas.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

FY06 Planned Program:

- Maintain, operate/monitor, and complete the upgrade of the ESS.
- Install security screening and an X-ray station leading into the JNIC research and development complex.
- Continue to provide around the clock monitoring/security of designated PL 1 resources/SSL-A areas.

FY07 Planned Program:

- Maintain, and operate/monitor the ESS.
- Implement required patches for all security hardware/software throughout the JNIC.
- Continue to provide around the clock monitoring/security for designated PL 1 resources/SSL-A areas.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| BMD Wargaming, Exercises and Analysis | 14,296 | 16,362 | 33,201 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The JNIC functions as the core integration activity 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 and Element-in-the-Loop Wargames; Joint Warfighter Exercises and Experiments; Missile Defense Integration Exercises; C2BMC integration testing and experiments, and System Level Missile Defense Analyses. These activities allow the developer, tester, and operator to assess capabilities in the same operationally representative environment. Additionally, 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 consolidated and integrated modeling and simulation development for the Agency. The BMDS Simulation, formerly known as MDWAR, is the only BMD force-on-force simulation with plug & play tactical message interfaces capable of interactive real-time execution. The Missile Defense and Space Warning Tool is the only trusted tool for injecting simulated missile threats into all Combatant Commands over the Integrated Broadcasting System so that theater and strategic early warning systems can be exercised. The Threat Modeling and Simulation System generates integrated, high-fidelity, force level threat scenarios across all threat objects in flight. Together the development and operation of these Modeling & Simulation tools by the JNIC provides MDA and the missile defense community the ability to simulate the current and evolving BMD environment, threat, and systems for wargames, exercises, training, tests, and performance analyses.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

FY05 Accomplishments:

- Supported demonstrations with USN Aegis ships to show interactions with BMDS command and control, radar tracking, and intercept capability.
- Conducted Ground Test/Missile Defense Integrated Exercise(s), on behalf of the MDA Director for Test and Assessment, to assess Engagement Sequence Groups and to improve interoperability and integration.
- Planned (under the Joint Warfighter Support Program) Missile Defense wargames, demonstrations, and workshops in support of BMDS Block development
  - Provided wargame scenarios to enhance understanding of current missile defense capabilities, and to investigate options for future capabilities
  - Conducted the Nimble Titan wargame, which allowed warfighters to develop, assess, and employ tactics, techniques, and procedures to protect the homeland
  - Conducted the first fully distributed Integrated Missile Defense Wargame, which involved globally distributed warfighters using equipment in their remote command and control centers.
- Planned, collected data, assessed, examined, and reported on MDA directed missile defense exercises
  - Maintained and operated the Exercise Operations Center (to include its related Tactical Display Processors) and the Area Air Defense Commander-Suite
  - Broadcast messages with the Missile Defense Space and Warning Tool for use in over 86 designated exercises and 20 different wargames and demonstrations
  - Populated and maintained the Missile Defense Exercise Connection Website
  - Managed, as directed, the Cooperative Air and Missile Defense Exercise Network and integrated it with JNIC capabilities
- Conducted MDA critical analysis efforts in support of
  - Block Capability Verification Assessment Reports
  - Other MDA Systems Engineering and Integration directed studies/assessments
- Conducted Verification & Validation of BMD models as directed
- Provided direct support to the MDA Program Director for International Support in the form of unique capabilities, tools and resources to enhance international missile defense cooperation
  - Supported the development of an unclassified and exportable missile defense simulation that is easy to use, transport, and configure (i.e., the International Model & Simulation)
  - Supported activities that promote all orientation to and knowledge of the BMDS and associated BMD concepts and issues
  - Supported the international integration of BMDS block development and system upgrades through bilateral and multilateral BMD analyses, seminars, simulations, and workshops
  - Leveraged International Model and Simulation technologies, processes and products into other JNIC initiatives

- Provided a foundation for incorporating advanced employment concepts into JNIC planning tools, exercises, test activities, and wargames across multiple security levels
  - Leveraged existing JNIC capabilities and provided technical coordination, analytical support, and an integrating function for advanced missile concepts across the JNIC
  - Leveraged connectivity and established interoperability with other Operator-in-the-Loop facilities involved in the incorporation of advanced technical capabilities into BMDS Block development

FY06 Planned Program:

- Support fleet demonstrations to prove that deployed Aegis ships are capable of integrating into the BMDS command and control structure, can conduct sensor tracking, and possess limited intercept capabilities
- Provide wargame scenarios to enhance understanding of current missile defense capabilities and investigate options for future capabilities
- Support the Combined Test Force (CTF) conduct of Ground Test/Missile Defense Integrated Exercise(s)
- Continue to provide Wargaming Support to the Joint Warfighter Support Program by:
  - Developing and producing documentation to support all directed wargaming events
  - Conducting wargames to develop, test, and refine Concept of Operations, Tactics, Techniques and Procedures, and Command and Control plans
  - Providing post-event data collection and analysis support
  - Providing for the operations and maintenance of the Wargaming Enterprise Support Center
  - Managing, as directed, the BMDS Training Center
- Continue to plan, collect data, assess, examine, and report on MDA Joint Warfighter Support Program directed missile defense exercises
- Continue to conduct MDA critical analysis efforts in support of Block Capability Verification Assessment Reports, and other MDA System Engineering and Integration directed studies/assessments
- Conduct Verification & Validation of BMD models as directed
- Continue to provide direct support to the MDA Director for International Support in the form of unique capabilities, tools and resources to enhance international missile defense cooperation
- Incorporate advanced employment concepts into JNIC planning tools, exercises, test activities, and wargames across multiple security levels

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

FY07 Planned Program:

- Continue to support the integration of missile defense capable deployed USN Aegis ships into the BMDS command and control structure
- Provide wargame scenarios to enhance the understanding of current missile defense capabilities, and to investigate options for future capabilities
- Conduct (as part of CTF-JNIC) Ground Test/Missile Defense Integrated Exercise(s) that assess Engagement Sequence Groups, and support the interoperability and integration of the BMDS program elements
- Operate as MDA's Warfighter Support Center of Excellence in the conduct of BMDS-level wargames, exercises, and training
- Plan, collect data, assess, examine, and report on MDA directed C2BMC integration exercises and experiments and C2BMC spiral integration testing
- Continue to conduct MDA critical analysis efforts in support of Block Capability Verification Assessment Reports, and other MDA System Engineering and Integration directed studies/assessments
- Operate as MDA's Model and Simulation (M&S) Center of Excellence for the development and implementation of BMDS-level M&S critical to wargaming and test support
- Continue to incorporate advanced employment concepts into JNIC planning tools, exercises, test activities, and wargames across multiple security levels

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Infrastructure Development & Support | 50,085 | 54,235 | 61,514 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The JNIC supports the technical development and provides the enabling infrastructure for several critical Agency activities. The JNIC supports the Ground-based Midcourse Missile Defense Mission Control Center Facility, as well as the C2BMC Integration and Test Centers and the C2BMC Experimentation Laboratories. It provides infrastructure support for the Satellite Tracking and Surveillance System's Missile Defense Space Experimentation Center; the Targets and Countermeasures' JNIC Target Operations Center; and the 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 Combined Test Force through the operation of the Test Execution Control node for distributed BMDS ground tests.

The JNIC provides the enabling infrastructure that supports operations of the Missile Defense Element, manned by the 100th Missile Defense Brigade, the USNORTHCOM C2BMC Support Center, and USSTRATCOM's Joint Functional Component Command-Integrated Missile Defense. In addition, the JNIC operates the MDA Technical Support Center, which provides situational awareness of the health and status of the end-to-end BMDS; provides network subject matter expertise and technical reachback for the program elements and COCOMs; maintains a technical repository

of BMDS Implementation Architectures for real-time Operation & Maintenance and configuration control; provides both state change management and asset management technical support for the BMDS; and provides the technical environment for BMDS Watch Officers, Safety Officers, and Information Assurance Officers to execute their assigned duties. The JNIC also operates the Joint Early Warning Laboratory, which provides USSTRATCOM with quick response analyses of real-world launches, and rapid anomaly identification and resolution.

The JNIC designs, implements, verifies, operates, maintains and manages secure Information Technology infrastructure(s) and service interfaces, communication circuit connectivity, and tiered service levels on site. It provides additional labor and diagnostic tools for around the clock information management, and facilities operation and maintenance technical support. This technical support, provided outside normal duty hours, is crucial to warfighter mission critical system outage restoration, coordination, and reporting.

FY05 Accomplishments:

- Provided Information Management services that
  - Sustained and enhanced the JNIC mission and administrative infrastructures in order to support all missions--RDT&E and operational
  - Supported Wargames, Exercises, Integration, Tests, Analyses, and the MDA Chief Information Officer
  - Provided O&M of Automated Data Processing Equipment, systems administration, communications, audiovisual equipment, and the Web
  - Executed Wide area and local area communications engineering and sustainment
  - Operated the Network Operations Center, Computer Center, and Enterprise Network Operations and Security Center
  - Provided Integration Data Center, MDA Web Portal, and Technical Information Service Center operations and maintenance
  - Provided Media Services and High Performance Computing Center support
- Conducted Environment and Facilities O&M to include
  - Operated and maintained the JNIC facility infrastructure
  - Provided around the clock support to critical operational assets, including Heating, Ventilation and Air Conditioning, and Electrical (Commercial, Uninterrupted Power Supply, Generators)
  - Provided safety training & analyses, fire prevention, and environmental protection support
  - Provided facility engineering analyses, estimates, designs, and project installation support
  - Accomplished facility services, personnel relocations, furniture reconfigurations, buildouts, and ergonomic & special event support
  - Provided Contract & Federal Acquisition Regulation compliant Property Control System including management of supplies
  - Monitored janitorial, installation, reproduction & cafeteria subcontracts
- Executed Systems Engineering of Mission Critical Systems to include

- Provided JNIC infrastructure system level engineering, planning, and process management to support concurrent MDA weapon system acquisition and Combatant Command operations
- Conducted engineering and board administration to accomplish requirements management, implementation strategy review, and configuration management of assets and technical implementation architectures
- Executed program risk management
- Maintained the JNIC Mission Assurance Implementation Plan
- Conducted integrated scheduling of JNIC mission critical resources
- Operated and maintained the MDA Technical Support Center

- Provided around the clock technical infrastructure support to the
  - Ground Based Midcourse Defense (GMD) Mission Control Center Facility (MCCF)
  - GMD Missile Defense Element (MDE) and 100th Missile Defense Brigade
  - Brigade Intelligence Cell
  - GMD Battle Management, Command, Control and Communications Element Laboratory (BEL)
- Provided Flight Test support
- Provided multimedia support in the areas of graphics, photography, and video production
- Executed public affairs and protocol activities in support of MDA and the JNIC
  - Operated and maintained the Presentation Center, International Event Complex, and major JNIC conference rooms
  - Provided visitor/event support
  - Promoted the Agency and JNIC missions to external audiences through the use and staffing of an MDA conference/multi-media booth
  - Provided Audio Visual system architecture and engineering expertise to ensure reliable operations and repair/sustainment paths

FY06 Planned Program:

- Provide ongoing information management services
- Conduct ongoing environment and facilities O&M
- Initiate environment and facility repairs:
  - Install an electrical backup capability in the Computer Center for servers supporting operational missions
  - Execute Phase II and Phase III of the Direct Digital Control (DDC) repair plan
  - Correct Facility Installation Standards (FIS) and Safety deficiencies identified in the previous fiscal year
  - Replace deteriorating stairwell treads throughout the JNIC
  - Procure and install a Hot Water Heater for Building 730

  - Repair and expand West Parking Lot to absorb 300 additional spaces required to support events and added missions
  - Begin the Phase I expansion of the Uninterrupted Power System (UPS) Switchgear to support MDA and COCOM organizations operating from the JNIC
  - Expand the Emergency Voice System into the rest of the Research and Development Complex (Building 720)
- Execute ongoing systems engineering of mission critical systems
- Provide continuing media support in the areas of graphics, photography, and video production
- Execute continuing public affairs and protocol activities in support of MDA and the JNIC
- Continue to provide an enabling infrastructure that supports MDA RDT&E efforts at the JNIC for the:
  - GMD Mission Control Center Facility
  - C2BMC Integration and Test Centers, and the C2BMC Experimentation Laboratories
  - STSS Missile Defense Space Experimentation Center
  - JNIC Target Operations Center
  - Joint Warfighter Support Program
  - Combined Test Force-JNIC
- Continue to provide an enabling infrastructure that supports BMDS operational capability development for the:
  - MDE and 100th Missile Defense Brigade
  - USNORTHCOM C2BMC Support Center
  - USSTRATCOM Joint Functional Component Command-Integrated Missile Defense (JFCC-IMD) Headquarters and Operations Center
  - Joint Early Warning Laboratory
- Operate and maintain the MDA Technical Support Center (MTSC); and as directed, expand the situational awareness and BMDS monitoring capability of the BWOs, BSOs, and Information Awareness Officers manning the MTSC
- Incorporate and support the MDA Centers of Excellence assigned to the JNIC
- Plan and begin, as directed, the consolidation of existing MDA spaces in Colorado Springs into the JNIC

FY07 Planned Program:

- Provide ongoing information management services
- Conduct ongoing environment and facilities O&M
- Initiate environment and facility repairs:
  - Initiate Phase II of the UPS Switchgear expansion
  - Construct a waste container enclosure off the south loading docks

- Replace the roof on the Research and Development Complex (Building 720)
- Reinforce the electrical infrastructure of the Network Operations Center (NOC)
- Install a digital monitoring system for the UPS
- Begin Phase I of the replacement of the Heating, Ventilation, and Air Conditioning (HVAC) units (Air Handling Unit, Evaporative Coolers, and Purge Fans)
- Repair mission spaces, and begin the infrastructure support planning for returning tenant (Space Warfare Center) spaces in FY08-09

- Execute ongoing systems engineering of mission critical systems
- Provide continuing media support in the areas of graphics, photography, and video production
- Execute continuing public affairs and protocol activities in support of MDA and the JNIC
- Continue to provide an enabling infrastructure (to include hardware, software maintenance, licenses, and upgrades) that supports MDA RDT&E efforts at the JNIC for the:
  - GMD Mission Control Center Facility
  - C2BMC Center of Excellence
  - STSS Missile Defense Space Experimentation Center
  - JNIC Target Operations Center
  - Warfighter Support Center of Excellence
  - Combined Test Force-JNIC
  - Models and Simulation Center of Excellence
- Continue to provide an enabling infrastructure that supports BMDS operational capability development for the:
  - MDE and 100th Missile Defense Brigade
  - USNORTHCOM C2BMC Support Center
  - USSTRATCOM JFCC-IMD Headquarters and Operations Center
  - Joint Early Warning Laboratory
- Operate and maintain the MDA Technical Support Center
- Continue, as directed, the consolidation of existing MDA spaces in Colorado Springs into the JNIC

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Special Programs | 331 | 360 | 366 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The JNIC runs the Intelligence Support Center/Special Programs Center for MDA/SI, USSTRATCOM, and the 100th Missile Defense Brigade.

FY05 Accomplishments:

- Provided the BMDS Watch Officers (BWOs) manning the JNIC's MDA Technical Support Center (MTSC) with critical situational awareness (SA) intelligence on worldwide ballistic missile developments that could affect the development or execution of the BMDS.
- Prepared and delivered over 240 daily intelligence briefings, 50 weekly special educational briefings, and 20 VIP briefings to support the BMDS, worldwide.
- Produced credible threat products and engineering trajectories for over 200 DoD users
  - Operated a threat system modeling and simulation tool in support of the MDA Intelligence Directorate
  - Maintained and integrated other assigned modeling tools.
- Maintained and supported the operation of the MDA Intelligence Support Center (ISC)
  - Provided intelligence support and products required to plan and execute MDA sponsored ballistic missile defense wargames, exercises, simulations, training, and activities
  - Provided daily intelligence update briefing to senior JNIC leadership
  - Developed and implemented a plan to add a near-real time infrared detection feed, which allowed the first-time capability to completely monitor the intelligence cycle for on-going missile events
  - Completed the planning and installation of the Cheyenne Mountain Operations Center (CMOC) operations loop into the ISC.

FY06 Planned Program:

- Continue to provide intelligence SA to the BWOs as they monitor BMDS health and status, and state changes.
- Continue to produce credible threat products and engineering trajectories for DoD users.
- Prepare daily intelligence briefings and special intelligence topic briefings as directed by MDA.
- Provide ongoing maintenance and operation support of the ISC for both MDA and COCOM customers.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

FY07 Planned Program:

- Provide intelligence support to the BWOs, and implement any intelligence hardware/software updates required to support the MTSC.
- Continue to produce credible threat products and engineering trajectories for DoD users
  - Operate the threat modeling module within a larger BMDS Simulation tool
  - Support the integration of other threat tools as required.
- Prepare and provide ongoing daily intelligence briefings and summaries as directed.
- Continue the maintenance and operation support of the ISC, and (when directed) plan/initiate the installation of any additional intelligence data feeds required to support the BMDS.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| International Program (Cong Add) | 2,500 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

In FY05, Congress directed the funding of $2.5M to the JNIC in support of International Programs.

FY05 Accomplishments:

- Conducted an interactive missile defense workshop in Tokyo for the Japanese Defense Agency.
- Initiated bilateral planning with the United Kingdom (UK) for the negotiation of a formal Program Arrangement to define a combined missile defense effort.
- Planned and executed a classified CONUS-overseas tabletop exercise using distributed simulation over live on the Combined Federated Battle Laboratories Network (CFBL Net) to derive joint US-UK operational concept alternatives.
- Conclude agreements and execute activities under the Program Agreement for Bilateral Activities via Secure Interactive Link (BASIL) between the JNIC and the UK Missile Defense Center.
- Conduct two additional distributed tabletop exercises with the UK to
  - Validate intended simulation boundaries
  - Review policy requirements for the forthcoming UK-US Bilateral, Collaborative Missile Defense Wargame.
- Conduct risk reduction testing between the US and UK over secure link.
- Plan, organize, and conduct the UK-US Bilateral, Collaborative Missile Defense Wargame.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603889C Ballistic Missile Defense Products |

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| JNIC Security | 3,128 | 3,509 | 3,634 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Provides physical and access control to protect BMDS development capabilities, annual training and education for all assigned personnel, and additional labor and diagnostic tools for around the clock security systems engineering and Security Operations Command Post activities.

FY05 Accomplishments:

- Provided program protection, force protection, and an anti-terrorism posture in compliance with MDA and DoD requirements, to include classified material handling, visitor control, and security awareness, training, and education.
  - Established an Emergency Management Plan.
  - Reviewed and revised the JNIC Security Training Program.
- Provided industrial and physical security, including foreign disclosure, counterintelligence analysis and threat assessment, and guard and response force management.

FY06 Planned Program:

- Continue to provide program protection, force protection, and an anti-terrorism posture in compliance with MDA and DoD requirements, capable of supporting various events scheduled at the JNIC.
  - Transition all applicable annual security training to a computer based system.
  - Provide an integrated security approach for all new mission areas assigned to the JNIC.
  - Transition the JNIC Classified Document Control Center from a long-term to short-term storage facility by leveraging the MDA electronic repository for all retained material.
- Provide ongoing industrial and physical security, including foreign disclosure, counterintelligence analysis and threat assessment, and guard/response force management.

FY07 Planned Program:

- Continue to provide program protection, force protection, and an anti-terrorism posture in compliance with MDA and DoD requirements, capable of supporting various events scheduled at the JNIC.
- Pursue Capability Maturity Model Integration (CMMI) Level 3 certification for all JNIC security processes and procedures.
- Provide ongoing industrial and physical security, including foreign disclosure, counterintelligence analysis and threat assessment, and guard/response force management.

- Receive and execute local delegated release authority for foreign disclosure information.
- Implement MDA effort to provide comprehensive technical security program in support of Combined Test Force events.

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## 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, JNIC Technical Advisory and Assistance Services, and major defense contractors.

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Infrastructure Development & Support** | | | | | | | | |
| JNIC | MIPR | JNIC/ 50th Space Wing, Schriever AFB, CO | 1,978 | 1,104 | 1Q | 1,124 | 1Q | 4,206 |
| Subtotal Support Costs | | | 1,978 | 1,104 | | 1,124 | | 4206 |

**Remarks** These funds are for utilities and base communications as specified in the Inter-service Support Agreement with the 50th Space Wing.

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **BMDS Operational Security** | | | | | | | | |
| JNIC | C/CPAF | Northrop Grumman Mission Sys./ CO | 1,090 | 1,063 | N/A | 541 | N/A | 2,694 |
| JNIC | | JNIC/ Colorado Springs, CO | 313 | 199 | N/A | 205 | N/A | 717 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **BMD Wargaming, Exercises and Analysis** | | | | | | | | |
| JNIC | C/CPAF | Northrop Grumman Mission Sys./ CO | 16,041 | 11,497 | N/A | 28,203 | N/A | 55,741 |
| JNIC | | JNIC/ Colorado Springs, CO | 5,161 | 3,284 | N/A | 3,389 | N/A | 11,834 |
| JNIC | C/FFP | JNIC/ SRS/Colorado Springs | 3,008 | 1,581 | 1Q | 1,609 | 1Q | 6,198 |
| **Infrastructure Development & Support** | | | | | | | | |
| JNIC | C/CPAF | JNIC/ CO | 85,630 | 44,729 | 1/4Q | 51,786 | 1/4Q | 182,145 |
| JNIC | | JNIC/ Colorado Springs, CO | 5,630 | 3,582 | N/A | 3,697 | N/A | 12,909 |
| JNIC | C/FFP | JNIC/ SRS/Colorado Springs, CO | 6,194 | 3,254 | 1Q | 3,313 | 1Q | 12,761 |
| JNIC | C/FFRDC | JNIC/ Mitre Corp/Colorado Springs, CO | 3,014 | 1,566 | 1Q | 1,594 | 1Q | 6,174 |
| **Special Programs** | | | | | | | | |
| JNIC | C/CPAF | Northrop Grumman Mission Sys./ CO | 556 | 360 | N/A | 366 | N/A | 1,282 |
| **International Program (Cong Add)** | | | | | | | | |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| JNIC | C/CPAF | Northrop Grumman/ CO | 2,500 | 0 | N/A | 0 | N/A | 2,500 |
| **JNIC Security** | | | | | | | | |
| JNIC | C/CPAF | 5457/ CO | 5,984 | 3,012 | 2/3Q | 3,121 | 2/3Q | 12,117 |
| JNIC | | JNIC/ Colorado Springs, CO | 782 | 497 | N/A | 513 | N/A | 1,792 |
| Subtotal Test and Evaluation | | | 135,903 | 74,624 | | 98,337 | | 308864 |

**Remarks**

These funds are executed by the Integration Center Research and Development Contractor and provide FFRDC and Technical Advisory and Assistance Services employees, for JNIC operations and oversight of the Integration Center Research and Development Contractor

Funds include FY05 Congressional Add of $2.5 million for International Missile Defense Events and Activities.

## IV. Management Services Cost ( $ in Thousands )

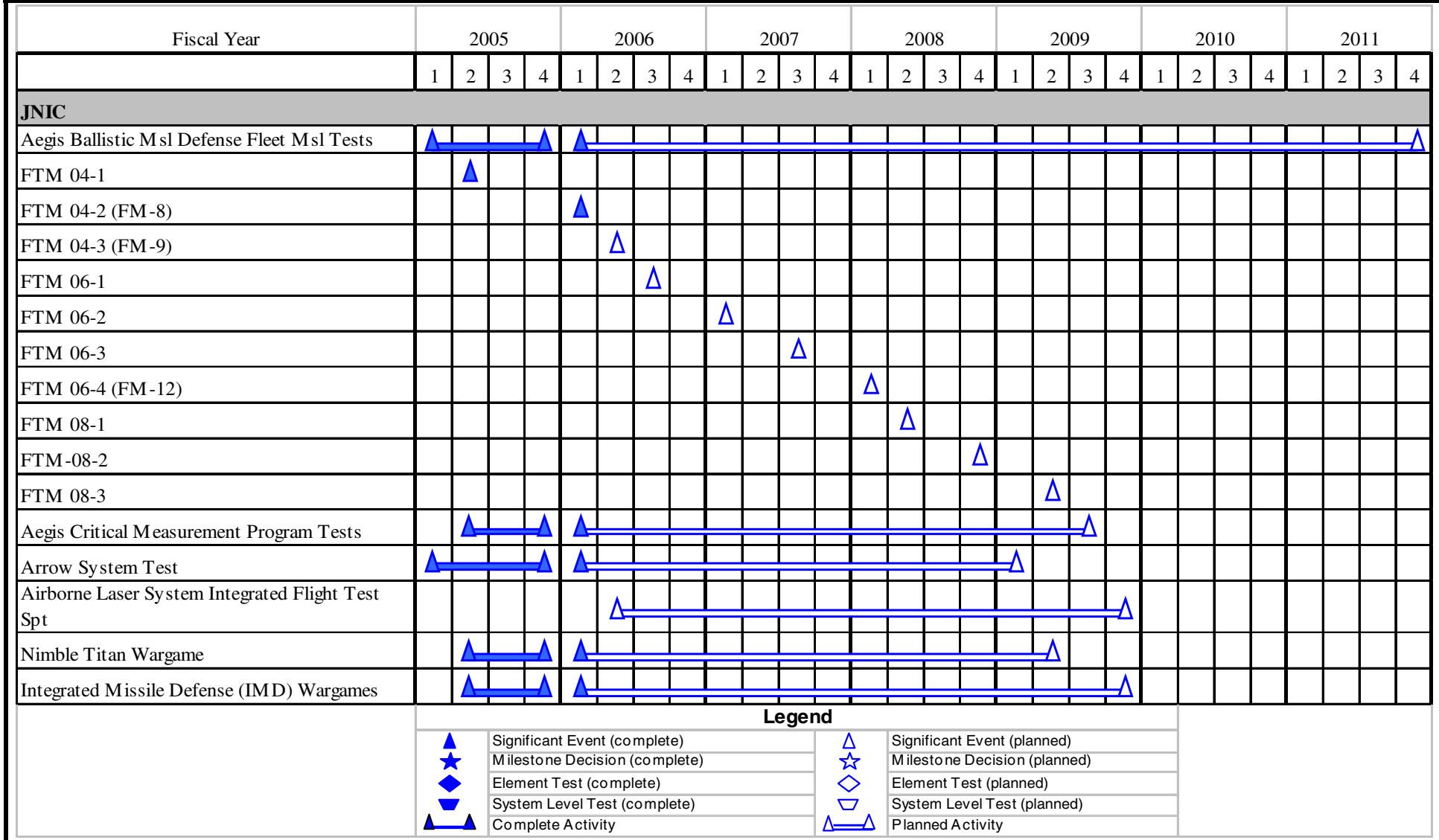
| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Subtotal Management Services | | | | | | | | |

**Remarks**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 137,881 | 75,728 | | 99,461 | | 313,070 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603889C Ballistic Missile Defense Products |

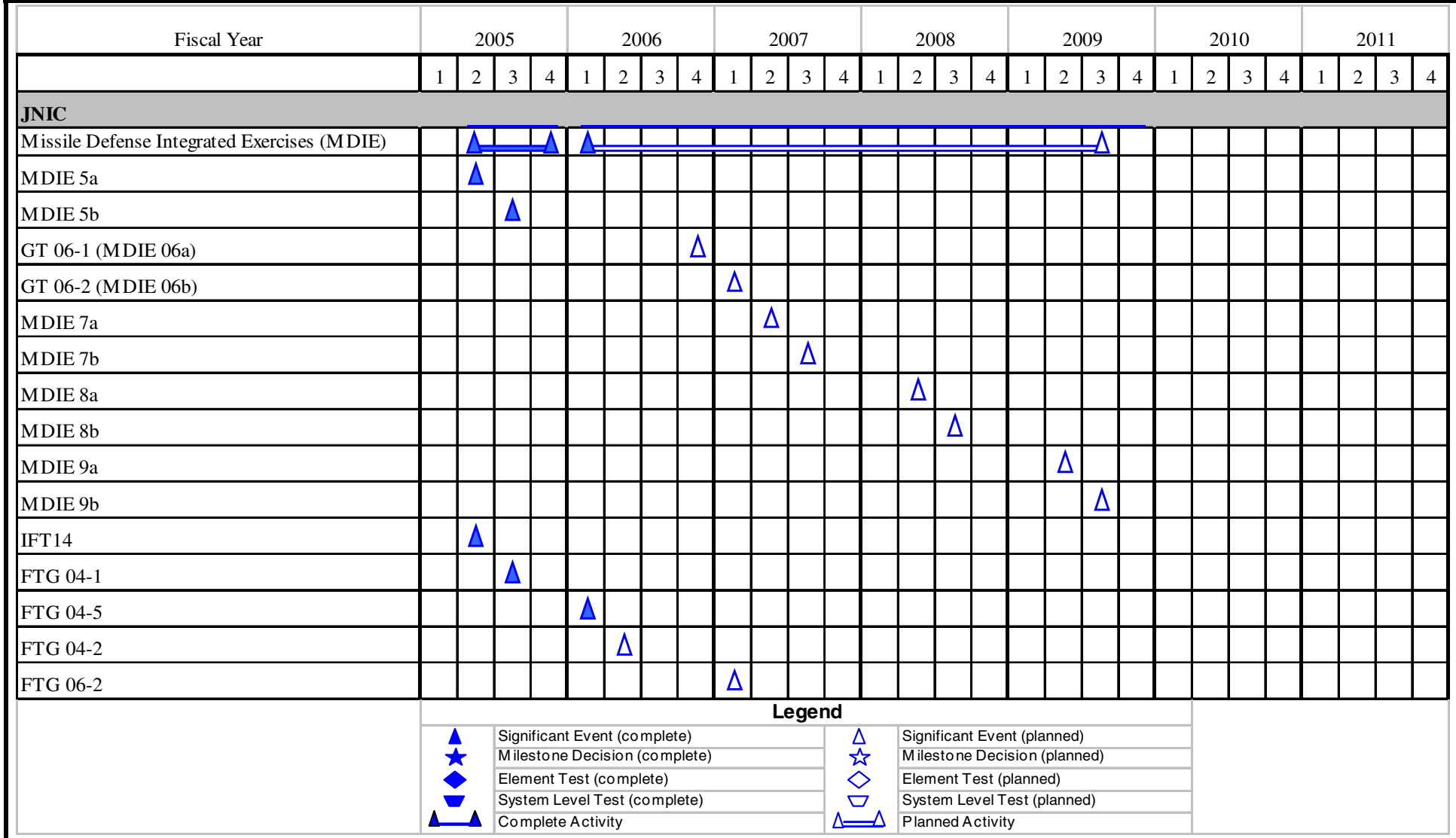


**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date: **February 2006**

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

R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products**

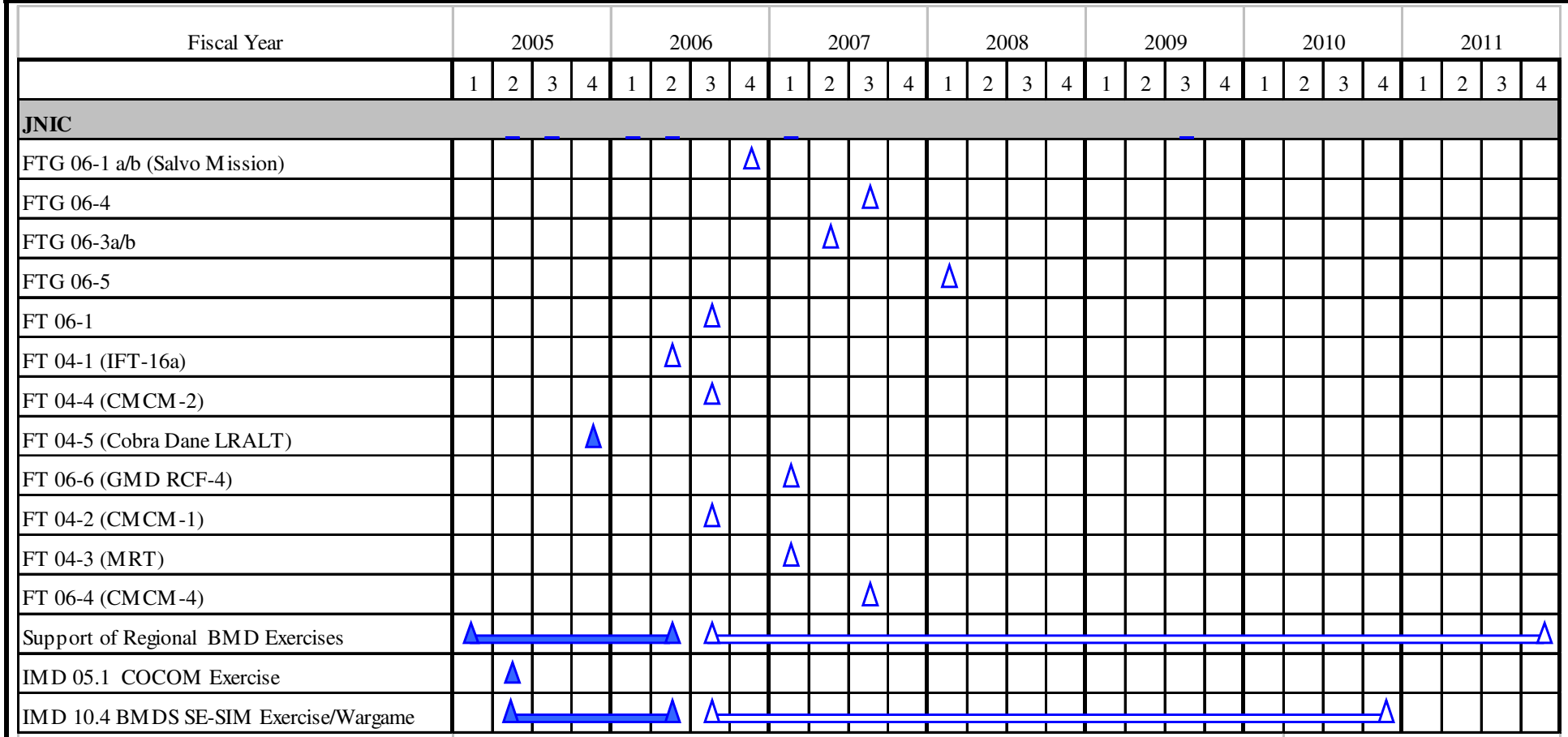


**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

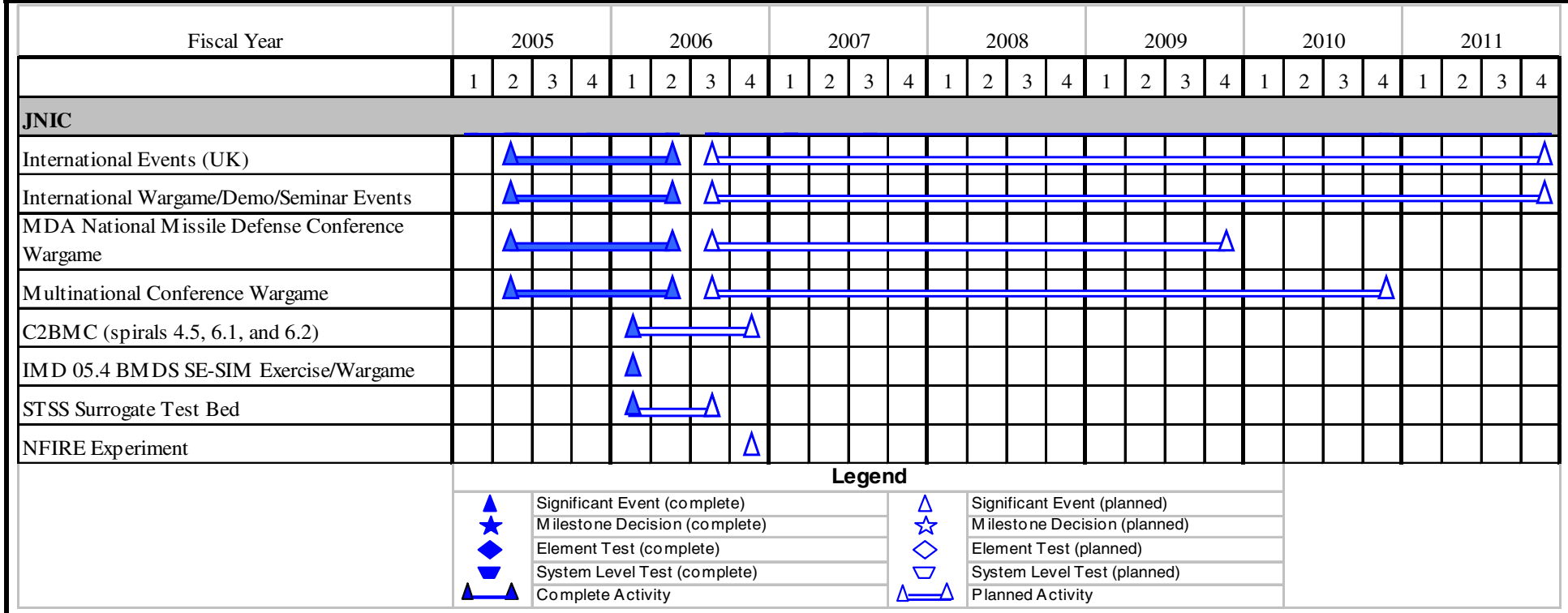
Date: **February 2006**

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 2006 |
|---|---|
| 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 2006 |
|---|---|
| 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 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 |
| FTM 04-1 | 2Q | | | | | | |
| FTM 04-2 (FM-8) | | 1Q | | | | | |
| FTM 04-3 (FM-9) | | 2Q | | | | | |
| FTM 06-1 | | 3Q | | | | | |
| FTM 06-2 | | | 1Q | | | | |
| FTM 06-3 | | | 3Q | | | | |
| FTM 06-4 (FM-12) | | | | 1Q | | | |
| 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-3Q | | |
| Arrow System Test | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q | | |
| Airborne Laser System Integrated Flight Test Spt | | 2Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | | |
| Nimble Titan Wargame | 2Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-2Q | | |
| Integrated Missile Defense (IMD) Wargames | 2Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | | |
| Missile Defense Integrated Exercises (MDIE) | 2Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-3Q | | |
| MDIE 5a | 2Q | | | | | | |
| MDIE 5b | 3Q | | | | | | |
| GT 06-1 (MDIE 06a) | | 4Q | | | | | |
| GT 06-2 (MDIE 06b) | | | 1Q | | | | |
| MDIE 7a | | | 2Q | | | | |
| MDIE 7b | | | 3Q | | | | |
| MDIE 8a | | | | 2Q | | | |
| MDIE 8b | | | | 3Q | | | |
| MDIE 9a | | | | | 2Q | | |
| MDIE 9b | | | | | 3Q | | |
| IFT14 | 2Q | | | | | | |
| FTG 04-1 | 3Q | | | | | | |
| FTG 04-5 | | 1Q | | | | | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| FTG 04-2 | | 2Q | | | | | |
| 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 | | 3Q | | | | | |
| FT 04-1 (IFT-16a) | | 2Q | | | | | |
| FT 04-4 (CMCM-2) | | 3Q | | | | | |
| FT 04-5 (Cobra Dane LRALT) | 4Q | | | | | | |
| FT 06-6 (GMD RCF-4) | | | 1Q | | | | |
| FT 04-2 (CMCM-1) | | 3Q | | | | | |
| FT 04-3 (MRT) | | | 1Q | | | | |
| FT 06-4 (CMCM-4) | | | 3Q | | | | |
| Receptions Staging Onward Movement & Integration | 1Q | 1Q | 1Q | 1Q | 1Q | 1Q | 1Q |
| Support of Regional BMD Exercises | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q |
| Weekly Theater Event System Support | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q |
| IMD 05.1 COCOM Exercise | 2Q | | | | | | |
| IMD 05.2 BMDS TACEX | 2Q | | | | | | |
| IMD 10.4 BMDS SE-SIM Exercise/Wargame | 2Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q |
| International Events (Japan) | 2Q | 2Q | | 2Q | | 1Q | |
| International Events (UK) | 2Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q |
| International Wargame/Demo/Seminar Events | 2Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q |
| Juniper Cobra | 2Q-3Q | | 3Q,4Q | | 3Q,4Q | | 3Q,4Q |
| MDA National Missile Defense Conference Wargame | 2Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | | |
| Marine Aviation Weapons and Tactics Squadron | 2Q,4Q | 2Q,4Q | 2Q,4Q | 2Q,4Q | 2Q,4Q | 2Q,4Q | 2Q,4Q |
| Multinational Conference Wargame | 2Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | |
| Optic Bar 05 | 2Q,4Q | 2Q,4Q | 2Q,4Q | 2Q,4Q | 2Q,4Q | 2Q,4Q | 2Q,4Q |
| Roving Sands | 2Q-3Q | | | | | | |
| IMD 05.3 Battle Planning Exercise | 3Q | | | | | | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| International Events (DTRA) | 3Q | 3Q | 3Q | 3Q | 3Q | 3Q | 3Q |
| International Events (NATO) | 3Q | 4Q | 2Q | 1Q | 4Q | 3Q | 2Q |
| International Events (Russia) | 3Q | 3Q | 4Q | | 1Q | 2Q | 3Q |
| International Events (Spain) | 3Q | 3Q,4Q | | 1Q | | 2Q | |
| International Events (Ukraine) | 3Q | 1Q,3Q | 4Q | | 1Q | | 2Q |
| Joint Project Windmill (JPOW) | 3Q | 4Q | | 3Q,4Q | | 3Q,4Q | |
| NT Workshop | 3Q | 3Q | 3Q | 3Q | 3Q | 3Q | |
| National Missile Defense Conference 05 Wargame | 3Q | | | | | | |
| Ulchi Focus Lens (UFL) | 3Q-4Q | | | | | | |
| 7th Air Force Peninsula Operations Readiness Ex | 4Q | | | | | | |
| Carrier Strike Group Composite Training Unit Ex | 4Q | 3Q,4Q | 3Q,4Q | 3Q,4Q | 3Q,4Q | 3Q,4Q | 3Q,4Q |
| Federation Testing | 4Q | 4Q | 4Q | 4Q | 4Q | 4Q | 4Q |
| Multinational Conference Wargame 05 | 4Q | | | | | | |
| PACOM Command and Control | 4Q | | | | | | |
| Stellar Valcory (FM-8) | 4Q | | | | | | |
| Terminal Fury | 4Q | 4Q | 4Q | 4Q | 4Q | 4Q | 4Q |
| USFJ Command and Control | 4Q | | | | | | |
| Virtual Flag | 4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-3Q |
| C2BMC (spirals 4.5, 6.1, and 6.2) | | 1Q-4Q | | | | | |
| IMD 05.4 BMDS SE-SIM Exercise/Wargame | | 1Q | | | | | |
| International Events (Taiwan) | | 1Q | | 1Q | | 1Q | |
| JDEP Defense of Israel Evaluation | | 1Q | | | | | |
| STSS Surrogate Test Bed | | 1Q-3Q,3Q | | | | | |
| International Events (India) | | 2Q,4Q | | 1Q | 2Q | | 1Q |
| Joint Expeditionary Force Experiment | | 2Q | 2Q | 2Q | 2Q | 2Q | 2Q |
| Keen Edge | | 2Q | 2Q | | 2Q | | 2Q |
| National Missile Defense Conference 06 Wargame | | 2Q | | | | | |
| IMD 06.1 COCOM Exercise | | 3Q | | | | | |
| IMD 06.2 BMDS SE-SIM Exercise/Wargame | | 3Q | | | | | |
| International Events (Australia) | | 3Q | | 3Q | | 3Q | |
| Multinational Conference Wargame 06 | | 4Q | | | | | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| NFIRE Experiment | | 4Q | | | | | |
| IMD 06.3 Battle Planning Exercise | | | 1Q | | | | |
| IMD 06.4 BMDS SE-SIM Exercise/Wargame | | | 1Q | | | | |
| International Events (Italy) | | | 1Q | 4Q | | 1Q | |
| International Events (Poland) | | | 1Q | | 2Q | | 2Q |
| International Events (Turkey) | | | 1Q | 4Q | 4Q | | 2Q |
| IMD 07.1 COCOM Exercise | | | 2Q | | | | |
| IMD 07.3 Battle Planning Exercise | | | 3Q | | | | |
| National Missile Defense Conference 07 Wargame | | | 3Q | | | | |
| International Events (Czech Republic) | | | 4Q | | 1Q | | 2Q |
| International Events (France) | | | 4Q | | 2Q | | 1Q |
| Multinational Wargame 07 | | | 4Q | | | | |
| IMD 07.4 BMDS SE-SIM Exercise/Wargame | | | | 1Q | | | |
| IMD 08.1 COCOM Exercise | | | | 2Q | | | |
| IMD 08.2 BMDS SE-SIM Exercise/Wargame | | | | 2Q | | | |
| IMD 08.3 Battle Planning Exercise | | | | 3Q | | | |
| National Missile Defense Conference 08 Wargame | | | | 3Q | | | |
| Multinational Conference Wargame 08 | | | | 4Q | | | |
| IMD 08.4 BMDS SE-SIM Exercise/Wargame | | | | | 1Q | | |
| IMD 09 BMDS SE-SIM Exercise/Wargame | | | | | 2Q | | |
| IMD 09.1 COCOM Exercise | | | | | 2Q | | |
| IMD 09.3 Battle Planning Exercise | | | | | 3Q | | |
| National Missile Defense Conference 09 Wargame | | | | | 3Q | | |
| Multinational Conference Wargame 09 | | | | | 4Q | | |
| IMD 09.4 BMDS SE-SIM Exercise/Wargame | | | | | | 1Q | |
| IMD 10.1 COCOM Exercise | | | | | | 2Q | |
| IMD 10.2 BMDS SE-SIM Exercise/Wargame | | | | | | 2Q | |
| IMD 10.3 Battle Planning Exercise | | | | | | 3Q | |
| National Missile Defense Conference 10 Wargame | | | | | | 3Q | |
| Multinational Conference Wargame 10 | | | | | | 4Q | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0817 Concurrent Test & Operations (CTO) - Distributed Multi-Echelon Training System (DMETS) Block 2006 | 0 | 0 | 22,500 | 0 | 0 | 0 | 0 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: Starting in FY07 Concurrent Test & Operations (CTO-Distributed Multi-Echelon Training System (DMETS) efforts previously included in Ballistic Missile Defense Products PE 0603889C in Projects 0803, 0903 and 0003 within the BMDS Training area are now addressed in CTO-DMETS dedicated Projects 0817 (Block 2006), 0917 (Block 2008) and 0017 (Block 2010).*

## A. Mission Description and Budget Item Justification

The Concurrent Test & Operations-Distributed Multi Echelon Training System (CTO-DMETS) program provides a vital capability allowing the warfighters to test the BMDS and to "Train as they will Fight" without actually launching target missiles and ballistic missile interceptors. CTO-DMETS is a vital tool that will be used to ensure that the complex Ballistic Missile Defense System (BMDS) will perform to the standards and specifications that it was designed to by conducting system-wide test over the operational hardware and operational communications architecture.

CTO-DMETS will test all functions of the BMDS: sensors, interceptors (shooters) and battle management, command, and control. To validate the system, CTO-DMETS will initiate a test event by stimulating a sensor or sensors and then evaluate every element being tested for accuracy, variance and latency. CTO-DMETS will be scalable and variable to meet goals and objectives of the test being conducted. CTO-DMETS is a primary need on the Strategic Command's Prioritized Capability List (PCL) as essential to sustaining BMDS proficiency. CTO-DMETS consists of live, virtual and constructive training environments for proficiency training, operator certification, wargames and exercises, and BMDS employment Tactics, Techniques and Procedures (TTPs) development, review, testing and revision. This system supplements the training and operational experience provided by the BMDS tests program.

The goal of the CTO-DMETS is to enable end-to end BMDS training that allows operators plug in any/all BMDS elements, as needed. The system will allow operators to train where they fight; allow for scalability from individual BMD assets to regional BMDS capabilities, to the full BMDS global community; safely separate training venues from real-world activities; and inject high-fidelity simulations to run realistic scenarios on operational equipment and networks. This will allow training and exercises for all BMDS forces/users and in all phases of the BMDS mission envelope using all sensor/shooter combinations with the same equipment configurations and communications networks as would be required in real-world live-fire BMD.

The CTO-DMETS will harness network technologies permitting missile defense warfighters to practice together on a virtual battlefield from their home stations. The CTO-DMETS will create a wargame-like environment for units to gain training task coverage and achieve other learning

objectives by presenting standardized, technically accurate threat scenarios and other problems, faults, and situations that elicit the performance of individual and collective tasks. As the MDA continues to develop the BMDS to defend the United States, deployed forces, friends and allies, the spiral development of CTO-DMETS will keep pace to meet the continuing need to maintain a viable, safe system and provide a capability to effectively train the crews, elements, staffs and commanders who execute the evolving BMDS mission.

The functions of the CTO-DMETS are to:

- Evaluate integrity of the BMDS.
- Conduct fault identification and isolation.
- Conduct analysis leading to a recommended engineering solution CTO.
- Provide a means for individuals, elements, and Combatant Commanders (COCOMS) to train, maintain proficiency, collaborate, and exercise from their go-to-war stations.
- Aid in unit standardization evaluation and certification for all BMDS personnel and ensure all crews are highly qualified to perform their mission-specific tasks by conducting exercises and wargames executed from actual equipment and networked configurations.
- Validate and practice Tactics, Techniques and Procedures (TTPs) on how to operate the BMDS.

**B. Accomplishments/Planned Program**

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| CTO-DMETS | 0 | 0 | 22,500 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The goal of the CTO-DMETS is to enable end-to end testing of the BMDS and enable BMDS training that allows operators plug in any/all BMDS elements, as needed. The system will allow for scalable testing of the BMDS over the operational architecture as well as allow operators to train where they fight utilizing a parallel architecture either physically separated or logically separated from the operational one; training will be scalable as well; from individual BMD assets to regional BMDS capabilities to the full BMDS global community; safely separate training venues from real-world activities; and inject high-fidelity simulations to run realistic scenarios on operational equipment and networks.

FY06 Planned Program: Activity and funding for CTO-DMETS in FY06 is within Project 0803 (Joint Warfighter Support Program) in the Training Task.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603889C Ballistic Missile Defense Products |

FY07 Planned Program:

- Initiate engineering analysis and trades.
- Develop initial designs and conduct initial design reviews.
- Begin procurement of hardware to implement Concurrent Test & Operations (CTO).
- Begin development, testing and integration of software required for CTO.
- Implement the dedicated CTO-DMETS network designed in FY06. This will entail the procurement, fabrication, fielding, and testing of Communications and Networking Equipment to support the CTO-DMETS.
- Provide 24/7 schedule availability for CTO-DMETS exercises with full function displays and interactive simulations.
- Design and implement connectivity to Aegis underway, the BMD Deployable X-Band Radar and Sea-Based X-Band Radar, as participants in CTO-DMETS training exercises.
- Design connectivity to theater assets Patriot and THAAD, through theater/regional battle management capability.
- Design and implement a CTO-DMETS red cell enabling off-nominal threat scenarios.
- Design, procure equipment for, fabricate, field and test two training enclaves to meet warfighter requirements, including scalability. Each enclave requires equipment to support Simulation/Stimulation, computing resources duplicating each of the major systems (i.e. Command, Control, Battle Management and Communications (C2BMC), Ground-Based Missile Defense (GMD) Fire Control, and Integrated Tactical Warning and Attack Assessment (ITW/AA) system).
- Commence availability for training, scalable to an individual COCOM.
- Continue to provide Operations and Support to warfighter training.
- Technically refresh installed training equipment to ensure it matches the deployed BMDS configurations.

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603889C Ballistic Missile Defense Products |

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## D. Acquisition Strategy

The CTO-DMETS Project Office will follow the MDA's capability-based acquisition strategy that emphasizes assessment, phased-development, testing and evolutionary acquisition through the definition of distinct phases and two-year capability blocks. The CTO-DMETS Project Office accomplishes this by design and development activities that support System Specification and Implementation Plan updates, and then vetting war fighter requirements through the MDA management processes and through the warfighter through forums such as the Integrated Training Working

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

Group, Joint Forces Component Command -- Integrated Missile Defense, the COCOMS and the Services utilizing seminars, workshops, table top exercises, wargames and simulation exercises.

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **CTO-DMETS** | | | | | | | | |
| | C/CPAF | MDNT/B/ Arlington, VA | 0 | 0 | N/A | 5,200 | N/A | 5,200 |
| Subtotal Product Development | | | 0 | 0 | | 5,200 | | 5200 |

**Remarks**

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **CTO-DMETS** | | | | | | | | |
| | C/CPAF | MDNT/B/ Arlington, VA | 0 | 0 | N/A | 5,550 | 2Q | 5,550 |
| Subtotal Support Costs | | | 0 | 0 | | 5,550 | | 5550 |

**Remarks**

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **CTO-DMETS** | | | | | | | | |
| | C/CPAF | MDNT/B/ Arlington, VA | 0 | 0 | N/A | 8,000 | 2Q | 8,000 |
| Subtotal Test and Evaluation | | | 0 | 0 | | 8,000 | | 8000 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **CTO-DMETS** | | | | | | | | |
| | C/CPAF | MDNT/B/ Arlington, VA | 0 | 0 | N/A | 3,750 | 2Q | 3,750 |
| Subtotal Management Services | | | 0 | 0 | | 3,750 | | 3750 |

**Remarks**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 0 | 0 | | 22,500 | | 22,500 |

**Remarks**

Funding for CTO-DMETS in FY06 is contained in Project 0803 (Joint Warfighter Support Program)

**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date
**February 2006**

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

R-1 NOMENCLATURE
**0603889C Ballistic Missile Defense Products**

| Fiscal Year | 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 |
| **BLOCK 2006** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Refresher Training Equip/Current HW/SW Versions | | | | | | | | | △ | | | △ | | | | | | | | | | | | | | | | |
| Complete CTO-DMETS Network | | | | | | | | | | | △ | | | | | | | | | | | | | | | | | |
| Establish Two Additional Training Enclaves | | | | | | | | | | | △ | | | | | △ | | | | | | | | | | | | |
| Engineering Workups for FY08 Tasks | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| Increase Training Availability To 2 Shifts | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲—▲ | Complete Activity | △—△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **BLOCK 2006** | | | | | | | |
| Refresher Training Equip/Current HW/SW Versions | | | 1Q-4Q | | | | |
| Complete CTO-DMETS Network | | | 3Q | | | | |
| Establish Two Additional Training Enclaves | | | 3Q-4Q | 1Q-4Q | | | |
| Engineering Workups for FY08 Tasks | | | 4Q | | | | |
| Increase Training Availability To 2 Shifts | | | 4Q | | | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0917 Concurrent Test & Operations (CTO) - Distributed Multi-Echelon Training System (DMETS) Block 2008 | 0 | 0 | 0 | 13,800 | 11,100 | 0 | 0 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: Funding for FY06, is addressed in Project 0803. Beginning in FY07 a unique Project structure is established for CTO-DMETS, with FY07 funding in Project 0817, Block 2008 (FY08-09) in Project 0917, and Block 2010 (FY10-11) in Project 0017.*

**A. Mission Description and Budget Item Justification**

The Missile Defense Agency (MDA) is developing a Concurrent Test & Operations (CTO)/Distributed Training Capability (DMETS) that will consist of a systemic, scalable testing capability to ensure and validate the operational specifications of the BMDS and a live, virtual and constructive training environments for proficiency training, operator certification, wargames and exercises, and Tactics, Techniques and Procedures (TTPs) development, review, testing and revision.

CTO-DMETS will provide 1) a systemic approach to validating and verifying the integrity of the BMDS through the ability to test the BMDS at the engineering/software level. Each spiral update, block improvement element addition or change will require a rigorous analysis to verify system operability. The only way to do this is to test the operational system, CTO will do this. 2) DMETS supplements the training and experience provided by the limited amount of live-fire Ballistic Missile Defense System (BMDS) tests possible. It will become one of the most vital components of the BMDS by ensuring all users have the ability to adequately train for employment of the BMDS without actually launching target missiles and ballistic missile interceptors. CTO is a vital tool that will be used to ensure that the complex Ballistic Missile Defense System (BMDS) will perform to the standards and specifications that it was designed to by conducting system-wide test over the operational hardware and operational communications architecture.

CTO will test all functions of the BMDS: sensors, interceptors (shooters) and battle management, command, and control. To validate the system, CTO will initiate a test event by stimulating a sensor or sensors and then evaluate every element being tested for accuracy, variance and latency. CTO will be scalable and variable to meet goals and objectives of the test being conducted.

The goal of the DMETS is to enable end-to end BMDS training through an architecture that lets operators plug in any/all BMDS elements desired and simulate/train as needed. The system will allow operators to train where they fight, allow for scalability from individual BMD assets to regional BMDS capabilities, up through the entire BMDS global community, safely separate training venues from real-world activities, and inject high-fidelity simulations to run realistic scenarios on operational equipment and networks. This will allow training and exercises for all BMDS forces/users and in all phases of the BMDS mission envelope using all sensor/shooter combinations with the same equipment configurations as would

be required in real-world live-fire BMD. DMETS will provide a system to enable routine training and exercising at the BMDS (above element) level, giving element operators and crews the opportunity to exercise across BMDS elements, communications, and coordination aspects for defensive operations.

The CTO-DMETS will harness network technologies permitting missile defense warfighters to practice together on a virtual battlefield from their home stations. The CTO-DMETS will create a wargame-like environment for units to gain training task coverage and achieve other learning objectives by presenting standardized, technically accurate threat scenarios and other problems, faults, and situations that elicit the performance of individual and collective tasks. As the MDA continues to develop the BMDS to defend the United States, deployed forces, friends and allies, the spiral development of CTO-DMETS will keep pace to meet the continuing need for a viable, safe system and to effectively train the crews, elements, staffs and commanders who execute the evolving BMDS mission.

The functions of the CTO-DMETS are to:

- Evaluate integrity of the BMDS.
- Conduct fault identification and isolation.
- Conduct analysis leading to a recommended engineering solution
- Provide a means for individuals, elements, and Combatant Commanders (COCOMs) to train, maintain proficiency, collaborate, and exercise from their go-to-war stations.
- Aid in unit standardization evaluation and certification for all BMDS personnel and ensure all crews are highly qualified to perform their mission-specific tasks by conducting exercises and wargames executed from actual equipment and networked configurations.
- Validate and practice Tactics, Techniques and Procedures (TTPs).

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 CTO-DMETS Project Office will follow the MDA's capability-based acquisition strategy that emphasizes assessment, phased-development, testing and evolutionary acquisition through the definition of distinct phases and two-year capability blocks. The CTO-DMETS Project Office accomplishes this by design and development activities that support System Specification and Implementation Plan updates, and then vetting war fighter requirements through the MDA management processes and through the warfighter through forums such as the Integrated Training Working Group, Joint Forces Component Command -- Integrated Missile Defense, the COCOMS and the Services utilizing seminars, workshops, table top exercises, wargames and simulation exercises.

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603889C Ballistic Missile Defense Products** |

| Fiscal Year | 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 |
| **BLOCK 2008** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Engineering Workup for FY09 Tasks | | | | | | | | | | | | | | | | △ | | | | | | | | | | | | |
| Interface w/Additional Element System Trainers | | | | | | | | | | | | | | | | △ | | | | △ | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲——▲ | Complete Activity | △——△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **BLOCK 2008** | | | | | | | |
| Engineering Workup for FY09 Tasks | | | | 4Q | | | |
| Interface w/Additional Element System Trainers | | | | 4Q | 4Q | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0017 Concurrent Test & Operations (CTO) - Distributed Multi-Echelon Training System (DMETS) Block 2010 | 0 | 0 | 0 | 0 | 0 | 9,300 | 9,600 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: CTO-DMETS activity is divided into two-year capability Blocks, with funding and planned activity addressed in those Blocks: Block 2006 (FY06-07) = Project 0817; Block 2008 (FY08-09) = Project 0917; Block 2010 (FY10-11) = Project 0017.*

**A. Mission Description and Budget Item Justification**

The Missile Defense Agency (MDA) is developing a Concurrent Test & Operations (CTO) Distributed Training Capability (DMETS) that will consist of a systemic, scalable testing capability to ensure and validate the operational specifications of the BMDS and a live, virtual and constructive training environments for proficiency training, operator certification, wargames and exercises, and Tactics, Techniques and Procedures (TTPs) development, review, testing and revision.

CTO-DMETS will provide 1) a systemic approach to validating and verifying the integrity of the BMDS through the ability to test the BMDS at the engineering/software level. Each spiral update, block improvement element addition or change will require a rigorous analysis to verify system operability. The only way to do this is to test the operational system, CTO will do this. 2) DMETS supplements the training and experience provided by the limited amount of live-fire Ballistic Missile Defense System (BMDS) tests possible. It will become one of the most vital components of the BMDS by ensuring all users have the ability to adequately train for employment of the BMDS without actually launching target missiles and ballistic missile interceptors. CTO is a vital tool that will be used to ensure that the complex Ballistic Missile Defense System (BMDS) will perform to the standards and specifications that it was designed to by conducting system-wide test over the operational hardware and operational communications architecture.

CTO will test all functions of the BMDS: sensors, interceptors (shooters) and battle management, command, and control. To validate the system, CTO will initiate a test event by stimulating a sensor or sensors and then evaluate every element being tested for accuracy, variance and latency. CTO will be scalable and variable to meet goals and objectives of the test being conducted.

The goal of the DMETS is to enable end-to end BMDS training through an architecture that lets operators plug in any/all BMDS elements desired and simulate/train as needed. The system will allow operators to train where they fight, allow for scalability from individual BMD assets to regional BMDS capabilities, up through the entire BMDS global community, safely separate training venues from real-world activities, and inject high-fidelity simulations to run realistic scenarios on operational equipment and networks. This will allow training and exercises for all BMDS forces/users and in all phases of the BMDS mission envelope using all sensor/shooter combinations with the same equipment configurations as would

be required in real-world live-fire BMD. CTO-DMETS will provide a system to enable routine training and exercising at the BMDS (above element) level, giving element operators and crews the opportunity to exercise across BMDS elements, communications, and coordination aspects for defensive operations.

The CTO-DMETS will harness network technologies permitting missile defense warfighters to practice together on a virtual battlefield from their home stations. The DMETS will create a wargame-like environment for units to gain training task coverage and achieve other learning objectives by presenting standardized, technically accurate threat scenarios and other problems, faults, and situations that elicit the performance of individual and collective tasks. As the MDA continues to develop the BMDS to defend the United States, deployed forces, friends and allies, the spiral development of CTO-DMETS will keep pace to meet the continuing need for a viable, safe system and to effectively train the crews, elements, staffs and commanders who execute the evolving BMDS mission.

The functions of the CTO-DMETS are to:

- Evaluate integrity of the BMDS
- Conduct fault identification and isolation
- Conduct analysis leading to a recommended engineering solution
- Provide a means for individuals, elements, and COCOMS to train, maintain proficiency, collaborate, and exercise from their go-to-war stations.
- Aid in unit standardization evaluation and certification for all BMDS personnel and ensure all crews are highly qualified to perform their mission-specific tasks by conducting exercises and wargames executed from actual equipment and networked configurations.
- Validate and practice Tactics, Techniques and Procedures (TTPs).

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603889C Ballistic Missile Defense Products |

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## D. Acquisition Strategy

The CTO-DMETS Project Office will follow the MDA's capability-based acquisition strategy that emphasizes assessment, phased-development, testing and evolutionary acquisition through the definition of distinct phases and two-year capability blocks. The CTO-DMETS Project Office accomplishes this by design and development activities that support System Specification and Implementation Plan updates, and then vetting requirements through the MDA management processes and through the warfighter through forums such as the Integrated Training Working Group, Joint Forces Component Command -- Integrated Missile Defense, the COCOMS and the Services utilizing seminars, workshops, table top exercises, wargames and simulation exercises.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0602 Program-Wide Support | 8,802 | 10,548 | 17,061 | 22,383 | 18,114 | 17,061 | 15,312 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## A. Mission Description and Budget Item Justification

Program-Wide Support provides funding for common non-headquarters support functions across the entire program such as strategic planning, program integration, business management, 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 outside services and support contractors that augment government staff in these areas. Many of these costs reside within the Missile Defense Agency 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, although some functions and costs within this program element are performed by MDA employees assigned within the National Capital Region (NCR). Other costs included herein provide facility capabilities for MDA Executing Agent locations, such as physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses. Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Civilian Salaries and Support | 8,802 | 10,548 | 17,061 |
| RDT&E Articles (Quantity) | 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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| Total PE Cost | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 |
| 0101 Systems Engineering & Integration | 226,222 | 100,033 | 112,626 | 116,353 | 115,984 | 127,960 | 141,556 |
| 0105 Countermeasures/Counter-Countermeasures (CM/CCM) | 27,295 | 21,161 | 25,700 | 26,700 | 27,700 | 23,000 | 23,400 |
| 0102 Intelligence and Security | 28,152 | 19,015 | 23,922 | 27,437 | 28,980 | 39,142 | 46,600 |
| 0103 Producibility & Manufacturing Technology | 36,540 | 32,752 | 36,921 | 40,247 | 43,214 | 44,112 | 45,028 |
| 0104 BMD Information Management Systems | 61,252 | 111,843 | 123,175 | 124,775 | 127,375 | 135,375 | 138,075 |
| 0106 Modeling & Simulation | 0 | 92,577 | 103,419 | 107,740 | 109,770 | 111,222 | 112,538 |
| 0107 Safety, Quality and Mission Assurance | 3,206 | 17,833 | 25,900 | 31,800 | 41,100 | 40,100 | 40,500 |
| 0602 Program-Wide Support | 16,185 | 12,278 | 21,414 | 26,343 | 29,549 | 33,627 | 25,714 |

*Note: In FY05, the funding for Project 0106 Modeling and Simulation appears under Project 0101 Systems Engineering and Integration.*

*In FY05, additional funding for Project 0107 Safety, Quality, and Mission Assurance in the amount of $12.0 million is captured in Program Element 0603882C.*

*In FY06 through FY11, there is an increase in Project 0104 BMD Information Management Systems partially due to the IT budgets from the Computing Infrastructure, Computing and Network Management Services, and Information Distribution Services projects being consolidated from Program Element 0901598C into this Program Element and Project.*

**A. Mission Description and Budget Item Justification**

(0101) SYSTEMS ENGINEERING AND INTEGRATION (SE&I)

SE&I Program Description: The Systems Engineering and Integration (SE&I) mission is to define, manage, and integrate all engineering development for the Ballistic Missile Defense System (BMDS). SE&I activities provide the technical expertise, tools, and facilities to develop an integrated, layered BMDS in a five-phased approach: 1) Test Bed Planning/concept development, 2) Design and Specification, 3) Integration and Implementation, 4) Verification and Assessment, and 5) Operational Integration (fielding) to defend the United States, its friends and allies. This strategy provides core technical efforts to define, design, and assess the BMDS capabilities, and to enhance these capabilities over time through Block upgrades. A cross-cutting System-level engineering effort is integrated with BMDS Elements and components throughout the full system development cycle with increased emphasis on collaborative system engineering activities with BMDS element systems. This strategy also improves efficiency in program execution; defines architectures and critical interfaces; identifies information exchange requirements; reviews technical and

performance risks and develops mitigation strategies; oversees program development maturity; and manages configuration baselines within Block development cycles to ensure continuous availability of a performance baseline system.

SE&I Program Budget Justification and Contribution to the Ballistic Missile Defense System (BMDS): 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. During this development process resources are needed not only for near-term Block requirements, but also for long-range Block developments. SE&I develops a set of time-phased technical goals and objectives to guide the design and development of evolutionary capabilities for the BMDS. The overarching development of individual components and elements to provide a capability for multiple engagements along the entire flight path of threat ballistic missiles is integrated into each Test Bed. Significant and thorough guidance to BMDS elements and components is provided throughout the full system development cycle phases.

SE&I employs a Test Bed development approach to set the conditions for ongoing evolutionary improvements to the system. The Test Bed enables 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. BMDS capabilities are matured using a block engineering development process within a Test bed framework. The process is repeated for each successive two-year development Block, and the phases for each development Block do overlap. For example, at the current time Block 2008 planning, Block 2006 design, and Block 2004 test, verification, assessment, and fielding are in progress.

SE&I Major Program Goals:

- Function as the MDA responsible engineering organization to execute a comprehensive SE&I effort for the BMDS.
- Establish Technical Objectives and Goals for the BMDS and the Elements.
- Define BMDS level performance parameters, validate BMDS Element designs, and assess and verify integrated BMDS capability.
- Develop the BMDS system design and overarching BMDS technical architecture.
- Determine the functionality, capabilities and interfaces required to implement Engagement Sequence Groups into BMDS capabilities.
- Develop BMDS level requirements and flowdown to Elements' Interface Control Specifications and ensure that the BMDS functions as an integrated system.
- Assess performance gaps in BMDS capabilities and identify improvements required to close those gaps.

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense System Core** |

(0105) COUNTERMEASURES/COUNTER-COUNTERMEASURES (CM/CCM)

CM/CCM Program Description: The 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 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.

The CM/CCM Program is a critical SE&I activity that 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. Working in conjunction with Threat Systems Engineering, the program ensures consistency of these adversary capabilities. These efforts bring 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 assessment 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 Budget Justification and Contribution to the Ballistic Missile Defense System (BMDS): The CM/CCM Program is the primary MDA activity focused on the assessment and improvement of BMDS system discrimination capabilities. The program's adversary engineering teams are a significant component of MDA's threat engineering resources focused on assessing adversary capabilities to employ countermeasures which degrade BMDS performance. The adversary teams establish the feasible engineering range of adversary countermeasures' capabilities through the development of engineering tools and generation of new phenomenological data to increase MDA's understanding of the performance of countermeasures, and the design of countermeasure concepts to realize these adversary capabilities. Selected countermeasure designs are transitioned to MDA Targets and Countermeasures for insertion in BMDS flight test target payloads.

The program conducts assessments of BMDS capabilities against countermeasures and develops concepts to improve the robustness of the system's capability to defeat ballistic missiles employing countermeasures. The CM/CCM Program is MDA's principal source of new concepts which improve the discrimination capabilities of the BMDS and mitigate the effects of countermeasures on system performance. The program integrates these concepts into the MDA system engineering process for development and deployment in future blocks of the BMDS.

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense System Core** |

CM/CCM Major Program Goals:

- Complete the characterization of adversary countermeasures against BMDS Boost Phase capabilities and deliver a countermeasure design for a BMDS FY08 critical measurements flight test.
- Complete the assessment of BMDS Boost Phase capabilities against ballistic missiles employing countermeasures.
- Complete the development of six system discrimination improvement concepts and integrate them into the BMDS Block Program.

(0102) INTELLIGENCE AND SECURITY

Intelligence and Security Program Description: This project funds three specific efforts focused on maximizing actionable threat information and ensuring the safety of the BMDS, MDA and its personnel: 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).

Intelligence and Security Program Budget Justification and Contribution to the Ballistic Missile Defense System (BMDS):
1) Intelligence 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 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.

2) 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.

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.

Intelligence and Security Major Program Goals:

- 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).

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense System Core** |

- 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 2008 release, including STSS, upgraded C2BMC backbone, SBX radar, ABL, and THAAD.
- Provide operational, investigative and counterintelligence (CI) functional support 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.

(0103) PRODUCIBILITY AND MANUFACTURING TECHNOLOGY (MP)

Producibility and Manufacturing Technology (MP)Program Description: 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. 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. This project funds a number of key investment areas: 1) Power Systems, 2) Radiation Hardening (RAD HARD), 3) Manufacturing Process Improvements, 4) Electro-Optics/Infrared (EO/IR), 5) Radar and RF, 6) Propulsion, 7) Advanced Materials and Structures, and 8) Anti-Tamper.

MP Program Budget Justification and Contribution to the Ballistic Missile Defense System (BMDS): MP provides crosscutting BMDS manufacturing risk assessments, industrial capability assessments, and near term (1-3 year) producibility enhancements. Common, integrated programs across the BMDS Elements are provided 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 Major Program Goals:
- Integrate technology refresh and critical supplier results into corporate MDA risk mitigation strategy.
- Develop Radiation Hardened (RH) Visible Sensors for missile and satellite surveillance applications.
- Continue development in producible materials and technologies to enhance thermal management.
- 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-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| 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 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.

(0104) BMD INFORMATION MANAGEMENT SYSTEMS

BMD Information Management Systems Program Description: The Ballistic Missile Defense (BMD) Information Management Systems Project 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 Elements and operators to collaborate and share information which is essential to accomplishing the complex integrated BMDS mission. The 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). The BMD Information Management Systems project, executed by the Information Management and Technology Operations Office (MDA/DOC), includes the following Task areas:

- Enterprise Architecture and Engineering,
- Enterprise Applications,
- Enterprise Plans and Policies,
- MDA Communications Infrastructure,
- Enterprise Information Assurance (IA),
- Service IM/IT for Executing Agents,
- Computing and Network Management Services (National Capital Region (NCR) Operations),
- Virtual Data Centers,
- MDA Video Teleconferencing Services,
- Computing Infrastructure (Enterprise),
- ITO South Computing Infrastructure,
- Information Management Services.

BMD Information Management Systems Program Budget Justification and Contribution to the Ballistic Missile Defense System (BMDS): The BMD Information Management Systems project is an essential and integral component 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.

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense System Core** |

BMD Information Management Systems Major Program Goals:

- Develop designs and improvement plans for MDA priority projects.
- Develop, update, coordinate and publish policies, guidelines and processes in accordance with applicable legislation, DoD and MDA guidance.
- Upgrade networking equipment to meet the demands of the BMDS information sharing environment.
- Provide system security planning, engineering and test support to the spiral development of BMDS Blocks 2006 and 2008 configurations.

(0106) MODELING AND SIMULATION (M&S)

M&S Program Description: The mission of MDA's Modeling and Simulation (M&S) program is to establish a tool set for planning, engineering, testing and operating an integrated ballistic missile defense system. Specific modeling and simulation products map to the six agency venues: 1) ground tests, 2) flight tests, 3) war games, 4) analysis, 5) training, and 6) element testing. For each of these venues and their stakeholders, M&S defines, designs, develops, deploys and maintains system simulations, including their constituent subsystem, threat and environment models, and provides user and analytical support services. In addition, M&S is responsible for requirements' development, configuration control, verification, validation and accreditation, facility and infrastructure planning, information assurance and risk management.

M&S Budget Justification and Contribution to the Ballistic Missile Defense System (BMDS): The BMDS exploits maturing capabilities to build an integrated, highly capable defense. As new capabilities are brought to the war fighter, the ``plug and fight`` missile defense system increases its effectiveness through the use of new engagement sequence groups. These engagement sequences take advantage of air, land, sea and space components to maximize the probability of kill, expand the area that can be defended and decrease the area from which the enemy can launch, as well as minimize, the number of weapons needed in the inventory. Likewise, a M&S framework is being developed that reflects the open architecture envisioned for the BMDS.

M&S Major Program Goals:

- Modify and sustain legacy tools, develop an integrated simulation open architecture and framework, define a Common Environment and Threat Model, and build a foundation of international missile defense initiatives.
- Promote MDA's simulation-based acquisition of the BMDS.
- Develop, proliferate, and maintain common standards across the enterprise including the architecture, framework, models, interfaces and quality assurance.

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date<br>**February 2006** |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>**RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE<br>**0603890C Ballistic Missile Defense System Core** |

(0107) SAFETY, QUALITY AND MISSION ASSURANCE (SQMA)

SQMA Program Description: The mission of the Safety, Quality, and Mission Assurance (SQMA) Directorate is to develop and implement BMDS-wide policies, perform engineering and technical studies, and to foster and ensure MDA system-wide safety, quality and mission assurance. Responsibilities are functionally allocated to four groups: 1) Assurance Integration, 2) Mission Assurance, 3) Quality Assurance, and 4) Safety. In addition, the SQMA directorate supports the MDA/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. This support 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.

SQMA Budget Justification and Contribution to the Ballistic Missile Defense System (BMDS): The SQMA efforts enable the development, testing, and fielding of an effective, reliable, and safe missile defense capability. The SQMA 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 BMDS.

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 BMDS Elements under the cognizance of MDA. SQMA has also been given the responsibility for developing and implementing an MDA High Reliability Parts (HRP) management program to identify key parts/materials issues to ensure overall MDA and BMDS success.

Safety, Quality and Mission Assurance (SQMA) Major Program Goals:

- Conduct independent Safety Assessments/Reviews of MDA programs and Elements to enhance BMDS safety.
- Provide technical support to MDA Programs and BMDS to develop and implement required safety, quality and mission assurance requirements.
- Implement the Software Acquisition Program Improvement Plan (SAIP).
- Develop an MDA Software Acquisition training/education program.
- Maintain/update the integrated MDA Metrics Program to provide information on the health of the BMDS to MDA management.

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense System Core** |

## A.4 Major Events Schedule and Description

| Major Event | Project | Timeframe |
|---|---|---|
| **Ground Test** | | |
| **Modeling and Simulation** | | |
| GTC 06-1 | 0106 | 2Q FY 2006 |
| **Delivery** | | |
| **Modeling and Simulation** | | |
| BMDS SIM v2.0 Release | 0106 | 1Q FY 2007 |
| **Other** | | |
| **BLOCK 2006** | | |
| Test Bed System Specifications (TBSS) | 0101 | 3Q FY 2005 |
| Test Bed Description Document (TBDD) | 0101 | 4Q FY 2005 |
| **BLOCK 2008** | | |
| Test Bed Description Document (TBDD) | 0101 | 4Q FY 2006 |
| Test Bed System Specifications (TBSS) | 0101 | 3Q FY 2007 |
| **Block 2010** | | |
| Test Bed Description Document (TBDD) | 0101 | 4Q FY 2007 |
| **Milestones** | | |
| Technical Objectives & Goals / Updates | 0101 | 1Q FY 2006 |
| Technical Objectives & Goals / Updates | 0101 | 3Q FY 2007 |
| Technical Objectives & Goals / Updates | 0101 | 3Q FY 2009 |
| Technical Objectives & Goals / Updates | 0101 | 3Q FY 2011 |
| **Enterprise Information Assurance** | | |
| Issue BMDS Block 04 ATO | 0104 | 2Q FY 2006 |

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense System Core** |

| B. Program Change Summary | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Previous President's Budget (FY 2006 PB) | 399,829 | 447,006 | 538,442 |
| Current President's Budget (FY 2007 PB) | 398,852 | 407,492 | 473,077 |
| Total Adjustments | -977 | -39,514 | -65,365 |
| Congressional Specific Program Adjustments | 0 | -26,854 | 0 |
| Congressional Undistributed Adjustments | 0 | -12,660 | 0 |
| Reprogrammings | 5,435 | 0 | 0 |
| SBIR/STTR Transfer | -6,412 | 0 | 0 |
| Adjustments to Budget Years | 0 | 0 | -65,365 |

FY05 Reduction of $0.977 million includes the SBIR/STTR Transfer and MDA reprogrammings.

FY06 Reduction of $39.514 million includes Congressional specific program adjustments and a portion of the MDA Congressional undistributed adjustment.

FY07 Reduction of $65.365 million includes adjustments to accommodate current MDA priorities and achieve overhead/infrastructure reductions.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0101 Systems Engineering & Integration | 226,222 | 100,033 | 112,626 | 116,353 | 115,984 | 127,960 | 141,556 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: In FY05, funding for the Modeling and Simulation program appears under Project 0101. Starting in FY06 the funding for this effort is in Project 0106.*

**A. Mission Description and Budget Item Justification**

Systems Engineering and Integration (SE&I) employs integrated working groups to achieve broad engineering collaboration across the Missile Defense Agency (MDA). Significant and thorough guidance to Ballistic Missile Defense System (BMDS) elements and components is provided throughout the full system development cycle phases, i.e., planning/concept development, system design and specification, integration and implementation, verification and assessment and operational integration (fielding). BMDS capabilities are matured using a block engineering development process within a Test Bed framework. During this development process resources are needed not only for near-term Block requirements, but also for long-range Block developments. The Test Bed represents two-year blocks for maturation, integration, and test of Elements contributing to a time-phased improvement of BMDS capability. The SE&I process is repeated through each successive two-year Block development cycle and the process phases for each development block do overlap. For example, at the current time Block 2008 planning, Block 2006 design, and Block 2004 test, verification, assessment, and fielding (operational integration) are in progress. The Test Bed 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. 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 (KVs). These technology efforts will generate enhanced ESGs and also lead to new ESGs.

It is an enormous challenge to coordinate 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. The MDA SE&I Team defines architectures and critical interfaces, identifies information exchange requirements, reviews technical and performance risks and develops mitigation strategies, oversees program development maturity across segments and manages 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 tasked to assess feasibility of BMDS evolutionary development concepts and make performance trade-offs and investment recommendations through the collaborative system engineering process. The system engineering process, which defines required system-wide behavior, validates Element

system designs, and assesses and verifies system capability, involves five-phases: 1) Test Bed planning/concept development; 2) design and specification; 3) integration and implementation 4) verification and assessment, and 5) operational integration (fielding). 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.

Test Bed Planning determines technology needs, develops concept descriptions (CDs), and defines Engagement Sequence Groups (ESGs). Test Bed Planning also finalizes recommended ESG assignments to Test Bed development levels. The Test Bed Planning function begins with an assessment of the threats to be countered by the BMDS. The broad scope of feasible threats is detailed in the Adversary Capability Document (ACD) which defines threat capabilities in three ways: limited by the physically possible, limited by current engineering capabilities, and limited by current intelligence capabilities. In addition to the ACD, an Adversary Data Package (ADP) is generated for each version of the Test Bed System Specification (TBSS). The ADP defines the specific threats and scenarios to be used for assessing BMDS performance with the associated TBSS.

The Test Bed Planning process continues by assessing additional inputs, such as maturing technology possibilities, and candidate concepts that enhance the capability of the BMDS. Inputs include the previous Test Bed system specifications, Element configurations, gap analysis, technical objectives and goals, technology assessments, Countermeasures/Counter-Countermeasures (CM/CCM) program inputs, international participation and director's guidance. The planning team writes and annually updates the Technical Objectives and Goals (TOG), which provides the overall development goals and metrics used to judge system capability and progress. These concept descriptions and their ESGs are the foundation for the improvements to the BMDS and form the building blocks for the Element programs. Test Bed Planning also produces the Test Bed Description Document (TBDD), the basis for engineering guidance through Decision Memoranda issued to the Elements by MDA which documents the concepts demonstrating the most potential for improving BMDS effectiveness and integrates them into BMDS program planning. Without the identification of these concepts and the associated ESG improvements, the Elements would not have the interface requirements necessary to make 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.

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BMDS design allocates the functions required to execute all ESGs 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. Approved system architectures and operational concepts are documented in the BMDS Test Bed System Specifications (TBSS). 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 and Specifications 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 the SE&I process.

Integration describes those system engineering activities and events required to structure and implement 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). The MIP defines phases within the Block, which become the building blocks to achieve final capability, and allocates the ESG functionality captured in the system specification and interface documents to those phases. 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 Assessment Plan (CAP). During the ``Build Phase``, 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. 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. Engineering studies and analysis are conducted to explore alternative approaches to attaining an ESG, assessing feasibility and affordability. During the test planning and execution phase, the integration team works closely with the Responsible Test Organization (RTO), MDA's Test program leader, to ensure test data required for system verification, assessment and model validation is collected.

System Verification and Assessment verifies the ``as built`` system is compliant with the system specification and assesses performance of the delivered capability. Emerging BMDS capabilities are critically assessed against the established Technical Objectives and Goals (TOG). Together with military utility assessments (MUA) and operational test and evaluation assessments (OTA), the warfighter obtains technical knowledge of the system's capabilities that facilitates development and deployment decisions by the Department of Defense (DoD). The assessment of the BMDS is highly dependent on analysis and grounded in the use of accredited system models. Ground and flight tests data anchor system models which in turn are used to determine the effectiveness of the system under realistic scenarios. BMDS performance is described in terms of ESGs to provide a common lexicon to measure the performance of various combinations of the sub-systems, and to simplify the complexities and interactions of the system. System verification is accomplished through a methodical allocation and tracing of all system-level requirements to the specifications of

MDA elements and components. Additionally, system issues are identified during BMDS test and verification activities and are either assigned to be worked to resolution within the current block, or are acknowledged as limitations and allocated for resolution in future blocks. The plans and status of these three items, 1) BMDS Verification, 2) BMDS Performance Assessment and 3) BMDS Issues, are reported periodically during the year. A formal report is published each January to summarize the verification and assessment activities of the previous year accomplishments. Verification at the component level is then rolled up to a system-level assessment. The results of system level tests and assessments are captured in interim and final (end-of-block) Capability Assessment Reports (CAR). DoD then uses CAR information to determine whether the ESG capability is ready for transition to operations, to production, or to the next stage of development.

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. The Operational Integration and Support function accomplishes the transition of an available defensive capability to the warfighter by providing the principal interface between the system engineering directorate and the user. This ensures successful transition of operational BMDS capability. The BMDS user handbooks, 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 obtains feedback from the warfighter through simulations and training exercises to refine system interfaces, CONOPs, and to enhance system reliability, maintainability, suitability and effectiveness. As-built system-level hardware and software products are managed within the Operational Configuration Baseline. Operational tests conducted by the Responsible Test Organization (RTO) are an important data source for lessons learned.

**B. Accomplishments/Planned Program**

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Test Bed Planning | 16,830 | 12,346 | 12,916 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The Test Bed planning phase 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, and production of formal Concept Descriptions (CDs). Concepts demonstrating the most potential for improving BMDS effectiveness are integrated into BMDS program planning and documented in the Test Bed Description Document (TBDD), Level 2 and 3. 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. 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

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Element for BMDS integration. 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.

FY05 Accomplishments:
- Delivered the update to the Technical Objectives and Goals (TOG) that guides the development of the BMDS.
- Finalized the formal planning process, documented in Decision Memorandum #1, for Block 2006 Level 2 and 3 ESGs.
- Finalized Test Bed 2006 and drafted Test Bed 2008 Test Bed Description Document (TBDD) which provide BMDS Elements with Concept Descriptions and Engagement Sequence Group improvements demonstrating the most potential for improving BMDS effectiveness.
- Facilitated Design Review Boards.
- Updated Test Bed 2006 and Test Bed 2008 Performance Gap Analysis.
- Oversaw Countermeasures/Counter-Countermeasures (CM/CCM) Program, using outputs to generate new Concept Descriptions.
- Oversaw the international program and analyzed effects on future capability.

FY06 Planned Program:
- Deliver the update to the Technical Objectives and Goals (TOG).
- Draft Engineering Guidance, Decision Memorandum #1, for Block 2008 requesting Element planning and programming for designated ESGs.
- Draft the TBDD for Block 2008 and Decision Memorandum #2 directing the Elements to develop supporting specifications.
- Facilitate Design Review Boards.
- Produce Concept Descriptions and ESGs for BMDS Test Bed 2010 Planning.
- Initiate Test Bed 2010 Performance Gap Analysis.
- Oversee CM/CCM Program.
- Oversee international program and analyze effects on future capability.
- Continue kill assessment investigation and obtaining information on post-impact debris signatures.

FY07 Planned Program:
- Deliver the update to the Technical Objectives and Goals (TOG).
- Produce Concept Descriptions and ESGs for BMDS Test Bed Evolution Planning.
- Draft the Test Bed 2010 TBDD.
- Facilitate Design Review Boards.

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- Complete Test Bed 2010 Performance Gap Analysis.
- Oversee CM/CCM Program.
- Oversee international program and analyze effects on future capability.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| BMDS Design & Specification | 11,050 | 10,508 | 13,970 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

BMDS Design and Specification continues the SE&I process and uses the data developed during the Test Bed Planning process, along with existing Element specifications, to develop system specification and interface requirements documented in the BMDS Test Bed System Specifications (TBSS). The TBSS provides a common set of requirements and design parameters to facilitate Element design and component specification development that drive the integration across the participating Elements within the Test Bed. 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.

FY05 Accomplishments:

- Finalized the Design and associated Specification and Interface requirements for Test Bed 2006 capabilities.
- Initiated the development of the System Specification and associated interface requirements for the Test Bed 2008 capabilities.
- Refined BMD Core Technical Standards that capture the environmental, design, and construction constraints.
- Completed adherence planning for the Test Bed 2006 Core Standards that include waivers and deviations.
- Incorporated refined approach for Reliability, Maintainability, and Availability (RMA) values as thresholds and goals in the Test Bed System Specifications (TBSS).
- Incorporated refined Information Assurance approach for the BMDS.
- Refined numbers associated with Engagement Performances in the TBSS.
- Incorporated refined safety approach in the TBSS.

FY06 Planned Program:

- Complete the Design and associated Specification and Interface requirements for Test Bed 2006 capabilities including Information Assurance.

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- Initiate the design and associated specification and interface requirements and update the Adversary Data Package for the Test Bed 2008 capabilities.
- Finalize the Test Bed 2008 and draft the Test Bed 2010 Test Bed Description Documents (TBDD).
- Refine BMD Core Technical Standards to capture the environmental, design, and construction constraints.
- Complete adherence planning for the Test Bed 2008 Core Standards that include waivers and deviations.
- Convene the Interface Control Working Group on a regular basis to collaboratively coordinate, control and manage BMDS interface activities.

FY07 Planned Program:
- Finalize the Design and associated Specification and Interface requirements for Test Bed 2010 capabilities.
- Initiate the development of the System Specification and associated interface requirements for the Test Bed 2012 capabilities.
- Refine 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 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Test Bed Integration & Implementation | 10,120 | 9,606 | 13,068 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Test Bed Integration and Implementation focuses on the system-level engineering activities during the SE&I process that are 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 and readiness to support system-level tests; participation in Element Design Reviews to ensure technical compliance with system specifications and standards; and conducting System Design Reviews to assess maturity and readiness to proceed to Block build, integration and test phase. Additionally, integration produces tools and products to facilitate the understanding and monitoring of BMDS capabilities by the Combatant Commands.

FY05 Accomplishments:
- Updated Block 2004 Master Integration Plan (MIP), which defines how the BMDS will be integrated, to incorporate new program content.
- Conducted Block 2004 Interim Capability Assessment / Review (ICAR) to determine whether the Engagement Sequence Group (ESG) capability is ready for transition to operations, to production, or to the next stage of development.
- Drafted Director's Instructions to Elements to execute Block 2004 in accordance with specifications, drawings, and integration and test plans.
- Built Block 2006 MIP and delivered to Element developers and Test and Verification Communities.

- Maintained MIP Planning Allocation Matrix (PAM) tool for Block 2004 and built integration database for Block 2006.
- Provided Technical and System Integration documentation to USNORTHCOM and USSTRATCOM to support training and end of Block 2004 capability (e.g. provide source data for BMDS users handbook, Operations Capability/Systems Capability (OPSCAP/SYSCAP) tool, and BMDS top-level drawings).
- Served as Co-Chairman with Director, Combined Test Force (CTF) and Deputy Director, Integration on the Test Configuration Change Board (TCCB) to coordinate test events and schedules and determine impact of delays in the integration process.
- Tracked system interfaces and related documentation and provided monthly status to the Executive Knowledge Database, the Director's database of information to support decision making at specific knowledge points.

FY06 Planned Program:

- Conduct Block 2006 System Design Review to assess maturity of plans and readiness to execute Block 2006, with emphasis on first phase of integration.
- Draft Director's Instructions to Elements to execute Block 2006 in accordance with specifications, drawings, and integration and test plans.
- Update 2006-2007 MIP to reflect changes in program execution plans.
- Maintain MIP information to support 2006-2007 test, assessment and verification activities.
- Provide system test objectives, scenarios, and required test article configurations for system test events.
- Conduct System Engineering Integration Working Group meetings to vet, assign and work Block 2006 implementation issues.
- Provide Technical and System Integration documentation to USNORTHCOM and USSTRATCOM to support training and early Block 2006 integration Source Data for BMDS Users Handbook.
- Track system interfaces and related documentation and provide status to the Director's Executive Knowledge Database.
- Serve as Co-Chairman with Director, Combined Test Force (CTF) and Deputy Director, Integration on the Test Configuration Change Board (TCCB) to coordinate test events and schedules and determine impact of delays in the integration process.
- Begin advance planning for 2008-2009 MIP.

FY07 Planned Program:

- Conduct Block 2006 In-Progress Technical Reviews for Integration Phase II to ensure system specifications are properly implemented.
- Update 2006-2007 MIP to incorporate any changes in planned delivery of Block 2006 program content.
- Build 2008-2009 MIP and deliver to Element developers and Test and Verification Communities.
- Conduct Block 2008 Integration Design Review following Element Preliminary Design Reviews.

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- Provide system test objectives, scenarios, and required test article configurations for system test events.
- Maintain MIP Planning Allocation Matrix (PAM) tool for Block 2006 and build integration database for Block 2008.
- Provide Technical and System Integration documentation to USPACOM, USNORTHCOM and USSTRATCOM to support training and late Block 2006 integration; Source Data for BMDS Users Handbook; BMDS top-level Drawings.
- Track system interfaces and related documentation and provide monthly status to the Director's Executive Knowledge Database.
- Serve as Co-Chairman with Director, Combined Test Force (CTF) and Deputy Director, Integration on the Test Configuration Change Board (TCCB) to coordinate test events and schedules and determine impact of delays in the integration process.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Verification & Assessment Engineering | 8,700 | 5,677 | 5,854 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The Verification and Assessment phase completes the SE&I cycle, provides feedback for the next phase of development, and gives the warfighter objective technical knowledge of the system's capabilities. Verification of system performance is accomplished primarily by allocating all performance requirements in the design phase to subsystem specifications, then testing and verifying performance to those specifications through analysis, modeling and simulation, demonstration, ground tests and flight tests, and finally rolling up all the subsystem verification results into a comprehensive set of system-level capability verification groups. Maintaining a complete and accurate specification trace therefore becomes critical to providing an accurate assessment of BMDS performance verification. The BMDS overall system performance is assessed against the Statement of Goals and Objectives which were established by the Agency during the initial block planning phase. This assessment is completed in part by using distributed ground tests, but it primarily uses models which were validated and accredited by using the results of the test program.

FY05 Accomplishments:

- Developed/provided BMD System Test Objectives, including overlays on Element Test Objectives to support the MDA's test planning process.
- Updated Block 2004 Capability Verification and Assessment Plan (CVAP) Annex, providing detailed verification planning data to support the system specifications cross reference matrix.
- Developed Block 2006 CVAP Annex, providing detailed verification planning data to support the system specifications cross reference matrix.
- Developed Block 2004 Modeling and Simulation (M&S) requirements.
- Developed/provided Interim Capability Verification and Assessment Reports to document the results of system level tests prior to final (end-of-block) assessment report.
- Developed/provided Capability Verification and Assessment Report Addenda for individual test events.
- Provided Verification and Assessment status to BMDS Readiness Reviews.

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FY06 Planned Program:

- Publish the CY 2005 Interim Capability Assessment Report (ICAR) to report assessments of BMDS performance demonstrated in BMDS system-level testing and analyses.
- Update Block 2006 Capability Assessment Plan (CAP) to describe the plan of action required to assess BMDS system-level technical performance.
- Establish and maintain the Traceability Matrix between system and element specifications.
- Develop Verification Ledger (Dynamic Object Oriented Requirements System (DOORS)-based) for monthly tracking of sub-system verification status.
- Provide System Impact Assessment Reports for significant test events and test campaigns.
- Collect and aggregate Element and Component Block 2006 Assessment Analysis Plans with Modeling and Simulation requirements.
- Draft Block 2008 Analysis Plan for unique system-level Modeling and Simulation requirements.

FY07 Planned Program:

- Publish the CY 2006 ICAR to report assessments of BMDS performance demonstrated in BMDS-level testing and analyses.
- Update Block 2006 CAP to describe the plan of action required to assess BMDS system-level technical performance.
- Maintain the Block 2006 Traceability Matrix and draft Block 2008 Traceability Matrix to map system-level requirements to the specifications of MDA elements and components.
- Draft Block 2008 CAP to describe the plan of action required to assess BMDS system-level technical performance.
- Complete Final Block 2004 Capability Assessment Report (CAR) with supporting subsystem annexes.
- Maintain Block 2006 Verification Ledger (DOORS-based) for monthly tracking of sub-system verification status.
- Provide System Impact Assessment Reports for significant test events and test campaigns.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| System Assessment and Analysis | 23,000 | 17,635 | 19,143 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Systems Assessment and Analysis provides the Director, Missile Defense Agency, and his staff with the technical basis and rationale for developing and balancing the integrated, layered BMDS. It is the only analytic team looking across system block/element/product programs to support the BMDS architecture and systems engineering process with force-on-force effectiveness analyses, identification of system level gaps and shortfalls, formulation of system alternatives and their relative contributions, engineering trade studies, and rapid responses to senior department ``what if```

questions and scenarios. Without this common and consistent engineering decision support team, the Director would be unable to effectively plan, develop, and execute the BMDS and its constituent elements.

FY05 Accomplishments:

- Conducted BMDS 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 Capabilities Verification and Assessment Report.
- Conducted engineering analyses and performed trade studies for system design and implementation products to include System Specification, Interface Control, Target Capabilities Specification, Information Exchange Requirements and Design Parameters Experiments.
- Conducted Quick reaction analyses in support of the Adversary Capability Document (ACD), Concept-of-Operations (CONOPS) Development, and BMDS Handbook.
- Developed and maintained the Element/Component Characterization Analysis and the analysis knowledge base.
- Developed models and simulation requirements for submission in the MDA modeling and simulation process.

FY06 Planned Program:

- Conduct BMDS architecture analyses to support development of Technical Objectives and Goals, Test Bed Description Documents, System Specifications, Interface Control Documents, System Implementation Plan, Capabilities Assessment Plan, and Capabilities 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, as required.
- Maintain the Element/Component Characterization Analysis and the analysis knowledge base.
- Develop models and simulation requirements for submission to the MDA modeling and simulation process.

FY07 Planned Program:

- Conduct BMDS architecture analyses to support development of Technical Objectives and Goals, Test Bed Description Documents, System Specifications, Interface Control, System Implementation Plan, Capabilities Assessment Plan, and Capabilities 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, as required.

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- Develop and maintain the Element/Component Characterization Analysis and the analysis knowledge base.
- Develop models and simulation requirements for submission to the MDA modeling and simulation process.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Threat Systems Engineering | 12,000 | 10,509 | 11,372 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Threat Systems Engineering interfaces throughout the SE&I process to define and assess threats to be countered by the BMDS and provides the initial adversary characteristics input to the Test Bed Planning process. It identifies the technically feasible adversary ballistic missile threat and countermeasure capabilities. It documents these threats by producing adversary characterizations products, including the Adversary Capability Document (ACD), the Block specific Adversary Data Packages (ADP) and other special purpose documents. Threat Systems Engineering provides detailed threat analysis and characterization of various chemical agents and their simulants, and obtains information on post-impact debris signatures as they impact the BMDS. It plans, executes and provides resources for the Countermeasures/Counter-Countermeasures (CM/CCM) Black Team; plans, executes, and administers the MDA Corporate Lethality program (CLP); and maintains oversight and liaison with element lethality programs, including system flight test opportunities.

FY05 Accomplishments:

- Finalized and published the updated Adversary Capability Document (ACD) Version 5.6 that includes Maneuvering Reentry Vehicle characteristics, and Block 2004 and Block 2006 missile characterization.
- Completed characterizations and published the initial draft and two updates to the Block 2006 Adversary Data Package (ADP) to be utilized for the design and assessment of the BMDS.
- Established the Lethality Sub-Group at the System Engineering and Integration Council (SEIC) and published FY06 BMDS Lethality Program Plan to identify lethality requirements and system standards.
- Continued efforts to obtain actual post-engagement lethality information through data collection and analysis on BMDS Element and system flight test opportunities.
- Developed, in conjunction with Targets and Countermeasures (TC), target requirements that reflect current and emerging adversary capabilities.
- Supported continuing Quick Reaction studies relating to the design and development of adversary products to support the SE&I development process.
- In collaboration with CM/CCM, completed Phases 1 and 2 of a study to establish inter-relationships among individual parameters in the BMDS ACD.

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FY06 Planned Program:

- Continue the development and evolution of the ACD to include additional data characterizations of emerging threats and payloads.
- Commence efforts associated with the development of the Block 2008 Adversary Data Package (ADP) to be utilized for the design and assessment of the BMDS performance.
- Commence technical evaluation of emerging adversary characteristics to be included within future Block-specific ADPs (Block 2010, Block 2012, Block 2014)
- Under the direction of the SEIC, ensure the efficient execution of the approved Corporate Lethality Plan (CLP).
- Develop and publish the BMDS Corporate Lethality objectives and goals with the FY07 Lethality Program Plan.
- Define and publish lethality specific payload characteristics to be utilized in conjunction with the Block-specific 2006-2008 ADP.
- Define and develop Adversary Threat Parameter Characterizations and their relationship to BMDS target development.
- In collaboration with CM/CCM, integrate the results from Phases 1 and 2 of the ACD Parameters Inter-Relationships Study into the ACD, and initiate Phase 3 to study additional parameter relationships.

FY07 Planned Program:

- Continue the development and evolution of the ACD to include additional data files characterizing the performance of Adversary Missile Characterizations and payloads.
- Continue efforts associated with the development of the Block 2008 Adversary Data Package (ADP) to be utilized for the design and assessment of the BMDS.
- Continue technical evaluation of emerging Adversary characteristics to be included within future Block-specific ADPs (Block 2010, Block 2012, Block 2014).
- Continue the efficient execution of the approved Corporate Lethality Plan (CLP) under the direction of the Systems Engineering and Integration Council (SEIC).
- Develop and publish the BMDS Corporate Lethality objectives and goals within the FY08 Lethality Plan.
- Define and publish lethality specific payload characterizations to be utilized in conjunction with the Block-specific 2010-2012 ADP.
- Define and develop Adversary Threat Parameter Characterizations and their relationship to BMDS target development.
- In collaboration with CM/CCM, continue to integrate the results from Phases 1 and 2 of the ACD Parameters Inter-Relationships Study into the ACD, and continue Phase 3 to study additional parameter relationships.

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| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Program Management | 42,808 | 31,699 | 32,975 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Program Management provides overall program operations support to the Missile Defense Agency Systems Engineering and Integration (SE&I) program to include planning, programming, budgeting and execution system (PPBES) support, contract management (including Boeing contract and award fee), correspondence, information and document management, policy and procedures, security, and government human relations functions.

FY05 Accomplishments:

- Maintained information library of all official engineering documents and briefings.
- Managed personnel and MDA site and information security.
- Provided administrative support for SE&I staff and managed formal correspondence.
- Provided project program management and control.
- Maintained Integrated Master Schedule for System Engineering products in concert with the overall MDA Integrated Program Policy.
- Performed contracting officer's representative functions for all project support functions including contract cost oversight.
- Managed the project budget.
- Launched a comprehensive collaboration strategy to ensure appropriate participation of Agency product and service stakeholders.
- Drafted the Systems Engineering Plan (SEP) and Configuration Management Plan (CMP) to maintain collaboration between system-level and sub-system level engineering efforts throughout the BMDS life cycle.
- Maintained the BMDS Risk Management Plan.
- Maintained the BMD System Risk Management Plan.

FY06 Planned Program:

- Maintain information library of all official engineering documents and briefings.
- Manage personnel and MDA site and information security.
- Administer SE&I Industry contract renewal and Award-fee plan determination; process self-assessments culminating in award fee to Industry.
- 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.
- Provide project/program management and control for all SE&I.
- Maintain Master Schedule for System Engineering products and coordinate with the overall MDA Integrated Program Policy.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense System Core** |

- Update the Systems Engineering Plan (SEP) and Configuration Management Plan (CMP) at the onset of the planning step of the next Block development (even year only).
- Perform contracting officer's representative functions for all project support functions including contract cost oversight.

FY07 Planned Program:
- Maintain information library of all official engineering documents and briefings.
- Manage personnel and MDA site and information security.
- Implement consistent task management across all programs and contracts including performance indicators and regular reporting.
- Provide project/program management and control for all SE&I.
- Maintain Master Schedule for System Engineering products and coordinate with the overall MDA Integrated Program Policy.
- Perform contracting officer's representative functions for all project support functions including contract cost oversight.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Operational Integration & Support | 2,230 | 2,053 | 3,328 |
| RDT&E Articles (Quantity) | 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 SE&I process by supporting Force Structure Integration and Deployment.

FY05 Accomplishments:
- Supported the Initial Defensive Operations (IDO) Task Force through the remainder of Block 2004.
- Supported Concept of Operations (CONOPS) development.
- Represented the systems engineering interfaces in the Warfighter Involvement Process (WIP) developed by USSTRATCOM.
- Supported warfighter surveys to collect and disseminate user input and feedback on the BMDS for incorporation into the collaborative SE&I process.
- Supported Force Structure Integration and Deployment by working with the Combatant Commanders (COCOMs) in focus groups or integrated process teams involving BMDS SE&I issues.
- Communicated SE&I concepts and analysis to users and stakeholders.

- Established, developed and implemented an operational control process for configuration management and served as Chairman and Secretariat for the Operational Configuration Management Board (OCMB).
- Participated in BMDS Handbook updates and act as a SE&I liaison for training tools. The BMDS Handbook provides a general understanding of BMDS operational and technical characteristics to enable combatant commanders, staffs and key operators to plan and train for defensive operations.
- Participated in the Joint Warfighter Support program and act as a SE&I liaison for joint or service exercises, wargames, and seminars.

FY06 Planned Program:

- Serve as SE focal point for the MDA Operations Center (MOC).
- Support 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&I process.
- Support Force Structure Integration and Deployment by working with the COCOMs in focus groups or integrated process teams involving BMDS SE&I issues.
- Coordinate an Early Capability Review (ECR) for BMDS components nominated by Decision Memorandum #5 to determine fielding capability.
- Communicate SE&I concepts and analysis to users and stakeholders.
- Manage operational system configuration control and serve as Chairman and Secretariat for the OCMB.
- Participate in BMDS Handbook updates and act as a SE&I liaison for training tools.
- Participate in the Joint Warfighter Support program and act as a SE&I liaison for joint or service exercises, wargames, and seminars.

FY07 Planned Program:

- Serve as a focal point for SE&I actions compiled by the MOC.
- Support 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&I process.
- Support Force Structure Integration and Deployment by working with the COCOMs in focus groups or integrated process teams involving BMDS SE&I issues.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense System Core** |

- Communicate SE&I concepts and analysis to users and stakeholders.
- Manage operational system configuration control and serve as Chairman and Secretariat for the OCMB.
- Participate in BMDS Handbook updates and act as a SE&I liaison for training tools.
- Participate in the Joint Warfighter Support program and act as a SE&I liaison for joint or service exercises, wargames, and seminars.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Modeling & Simulation Engineering | 99,484 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

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 Initial Defensive Operations (IDO) and Block 2004 objectives and provide warfighter support and sustainment for BMDS. A modeling and simulation open architecture will be established to assess overall BMDS interoperability and performance, and to evolve legacy simulation assets to this standard as appropriate. It will provide development, training and operations at the system-level, and improve the BMDS through incremental improvements and Block upgrades over time.

FY05 Accomplishments:

- Initiated and completed Model Assessments.
- Assessed Existing Threat and Environment Tools.
- Block 2004 System Verification Action Team (SVAT) Report Out.
- M&S Open Architecture and Implementation Framework Requirements.
- M&S Open Architecture Framework Specification Document.
- M&S Open Architecture Model Specification Document.
- Began Collaboration with International partners on defining requirements and interfaces for an open system modeling framework.
- Released Parametric Endo-Exo Lethality Simulation (PEELS) Update.
- Released Post Engagement Ground Effects Model (PEGEM) Update.
- Released Kinetic Impact Debris Distribution (KIDD) Update.
- Released Performance Assessment Workbench Software (PAWS) Update.
- Released CT-Analyst Update.
- Released Extended Air Defense Simulation (EADSIM) Update, THAAD Representation Accreditation to support War games.

- Released Battlespace Environment and Signatures Toolkit (BEST) Update.
- Released Strategic Scene Generation Model (SSGM) Update.
- Released Optical Signature Code (OSC) Update.
- Released Missile Defense Wargaming and Analysis Resource (MDWAR) Update.
- Released Missile Defense System Exerciser (MDSE) Update.
- Developed Monthly Technical, Cost and Schedule Reports.
- Developed Reference Manuals, User Manuals, Methodology Manuals, Configuration Manuals, Assessment Reports and Vision Documents.

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## D. Acquisition Strategy

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 SE&I effort 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 the necessary engineering for the BMD System.

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Test Bed Planning** | | | | | | | | |
| Industry | CPAF | Boeing/ VA | 5,272 | 2,847 | 1/3Q | 2,981 | 1/3Q | 11,100 |
| SETA | CPFF | Sparta/ VA | 10,920 | 1,708 | 1/3Q | 1,787 | 1/3Q | 14,415 |
| SETA | CPFF | CSC/ VA | 8,192 | 1,488 | 1/3Q | 1,557 | 1/3Q | 11,237 |
| FFRDC/UARC | MIPR | Aerospace/ VA, CA | 4,750 | 1,662 | 1/3Q | 1,738 | 1/3Q | 8,150 |
| FFRDC/UARC | FFRDC | JHU/APL/ MD | 4,250 | 1,534 | 1/3Q | 1,604 | 1/3Q | 7,388 |
| FFRDC/UARC | MIPR | MIT/LL/ MA | 3,190 | 1,151 | 1/3Q | 1,204 | 1/3Q | 5,545 |
| FFRDC/UARC | MIPR | MITRE/ VA | 1,415 | 511 | 1/3Q | 535 | 1/3Q | 2,461 |
| FFRDC/UARC | MIPR | LLNL/ NM | 1,875 | 741 | 1/3Q | 775 | 1/3Q | 3,391 |
| FFRDC/UARC | FFRDC | SDL/ UT | 585 | 256 | 1/3Q | 267 | 1/3Q | 1,108 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| FFRDC/UARC | MIPR | CNA/ VA | 175 | 64 | 1/3Q | 67 | 1/3Q | 306 |
| FFRDC/UARC | MIPR | Sandia/ NM | 708 | 256 | 1/3Q | 267 | 1/3Q | 1,231 |
| **BMDS Design & Specification** | | | | | | | | |
| Industry | CPAF | Boeing/ VA | 22,512 | 7,577 | 1/3Q | 10,086 | 1/3Q | 40,175 |
| SETA | CPFF | Sparta/ VA | 3,540 | 1,396 | 1/3Q | 1,859 | 1/3Q | 6,795 |
| SETA | CPFF | CSC/ VA | 2,972 | 1,386 | 1/3Q | 1,845 | 1/3Q | 6,203 |
| FFRDC/UARC | MIPR | Aerospace, MITRE/ CA, VA | 1,358 | 0 | N/A | 0 | N/A | 1,358 |
| **Test Bed Integration & Implementation** | | | | | | | | |
| Industry | CPAF | Boeing/ VA | 18,297 | 7,328 | 1/3Q | 9,968 | 1/3Q | 35,593 |
| SETA | CPFF | Sparta/ VA | 5,472 | 942 | 1/3Q | 1,282 | 1/3Q | 7,696 |
| SETA | CPFF | CSC/ VA | 4,521 | 1,336 | 1/3Q | 1,818 | 1/3Q | 7,675 |
| FFRDC/UARC | MIPR | Aerospace, JHU/APL/ CA, VA, MD | 1,654 | 0 | N/A | 0 | N/A | 1,654 |
| **Verification & Assessment Engineering** | | | | | | | | |
| Industry | CPAF | Boeing/ VA | 13,481 | 0 | N/A | 0 | N/A | 13,481 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| SETA | CPFF | Sparta/ VA | 2,333 | 1,572 | 1/3Q | 1,448 | 1/3Q | 5,353 |
| SETA | CPFF | CSC/ VA | 5,386 | 2,974 | 1/3Q | 3,019 | 1/3Q | 11,379 |
| FFRDC/UARC | FFRDC | JHU/APL/ MD | 1,880 | 850 | 1/3Q | 1,042 | 1/3Q | 3,772 |
| FFRDC/UARC | MIPR | Sandia/ NM | 310 | 142 | 1/3Q | 174 | 1/3Q | 626 |
| **System Assessment and Analysis** | | | | | | | | |
| Industry | CPAF | Boeing/ VA | 18,321 | 6,890 | 1/3Q | 7,480 | 1/3Q | 32,691 |
| SETA | CPFF | Sparta/ VA | 16,959 | 8,543 | 1/3Q | 9,273 | 1/3Q | 34,775 |
| SETA | CPFF | CSC/ VA | 6,148 | 2,202 | 1/3Q | 2,390 | 1/3Q | 10,740 |
| FFRDC/UARC | FFRDC | JHU/APL/ MD | 3,979 | 0 | N/A | 0 | N/A | 3,979 |
| **Threat Systems Engineering** | | | | | | | | |
| SETA | CPFF | Sparta/ VA | 3,240 | 1,202 | 1/3Q | 1,302 | 1/3Q | 5,744 |
| SETA | CPFF | CSC/ VA | 1,380 | 1,244 | 1/3Q | 1,346 | 1/3Q | 3,970 |
| SETA | CPFF | Schafer/ VA | 0 | 1,468 | 1/3Q | 1,588 | 1/3Q | 3,056 |
| FFRDC/UARC | MIPR | Aerospace/ CA, VA | 600 | 266 | 1/3Q | 288 | 1/3Q | 1,154 |
| FFRDC/UARC | MIPR | MIT/LL/ MA | 750 | 400 | 1/3Q | 433 | 1/3Q | 1,583 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| FFRDC/UARC | FFRDC | JHU/APL/ MD | 2,155 | 1,066 | 1/3Q | 1,153 | 1/3Q | 4,374 |
| FFRDC/UARC | MIPR | Sandia/ NM | 1,570 | 733 | 1/3Q | 794 | 1/3Q | 3,097 |
| FFRDC/UARC | MIPR | LLNL/ CA, VA | 650 | 294 | 1/3Q | 318 | 1/3Q | 1,262 |
| Other DoD | | SMDC/ AL | 5,500 | 1,134 | 1/3Q | 1,227 | 1/3Q | 7,861 |
| Other DoD | MIPR | Battelle/ OH | 2,205 | 846 | 1/3Q | 915 | 1/3Q | 3,966 |
| Other DoD | MIPR | NSWC/ VA | 1,950 | 736 | 1/3Q | 796 | 1/3Q | 3,482 |
| Other DoD | MIPR | AMSC/ VA | 400 | 211 | 1/3Q | 229 | 1/3Q | 840 |
| **Operational Integration & Support** | | | | | | | | |
| Industry | CPAF | Boeing/ VA | 500 | 628 | 1/3Q | 1,018 | 1/3Q | 2,146 |
| SETA | CPFF | Sparta/ VA | 460 | 422 | 1/3Q | 684 | 1/3Q | 1,566 |
| SETA | CPFF | CSC/ VA | 460 | 580 | 1/3Q | 940 | 1/3Q | 1,980 |
| **Modeling & Simulation Engineering** | | | | | | | | |
| M&S Tools | CPAF | Northrop Grumman/ JNIC/CO | 10,077 | 0 | N/A | 0 | N/A | 10,077 |
| M&S Tools | TM | DSI/ GSA/LA | 2,573 | 0 | N/A | 0 | N/A | 2,573 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| M&S Tools | CPAF | Teledyne Brown Eng PEO AMSD/ AL | 4,500 | 0 | N/A | 0 | N/A | 4,500 |
| M&S Tools | CPAF | PEO AMSD/ AL | 13,066 | 0 | N/A | 0 | N/A | 13,066 |
| M&S Tools | CPAF | JTAGS PEO AMSD/ AL | 565 | 0 | N/A | 0 | N/A | 565 |
| M&S Tools | Various | SBIRS/MCS/ Air Force | 3,433 | 0 | N/A | 0 | N/A | 3,433 |
| M&S Tools | Various | JNIC/ CO | 20,235 | 0 | N/A | 0 | N/A | 20,235 |
| M&S Tools | MIPR | GMD/ AL | 800 | 0 | N/A | 0 | N/A | 800 |
| M&S Tools | MIPR | SPAWAR/ CA | 4,326 | 0 | N/A | 0 | N/A | 4,326 |
| M&S Tools | Various | USA NET Design Facility/ PEO ASMD, AL | 500 | 0 | N/A | 0 | N/A | 500 |
| M&S Tools | MIPR | THAAD/ AL | 1,800 | 0 | N/A | 0 | N/A | 1,800 |
| M&S Tools | CPAF | Lockheed Martin/ PA | 2,000 | 0 | N/A | 0 | N/A | 2,000 |
| M&S Tools | Various | Patriot | 450 | 0 | N/A | 0 | N/A | 450 |
| M&S Tools | MIPR | FBX-T/ VA | 800 | 0 | N/A | 0 | N/A | 800 |
| M&S Tools | MIPR | Photon Research Assoc/ VA | 10,700 | 0 | N/A | 0 | N/A | 10,700 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| M&S Tools | CPFF | NRL/ DC | 2,300 | 0 | N/A | 0 | N/A | 2,300 |
| M&S Tools | CPFF | AFRL-PR/ CA | 800 | 0 | N/A | 0 | N/A | 800 |
| M&S Tools | CPFF | SMDC/ AL | 21,828 | 0 | N/A | 0 | N/A | 21,828 |
| M&S Tools | CPFF | AFRL-VS/ MA | 200 | 0 | N/A | 0 | N/A | 200 |
| M&S Tools | CPFF | AFRL-MN/ FL | 100 | 0 | N/A | 0 | N/A | 100 |
| M&S Tools | CPFF | AFRL-SN/ OH | 100 | 0 | N/A | 0 | N/A | 100 |
| M&S Tools | MIPR | NASIC/ OH | 200 | 0 | N/A | 0 | N/A | 200 |
| M&S Tools | MIPR | MSIC/ AL | 200 | 0 | N/A | 0 | N/A | 200 |
| M&S Tools | FFP | SPARTA/ CA | 294 | 0 | N/A | 0 | N/A | 294 |
| M&S Tools | CPIF | Teledyne Brown Eng SMDC/ AL | 1,840 | 0 | N/A | 0 | N/A | 1,840 |
| M&S Tools | MIPR | ITT GSA/ GA | 3,265 | 0 | N/A | 0 | N/A | 3,265 |
| M&S Tools | FFP | CSC SMDC/ GA | 860 | 0 | N/A | 0 | N/A | 860 |
| M&S Tools | FFP | Dynetics SMDC/ GA | 250 | 0 | N/A | 0 | N/A | 250 |
| M&S Tools | MIPR | Miltec GSA/ GA | 1,225 | 0 | N/A | 0 | N/A | 1,225 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| M&S Tools | MIPR | BAE GSA/ GA | 2,769 | 0 | N/A | 0 | N/A | 2,769 |
| M&S Tools | | NRL/ DC | 475 | 0 | N/A | 0 | N/A | 475 |
| M&S Framework | CPAF | TBD | 20,163 | 0 | N/A | 0 | N/A | 20,163 |
| M&S Tools | | DSI, GSA/ AL | 295 | 0 | N/A | 0 | N/A | 295 |
| M&S Tools | CPIF | Teledyne Brown Engineering, SMDC/ AL | 300 | 0 | N/A | 0 | N/A | 300 |
| M&S Tools | MIPR | Sparta/ VA | 380 | 0 | N/A | 0 | N/A | 380 |
| Computational Facilities | | Various/ VA | 23,429 | 0 | N/A | 0 | N/A | 23,429 |
| SETA | | Booze Allen/ VA | 6,335 | 0 | N/A | 0 | N/A | 6,335 |
| Other DoD | MIPR | Navy | 2,812 | 0 | N/A | 0 | N/A | 2,812 |
| Industry | | Boeing/ AL | 2,331 | 0 | N/A | 0 | N/A | 2,331 |
| Other DoD | | Aegis/ VA | 2,995 | 0 | N/A | 0 | N/A | 2,995 |
| Subtotal Support Costs | | | 363,846 | 66,586 | | 77,497 | | 507929 |

**Remarks**

FY06-11 funding for Modeling and Simulation Engineering appears in Program Element 0603890C, Project 0106

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Test Bed Planning** | | | | | | | | |
| FFRDC/UARC | MIPR | LLNL/ CA, VA | 375 | 128 | 1/3Q | 134 | 1/3Q | 637 |
| **BMDS Design & Specification** | | | | | | | | |
| FFRDC/UARC | MIPR | CNA/ VA | 0 | 149 | 1/3Q | 180 | 1/3Q | 329 |
| **Verification & Assessment Engineering** | | | | | | | | |
| FFRDC/UARC | FFRDC | JHU/APL/ MD | 300 | 139 | 2Q | 171 | 2Q | 610 |
| **Threat Systems Engineering** | | | | | | | | |
| SETA | CPFF | Sparta/ VA | 1,200 | 394 | 1/3Q | 426 | 1/3Q | 2,020 |
| SETA | CPFF | CSC/ VA | 1,050 | 381 | 1/3Q | 412 | 1/3Q | 1,843 |
| FFRDC/UARC | MIPR | LLNL/ CA, VA | 0 | 134 | 1/3Q | 145 | 1/3Q | 279 |
| **Program Management** | | | | | | | | |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Industry | CPAF | Boeing/ VA | 71,497 | 23,340 | 1/3Q | 24,279 | 1/3Q | 119,116 |
| SETA | CPFF | Sparta/ VA | 7,367 | 2,254 | 1/3Q | 2,345 | 1/3Q | 11,966 |
| SETA | CPFF | CSC/ VA | 6,174 | 1,685 | 1/3Q | 1,753 | 1/3Q | 9,612 |
| FFRDC/UARC | MIPR | Aerospace/ VA | 553 | 152 | 1/3Q | 158 | 1/3Q | 863 |
| Govt Personnel | | WHS/ DC | 20,812 | 3,941 | 2/4Q | 4,100 | 2/4Q | 28,853 |
| Travel | | | 1,235 | 240 | 2/4Q | 250 | 2/4Q | 1,725 |
| SETA | FFP | Paradigm/ VA | 190 | 87 | 1/3Q | 90 | 1/3Q | 367 |
| **Operational Integration & Support** | | | | | | | | |
| Other DoD | | SMDC/ AL | 900 | 277 | 1/3Q | 450 | 1/3Q | 1,627 |
| FFRDC/UARC | MIPR | CNA/ VA | 0 | 146 | 1/3Q | 236 | 1/3Q | 382 |
| **Modeling & Simulation Engineering** | | | | | | | | |
| SETA | FFP | MDA/ VA | 2,810 | 0 | N/A | 0 | N/A | 2,810 |
| FFRDC/UARC | FFRDC | JHU/APL/ MD | 4,045 | 0 | N/A | 0 | N/A | 4,045 |
| FFRDC/UARC | FFRDC | Aerospace/ CA | 480 | 0 | N/A | 0 | N/A | 480 |
| FFRDC/UARC | FFRDC | MIT/LL/ MA | 790 | 0 | N/A | 0 | N/A | 790 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| FFRDC/UARC | FFRDC | MITRE/ VA | 1,220 | 0 | N/A | 0 | N/A | 1,220 |
| FFRDC/UARC | FFRDC | Torch Technologies/ VA | 58 | 0 | N/A | 0 | N/A | 58 |
| Govt Personnel | | WHS/ DC | 2,900 | 0 | N/A | 0 | N/A | 2,900 |
| Travel | | | 300 | 0 | N/A | 0 | N/A | 300 |
| Subtotal Management Services | | | 124,256 | 33,447 | | 35,129 | | 192832 |

**Remarks**

FY06-11 funding for Modeling and Simulation Engineering appears in Program Element 0603890C, Project 0106

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 488,102 | 100,033 | | 112,626 | | 700,761 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 | 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 |
| **Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Technical Objectives & Goals / Updates | | | | | ▲ | | | | | | △ | | | | | | | | △ | | | | | | | | △ | |
| Master Integration Plan (MIP) | ▲ | | ▲ | | | △ | | | | △ | | | | | | | | △ | | | | | | | | △ | | |
| Adversary Capability Document / updates | | | ▲ | | | | | | △ | | | | △ | | | | △ | | | | △ | | | | △ | | | |
| Interim Capability and Assessment Report (ICAR) | | | | | | △ | | | | △ | | | | △ | | | | △ | | | | △ | | | | △ | | |
| **Initial Defensive Operations** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IDO Capability Verification & Assessment Report | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | |
| **BLOCK 2004** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Capability Verification and Assessment Plan/update | | ▲ | | | | △ | | | | | | | | | | | | | | | | | | | | | | |
| Capability Assessment Report (CAR) | | | | | | | | | | | | ▲ | | | | | | | | | | | | | | | | |
| **BLOCK 2006** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Test Bed Description Document (TBDD) | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | |
| Test Bed System Specifications (TBSS) | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | |
| Interface Control Document (ICD) | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | |
| Adversary Data Package (ADP) | | | ▲ | | | | △ | | | | △ | | | | | | | | | | | | | | | | | |
| Capability Assessment Report (CAR) | | | | | | | | | | | | | | | △ | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲——▲ | Complete Activity | △——△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 | 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 |
| **BLOCK 2006** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Capability Assessment Plan (CAP) / update | | | | | | △ | | | | | | | | | | | | | | | | | | | | | | |
| **BLOCK 2008** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Test Bed Description Document (TBDD) | | | | | | | | △ | | | | | | | | | | | | | | | | | | | | |
| Test Bed System Specifications (TBSS) | | | | | | | | | | | △ | | | | | | | | | | | | | | | | | |
| Interface Control Document (ICD) | | | | | | | | | | | △ | | | | | | | | | | | | | | | | | |
| Adversary Data Package (ADP) | | | | | | | △ | | | | △ | | | | △ | | | | | | | | | | | | | |
| Capability Assessment Plan (CAP) / update | | | | | | | | | | | △ | | | | | | | | | | | | | | | | | |
| Capability Assessment Report (CAR) | | | | | | | | | | | | | | | | | | | | | | | △ | | | | | |
| **Block 2010** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Test Bed Description Document (TBDD) | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| Test Bed System Specifications (TBSS) | | | | | | | | | | | | | | △ | | | | | | | | | | | | | | |
| Interface Control Document (ICD) | | | | | | | | | | | | | | △ | | | | | | | | | | | | | | |
| Adversary Data Package (ADP) | | | | | | | | | | | | | | | △ | | | | △ | | | | △ | | | | | |
| Capability Assessment Plan (CAP) / update | | | | | | | | | | | | | | | | | | | △ | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲▬▲ | Complete Activity | △▬△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Milestones** | | | | | | | |
| Technical Objectives & Goals / Updates | | 1Q | 3Q | | 3Q | | 3Q |
| Master Integration Plan (MIP) | 1Q,3Q | 2Q | 2Q | | 2Q | | 2Q |
| Adversary Capability Document / updates | 3Q | | 1Q | 1Q | 1Q | 1Q | 1Q |
| Interim Capability and Assessment Report (ICAR) | | 2Q | 2Q | 2Q | 2Q | 2Q | 2Q |
| **Initial Defensive Operations** | | | | | | | |
| IDO Capability Verification & Assessment Report | 3Q | | | | | | |
| **BLOCK 2004** | | | | | | | |
| Capability Verification and Assessment Plan/update | 2Q | 2Q | | | | | |
| Capability Assessment Report (CAR) | | | 4Q | | | | |
| **BLOCK 2006** | | | | | | | |
| Test Bed Description Document (TBDD) | 2Q,4Q | 4Q | | | | | |
| Test Bed System Specifications (TBSS) | 3Q | | | | | | |
| Interface Control Document (ICD) | 4Q | | | | | | |
| Adversary Data Package (ADP) | 3Q | 3Q | 3Q | | | | |
| Capability Assessment Report (CAR) | | | | 3Q | | | |
| Capability Assessment Plan (CAP) / update | | 2Q | | | | | |
| **BLOCK 2008** | | | | | | | |
| Test Bed Description Document (TBDD) | | 4Q | | | | | |
| Test Bed System Specifications (TBSS) | | | 3Q | | | | |
| Interface Control Document (ICD) | | | 3Q | | | | |
| Adversary Data Package (ADP) | | 3Q | 3Q | 3Q | | | |
| Capability Assessment Plan (CAP) / update | | | 3Q | | | | |
| Capability Assessment Report (CAR) | | | | | | 3Q | |
| **Block 2010** | | | | | | | |
| Test Bed Description Document (TBDD) | | | 4Q | | | | |
| Test Bed System Specifications (TBSS) | | | | 2Q | | | |
| Interface Control Document (ICD) | | | | 2Q | | | |
| Adversary Data Package (ADP) | | | | 3Q | 3Q | 3Q | |
| Capability Assessment Plan (CAP) / update | | | | | 3Q | | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Modeling and Simulation** | | | | | | | |
| Analysis Event 1 | 1Q-2Q | | | | | | |
| Analysis Event 2 | 1Q-4Q | | | | | | |
| EADSIM v12 | 1Q | | | | | | |
| IMD 05-1 | 1Q-2Q | | | | | | |
| IMD 05-2 | 1Q-3Q | | | | | | |
| IMD 05-4 | 1Q-4Q | | | | | | |
| 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 | | | | | | |
| CT-Analyst: Version 3 | 2Q | | | | | | |
| Develop T1, T2, T3, and CETM | 2Q-4Q | | | | | | |
| FLITES | 2Q | | | | | | |
| IMD 05-5 | 2Q-4Q | | | | | | |
| Make or Buy Decision Based on Model Assessments | 2Q | | | | | | |
| **Studies & Analyses** | | | | | | | |
| 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 |
| POM 06 & ESG Analysis | 1Q | | | | | | |
| **Other** | | | | | | | |
| BMDS Technical Performance and Risk Summary | 1Q | | | | | | |
| BMDS Technical Risk Summary | 1Q | | | | | | |
| Risk Assessment Management Plan | 2Q | | | | | | |
| **Contractual Activities& Events** | | | | | | | |
| MDNTS(I) Phase 4 Contract Award | 1Q | | | | | | |
| SE Technical Support | 2Q | | | | | | |
| OTA Contract Award | | 1Q | | | | | |
| MDNTS(I) Phase 5 Contract Award | | | | 1Q | | | |
| **General Milestones** | | | | | | | |
| Adversary Engineering | 1Q | 1Q | 1Q | 1Q | 1Q | 1Q | 1Q |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 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 |
| Perform Intel Threat Analysis | 2Q | 2Q | 2Q | 2Q | 2Q | 2Q | 2Q |
| Missile Characterizations | 3Q | 3Q | 3Q | 3Q | 3Q | 3Q | 3Q |
| Countermeasure Characterizations | 4Q | 4Q | 4Q | 4Q | 4Q | 4Q | 4Q |
| **Lethality** | | | | | | | |
| Perform Studies Chem./Bio - Agents at Altitudes | 1Q | 1Q | 1Q | 1Q | 1Q | 1Q | 1Q |
| Analyze Missile Payload Lethality | 2Q | 2Q | 2Q | 2Q | 2Q | 2Q | 2Q |
| Analyze Post Engagement Lethality Data | 2Q | 2Q | 2Q | 2Q | 2Q | 2Q | 2Q |
| Kill Assessment Phenomenology | 3Q | 3Q | 3Q | 3Q | 3Q | 3Q | 3Q |
| Submunition Properties | 3Q | 3Q | 3Q | 3Q | 3Q | 3Q | 3Q |
| Viscoelastic Fluid Properties | 3Q | 3Q | 3Q | 3Q | 3Q | 3Q | 3Q |
| Chem-Bio Threats - Report | 4Q | 4Q | 4Q | 4Q | 4Q | 4Q | 4Q |
| **Integration** | | | | | | | |
| 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 |
| Block 2006 Integration Design Review | 3Q | | | | | | |
| Block 2008 Integration Design Review | | | 2Q | | | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0105 Countermeasures/Counter-Countermeasures (CM/CCM) | 27,295 | 21,161 | 25,700 | 26,700 | 27,700 | 23,000 | 23,400 |
| RDT&E Articles Qty | 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 and performance risks, identifies mitigation strategies 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 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 the representation of adversary capabilities is consistent with the MDA Adversary Capability Document (ACD).

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. 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.

Acting through the Systems Engineering and Integration (SE&I) team, the CM/CCM Program employs collaborative engineering throughout the entire engineering process from concept through development to operational integration to ensure that its solutions are part of the integrated system design.

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Adversary Engineering | 12,625 | 9,088 | 11,450 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The Adversary Engineering effort determines the range of feasible engineering approaches an adversary could use to defeat or degrade the BMDS, identifies gaps and risk in BMDS performance, and develops conceptual countermeasures to exploit these potential shortfalls. The adversary engineering is performed by two teams, each operating with a different perspective of adversary capabilities. The Red Team, restricted to using only

information on the BMDS available from open sources, provides an outside perspective, analogous to an actual adversary. The Black Team develops countermeasures based on complete access to all technical and design data on the BMDS.

FY05 Accomplishments:

- Continued characterization of adversary countermeasure capabilities and phenomenology related to countermeasure design, deployment, and performance.
- Updated and developed detailed parametric descriptions of specific countermeasure suites and selected regimes of the adversary capability space.
- Delivered engineering descriptions for three conceptual countermeasure suites in support of BMDS risk assessments.
- Completed a Level 1 design for a countermeasure suite slated for an FY06 MDA experimental flight test.
- Completed, in collaboration with Threat Systems Engineering, Phases 1 and 2 of a study to establish the inter-relationships among individual parameters in the BMDS Adversary Capability Document (ACD) which will improve the ability of threat engineers to rapidly develop and assess new countermeasure concepts and designs.

FY06 Planned Program:

- Characterize 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.
- Conduct phenomenology studies on employment techniques for a range of countermeasure suites.
- Integrate, in collaboration with Threat Systems Engineering, results from Phases 1 and 2 of the ACD Parameters Inter-Relationships Study into the ACD, and initiate Phase 3 to study additional parameter relationships.

FY07 Planned Program:

- Continue characterization of adversary countermeasures capabilities and phenomenology related to countermeasure design, employment, 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.
- Integrate, in collaboration with Threat Systems Engineering, results from Phase 3 of the ACD Parameters Inter-Relationships Study into the ACD, and initiate Phase 4 to study additional parameter relationships.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 |
|---|---|---|---|
| Independent Assessment | 930 | 650 | 930 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Independent Assessment supports a series of annual analyses by a panel of senior experts, the White Team, of adversary capabilities and conceptual countermeasures posed by the Black and Red Teams, and the risk assessments and mitigation approaches presented by the Blue Team. The White Team presents to the MDA Director their independent assessments of performance risks associated with countermeasures and recommended priorities for MDA investments in counter-countermeasures that have a strong potential to mitigate these risks.

FY05 Accomplishments:

- Conducted annual reviews of CM/CCM Program Red and Black Team countermeasures and Blue Team risk assessments, and proposed mitigation options.
- Provided independent assessments of CM/CCM Program products and recommendations to the MDA Director.

FY06 Planned Program:

- Conduct annual reviews of CM/CCM Program Red and Black Team countermeasures and Blue Team risk assessments, and proposed mitigation options.
- Provide independent assessments of CM/CCM Program products and recommendations to the MDA Director.

FY07 Planned Program:

- Conduct annual reviews of CM/CCM Program Red and Black Team countermeasures and Blue Team risk assessments, and proposed mitigation options.
- Provide independent assessments of CM/CCM Program products and recommendations to the MDA Director.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| BMDS Risk Assessment and Mitigation Engineering | 13,740 | 11,423 | 13,320 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

BMDS Risk Assessment and Mitigation Engineering funds the Blue Team, comprised of BMDS system, element, and component technical experts, to perform integrated performance and risk assessments of the BMDS against projected adversary capabilities and conceptual countermeasures, to identify and characterize counter-countermeasure options to mitigate BMDS risks posed by these adversary capabilities and countermeasures, and to perform the system-level engineering required to identify the BMDS baseline changes to implement and integrate the options into the operational

system baseline. In order to integrate Blue Team counter-countermeasure concepts into the design of the BMDS, 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., specifications, interfaces, standards etc. that define the design, assessment, and integration into the BMDS are produced.

FY05 Accomplishments:

- Completed system analysis to develop the strategy to improve midcourse target designation capabilities, focused on the assessment of required sensor functions and capabilities and the battle management functions required to integrate the improvements into the BMDS fire control.
- Completed system analysis to develop the strategy to improve the discrimination databases deployed on current and future BMDS sensors.
- Performed system engineering required to enable critical discrimination functions for Test Bed Blocks 2006 and 2008 capabilities.
- Identified critical discrimination functions that generate the functional sequences required to enable BMDS Engagement Control Sequences.
- Allocated critical discrimination functions to appropriate Elements for implementation/execution.
- Provided alternative Block evolution paths/schedules for test and implementation of critical discrimination functions.
- Completed assessment of midcourse discrimination risks and identified five risk mitigation approaches for concept engineering beginning in FY06 for insertion in the BMDS beginning in Block 2008.

FY06 Planned Program:

- Conduct system analyses to establish the sensor requirements, discrimination techniques, and information fusion required for a BMDS Discrimination Architecture.
- Identify evolutionary strategy options for implementing the BMDS Discrimination Architecture.
- Develop a concept description to implement improvements to BMDS midcourse target designation capabilities for integration into the BMDS Test Bed beginning in Block 2008.
- Develop a concept description to implement improvements in BMDS lethality for integration into the BMDS Test Bed beginning in Block 2008.
- Develop a concept description to implement improvements in the discrimination databases deployed on current and future BMDS sensors for integration into the BMDS Test Bed beginning in Block 2008.
- Develop a concept description to implement an advanced discrimination initiative for integration into the BMDS Test Bed beginning in Block 2008.
- Conduct assessments of BMDS performance against projected adversary capabilities and conceptual countermeasures posed by the Red and Black Teams to identify and evaluate performance risks and gaps.

- Identify and characterize counter-countermeasures to mitigate BMDS risks posed by Black and Red Team conceptual countermeasures.

FY07 Planned Program:

- Perform design trades and initial engineering to implement the specifications and standards for a BMDS Discrimination Architecture, midcourse target designation capabilities, lethality improvements, discrimination databases, information fusion, and an advanced discrimination initiative.
- Conduct assessments of BMDS performance against projected adversary capabilities and conceptual countermeasures posed by the Red and Black Teams to identify and evaluate performance risks and gaps.
- Identify and characterize counter-countermeasures to mitigate BMDS risks posed by Black and Red Team conceptual countermeasures.
- Conduct advanced studies to determine the engineering changes to the baseline BMDS required to integrate counter-countermeasure initiatives proposed by the Blue Team.

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## 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 2006 |
|---|---|
| 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 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Adversary Engineering** | | | | | | | | |
| SETA | CPFF | SPARTA/ VA | 2,367 | 1,568 | 1/3Q | 1,714 | 1/3Q | 5,649 |
| SETA | CPFF | CSC/ VA | 483 | 509 | 1/3Q | 551 | 1/3Q | 1,543 |
| Other DoD | | SMDC/ AL | 850 | 335 | 1/3Q | 742 | 1/3Q | 1,927 |
| Other DoD | MIPR | ARL/ NM | 1,442 | 956 | 1/3Q | 1,030 | 1/3Q | 3,428 |
| Other DoD | MIPR | Battelle/ OH | 783 | 445 | 1/3Q | 486 | 1/3Q | 1,714 |
| FFRDC/UARC | MIPR | MIT/LL/ MA | 1,250 | 225 | 1/3Q | 277 | 1/3Q | 1,752 |
| FFRDC/UARC | MIPR | IDA/ VA | 960 | 350 | 1/3Q | 400 | 1/3Q | 1,710 |
| Red Team | | Various | 6,656 | 3,300 | 2Q | 3,400 | 2Q | 13,356 |
| Other DoD | | MDA Elements | 3,125 | 1,400 | 1/3Q | 2,850 | 1/3Q | 7,375 |
| **BMDS Risk Assessment and Mitigation Engineering** | | | | | | | | |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| SETA | CPFF | CSC/ MA | 500 | 500 | 1/3Q | 500 | 1/3Q | 1,500 |
| Industry | CPAF | Boeing/ NM | 5,700 | 2,300 | 1/3Q | 2,300 | 1/3Q | 10,300 |
| Industry | CPAF | Raytheon/ AL | 4,950 | 2,000 | 1/3Q | 2,000 | 1/3Q | 8,950 |
| FFRDC/UARC | MIPR | MIT/LL/ MA | 3,455 | 1,200 | 1/3Q | 1,300 | 1/3Q | 5,955 |
| Other DoD | MIPR | NSWC/ IN | 2,000 | 1,000 | 1/3Q | 1,000 | 1/3Q | 4,000 |
| Collaborative Engineering | | MDA Elements | 13,434 | 1,922 | 1/3Q | 2,692 | 1/3Q | 18,048 |
| Assessment and Concept Development Support | | MDA Elements | 3,383 | 2,251 | 1/3Q | 3,278 | 1/3Q | 8,912 |
| Subtotal Support Costs | | | 51,338 | 20,261 | | 24,520 | | 96119 |

**Remarks**

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Independent Assessment** | | | | | | | | |
| FFRDC/UARC | MIPR | IDA/ VA | 2,235 | 650 | 1/3Q | 930 | 1/3Q | 3,815 |
| **BMDS Risk Assessment and Mitigation Engineering** | | | | | | | | |
| SETA | CPFF | CSC/ VA | 500 | 250 | 1Q | 250 | 1Q | 1,000 |
| Subtotal Management Services | | | 2,735 | 900 | | 1,180 | | 4815 |

**Remarks**

| Project Total Cost | | | 54,073 | 21,161 | | 25,700 | | 100,934 |
|---|---|---|---|---|---|---|---|---|

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 | 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 |
| **Adversary Engineering** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Deliver Countermeasure Concepts | | △ | △ | △ | | △ | | △ | | △ | | △ | | △ | | △ | | △ | | △ | | | | | | | | |
| Deliver Special Studies Report | ▲ | | | | ▲ | | | | △ | | | | △ | | | | △ | | | | | | | | | | | |
| **Independent Assessment** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Provide Independent Assessments to MDA | | △ | | △ | | △ | | △ | △ | | | △ | △ | | | △ | △ | | | △ | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲——▲ | Complete Activity | △——△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 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 | | |
| Develop Countermeasure Concepts | 1Q,2Q,3Q | 1Q,2Q,3Q | 1Q,2Q,3Q | 1Q,2Q,3Q | 1Q,2Q,3Q | | |
| Deliver Countermeasure Concepts | 2Q,3Q,4Q | 2Q,4Q | 2Q,4Q | 2Q,4Q | 2Q,4Q | | |
| Conduct Special Studies | 2Q,3Q,4Q | 2Q,3Q,4Q | 2Q,3Q,4Q | 2Q,3Q,4Q | 2Q,3Q,4Q | | |
| Deliver Special Studies Report | 1Q | 1Q | 1Q | 1Q | 1Q | | |
| **BMDS Risk Assessment and Mitigation Engineering** | | | | | | | |
| Assess Performance Against Countermeasures | 1Q,2Q | 1Q,2Q | 2Q,3Q | 2Q,3Q | 2Q,3Q | | |
| Develop and Analyze CCM Concepts | 2Q,3Q,4Q | 2Q,3Q,4Q | 2Q,3Q,4Q | 2Q,3Q,4Q | 2Q,3Q,4Q | | |
| Conduct Studies to Ident Eng Changes to Implem CCM | 4Q | 1Q | 1Q | 1Q | 1Q | | |
| Perform Collab Eng to Integrate CCM into BMDS TB | | 2Q,3Q | 2Q,3Q | 2Q,3Q | 2Q,3Q | | |
| **Independent Assessment** | | | | | | | |
| Provide Independent Assessments to MDA | 2Q,4Q | 2Q,4Q | 1Q,4Q | 1Q,4Q | 1Q,4Q | | |
| Review Black and Red Team Countermeasure Concepts | 3Q,4Q | 2Q,4Q | 1Q,2Q | 1Q,2Q | 1Q,2Q | | |
| Review Blue Team CCM Concepts and Plans | 3Q,4Q | 2Q,3Q | 3Q,4Q | 3Q,4Q | 3Q,4Q | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0102 Intelligence and Security | 28,152 | 19,015 | 23,922 | 27,437 | 28,980 | 39,142 | 46,600 |
| RDT&E Articles Qty | 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. Prior to these realignments, the efforts were contained under PE 0901598C (MDA Management Headquarters).*

## A. Mission Description and Budget Item Justification

In the FY05 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 2006 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.

**B. Accomplishments/Planned Program**

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Counterintelligence | 4,052 | 2,643 | 3,105 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

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.

FY05 Accomplishments:

- Developed a Technical Surveillance and Countermeasures (TSCM) Capability
- Developed an automated Travel Net Program
- Initiated an exhaustive counterintelligence (CI) review of Small Business Innovation Research (SBIR) proposals
- Initiated CI Mapping/Matrix Project for MDA Critical Program Information (CPI)
- Established on-site LNO at Defense Security Service

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense System Core** |

- Provided CI Support to PROJECT DOMAIN (FBI) and PROJECT BLUEPRINT (Naval Criminal Investigative Service (NCIS))
- Implemented CI support model for MDA/TE
- Published CI Threat Assessments and MDCITAs
- Expanded and updated CI Database (Primes, SBIR, FBI, Mapping)
- Fielded Remote Intelligence Support Capability
- Developed/Implemented MDA CI Policy
- Implemented CI portal of the MDA classified LAN

FY06 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

FY07 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
- Continue to develop, expand and populate CI databases
- Conduct CI Assessments of MDA Test Ranges

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 |
|---|---|---|---|
| BMDS Certification | 2,116 | 1,249 | 6,096 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The BMDS Certification activity develops a comprehensive picture of the overall Information Assurance/Computer Network Defense (IA/CND) architecture at all levels of the BMDS.

FY05 Accomplishments:

- Developed a certification recommendation on behalf of the BMDS components and overall system in time to fulfill Block 2004 release dates.
- Conducted vulnerability assessments against the block release, to include White Team Assessments (e.g., policy, procedure and process review conducted by an unbiased third party).
- Implemented risk management processes across the BMDS elements to prioritize and categorize vulnerabilities. This information helped 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.
- Enhanced the confidentiality, integrity and availability of key systems, networks and data through direct participation in information assurance related activities designed to enforce requirements, verified and/or implemented essential processes, controls and procedures required by key systems as part of a defensive strategy.
- Characterized 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.

FY06 Planned Program:

- Maintain the chartered Certification & Accreditation role and support levels to 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.
- Provide domain expertise as the independent IA/CND think tank to assess the BMDS IA state and provide on-going IA/CND engineering guidance.
- Leverage MDA Element engineering and IA development teams for the National Team and Prime Contractors to perform IA/CND architecture and design studies.
- Manage all planning activities designed to support third party assessments (White/Blue/Red) of the BMDS.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense System Core** |

FY07 Planned Program:

- Maintain the chartered Certification & Accreditation role and support levels to 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.
- Provide domain expertise as the independent IA/CND think tank to assess the BMDS IA state and provide on-going IA/CND engineering guidance.
- Characterize mission specific and DoD IA/CND doctrine to realize BMDS lifecycle objectives.
- Decompose IA/CND requirements to enhance assessments and traceability.
- Leverage MDA Element engineering and IA development teams for the National Team and Prime Contractors to perform IA/CND architecture and design studies.
- Identify high-return/near-term deployment opportunities for IA/CND Element-level initiatives.
- Manage all planning activities designed to support third party assessments (White/Blue/Red) of the BMDS.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Intelligence | 21,984 | 15,123 | 14,721 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Note: The External Sensor Program was formerly known as the National Sensor Integration Rapid Prototyping (NSIRP) program and was funded under this PE through FY06. Starting in FY07 the External Sensor Program will be funded as a Block 2010 activity (Project 0011) within the Sensors Program Element (0603884C).

The Intelligence 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.

FY05 Accomplishments:

- Expanded 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.
- Expanded 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.

- Enhanced and expanded the Missiles and Rockets Knowledge Base (MARKB).
- Enhanced 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).

FY06 Planned Program:

- Further enhance and expand the Missiles and Rockets Knowledge Base (MARKB).
- Further develop 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).
- Upgrade External Sensor Laboratory (ESL) hardware.
- Establish development and demonstration hardware configuration.
- ESL accreditation.
- Establish connectivity to C2BMC.
- Demonstrate cueing of Forward Based Sensor.

FY07 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).

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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

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 2006 |
|---|---|
| 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 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 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 | 3,777 | 2,343 | 1/2Q | 2,621 | 1/2Q | 8,741 |
| Analysis and Support | Various | Various/ Various | 275 | 300 | 1/4Q | 484 | 1/4Q | 1,059 |
| **Intelligence** | | | | | | | | |
| Leverage Existing/Future Assets | MIPR | USAF/ SMC, Los Angeles, CA | 6,200 | 1,130 | 1/4Q | 0 | N/A | 7,330 |
| Leverage Existing/Future Assets | Various | Various/ JNIC, CO; NSWC, VA; USAF, OH | 3,271 | 2,375 | 1/4Q | 0 | N/A | 5,646 |
| Intelligence Support Center | SS/CPAF | JNIC - Northrop Grumman/ Shriever AFB,CO | 2,000 | 1,350 | 1/3Q | 1,750 | 1/3Q | 5,100 |
| Scenario Applications | Various | SMDC - TSC/ Huntsville, AL | 5,067 | 2,043 | 1/3Q | 2,750 | 1/3Q | 9,860 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 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 | 4,198 | 2,000 | 1/3Q | 2,255 | 1/3Q | 8,453 |
| Current Intelligence & Portal | Various | Various/ Various | 2,135 | 1,089 | 1/3Q | 1,606 | 1/3Q | 4,830 |
| Wargaming | SS/CPAF | JNIC - Northrop Grumman/ Shriever AFB,CO | 650 | 380 | 1/2Q | 438 | 1/2Q | 1,468 |
| Studies & Scenario Development | Various | Various/ Various | 1,221 | 419 | 2/4Q | 670 | 2/4Q | 2,310 |
| Subtotal Support Costs | | | 28,794 | 13,429 | | 12,574 | | 54797 |

**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 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 2006 |
|---|---|
| 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 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 | 2,116 | 1,249 | 1/2Q | 6,096 | 1/2Q | 9,461 |
| **Intelligence** | | | | | | | | |
| Project Management Support | FFRDC | SMC (Aerospace)/ Los Angeles, CA | 1,530 | 960 | 1Q | 990 | 1Q | 3,480 |
| Project Management | C/FFP | BAH/ McLean, VA | 10,257 | 2,349 | 1/4Q | 2,862 | 1/4Q | 15,468 |
| Project Management | SS/TM | PRA/ San Diego, CA | 2,023 | 1,028 | 1/3Q | 1,400 | 1/3Q | 4,451 |
| Subtotal Management Services | | | 15,926 | 5,586 | | 11,348 | | 32860 |

**Remarks**

Prior to FY05, BMDS Certification funding was contained in PE 0901598C (MDA Management Headquarters).

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 44,720 | 19,015 | | 23,922 | | 87,657 |

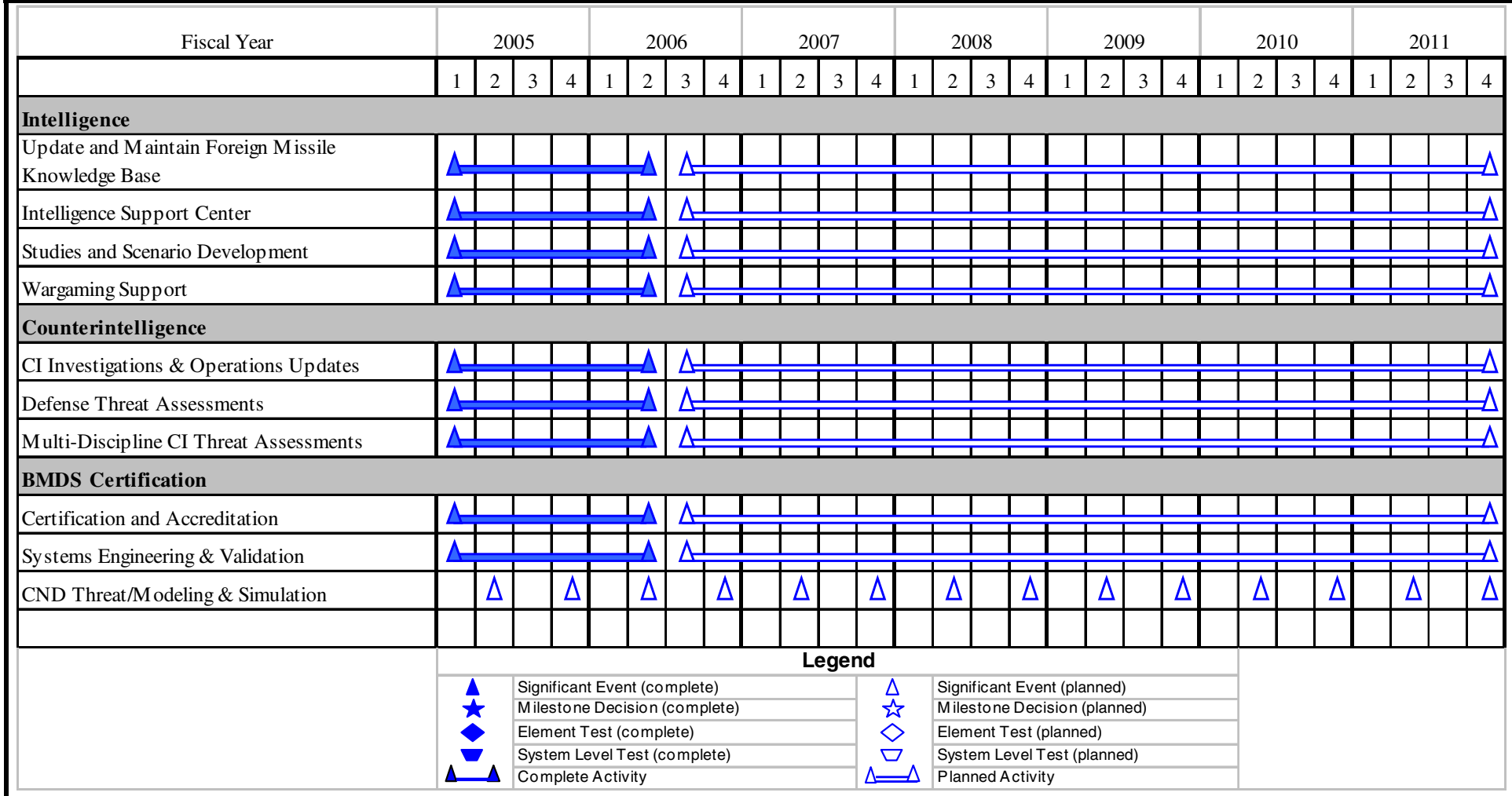
**Remarks**

**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date: **February 2006**

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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Intelligence** | | | | | | | |
| Update and Maintain Foreign Missile Knowledge Base | 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 |
| Intelligence Support Center | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q |
| Studies and Scenario Development | 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 |
| **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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0103 Producibility & Manufacturing Technology | 36,540 | 32,752 | 36,921 | 40,247 | 43,214 | 44,112 | 45,028 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: In FY05 and FY06, $6.5M and $9.0M of Project 0103 core funding respectively, was reprogrammed to an industrial investment appropriation on a trial basis to better leverage MDA Producibility and Manufacturing Technology efforts. These efforts have produced new lightweight batteries for spacecraft, improved radiation hardness for BMDS kill vehicles, and started a competitor to the sole source provider of all Department of Defense thermal reserve batteries. 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 RF / Electronics, Propulsion, Advanced Materials and Structures, Anti-Tamper, and additional areas as required for integration efforts of Low Cost Kill Vehicle (LCKV). 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 was 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.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
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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 |

**B. Accomplishments/Planned Program**

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Power Systems | 4,196 | 3,239 | 3,500 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

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 Ground Based Interceptors and THAAD Program Kill Vehicles. 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.

Eagle Picher (EP) Projects
Lithium oxyhalide batteries for Ground Based Interceptor Exoatmospheric Kill Vehicles and THAAD Kill Vehicles are mostly handmade, 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. Under MDA effort, the oxyhalide manufacturing area underwent a full Value Stream Mapping (VSM) exercise last year that resulted in an optimized to be layout that improves production flow, reduces task time and production costs. EP will implement the agreed to changes as EKV and THAAD production schedule allows. 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.

FY05 Program Accomplishments:
- Improved Processes for Lithium Oxyhalide Batteries
- Mitigated battery build and inspection errors -Build Expert System
- Improved and optimized MDA batteries produced at EP
- Improved MDA battery manufacturing processes
- Developed an Advanced Lithium-Ion Battery for space applications

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
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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 |

- Developed and prioritized a battery roadmap for MDA - MDA Battery Steering Group

FY06 Planned Program:
- Second source battery for GBI EKV
- MDA Battery Steering Group - Maintaining and prioritizing MDA/MP Battery investments
- Continue Eagle Picher Technologies (EPT) manufacturing improvements projects.
- Develop an Advanced Lithium-Ion Battery for space applications

FY07 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 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Radiation Hardening | 11,384 | 11,913 | 14,221 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

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.

FY05 Program Accomplishments:
- Developed initial phase of Inertial Measurement Unit (IMU) Interface Electronics in support of an MDA core standard for electronics capable of IMU interchangeability
- Initiated Virtually Hard Field Programmable Gate Array (FPGA) involving the use of commercial FPGAs with and without hard wired processor cores
- Produced Rad Hard Common Processor for missile applications involving stacking, shielding and survivability assessment

- Conducted Detector Testing - radiation tolerance testing of EKV long wave IR and visible sensors relative to High Altitude Exoatmospheric Nuclear Survivability (HAENS) standard
- Conducted 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
- Continued packaging, development and assessment of Non-Volatile C-RAM program
- Continued packaging, development, and assessment of EEPROM program

FY06 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

FY07 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 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Manufacturing Process Improvements | 1,996 | 2,000 | 1,400 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

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

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
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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.

FY05 Program Accomplishments:
- Continued Technology Refresh efforts
- Initiated Tin Whisker effort to better understand the physics of failure
- Developed processes for robotic soldier dipping of leads and embedding die on printed circuit cards to mitigate tin whisker risk
- Continued RLSN efforts to develop, demonstrate, and deploy tools to evaluate risks in the supply chain of weapons systems
- Continued inter-service activities in manufacturing technology, EMRLs/MRLs, and batteries
- Conducted Lean Pathways events at several prime/original equipment manufacturers (OEMs) and supplier companies

FY06 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

FY07 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 2006 |
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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** |

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Electro-Optics/Infrared (EO/IR) | 8,096 | 9,400 | 6,900 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The Electro-Optics/Infrared (EO/IR) objective is to implement producibility and reliability programs to assure availability of Radiation Hardened (RH) and Radiation Tolerant Infrared (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.

FY05 Program Accomplishments:

- RH Scalable Missile Telescopes - low cost alternative materials and processing development and assessment
- Technology developed for SiC Mirrors polishings and coatings
- Two Color (LW/LW) Detector producibility and radiation tolerant assessment
- Made developments in Light Detection and Ranging (LIDAR) Detector to improve detector sensitivity enabling improvement detection range
- Tested device performance of Laser RADAR (LADAR)
- Space Cryocooler Thermal and Electronics development and assessment
- Conducted Environmental Testing for Two Color (LW/LW) missile kill vehicle applications
- Developed improved RH (proton radiation) large 256X256 array VLWIR Detectors for satellite surveillance applications
- Developed RH Visible Sensors for satellite and surveillance applications
- Stacked Electronics Processing development and assessment to improve density and radiation tolerance of missile kill vehicle electronics

FY06 Planned Program:

- RH Scalable Missile Telescopes - optical component alignment technology and development (Silicon Carbide, Silicon, Carbon Composite)
- SiC Mirrors polishing preprocessing and radiation hardened coatings technology development
- Satellite payload cryocooler radiation hardened electronics development and assessment
- 2-color IR detector and readout process yield and improved radiation tolerance
- 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

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense System Core** |

FY07 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
- 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 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Radar RF / Electronics | 3,296 | 2,000 | 3,500 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The Radar RF / Electronics 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.

FY05 Program Accomplishments:

- Continue the High Power Electronics Reliability Test program - continue reliability testing of High Voltage GaAs MMICs at Naval Research Lab (NRL) and initiate reliability testing of Gallium Nitride (GaN) MMICs at NRL, Naval Surface Warfare Center -Crane, IN (NSWC-Crane), Penn State University-Applied Research Lab (PSU-ARL), and Air Force Research Lab (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.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense System Core |

FY06 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
- Completion of the Advanced Optical Processor (AOP) testing
- ALCOR insertion testing

FY07 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

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Propulsion | 4,296 | 2,700 | 2,500 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

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.

FY05 Program Accomplishments:

- Characterized C-SiC material properties from alternate sources to evaluate manufacturing process variation on material strength under high temperature, high pressure operation
- Initiated a producibility improvement for the TDACS divert thruster system, using braided C-SiC, to reduce part count and improve performance for BMDS applications

- Developed concept definition of proportional controlled solid DACS components for application to BMDS interceptors
- Executed efforts to address insensitive munitions for Missile Defense Systems

FY06 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

FY07 Planned Program:
- Complete data reduction on FY06 hot fire tests
- Execute design and development of MKV sized attitude control system thrusters/actuators
- Develop and demonstrate sealed up embedded divert thruster for application to next generation solid DACS systems for BMDS interceptors

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Advanced Materials & Structures | 3,276 | 1,500 | 2,500 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

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.

FY05 Program Accomplishments:
- Developed an assembly more amenable to radiation hardening at a reduced cost - Composite Mirror Structure
- Developed compatibility with both KEI and EKV at a reduced cost - Liquid Divert and Attitude Control System (LDACS) Structure
- Met schedule milestones and produced better performing products at a reduced cost - KEI Radome
- Produced prototype hardware at a reduced cost in time for preliminary design review and dynamic inert model tests - KEI Payload Adapter
- Developed an improved nosecone at a reduced cost - KEI Nosecone

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense System Core** |

FY06 Planned Program:

- Continue to develop an assembly more amenable to radiation hardening at a reduced cost - Composite Mirror Structure
- Continue to develop compatibility with both KEI and EKV at a reduced cost - Liquid Divert and Attitude Control System (LDACS) Structure
- Continue to meet schedule milestones and produce better performing products at a reduced cost - KEI Radome
- Continue to produce prototype hardware at a reduced cost in time for preliminary design review and dynamic inert model tests - KEI Payload Adapter
- Continue to develop an improved nosecone at a reduced cost - KEI Nosecone

FY07 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

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Anti-Tamper | 0 | 0 | 2,400 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The Anti-Tamper objective is to provide protection against reverse engineering of BMDS critical technologies vulnerable to exploitation as a result of Battlefield Loss, Foreign Military Sales (FMS), or Cooperative Development. Robust Anti-Tamper solutions support coalition warfare and extend the effective operational life of the BMDS.

FY07 Planned Program:

- Command Destruct continue to develop and test a command destruct technology that protects information residing on computer hard-drives, while limiting collateral damage to surrounding systems or personnel
- Software Solutions continue to identify and develop software-based protection solutions that provide robust tamper protection at a minimal cost and with minimal system redesign
- Specialized Solutions Identify opportunities to leverage DoD investment in long-lead time protection technologies that will provide robust protection while minimizing non-recurring expenses

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2006 |
|---|---|
| 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 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 | 4,140 | 2,427 | 1Q | 2,657 | 1Q | 9,224 |
| **Radiation Hardening** | | | | | | | | |
| Rad Hard | Various | AFRL/ Kirtland, NM | 5,834 | 3,957 | 1/2Q | 4,879 | 1Q | 14,670 |
| Rad Hard | Various | SMDC/ Huntsville, AL | 4,737 | 3,116 | 1/2Q | 3,486 | 1Q | 11,339 |
| Rad Hard | MIPR | Various | 4,730 | 3,115 | 2Q | 3,704 | 1/2Q | 11,549 |
| **Manufacturing Process Improvements** | | | | | | | | |
| Tech Refresh/RLSN | CPFF | ATI | 1,300 | 900 | 2Q | 300 | 1Q | 2,500 |
| Tin Whisker | CPFF | ONR/VA | 650 | 258 | 1Q | 200 | 1Q | 1,108 |
| Manufacturing Processes | MIPR | Various | 210 | 100 | 2Q | 81 | 1/2Q | 391 |
| **Electro-Optics/Infrared (EO/IR)** | | | | | | | | |
| EO/IR | Various | AFRL/ Kirtland, NM | 6,630 | 3,967 | 2Q | 1,676 | 1Q | 12,273 |
| EO/IR | CPFF | Fibertek/ Hendon, VA | 3,620 | 1,424 | 2Q | 1,080 | 1Q | 6,124 |
| EO/IR | Various | SMDC/ Huntsville, AL | 3,520 | 1,367 | 2Q | 1,500 | 1Q | 6,387 |
| EO/IR | MIPR | DMEA/ MCLELLAN, CA | 0 | 1,500 | 2Q | 1,500 | 2Q | 3,000 |
| **Radar RF / Electronics** | | | | | | | | |
| SiC MMIC | Various | AFRL/ Kirtland, NM | 900 | 550 | 1Q | 1,000 | 1Q | 2,450 |
| RF Device Test | MIPR | NRL/ Washington, DC | 918 | 158 | 1Q | 681 | 1Q | 1,757 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| High Voltage GaAs | CPFF | Triquint/TX | 1,017 | 150 | 1/2Q | 600 | 1/2Q | 1,767 |
| RF | MIPR | Various | 1,125 | 200 | 1Q | 300 | 1Q | 1,625 |
| **Propulsion** | | | | | | | | |
| SMDC | CPFF | Aerojet/ Sacramento, CA | 4,410 | 1,066 | 1Q | 956 | 1Q | 6,432 |
| Propulsion | MIPR | NSWCCD/MD | 800 | 247 | 1Q | 218 | 1Q | 1,265 |
| Propulsion | MIPR | ATK/Elkton, MD | 800 | 250 | 1Q | 215 | 1Q | 1,265 |
| Propulsion | MIPR | Various | 763 | 245 | 2Q | 219 | 2Q | 1,227 |
| **Advanced Materials & Structures** | | | | | | | | |
| Advanced Materials | CPFF | San Diego Composites/ San Diego, CA | 2,035 | 631 | 1Q | 1,093 | 1Q | 3,759 |
| Advanced Materials | CPFF | Mentis Sciences, Inc./ Manchester, NH | 628 | 150 | 1Q | 304 | 1Q | 1,082 |
| Advanced Structures | Various | SMDC/ Huntsville, AL | 2,040 | 219 | 1Q | 335 | 1Q | 2,594 |
| **Anti-Tamper** | | | | | | | | |
| Anti-Tamper | MIPR | NSWC CRANE/ CRANE, IN | 0 | 0 | N/A | 1,588 | N/A | 1,588 |
| Subtotal Product Development | | | 50,807 | 25,997 | | 28,572 | | 105376 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense System Core |

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 | 460 | 200 | 1/2Q | 250 | 1/2Q | 910 |
| SETA | FFP | DRC, SPARTA/ VA | 784 | 350 | 1Q | 356 | 1Q | 1,490 |
| **Radiation Hardening** | | | | | | | | |
| Rad Hard | Various | AFRL/ Kirtland, NM | 710 | 376 | 1Q | 537 | 1Q | 1,623 |
| Rad Hard | Various | SMDC/ Huntsville, AL | 500 | 275 | 1Q | 393 | 1Q | 1,168 |
| Rad Hard | MIPR | NSWC CRANE/ IN | 477 | 327 | 1Q | 468 | 1Q | 1,272 |
| SETA | FFP | DRC, SPARTA/ VA | 784 | 485 | 1Q | 517 | 1Q | 1,786 |
| **Manufacturing Process Improvements** | | | | | | | | |
| Tech Support | MIPR | REDCOM/AL | 180 | 96 | 1Q | 117 | 1Q | 393 |
| Tech Support | MIPR | NSWC/ Crane, IN | 160 | 77 | 1Q | 94 | 1Q | 331 |
| JDMTP | MIPR | ONR/VA | 100 | 51 | 2Q | 63 | 2Q | 214 |
| SETA | FFP | DRC, SPARTA/ VA | 784 | 256 | 1Q | 308 | 1Q | 1,348 |
| **Electro-Optics/Infrared (EO/IR)** | | | | | | | | |
| EO/IR | Various | AFRL/ Kirtland, NM | 720 | 246 | 1/2Q | 272 | 1/2Q | 1,238 |
| EO/IR | CPFF | Fibertek/ Herndon, VA | 435 | 138 | 1/2Q | 139 | 1/2Q | 712 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| EO/IR | Various | SMDC/ Huntsville, AL | 375 | 192 | 1Q | 193 | 1Q | 760 |
| SETA | FFP | DRC, SPARTA/ VA | 784 | 304 | 1Q | 303 | 1Q | 1,391 |
| **Radar RF / Electronics** | | | | | | | | |
| SiC MMIC | CPFF | CREE/NC/ Triquint/TX | 100 | 41 | 1Q | 41 | 1Q | 182 |
| RF Device Test | MIPR | NRL/ Washington, DC | 113 | 64 | 1Q | 65 | 1Q | 242 |
| High Voltage GaAs | CPFF | Triquint/TX | 102 | 79 | 1/2Q | 79 | 1/2Q | 260 |
| RF | Various | Various | 125 | 92 | 1Q | 92 | 1Q | 309 |
| SETA | FFP | DRC, SPARTA/ VA | 784 | 404 | 1Q | 405 | 1Q | 1,593 |
| **Propulsion** | | | | | | | | |
| SMDC | CPFF | Aerojet/ Sacramento, CA | 490 | 175 | 1Q | 182 | 1Q | 847 |
| Propulsion | MIPR | NSWCCD/MD | 95 | 40 | 1Q | 41 | 1Q | 176 |
| Propulsion | MIPR | ATK/ Elkton, MD | 95 | 40 | 1Q | 41 | 1Q | 176 |
| Propulsion | MIPR | Various | 73 | 40 | 1/2Q | 41 | 1/2Q | 154 |
| SETA | FFP | DRC, SPARTA/ VA | 784 | 335 | 1Q | 350 | 1Q | 1,469 |
| **Advanced Materials & Structures** | | | | | | | | |
| Advanced Materials | CPFF | San Diego Composites/ San Diego, CA | 221 | 59 | 1Q | 162 | 1Q | 442 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Advanced Materials | CPFF | Mentis Sciences, Inc./ Manchester, NH | 68 | 38 | 1Q | 45 | 1Q | 151 |
| Advanced Structures | Various | SMDC/ Huntsville, AL | 211 | 41 | 1Q | 49 | 1Q | 301 |
| SETA | FFP | DRC, SPARTA/ VA | 784 | 100 | 1Q | 275 | 1Q | 1,159 |
| **Anti-Tamper** | | | | | | | | |
| SETA | FFP | DRC, SPARTA / VA | 0 | 0 | N/A | 375 | 1/2Q | 375 |
| ANTI-TAMPER | MIPR | NSWC CRANE/ CRANE, IN | 0 | 0 | N/A | 200 | 1/2Q | 200 |
| Subtotal Support Costs | | | 11,298 | 4,921 | | 6,453 | | 22672 |

**Remarks**

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

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

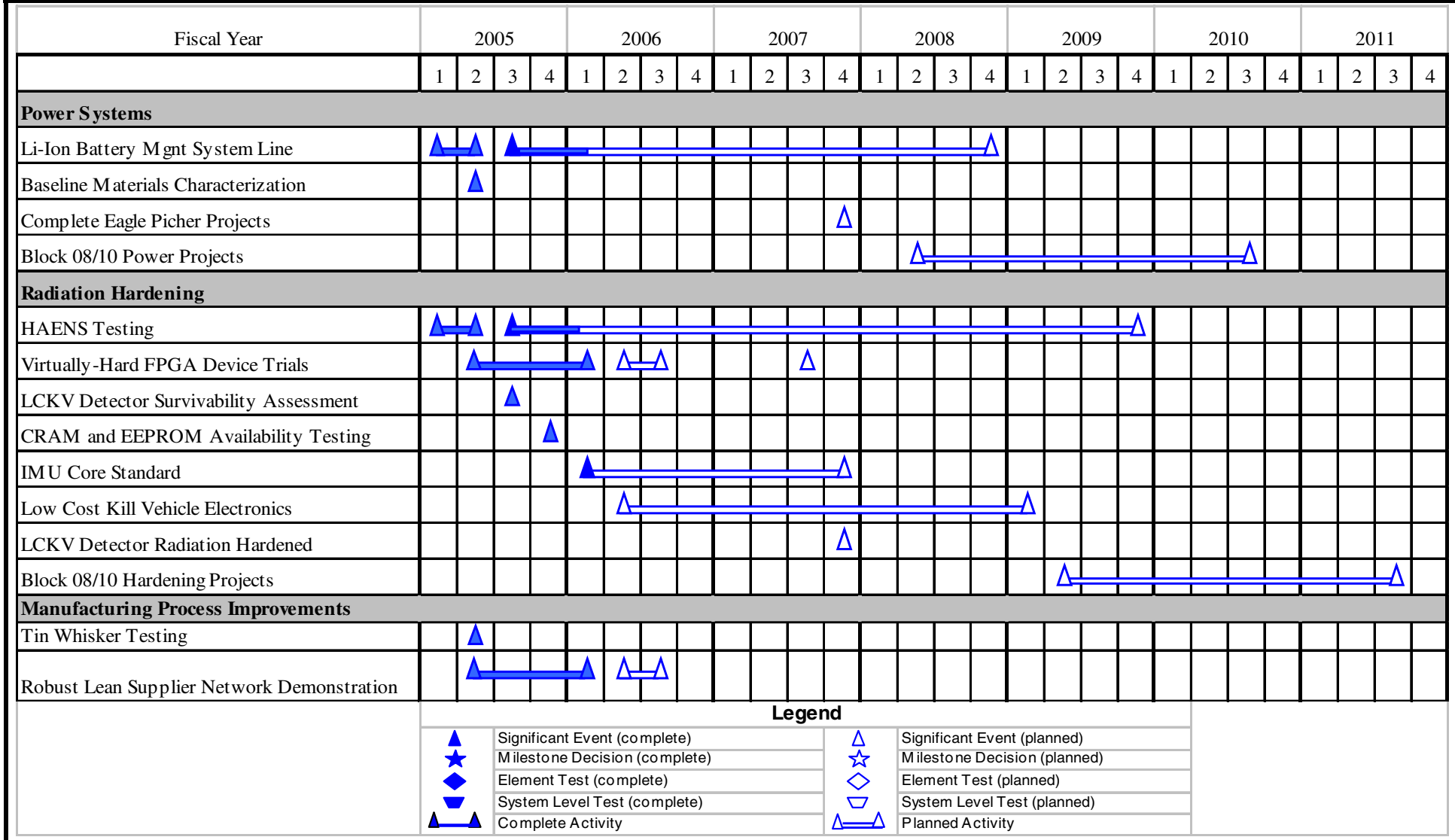
**Remarks**

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense System Core** |

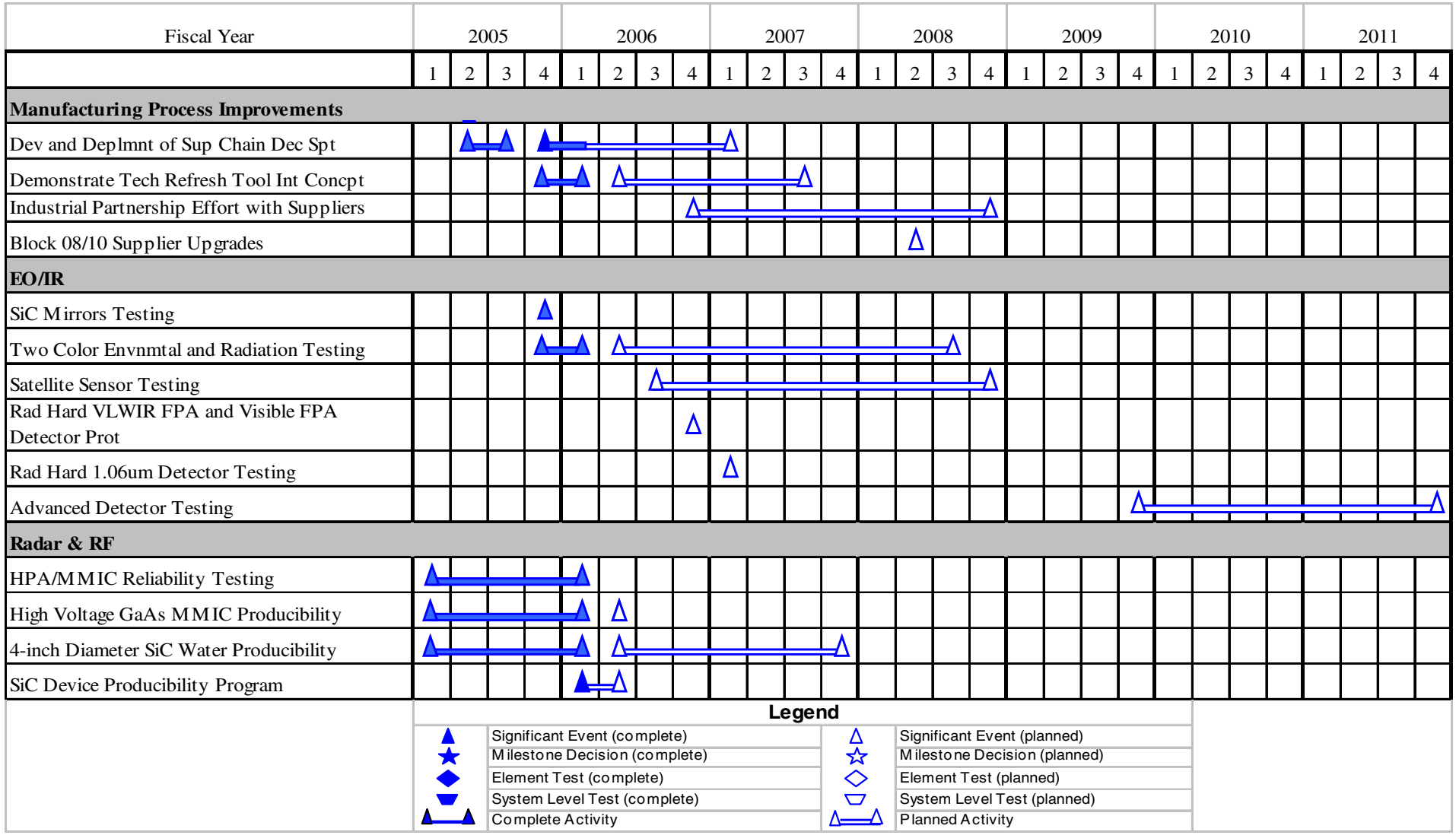
## IV. Management Services Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Power Systems** | | | | | | | | |
| Govt Personnel | | MDA/ VA | 386 | 262 | 1/2Q | 237 | 1/2Q | 885 |
| **Radiation Hardening** | | | | | | | | |
| Govt Personnel | | MDA/ VA | 386 | 262 | 1/2Q | 237 | 1/2Q | 885 |
| **Manufacturing Process Improvements** | | | | | | | | |
| Govt Personnel | | MDA/ VA | 386 | 262 | 1/2Q | 237 | 1/2Q | 885 |
| **Electro-Optics/Infrared (EO/IR)** | | | | | | | | |
| Govt Personnel | | MDA/ VA | 386 | 262 | 1/2Q | 237 | 1/2Q | 885 |
| **Radar RF / Electronics** | | | | | | | | |
| Govt Personnel | | MDA/ VA | 386 | 262 | 1/2Q | 237 | 1/2Q | 885 |
| **Propulsion** | | | | | | | | |
| Govt Personnel | | MDA/ VA | 386 | 262 | 1/2Q | 237 | 1/2Q | 885 |
| **Advanced Materials & Structures** | | | | | | | | |
| Govt Personnel | | MDA/ VA | 386 | 262 | 1/2Q | 237 | 1/2Q | 885 |
| **Anti-Tamper** | | | | | | | | |
| Govt Personnel | | MDA/ VA | 0 | 0 | N/A | 237 | 1/2Q | 237 |
| Subtotal Management Services | | | 2,702 | 1,834 | | 1,896 | | 6432 |
| Project Total Cost | | | 64,807 | 32,752 | | 36,921 | | 134,480 |

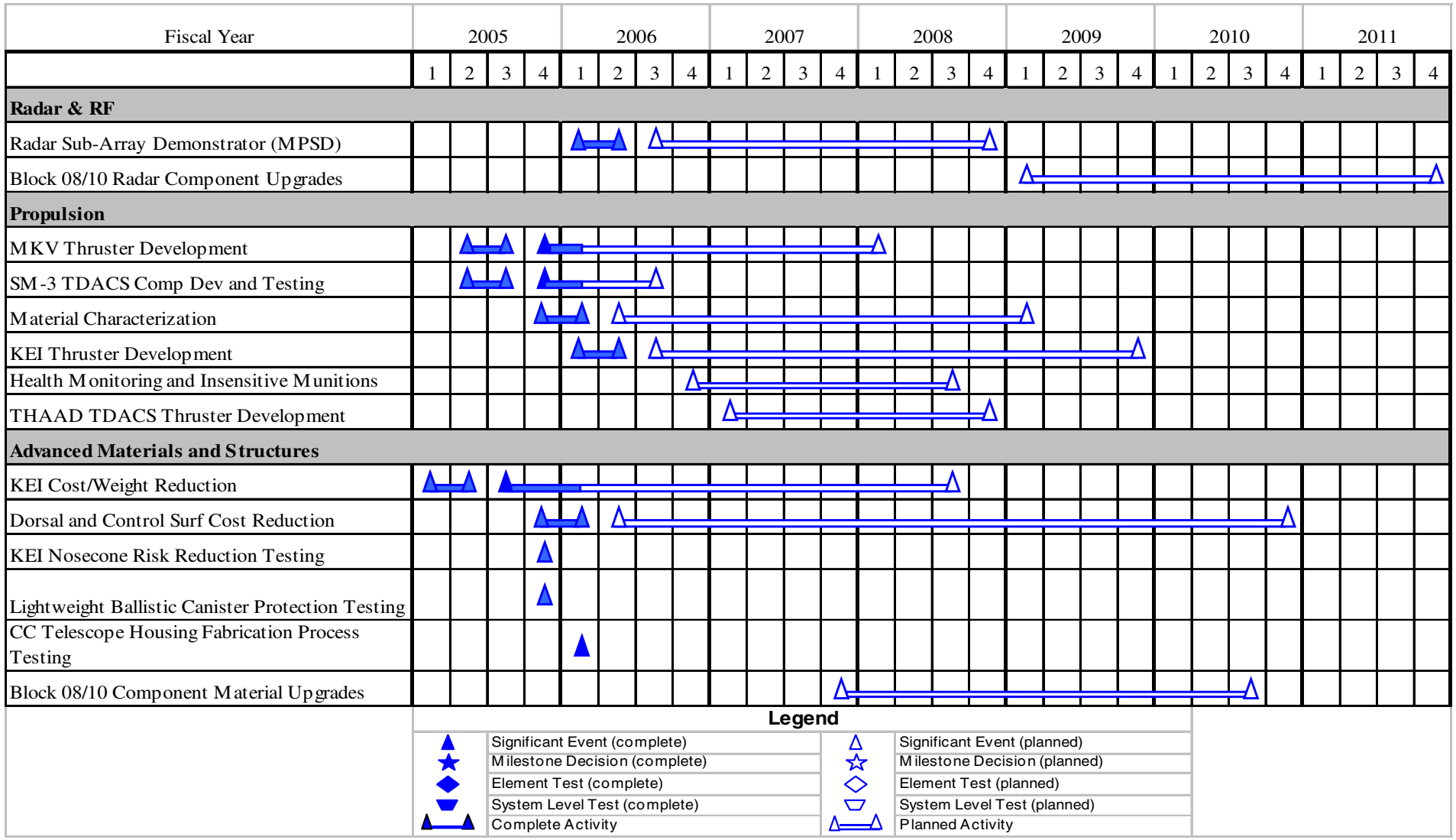
| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense System Core |



| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 2006 |
|---|---|
| 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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Power Systems** | | | | | | | |
| Battery Manufacturing Improvements | 1Q-4Q | 1Q-2Q | | | | | |
| Li-Ion Battery Mgnt System Line | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | | | |
| Baseline Materials Characterization | 2Q | | | | | | |
| Technology Roadmap Planning Meeting | 2Q | | | | | | |
| Relocation of Oxyhalide Production Line | 3Q | | | | | | |
| Computer Aided Process/Planning | 4Q | | | | | | |
| Solar & Fuel Cells, High Capacity Storage Devices | | 4Q | | | | | |
| Complete Eagle Picher Projects | | | 4Q | | | | |
| Block 08/10 Power Projects | | | | 2Q-4Q | 1Q-4Q | 1Q-3Q | |
| **Radiation Hardening** | | | | | | | |
| HAENS Testing | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | | |
| Rad Hard Catalog | 1Q-4Q | 1Q-3Q | | | | | |
| COTS FPGA Assessment | 2Q | | | | | | |
| Virtually-Hard FPGA Device Trials | 2Q-4Q | 1Q-3Q | 3Q | | | | |
| LCKV Detector Survivability Assessment | 3Q | | | | | | |
| CRAM and EEPROM Availability Testing | 4Q | | | | | | |
| Detector Testing | 4Q | | | | | | |
| IMU Core Standard | | 1Q-4Q | 1Q-4Q | | | | |
| Rad Hard common Processor | | 1Q | | | | | |
| THAAD Detector/IMU Survivability Assessment | | 1Q | | | | | |
| Low Cost Kill Vehicle Electronics | | 2Q-4Q | 1Q-4Q | 1Q-4Q | 1Q | | |
| LCKV Detector Radiation Hardened | | | 4Q | | | | |
| Block 08/10 Hardening Projects | | | | | 2Q-4Q | 1Q-4Q | 1Q-3Q |
| **Manufacturing Process Improvements** | | | | | | | |
| Tin Whisker Testing | 2Q | | | | | | |
| Robust Lean Supplier Network Demonstration | 2Q-4Q | 1Q-3Q | | | | | |
| Dev and Deplmnt of Sup Chain Dec Spt | 2Q-4Q | 1Q-4Q | 1Q | | | | |
| Demonstrate Tech Refresh Tool Int Concpt | 4Q | 1Q-4Q | 1Q-3Q | | | | |
| Industrial Partnership Effort with Suppliers | | 4Q | 1Q-4Q | 1Q-4Q | | | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| Block 08/10 Supplier Upgrades | | | | 2Q | | | |
| Technology Refresh | 2Q | | | | | | |
| **EO/IR** | | | | | | | |
| Two Color FPA | 3Q | | | | | | |
| SiC Mirrors Testing | 4Q | | | | | | |
| Stacked Electronics Processing Prototypes | 4Q | | | | | | |
| Two Color Envnmtal and Radiation Testing | 4Q | 1Q-4Q | 1Q-4Q | 1Q-3Q | | | |
| Hybrid/Stirling Cryocooler Electronics | | 1Q | | | | | |
| Scalable SiC Mirror Assembly/Inspection | | 1Q | | | | | |
| Satellite Sensor Testing | | 3Q-4Q | 1Q-4Q | 1Q-4Q | | | |
| Hybrid Stirling/Cryocooler | | 4Q | | | | | |
| Rad Hard VLWIR FPA and Visible FPA Detector Prot | | 4Q | | | | | |
| Rad Hard 1.06um Detector Testing | | | 1Q | | | | |
| Visible Hybrid Detector | | | 1Q | | | | |
| Advanced Detector Testing | | | | | 4Q | 1Q-4Q | 1Q-4Q |
| **Radar & RF** | | | | | | | |
| HPA/MMIC Reliability Testing | 1Q-4Q | 1Q | | | | | |
| High Voltage GaAs MMIC Producibility | 1Q-4Q | 1Q-2Q | | | | | |
| 4-inch Diameter SiC Water Producibility | 1Q-4Q | 1Q-4Q | 1Q-4Q | | | | |
| SiC Device Producibility Program | | 1Q-2Q | | | | | |
| Radar Sub-Array Demonstrator (MPSD) | | 1Q-4Q | 1Q-4Q | 1Q-4Q | | | |
| Block 08/10 Radar Component Upgrades | | | | | 1Q-4Q | 1Q-4Q | 1Q-4Q |
| **Propulsion** | | | | | | | |
| MKV Thruster Development | 2Q-4Q | 1Q-4Q | 1Q-4Q | 1Q | | | |
| SM-3 TDACS Comp Dev and Testing | 2Q-4Q | 1Q-3Q | | | | | |
| Material Characterization | 4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q | | |
| KEI Thruster Development | | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | | |
| Health Monitoring and Insensitive Munitions | | 4Q | 1Q-4Q | 1Q-3Q | | | |
| THAAD TDACS Thruster Development | | | 1Q-4Q | 1Q-4Q | | | |
| **Advanced Materials and Structures** | | | | | | | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| KEI Cost/Weight Reduction | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-3Q | | | |
| Dorsal and Control Surf Cost Reduction | 4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | |
| KEI Nosecone Risk Reduction Testing | 4Q | | | | | | |
| KEI Radome Development Testing | 4Q | | | | | | |
| LDACS Structure Development Testing | 4Q | | | | | | |
| Lightweight Ballistic Canister Protection Testing | 4Q | | | | | | |
| CC Telescope Housing Fabrication Process Testing | | 1Q | | | | | |
| KEI Payload Shock and Vibration Mitigation Testing | | | 1Q | | | | |
| Block 08/10 Component Material Upgrades | | | 4Q | 1Q-4Q | 1Q-4Q | 1Q-3Q | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0104 BMD Information Management Systems | 61,252 | 111,843 | 123,175 | 124,775 | 127,375 | 135,375 | 138,075 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: FY06 includes an overall increase of $50.5 million from FY05. The IT budgets from the Computing Infrastructure, Computing and Network Management Services, and Information Distribution Services projects were consolidated from PE 0901598C into this PE for a total of $26.5 million. An increase of $10.5 million supports planning, engineering, and test support for the BMDS Block 2004 system deployment certification, the Block 2006 System Security Authorization Agreement (SSAA) development, and increased security testing to achieve a 90% Authority to Operate on all MDA networks and systems An additional $8.2 million is for federally mandated initiatives (Electronic Records Management, Business Management Modernization Program, PKI-CAC, Privacy Management, and Collaborative Tools) to meet the requirements of the E-Govt Act. A $5.3 million increase is for consolidation of IT systems in the Huntsville region in preparation for transition to the new Von Braun II Complex. FY07 includes an increase of $11 million from FY06. A $2 million increase is allocated to support the System Testing of the IA controls of the BMDS Block 2006 to accomplish the Interim Authority to Operate(IATO) and to develop the BMDS Block 2008 System Security Authorization Agreement (SSAA). A $2 million increase is to assume responsibility for Video Teleconferencing systems supporting the Airborne Laser Program at Kirtland and Los Angeles Air Force Bases. The remainder of the increase is spread across the other major initiatives to support continued consolidation efforts as well as roll-out of federally mandated programs.*

## A. Mission Description and Budget Item Justification

Project 0104 includes initiatives that comprise the MDA secure communications infrastructure, which are vital to the strategic mission of the Agency. The MDA Secure Communications Infrastructure includes costs required to provide and sustain access to the classified Secret Internet Protocol Router Network (SIPRNET), MDA (MDANet), classified and unclassified Video Teleconferencing services 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. The above initiatives will provide for the efficient operation and safeguarding of all agency information. This Project funds initiatives that support the MDA Systems Engineering and Integration (SEI) mission for the BMDS System including:

- Information Assurance (IA) controls and Computer Network Defense (CND) of MDA networks
- Certification and Accreditation (C&A) processes that support the Ballistic Missile Defense System (BMDS), test assets, and administrative support networks
- IM/IT Enterprise Architecture that is compliant with Federally-mandated standards for the business and mission support activities of the MDA

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
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- Business Management Modernization Program (BMMP) efforts to provide DoD approved solutions for information sharing, electronic records management, financial management, and decision support systems to achieve more effective, efficient and secure business and mission support activities throughout MDA
- MDA communication networks that allow Information Management /Information Technology (IM/IT) operations to be performed in an efficient, secure, and effective manner
- IM/IT policies, guidance, planning, oversight, and monitoring to ensure continued compliance with DoD mandated initiatives, statutes, regulations, directives, and policies
- Operations and maintenance support to provide world-class day-to-day IT operations

The BMD Information Management Systems project, executed by the Information Management and Technology Operations Office (MDA/DOC), includes the following Task areas:

- Enterprise Architecture and Engineering,
- Enterprise Applications,
- Enterprise Plans and Policies,
- MDA Communications Infrastructure,
- Enterprise Information Assurance (IA),
- Service IM/IT for Executing Agents,
- Computing and Network Management Services (National Capital Region (NCR) Operations),
- Virtual Data Centers,
- MDA Video Teleconferencing Services,
- Computing Infrastructure (Enterprise),
- ITO South Computing Infrastructure,
- Information Management Services.

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**B. Accomplishments/Planned Program**

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Enterprise Architecture and Engineering | 4,014 | 4,583 | 5,185 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Enterprise Architecture and Engineering initiatives support the MDA and especially the Ballistic Missile Defense System (BMDS) Core projects through the design, and planning of an MDA Enterprise Architecture (EA) that is compliant with the DoD Federal enterprise architecture standards. The MDA EA will improve the management of, and access to information throughout the MDA through the integration and consolidation of disparate networks and systems. These efforts will improve the value of the Information Management and Information Technology (IM/IT) infrastructure that is necessary for the design, development, modeling, and testing of the BMDS.

FY05 Accomplishments:

- Completed Version 4.0 of the MDA Enterprise Architecture
- Developed a secure wireless design and implementation plan for portable devices
- Developed a plan to implement an enterprise service delivery to BMDS Block 2004 remote sites
- Developed an implementation plan for a classified data recovery system in the National Capital Region and the Joint National Integration Center
- Developed a realignment and transition plan in support of the MDA transition efforts to Huntsville AL, and Fort Belvoir VA

FY06 Planned Program:

- Develop designs and improvement plans for MDA priority projects (BMDS Mission Ops Center, MDA Technical Support Center, Business Management Modernization Tools)
- Develop designs and improvement plans to meet continued evolution of Information Assurance (IA) controls
- Develop engineering plans to implement network protocol upgrades in accordance with recent DoD standards
- Develop engineering plans to consolidate data and email servers across the MDA
- Develop implementation plans to consolidate helpdesk services across the MDA
- Develop disaster recovery designs for classified systems in the Huntsville area
- Complete documentation of Version 5.0 of the MDA Enterprise Architecture

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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** |

FY07 Planned Program:

- Develop designs and improvement plans for MDA priority projects (BMDS Mission Ops Center, MDA Technical Support Center, Business Management Modernization Tools)
- Develop designs and improvement plans to meet continued evolution of IA controls
- Develop disaster recovery designs for MDA unclassified systems
- Develop designs and implementation plans for secure classified processing for all MDA users in Huntsville
- Complete documentation of Version 6.0 of the MDA Enterprise Architecture

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Enterprise Applications | 5,965 | 14,218 | 15,952 |
| RDT&E Articles (Quantity) | 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 information. DoD mandated and mission essential examples include BMD System Asset Management (BAM), Electronic Records Management System (EMS), E-Tasker, Data Warehousing and Mining, Financial Management Tools, personnel tracking system, standard procurement system, and on-line BMDS University.

FY05 Accomplishments:

- Implemented the BMD System Asset Management application (BAM) for web-based asset management
- Established and funded enterprise license agreements for office automation, and collaboration tools
- Implemented Phase 1 of an Agency EMS project and training program (1000 users)
- Implemented prototypes and began testing of DoD standardized financial management applications
- Implemented Phase I of the E-Tasker Project, (the Agency action tracking system) and provided training to 500 initial users

FY06 Planned Program:

- Implement upgrades for the Phase I baseline of DoD mandated and mission essential support applications
- Develop Phase II sequencing plan, update training programs, and continue rollout of DoD standardized financial management, information sharing and collaboration applications
- Implement Phase II of the E-Tasker Project, (the Agency action tracking system) and provide training to users

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
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- Integrate IA training into the MDA on-line university
- Fund recurring enterprise application license fees

FY07 Planned Program:
- Implement upgrades for the Phase II baseline of DoD mandated and mission essential support applications
- Develop Phase III sequencing plans, update training programs, and continue rollout of DoD standardized financial management, information sharing and collaboration applications
- Implement Phase III of the E-Tasker Project, (the Agency action tracking system) and provide training
- Begin development of metadata taxonomy to standardize information storage and to facilitate data mining across MDA
- Fund recurring enterprise application license fees

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Enterprise Plans & Policies | 6,518 | 4,245 | 5,642 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This initiative funds efforts that support development and implementation of Agency-wide IM/IT strategies, policies, guidelines, and management processes to ensure efficient and effective oversight of information resources. These efforts ensure a secure MDA corporate infrastructure is in place to support the BMDS mission and to comply with statutory and DoD policies including: the Clinger-Cohen Act, the Federal Information Security Management Act (FISMA), the Government Paperwork Elimination Act (GPEA), and Office of Management and Budget (OMB) IT budget reporting policies. Specific examples include development, implementation, and oversight of various plans, guidelines, and policies to include the MDA Information Resource Strategic Plan, the IA Program Plan, and the MDA IM/IT Capital Planning and Investment Control (CPIC) process. This initiative also includes budget formulation and execution as well as contract management and oversight.

FY05 Accomplishments:
- Developed and published the MDA Information Resource Strategic Plan and the MDA Information Assurance Program Plan
- Developed a CIO implementation plan to support the MDA Reengineering Initiative
- Updated budget plans for future years in accordance with DoD and MDA guidance
- Successfully executed, tracked and reported the MDA CIO FY05 budget
- Conducted assessments, prepared status and metrics reports for MDA Senior Leadership, OSD, OMB, and DoD

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
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FY06 Planned Program:

- Develop, update, coordinate and publish policies, guidelines and processes in accordance with applicable legislation, DoD and MDA guidance
- Update budget plans for future years in accordance with MDA guidance
- Successfully execute, track and report the MDA CIO FY06 budget
- Conduct assessments, prepare status and metrics reports for MDA Senior Leadership, OSD, OMB, and DoD

FY07 Planned Program:

- Develop, update, coordinate and publish policies, guidelines and processes in accordance with applicable legislation, DoD and MDA guidance
- Update budget plans for future years in accordance with MDA guidance
- Successfully execute, track and report the MDA CIO FY07 budget
- Conduct assessments, prepare status and metric reports for MDA Senior Leadership, OSD, OMB, and DoD

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| MDA Communications Infrastructure | 11,003 | 12,647 | 13,734 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The MDA Enterprise Communications Infrastructure initiative consists of leased communications 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). These circuits provide access to government and industry locations to enable information sharing of BMD-related data throughout the global MDA Enterprise.

FY05 Accomplishments:

- Installed Service Delivery Points (SDPs) to support network consolidation plans at the National Capital Region (NCR), Joint National Integration Center (JNIC), and Fort Greely AK
- Funded recurring maintenance agreements on MDA Enterprise network equipment
- Funded MDA Enterprise leased communications for existing circuits provided by DISA and DREN

FY06 Planned Program:

- Upgrade networking equipment to meet the demands of the BMDS information sharing environment

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- Install Service Delivery Points (SDPs) to support network consolidation plans at Huntsville AL
- 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
- Fund recurring maintenance agreements on MDA Enterprise network equipment
- Fund MDA Enterprise leased communications for existing circuits provided by DISA and DREN

FY07 Planned Program:
- Upgrade networking equipment to meet the demands of the BMDS information sharing environment
- Install Service Delivery Points (SDPs) to support network consolidation plans at Kirtland, Los Angeles, and Edwards AFBs
- Fund recurring maintenance agreements on MDA Enterprise network equipment
- Fund MDA Enterprise leased communications for existing circuits provided by DISA and DREN

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Enterprise Information Assurance | 11,121 | 21,650 | 23,782 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This initiative is not only a Federal mandate but also a key priority of the MDA Director. This vital program of the BMDS and MDA Enterprise consists of Information and Assurance (IA), Computer Network Defense (CND), and Certification and Accreditation (C&A) activities. The IA program provides system security engineering, 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 provides the network security operations centers and supporting processes to protect and defend information and information systems. This ensures the availability, integrity, authentication, confidentiality and non-repudiation of the MDA mission, test and administrative systems.

FY05 Accomplishments:
- Issued the BMDS Block 2004 Interim Authority to Operate (IATO) and risk mitigation plan
- Developed the IA portion of the Test Bed System Specifications (TBSS) for the BMDS Block 2006
- Provided IA engineering and planning staff support for all IT acquisition programs
- Supported Enterprise Network Operations Security Center (ENOSC) operations
- Trained the entire MDA workforce in Information Assurance in compliance with the Federal Information Security Management Act (FISMA)

- Conducted in excess of 150 System Test and Evaluations (ST&Es) of the mission, test and administrative systems and networks to ensure implementation of appropriate IA controls

FY06 Planned Program:

- Provide planning, engineering and test support for BMDS Block 2004 system deployment certification
- Provide BMDS Block 2006 System Security Authorization Agreement (SSAA) development
- Develop and insert Information Assurance requirements into the Test Bed System Specifications (TBSS) for the BMDS Block 2008
- Conduct BMDS Block 2004 ST&Es to certify and accomplish Authority to Operate (ATO) accreditation
- Conduct ST&Es of test and administrative systems
- Provide 100% IA training for the MDA workforce
- Provide IA engineering and planning guidance for all IT acquisition programs
- Accredit test and administrative networks
- Implement Phase II of the Classified Disaster Recovery Storage Systems (Huntsville AL)
- Support Enterprise Network Operations Security Center (ENOSC) operations and maintenance

FY07 Planned Program:

- Provide system security planning, engineering and test support to the spiral development of BMDS Blocks 2006 and 2008 configurations
- Conduct BMDS Block 2006 ST&Es to certify and accomplish Interim Authority to Operate (IATO) accreditation
- Provide BMDS Block 2008 System Security Authorization Agreement (SSAA) development
- Conduct ST&Es of the test and administrative systems and networks
- Accredit test and administrative networks
- Provide 100% IA training for the MDA workforce
- Implement Phase I of the Unclassified Disaster Recovery Storage Systems (Colorado Springs CO)
- Support Enterprise Network Operations Security Center (ENOSC) operations and maintenance

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| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Service IM/IT | 7,713 | 6,911 | 7,250 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This initiative provides recurring funds to three MDA Executing Agents in support of BMDS research and mission 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 support continuing operations and maintenance of their communications and computing infrastructure in the Von Braun I facility in Huntsville AL. This includes the communications costs, help desk services, and hardware and software sustainment. SMDC also receives MDA funds to update and maintain the Program Resource Internet Database Environment (PRIDE), a database management tool used by MDA for planning and budgeting efforts. Funds provided to PEO ASMD support IT infrastructure costs for multiple MDA research contracts and projects. Funds provided to the USAF PEO support MDA related logistics, database management, and network communications costs.

FY05 Accomplishments:

- Operated and maintained IT networks in support of MDA efforts in Army and Air Force facilities located in Huntsville and Los Angeles
- Updated and maintained the PRIDE database management tool
- Provided helpdesk services to MDA users
- Funded recurring O&M and helpdesk services provided through SMDC in direct support of MDA personnel
- Provided IT support for the Missile Defense conference
- Implemented a Budget Execution module in CIMS for MDA

FY06 Planned Program:

- Operate and maintain IT networks, systems and helpdesk services in support of MDA efforts in Army and Air Force facilities
- Update and maintain the PRIDE database management tool
- Provide helpdesk services to MDA users
- Provide IT support for the Missile Defense conference

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
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FY07 Planned Program:

- Operate and maintain IT networks in support of MDA efforts in Army and Air Force facilities located in Huntsville and Los Angeles
- Update and maintain the PRIDE database management tool
- Provide helpdesk services to MDA users
- Provide IT support for the Missile Defense conference
- Provide IT support to MDA international programs and conferences

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Computing & Network Management Services | 0 | 21,637 | 23,210 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The Computing and Network Management Services initiative (formerly funded under PE 0603882C, Program Wide Support for $16.5 million) consists of IT support services required to operate and maintain the classified and unclassified local area networks in the National Capital Region (approximately 2900 users). This includes operations and maintenance of hardware, software and help desk services in support of BMDS mission, research and test efforts as well as MDA business processes.

FY06 Planned Program:

- Sustain the BMDS Mission Operation Center (MOC)
- Support the MDA CIO helpdesk consolidation program
- Maintain the network and help desk services at 99% readiness
- Provide weekly training to MDA users

FY07 Planned Program:

- Sustain the BMDS Mission Operation Center (MOC)
- Sustain the network and help desk services at 99% readiness
- Support the transition of the Regional Network Operations and Security Center (RNOSC) to Huntsville, AL
- Provide weekly training to MDA users

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
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| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Virtual Data Centers | 3,668 | 0 | 0 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

In accordance with OMB 9602, ``Consolidation of Agency Data Centers``, the Virtual Data Center (VDC) task integrates data centers to the MDA portals. 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, the Joint National Integration Center Ballistic Missile Defense System Integration Data Center (BMDS IDC) and the BMD Information Resource Center (BIRC).

FY05 Accomplishments:

- Access to the Data Centers is now available through the MDA Portals based on completion of this project

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| MDA Video Teleconferencing | 5,171 | 6,135 | 7,942 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The MDA Video Teleconferencing (VTC) initiative supports management, engineering, systems integration, operation, maintenance and technical support services for the teleconferencing systems and implementation of a high-bandwidth, Video Over Internet Protocol (VOIP) capability to enhance resolution and reduce per-minute unit cost. Primary MDA video-teleconferencing sites include the NCR, JNIC, Airborne Laser (ABL) at Kirtland Air Force Base (AFB), and Space Tracking and Surveillance System (STSS) at Los Angeles AFB. Future sites will include numerous offices in Huntsville, AL including Terminal High Altitude Area Defense (THAAD), Targets and Countermeasures, and Ground Based Missile Defense.

FY05 Accomplishments:

- Implemented a VTC Scheduling Operations Center (VSOC) to support BMDS situational awareness between MDA and COCOMs
- Developed a standardized VTC platform design for all MDA locations
- Implemented Phase I of the Video-Over-Internet Protocol (VOIP) capability for Executive Offices in the NCR and JNIC
- Funded recurring O&M for VTC facilities and equipment

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense System Core** |

FY06 Planned Program:
- Operate VTC Scheduling Operations Center (VSOC) in support of BMDS situational awareness between MDA and COCOMs
- Implement Phase II of the VOIP project to MDA sites in Huntsville AL
- Standardize VTC equipment and software at MDA facilities in Huntsville AL and Los Angeles CA
- Fund recurring O&M for VTC facilities and equipment

FY07 Planned Program:
- Operate VTC Scheduling Operations Center (VSOC) capability in support of BMDS situational awareness between MDA and COCOMs
- Implement Phase III of the VOIP project to MDA sites in Kirtland AFB, NM, Edwards AFB, CA, and Los Angeles AFB, CA
- Standardize VTC equipment and software at MDA facilities in Albuquerque, NM
- Fund recurring O&M for VTC facilities and equipment

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Computing Infrastructure | 0 | 5,172 | 5,852 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The Computing Infrastructure initiative provides funds to support the operations and sustainment of hardware and software systems supporting the MDA Enterprise and regional support of consumables for the NCR. Typical hardware devices include; network routing and switching gear, server farms, storage devices and desktop computers.

FY05 Accomplishments: (initiative funded under PE 0603882, Program Wide Support in FY05 for 8.5M)
- Completed the first phase in the transition from regional software licensing to MDA enterprise licensing to achieve cost savings
- Funded maintenance agreements for hardware systems (NCR)
- Funded recurring operations and maintenance for the MDA NCR classified and unclassified LANs

FY06/07 Planned Program:
- Complete the consolidation of regional software licenses to MDA Enterprise licenses
- Begin the transition from regional to enterprise maintenance agreements for hardware systems
- Fund recurring operations and maintenance for the MDA NCR classified and unclassified LANs

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 |
|---|---|---|---|
| ITO South Computing Infrastructure | 276 | 5,517 | 4,271 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This initiative supports the build-out of IT resources to support the transition of 400 personnel from the NCR.. This effort includes: acquisition, operations and maintenance, and consolidation of classified and unclassified local area networks (LAN), helpdesks, servers and desktop computers. In order to maintain continuity of operations, the transition and realignment efforts must include an IT capability (systems installation, testing, training, and certification) that is completed prior to the movement of the personnel.

FY05 Accomplishments

- Provided IT support to the MDA CIO Huntsville Information Technology Office (ITO)

FY06 Planned Program:

- Initiate Huntsville region implementation (Phase I) of the MDA CIO realignment and infrastructure consolidation (networks, servers, helpdesks)
- Implement Phase I of the secure classified processing capability for all MDA users in Huntsville (eliminates dual desktop PCs)
- Provide IT support for the transition of 400 MDA personnel from the NCR to Huntsville

FY07 Planned Program:

- Initiate Huntsville region implementation (Phase II) of the MDA CIO realignment and infrastructure consolidation (networks, servers, helpdesks)
- Complete the fielding of the secure classified processing capability for all MDA users in Huntsville (eliminates dual desktop PCs)

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Information Management Services | 5,803 | 9,128 | 10,355 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The Information Management Services initiative includes costs to develop, manage content, and operate and maintain the unclassified and classified MDA Portals. The MDA Portals are a vital asset used to share information and knowledge throughout the Missile Defense community. This initiative also supports the operations and maintenance of the Visual Information Production Center (VIPC), a state-of-the-art, high capacity graphic and video production center, which provides services to senior leadership and agency employees.

FY05 Accomplishments:

- Produced over 3500 VIPC products per month to support Agency sponsored briefings, conferences, training, and other functions

- Consolidated 49 web sites into the classified and unclassified MDA Portals reducing overall administrative support costs
- Implemented Phase I of the web-based training through the MDA Portals (IA training, ethics training, etc.)
- Funded recurring operations and maintenance of the MDA Portals

FY06 Planned Program:
- Implement Phase I of the Portal user interfaces upgrade project to improve access to BMDS data and Director's plans, policies and guidance
- Consolidate GM and THAAD web sites into the MDA Portals
- Implement Phase I of the MDA information cataloging project hosted on the MDA Portal
- Implement Phase II of the web-based training through the MDA Portals (new employee orientation, new IT user training, etc)
- Fund VIPC services providing graphic and video production capabilities to Agency senior leaderships and MDA-wide personnel
- Fund recurring operations and maintenance of the MDA Portals

FY07 Planned Program:
- Implement Phase II of the Portal user interfaces upgrade project to improve access to BMDS data and Director's plans, policies and guidance
- Implement Phase II of the MDA information cataloging project hosted on the MDA Portal
- Implement Phase III of the web-based training through the MDA (additional and enhanced training courses and programs)
- Fund VIPC services providing graphic and video production capabilities to Agency senior leaderships and MDA-wide personnel
- Fund recurring operations and maintenance of the MDA Portals

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## 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, AL; Colorado Springs, CO; Albuquerque, NM; and Los Angeles, CA).

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Enterprise Architecture and Engineering** | | | | | | | | |
| Enterprise Architecture & Engineering | MIPR | FEDSIM/SRA/ VA | 4,014 | 4,423 | 2Q | 5,004 | 2Q | 13,441 |
| SETA Support | CPFF | Anteon/ VA | 0 | 160 | 3Q | 181 | 3Q | 341 |
| **Enterprise Applications** | | | | | | | | |
| Enterprise Application | C/CPAF | FEDSIM/ VA | 3,356 | 11,357 | 2Q | 12,847 | 1/2Q | 27,560 |
| PRIDE Maintenance and Support | MIPR | SMDC/ AL | 999 | 999 | 1Q | 999 | 1Q | 2,997 |
| Database Support | MIPR | GSA/ VA | 100 | 0 | N/A | 0 | N/A | 100 |
| BMDS University support | MIPR | NTIS/ VA | 133 | 0 | N/A | 0 | N/A | 133 |
| SETA Support | CPFF | Anteon/ VA | 0 | 1,862 | 3Q | 2,106 | 3Q | 3,968 |
| **Enterprise Plans & Policies** | | | | | | | | |
| SETA Support | C/CPFF | Anteon/ VA | 5,864 | 1,960 | 2/3Q | 2,217 | 2/3Q | 10,041 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| CIO Support | Various | Various/ CO | 818 | 545 | 1/2Q | 1,456 | 1/2Q | 2,819 |
| CIO Support | C/CPFF | Decisive Analytics/ VA | 320 | 1,138 | N/A | 1,288 | N/A | 2,746 |
| SETA Support | SS/MIPR | NAWC Pt Mugu/ CA | 1,366 | 0 | N/A | 0 | N/A | 1,366 |
| CIO Support | MIPR | STRATCOM | 255 | 266 | 2Q | 301 | 2Q | 822 |
| CIO Travel | | | 79 | 106 | N/A | 120 | N/A | 305 |
| SETA | CPAF | SRS/ CO | 0 | 230 | 3Q | 260 | 3Q | 490 |
| **MDA Communications Infrastructure** | | | | | | | | |
| Leased Communications | MIPR | DISA/ IL | 1,274 | 1,613 | 1Q | 1,825 | 1Q | 4,712 |
| Leased Communications | MIPR | Army Rsch Lab/ MD | 2,533 | 2,307 | 2Q | 2,611 | 1Q | 7,451 |
| WAN Transport | C/CPAF | Northrop Grumman/ CO | 6,640 | 7,676 | 2Q | 8,109 | 2Q | 22,425 |
| Hub Services | MIPR | AFRL Hanscom/ MA | 10 | 11 | 1Q | 12 | 1Q | 33 |
| Hub Services | MIPR | AFRL Redstone/ AL | 23 | 22 | 1Q | 25 | 1Q | 70 |
| Leased Communications | MIPR | DTSW/ VA | 298 | 539 | 1Q | 610 | 1Q | 1,447 |
| SETA Support | CPFF | Anteon/ VA | 0 | 479 | 3Q | 542 | 3Q | 1,021 |
| Special Access WAN | MIPR | FEDSIM/SRA/ VA | 225 | 0 | N/A | 0 | N/A | 225 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Enterprise Information Assurance** | | | | | | | | |
| C&A Support | MIPR | FEDSIM/ VA | 1,452 | 2,867 | 2Q | 3,244 | 2Q | 7,563 |
| SETA C&A Support | MIPR | Anteon/ VA | 895 | 4,043 | 1/3Q | 4,574 | 1/3Q | 9,512 |
| NCR Info Assurance | C/CPAF | ZEN Tech/ VA | 4,562 | 5,056 | 1/3Q | 5,609 | 1/3Q | 15,227 |
| Enterprise Network Op Security Center | C/CPAF | Northrop Grumman/ CO | 3,990 | 7,029 | 2Q | 7,351 | 2Q | 18,370 |
| Disaster Recovery | C/CPAF | Northrop Grumman/ CO | 0 | 1,302 | 2Q | 1,473 | 2Q | 2,775 |
| PKI Support | C/CPAF | FEDSIM/ VA | 454 | 1,034 | 2Q | 1,170 | 2Q | 2,658 |
| Info Assurance Training | C/CPAF | FEDSIM/ VA | 300 | 319 | 2Q | 361 | 2Q | 980 |
| **Service IM/IT** | | | | | | | | |
| Service IM/IT | C/CPAF | SMDC/SAIC/ AL | 6,172 | 6,383 | 1/2Q | 6,653 | 1/2Q | 19,208 |
| Service IM/IT | C/CPAF | PEO ASMD/SAIC/ AL | 1,345 | 319 | N/A | 361 | N/A | 2,025 |
| Service IM/IT | C/CPFF | USAF/SAIC/ CA | 196 | 209 | 1/2Q | 236 | 1/2Q | 641 |
| **Computing & Network Management Services** | | | | | | | | |
| Computing & Network Services | C/CPFF | ZEN Tech/ MD | 0 | 17,116 | 2/3Q | 18,094 | 2/3Q | 35,210 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| IM/IT SETA Support | C/CPFF | Anteon/ VA | 0 | 4,521 | 3Q | 5,116 | 3Q | 9,637 |
| **Virtual Data Centers** | | | | | | | | |
| VDC Support | MIPR | Missile Defense Data Ctr/ AL | 348 | 0 | N/A | 0 | N/A | 348 |
| VDC Support | MIPR | Joint Natl Integ Ctr/ CO | 2,905 | 0 | N/A | 0 | N/A | 2,905 |
| VDC Support | MIPR | Missile Signature Ctr/ AL | 300 | 0 | N/A | 0 | N/A | 300 |
| VDC Support | MIPR | Naval Surface Warfare Ctr/ CA | 115 | 0 | N/A | 0 | N/A | 115 |
| **MDA Video Teleconferencing** | | | | | | | | |
| VTC Support and Maintenance | SS/CPAF | SGICOM/ VA | 4,256 | 5,816 | 1/3Q | 7,581 | 1/3Q | 17,653 |
| VTC Enterprise Engineering | C/CPAF | FEDSIM/ VA | 915 | 0 | N/A | 0 | N/A | 915 |
| Integration Support | C/CPAF | Northrop/ CO | 178 | 0 | N/A | 0 | N/A | 178 |
| SETA Support | C/CPFF | Anteon/ VA | 0 | 319 | 3Q | 361 | 3Q | 680 |
| **Computing Infrastructure** | | | | | | | | |
| Cabling | C/TM | Crawford/ MD | 0 | 300 | 1/2Q | 0 | N/A | 300 |
| IT HW/SW Equipment | MIPR | GSA | 0 | 4,872 | 1/2Q | 5,852 | N/A | 10,724 |
| **ITO South Computing Infrastructure** | | | | | | | | |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| ITO South IT Equipment/Lease | | Various | 276 | 5,517 | N/A | 4,271 | N/A | 10,064 |
| **Information Management Services** | | | | | | | | |
| Portal and VIPC support | SS/CPFF | CSC/ VA | 5,803 | 8,809 | 2/3Q | 9,994 | 1/2Q | 24,606 |
| SETA Support | C/CPFF | Anteon/ VA | 0 | 319 | 3Q | 361 | 3Q | 680 |
| Subtotal Support Costs | | | 62,769 | 111,843 | | 123,175 | | 297787 |

**Remarks**

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 )

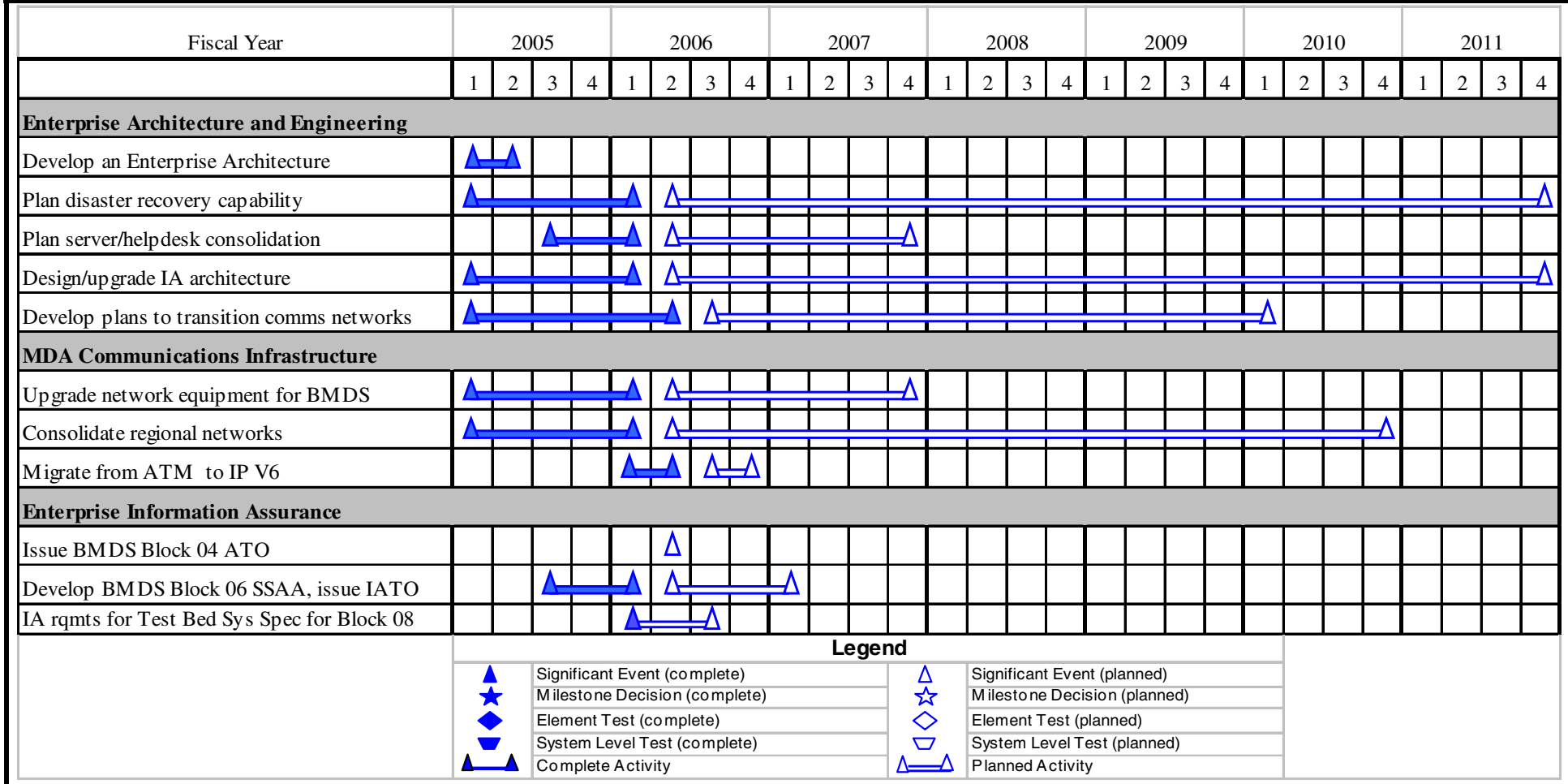
| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Subtotal Management Services | | | | | | | | |

**Remarks**

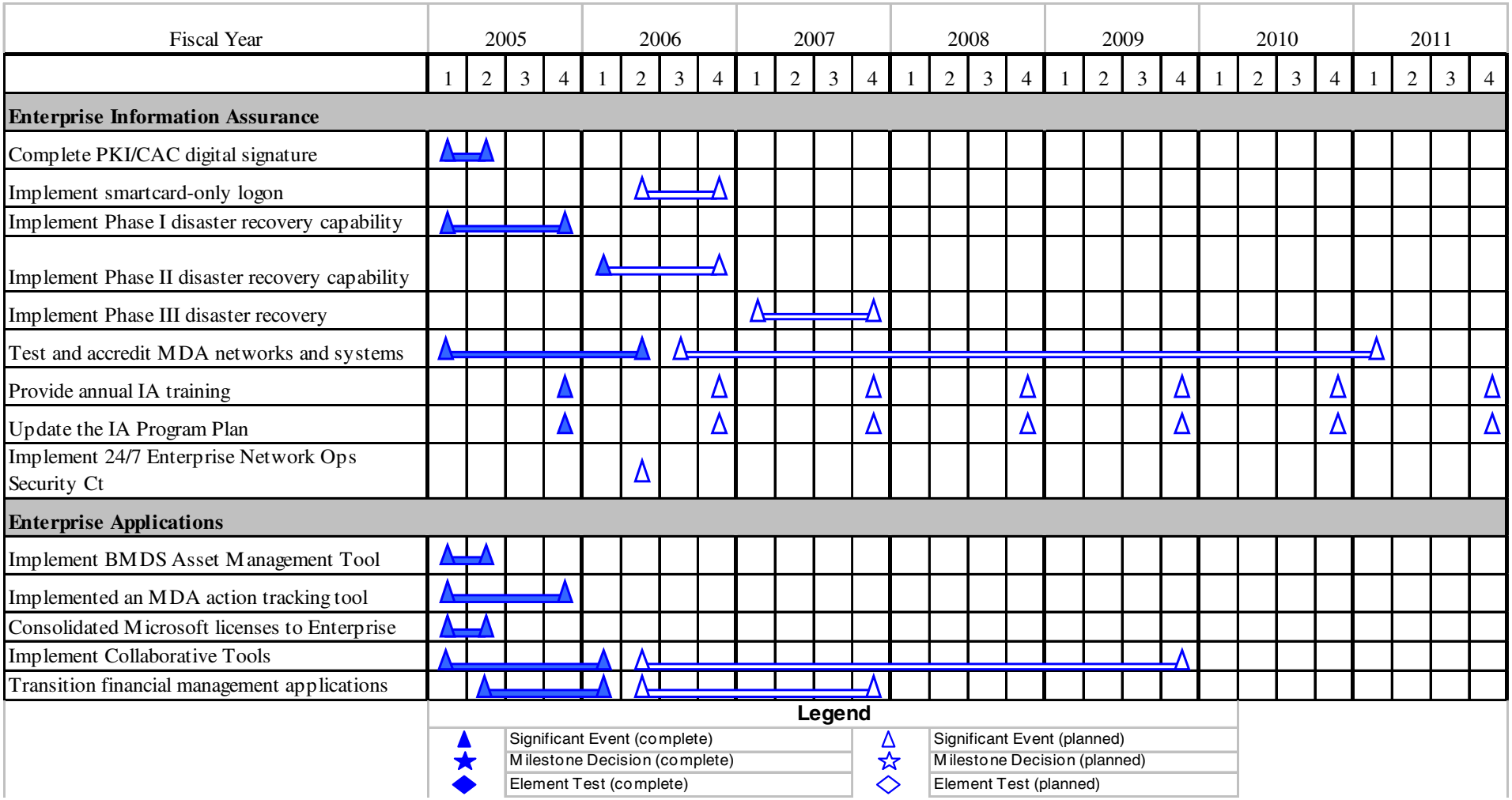
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 62,769 | 111,843 | | 123,175 | | 297,787 |

**Remarks**

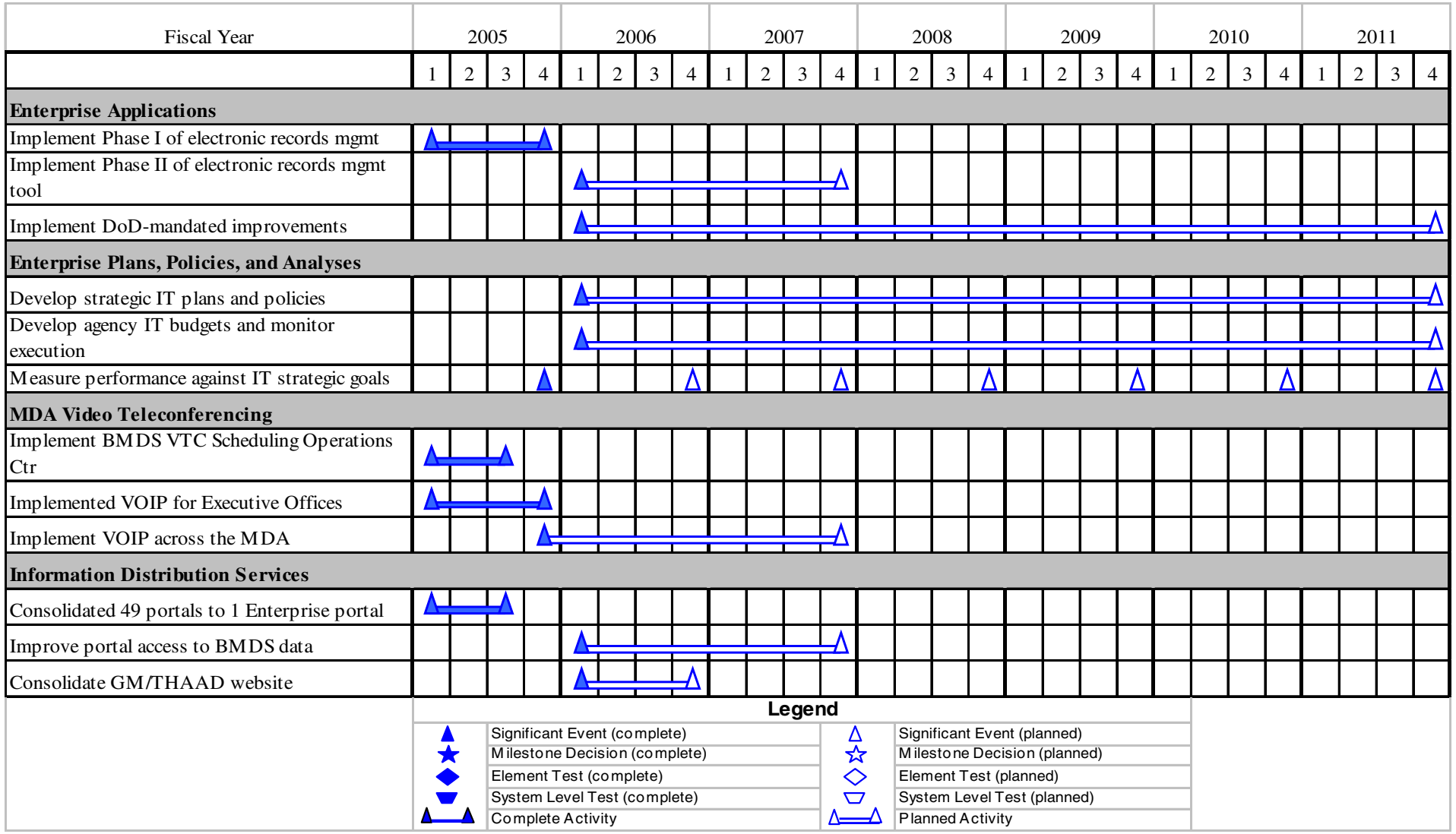
| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense System Core** |



| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 2006 |
|---|---|
| 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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Enterprise Architecture and Engineering** | | | | | | | |
| Develop an Enterprise Architecture | 1Q-2Q | | | | | | |
| Increased server capacity for IDO | 1Q-4Q | | | | | | |
| Plan disaster recovery capability | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q |
| Plan server/helpdesk consolidation | 3Q-4Q | 1Q-4Q | 1Q-4Q | | | | |
| Design/upgrade IA architecture | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q |
| Develop plans to transition comms networks | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q | |
| **MDA Communications Infrastructure** | | | | | | | |
| Fund DISA/DREN for comms and services | 1Q,1Q | 1Q,1Q | 1Q,1Q | 1Q,1Q | 1Q,1Q | 1Q | 1Q |
| Continue migration of circuits to DISA | | 1Q,2Q | | | | | |
| Execute Service Level Agreements for hub services | 1Q | 1Q | 1Q | 1Q | 1Q | | |
| Support recurring maintenance agreements | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q |
| Sustain operations of the MDA Wide Area Network | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q |
| Upgrade network equipment for BMDS | 1Q-4Q | 1Q-4Q | 1Q-4Q | | | | |
| Consolidate regional networks | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | |
| Migrate from ATM to IP V6 | | 1Q-4Q | | | | | |
| **Enterprise Information Assurance** | | | | | | | |
| Issue BMDS Block 04 ATO | | 2Q | | | | | |
| Develop BMDS Block 06 SSAA, issue IATO | 3Q-4Q | 1Q-4Q | 1Q | | | | |
| IA rqmts for Test Bed Sys Spec for Block 08 | | 1Q-3Q | | | | | |
| Complete PKI/CAC digital signature | 1Q-2Q | | | | | | |
| Implement smartcard-only logon | | 2Q-4Q | | | | | |
| Implement Phase I disaster recovery capability | 1Q-4Q | | | | | | |
| Implement Phase II disaster recovery capability | | 1Q-4Q | | | | | |
| Implement Phase III disaster recovery | | | 1Q-4Q | | | | |
| Test and accredit MDA networks and systems | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q |
| Submit FISMA Report | 3Q | 3Q | 3Q | 3Q | 3Q | 3Q | 3Q |
| Provide annual IA training | 4Q | 4Q | 4Q | 4Q | 4Q | 4Q | 4Q |
| Update the IA Program Plan | 4Q | 4Q | 4Q | 4Q | 4Q | 4Q | 4Q |
| Implement 24/7 Enterprise Network Ops Security Ct | | 2Q | | | | | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Enterprise Applications** | | | | | | | |
| Implement BMDS Asset Management Tool | 1Q-2Q | | | | | | |
| Implemented the BMDS University application | 1Q-4Q | | | | | | |
| Implement a Personnel Tracking System | 1Q-4Q | 1Q | | | | | |
| Implemented a System Development Schedule | 1Q-4Q | 1Q | | | | | |
| Implemented an MDA action tracking tool | 1Q-4Q | | | | | | |
| Consolidated Microsoft licenses to Enterprise | 1Q-2Q | | | | | | |
| Fund recurring enterprise application license fees | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q |
| Implement Collaborative Tools | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | | |
| Transition financial management applications | 2Q-4Q | 1Q-4Q | 1Q-4Q | | | | |
| Implement Phase I of electronic records mgmt | 1Q-4Q | | | | | | |
| Implement Phase II of electronic records mgmt tool | | 1Q-4Q | 1Q-4Q | | | | |
| Implement DoD-mandated improvements | | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q |
| **Virtual Data Centers** | | | | | | | |
| Completed conversion of BIRC to a Virtual Library | 2Q-4Q | | | | | | |
| Migrated VDC program into MDA Portals | 3Q-4Q | | | | | | |
| **Enterprise Plans, Policies, and Analyses** | | | | | | | |
| Develop strategic IT plans and policies | | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q |
| Develop agency IT budgets and monitor execution | | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q |
| Measure performance against IT strategic goals | 4Q | 4Q | 4Q | 4Q | 4Q | 4Q | 4Q |
| Update Info Security Approach w/evolving DoD Stnds | 1Q-4Q | | | | | | |
| Submit DOJ Section 508 Survey | 1Q | 1Q | 1Q | 1Q | 1Q | | |
| Implement a SW Asset Management Program | | | | | 4Q | | |
| Provide Quarterly Update to DITPR | 1Q,2Q,3Q,4Q | 1Q,2Q,3Q,4Q | 1Q,2Q,3Q,4Q | 1Q,2Q,3Q,4Q | 1Q,2Q,3Q,4Q | | |
| Coordinate FISMA review, inspection, audit | 2Q | 2Q | 2Q | 2Q | 2Q | | |
| Update DITPR Quarterly | 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 |
| Submit updates to PMA/PART E-Gov | 3Q | 3Q | 3Q | 3Q | 3Q | 3Q | 3Q |
| Submit Agency IT Resources Exhibit 53 | 4Q | 4Q | 4Q | 4Q | 4Q | 4Q | 4Q |
| IT/NSS Commercial-Off-The-Shelf (COTS) SW/Services | 1Q | 1Q | 1Q | 1Q | 1Q | 1Q | 1Q |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **MDA Video Teleconferencing** | | | | | | | |
| Implement BMDS VTC Scheduling Operations Ctr | 1Q-3Q | | | | | | |
| Implemented VOIP for Executive Offices | 1Q-4Q | | | | | | |
| Implement VOIP across the MDA | 4Q | 1Q-4Q | 1Q-4Q | | | | |
| Sustain VTC operations and maintenance | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q |
| **Computing Infrastructure** | | | | | | | |
| Maintain software licenses for the NCR | 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 |
| Sustain O&M of IM/IT infrastructure | | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q |
| **Information Distribution Services** | | | | | | | |
| Consolidated 49 portals to 1 Enterprise portal | 1Q-3Q | | | | | | |
| Improve portal access to BMDS data | | 1Q-4Q | 1Q-4Q | | | | |
| Consolidate GM/THAAD website | | 1Q-4Q | | | | | |
| Sustain the O&M of the VIPC | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q |
| **Computing & Network Management Services** | | | | | | | |
| Continue operations of the NCR LAN/WAN | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q |
| Support BRAC and transition planning | | 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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0106 Modeling & Simulation | 0 | 92,577 | 103,419 | 107,740 | 109,770 | 111,222 | 112,538 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: 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 Missile Defense Agency is developing the capability to defend the homeland, its friends, allies and deployed forces against ballistic missiles of all ranges, in all phases of their flight. The Ballistic Missile Defense System exploits maturing capabilities, both national and in the theater to build an integrated, highly capable defense. As we bring new capabilities to the war fighter, the ``plug and fight`` missile defense system increases its effectiveness through the use of new engagement sequence groups. These engagement sequences take advantage of air, land, sea and space components to maximize the probability of kill, expand the area we can defend and decrease the area from which our enemy can launch, as well as minimize the number of weapons we need in the inventory. Likewise, we are developing a modeling and simulation framework that reflects the open architecture we envision for the Ballistic Missile Defense system.

The mission of the Agency's Modeling and Simulation program is to establish a tool set for planning, engineering, testing and operating an integrated ballistic missile defense system. Specific modeling and simulation products map to the six agency venues: ground tests, flight tests, war games, analysis, training and element testing. For each of these venues and their stakeholders, we define, design, develop, deploy and maintain system simulations, including their constituent subsystem, threat and environment models, and provide user and analytical support services. In addition, we are responsible for requirements development, configuration control, verification, validation and accreditation, facility and infrastructure planning, information assurance and risk management.

The modeling and simulation enterprise uses a centrally managed - distributed execution management paradigm drawing on the existing geographically dispersed workforce to accurately and credibly represent the system, its threats and the multitude of environments. Our implementation teams consisting of the Element project offices and our Modeling and Simulation Centers of Excellence at the U.S. Army Space and Missile Defense Center in Huntsville, Alabama and the Agency's Joint National Integration Center in Colorado Springs, Colorado have highly capable teams and state of the art facilities already onsite around the country, servicing the design, development and testing needs of the Agency. The Agency's Modeling and Simulation Directorate comprises a modest, simulation-literate team of government, Federally Funded Research and Development Center and University Affiliated Research Center staff; it sets policy, leads system engineering and centrally manages the Agency-wide enterprise.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense System Core** |

MODEL DEVELOPMENT

Modeling and simulation is required in every facet of fielding a credible missile defense system from capability needs analysis to activation of the system. The Agency's system engineering process guides our program strategy and implementation.

Our comprehensive Modeling and Simulation plan based on Agency and War fighter needs described in the Needs Statement and Capabilities Requirements Document includes modifying and sustaining our legacy tools, developing an integrated simulation open architecture and framework, defining a Common Environment and Threat Model and building a foundation of international missile defense initiatives.

We have defined a simulation architecture that mirrors the Ballistic Missile Defense System's open architecture. Moving to an open simulation architecture, we accrue significant benefits. Plugging and fighting element models within the architecture assures that we have a flexible tool set, anchored by high fidelity, engineering level models with a vast store of verification and validation data. We are also evolving to a multi-layer modeling and simulation framework within which the models described above will operate. This standardized simulation framework, called the Open Architecture Simulation System, or OASiS, customized for various uses optimizes commonality and potentially reduces infrastructure complexity. In FY05 - FY06 we defined framework standards and specifications. In FY07, we apply resources to reconfigure models to meet these standards.

Over the last decade, the Agency has developed a number of element, component and system tools. These tools evolved to meet the needs of our formerly stand-alone theater and strategic weapons. Our approach leverages investments already made in these legacy assets, including the Missile Defense Wargaming Resource 2000 (MDWAR), transitioning to Ballistic Missile Defense System Simulation (BMDS Sim) in FY06, and the Missile Defense System Exerciser (MDSE) to meet near term needs while we migrate them to the framework and standards described.

In FY05 and FY06 we applied funds to MDWAR/BMDS Sim to support war fighter exercises, war games, and element testing. In FY06 we applied development funds to MDWAR/BMDS Sim in support of WG 04-5, GT 06-1, and GT 06-2. In FY07, we fund upgrades to evolve the tool to continue to support these venues for Block 2006 as well as migrate to OASiS standards.

We invested FY05-2006 resources to evolve the MDSE architecture for Block 2004 system ground testing to include CGT 06-1 & 2 and IGT 06-1. FY07 and out year resources modify the tool architecture to permit testing of the Block 2006 system ground testing, IGT 06-2 and migrate to OASiS standards.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense System Core |

In FY05 and FY06 we invested resources in to two Block 2004 performance assessment tools, the BMDS Sim and BMDS Analysis Federation. Data from these tools support Agency Interim Capability Assessment Reports and Capability Assessment Reports. In FY07 we continue to support development of Block 2006 performance assessment tools.

In addition to these assessment tools in FY05 and FY06 we applied funds to risk reduction efforts. These risk reduction efforts include a C2BMC Planner and modifying BMDS Sim to OASiS standards. In FY07 we continue model and tool development to meet OASiS standards.

To respond to a rapidly changing threat and take advantage of advances in technology, we define a Common Environment and Threat Model (CETM). The model provides a standard framework and rule set for representing the battle space environment and adversary capabilities. The domain of the model includes active and passive signatures of threat objects and their kinematics and operational behaviors, the relevant natural and perturbed battle space environment, the effects of this environment on threats and defensive systems, and a common way of dealing with the consequences of missile defense engagements. We applied FY05-2006 resources to define the CETM and consolidate existing phenomenology tools to include Parametric Endo-Exo Lethality Simulation (PEELS), Post Engagement Ground Effects Model (PEGEM), Kinetic Impact Debris Distribution (KIDD), Performance Assessment Workbench Software (PAWS), CT-Analyst, Battlespace Environment and Signatures Toolkit (BEST), Strategic Scene Generation Model (SSGM), and Optical Signature Code (OSC). In FY07 and beyond, we will migrate the tools to this framework.

To support Agency and Department international goals, we are building a foundation for international missile defense initiatives by partnering on defining requirements and interfaces for an open system modeling framework. Defining our modeling and simulation requirements up front with our friends and allies, we can ensure compatibility of our simulation architecture at all levels with future missile defense partners. Compatibility of our simulation architecture significantly increases our ability to develop interoperable missile defense elements both theater and global. It also establishes a laboratory for exploring concept of operations, battle management command and control networks and capability assessment. In FY05 and 2006, we established cooperative work with the North Atlantic Treaty Organization, Australia and the United Kingdom. In FY07, we plan additional bi-lateral initiatives in both the Pacific and European regions.

TEST AND OPERATIONS

One of our key cornerstones is promoting the Agency's simulation-based acquisition of the Ballistic Missile Defense System. Obtaining a statistically relevant set of flight data to characterize our system is unachievable. Therefore models and simulation anchored to data from well-contrived flight tests are fundamental tools for verifying and assessing system performance. The Agency employs an integrated approach to testing, bringing together

the contributions of various elements into combined system tests. The Agency's Integrated Master Test Plan specifies the tests that require modeling and simulation products as well as the sources of real-world data to anchor those products.

The Modeling and Simulation Resource Master Plan allocates execution and resources to the Centers of Excellence. The Modeling and Simulation Center of Excellence at the U.S. Army Space and Missile Defense Center operates and maintains the facilities and infrastructure necessary to execute hardware-in-the-loop ground testing. The Missile Defense System Exerciser facilitates these ground tests. The Modeling and Simulation Center of Excellence at the Joint National Integration Center installs, operates and maintains digital simulation hardware and software at the Center as well as designated element locations. In FY05 and FY06 these Centers of Excellence supported the execution of Block 2004 and 2006 Ground Tests and Wargames, and will continue through 2007.

MODELING AND SIMULATION ENGINEERING AND INTEGRATION

The Modeling and Simulation Program Directorate leads an integrated Agency team leveraging skills from the Element program offices, the modeling and simulation Centers of Excellence, industry and academia to accomplish the mission. In addition to establishing Agency policy and strategic direction, one of the primary responsibilities of the program is to develop, proliferate and maintain common standards across the enterprise including the architecture, framework, models, interfaces and quality assurance.

To help meet this responsibility, the Directorate establishes enterprise-wide processes including; requirements engineering, development, configuration management, and verification, validation and accreditation. We use the requirements engineering process to develop requirements based on stakeholder needs (including the Block Test Bed System Specifications), estimate implementation costs and risks and develop modeling and simulation support plans. We use the development process to formulate implementation concepts and design specifications to meet these requirements, develop software and components, perform integration and checkout and deploy modeling and simulation capabilities to the venues. We use the configuration management process to archive and manage modeling and simulation-related programmatic data, design and interface information, as well as control upgrade and release of model and simulation components. The verification, validation and accreditation process ensures that the models and simulation we implement meet the designer's intent, adequately represent reality and are appropriate for their intended use.

In FY05 and FY06 we developed and updated the Modeling and Simulation Strategic Plan, System Engineering Management Plan, Needs Statement, and Capability Requirements Document. In 2007 we update the Modeling and Simulation Needs Statement and Capability Requirements Document to incorporate Block 2008 changes.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense System Core** |

In FY06 we initiated a Verification, Validation, and Accreditation process for BMDS level system models. Within this process the responsible Centers of Excellence identify and deliver the required validation evidence including plans and reports needed for model accreditation. The Modeling and Simulation Program Directorate is responsible for configuration and accrediting the M&S Tools to meet Agency needs.

**B. Accomplishments/Planned Program**

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Model Development | 0 | 68,252 | 79,971 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Modeling and simulation is required in every facet of fielding a credible missile defense system from capability needs analysis to activation of the system.

FY06 Planned Program:
- Updates of BMDS simulations (BMDS SIM, MDSE) for Ground Test and Integrated Missile Defense Exercises
- Updates of industry standard lethality, ground effects and debris dispersion phenomenology codes (PEELS, PEGEM and KIDD)
- Updates threat and scene generation codes (BEST, SSGM and OSC)
- Update Open Architecture Simulation System (OASiS) Model and Framework Specifications
- OASiS-based Analysis Engine for the BMDS Planner
- Constructive Analysis Federation Prototype 1
- OASiS middleware risk reduction
- OASiS simulation engine risk reduction

FY07 Planned Program:
- Updates of BMDS simulations (BMDS SIM, MDSE) Ground Test and Integrated Missile Defense Exercises
- Updates of industry standard lethality, ground effects and debris dispersion phenomenology codes (PEELS, PEGEM and KIDD)
- Updates of threat and scene generation codes (BEST, SSGM and OSC)
- Update Open Architecture Simulation System (OASiS) Model and Framework Specifications
- OASiS-based Analysis Engine for the BMDS Planner
- Constructive Analysis Federation Prototype 2 - OASiS compliant
- OASiS risk reduction aimed at transition to legacy simulations

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 |
|---|---|---|---|
| Product Test and Operations | 0 | 12,025 | 10,950 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Models and simulations anchored to data from well-contrived flight tests are fundamental tools for verifying and assessing system performance. The Agency employs an integrated approach to testing, bringing together the contributions of various elements into combined system tests.

FY06 Planned Program:
- Accredit Models and Simulations for Core Intended Uses
- Develop Accreditation Reports
- Facility/Test support for test events
- Release Accreditation Plans and Final Report
- Test Event Assessment Reports
- Sustainment of core facilities and capabilities
- Support test events including GTC 06-1, WG 06-2, GTC 06-2, and GTI 06-1

FY07 Planned Program:
- Accredit Models and Simulations for Core Intended Uses
- Develop Accreditation Reports
- Facility/Test support for test events
- Release Accreditation Plans and Final Report
- Test Event Assessment Reports
- Support test events including WG 06-3, WG 06-4, GTC 06-3, GTI 06-2, GTC 06-4, and WG 06-5

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Systems Engineering and Integration (SE&I) | 0 | 12,300 | 12,498 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The Modeling and Simulation Program Directorate leads an integrated Agency team leveraging skills from the Element program offices, the modeling and simulation Centers of Excellence, industry and academia to accomplish the mission.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603890C Ballistic Missile Defense System Core |

FY06 Planned Program:

- Update Modeling and Simulation System Engineering Management Plan
- Update Block 06 Modeling and Simulation Needs Statement
- Update Block 06 Modeling and Simulation Capability Requirements Document
- Update Block 06 Modeling and Simulation Implementation Plans
- Establish Modeling and Simulation Enterprise Verification, Validation and Accreditation Process
- Establish Modeling and Simulation Enterprise Requirements Engineering Process

FY07 Planned Program:

- Block 08 Modeling and Simulation Needs Statement
- Block 08 Modeling and Simulation Capability Requirements Document
- Block 08 Modeling and Simulation Implementation Plans
- Establish Modeling and Simulation Enterprise Configuration Control Process
- Establish Modeling and Simulation Enterprise Development Control Process

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## D. Acquisition Strategy

The M&S acquisition strategy is to build an integrated open system framework (OASiS) for Block 2006 and beyond. We implemented a centralized management and decentralized execution approach to achieving this goal. We leverage the use of legacy M&S Tools and element M&S Tools to fit within this new framework and support the spiral development of the BMDS. The Modeling and Simulation Centers of Excellence at Colorado Springs and Huntsville execute modeling and simulation implementation plans to deliver the desired capabilities and tools. The results of the requirements engineering, risk reduction, and knowledge-based requirements will drive future investments.

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Model Development** | | | | | | | | |
| Consolidated and Integrated M&S (CIMS) | C/CPAF | Northrup Gruman/ CO | 0 | 24,912 | 1/2Q | 27,553 | 1Q | 52,465 |
| V&V | C/CPAF | Dynamics Solutions Inc. and NG/ CO | 0 | 2,790 | 1/2Q | 2,830 | 1Q | 5,620 |
| MDSE | C/CPFF | TBE/ AL | 0 | 7,031 | 1/2Q | 7,031 | 1Q | 14,062 |
| MDSE - Patriot | MIPR | AMRDEC SED/ AL | 0 | 766 | 1/2Q | 766 | 1Q | 1,532 |
| MDSE - Aegis BMD | SS/CPAF | Lockheed Martin/ NJ | 0 | 1,108 | 1/2Q | 1,108 | 1Q | 2,216 |
| MDSE - Aegis BMD | MIPR | NSWC Dahlgren/ VA | 0 | 640 | 1/2Q | 640 | 1Q | 1,280 |
| MDSE - SBIRS | SS/CPAF | Northrup Gruman/ CA | 0 | 686 | 1/2Q | 686 | 1Q | 1,372 |
| MDSE - JTAGS | SS/CPFF | Northrup Gruman/ CA | 0 | 600 | 1/2Q | 600 | 1Q | 1,200 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| MDSE - GMD | C/CPFF | Boeing/ AL | 0 | 1,400 | 1/2Q | 1,400 | 1Q | 2,800 |
| MDSE - FBX-T | SS/CPAF | Raytheon/ MA | 0 | 2,550 | 1/2Q | 2,550 | 1Q | 5,100 |
| MDSE - TCES | MIPR | SSC San Diego/ CA | 0 | 1,885 | 1/2Q | 1,885 | 1Q | 3,770 |
| MDSE - C2BMC | MIPR | Various/ CO | 0 | 0 | N/A | 500 | 1Q | 500 |
| MDSE - THAAD | SS/CPAF | TMI/ AL | 0 | 2,000 | 1/2Q | 2,000 | 1Q | 4,000 |
| V&V - Verification | C/CPFF | TBD/ Competitive | 0 | 870 | 2/3Q | 870 | 1Q | 1,740 |
| V&V - Element Validation | MIPR | Various | 0 | 2,000 | 2Q | 2,000 | 1Q | 4,000 |
| Risk Reduction | MIPR | Boeing/ VA | 0 | 1,321 | 2Q | 0 | N/A | 1,321 |
| Risk Reduction | C/CPAF | Lockheed Martin/ VA | 0 | 500 | 2Q | 0 | N/A | 500 |
| Risk Reduction | C/CPAF | Lockheed Martin and Boeing/ VA | 0 | 2,033 | 2/3Q | 5,378 | 1Q | 7,411 |
| Phenomenology | C/CPFF | TSI/ AL | 0 | 700 | 1/2Q | 700 | 1Q | 1,400 |
| CETM / Lethality | Various | Various | 0 | 3,800 | 1/2Q | 3,800 | 1Q | 7,600 |
| OASIS | Various | Various | 0 | 3,508 | 1/2Q | 6,948 | 1Q | 10,456 |
| EADSIM | C/CPFF | TBE/ AL | 0 | 1,840 | 1Q | 0 | N/A | 1,840 |
| International | MIPR | MITRE/ VA | 0 | 100 | 1Q | 0 | N/A | 100 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| International | MIPR | SPARTA/ VA | 0 | 705 | 1/2Q | 738 | 1Q | 1,443 |
| International | MIPR | PRA/ VA | 0 | 370 | 1/2Q | 387 | 1Q | 757 |
| International | Various | Various | 0 | 425 | 1/2Q | 396 | 1Q | 821 |
| M&S Tools | Various | Various | 0 | 1,798 | 3/4Q | 7,541 | 2/3Q | 9,339 |
| MDSE | C/CPFF | TBD/ Competitive | 0 | 864 | 1/2Q | 864 | 1Q | 1,728 |
| MDSE - DMOC | MIPR | Various/ CO | 0 | 400 | 1/2Q | 400 | 1Q | 800 |
| MDSE - MCUSMC | SS/CPFF | Sensis Corp/ CA | 0 | 400 | 1/2Q | 400 | 1Q | 800 |
| EADTB | C/CPAF | Raytheon/ AL | 0 | 250 | 1/2Q | 0 | 4Q | 250 |
| **Product Test and Operations** | | | | | | | | |
| Computational Facilities | Various | Various | 0 | 12,025 | 1/2Q | 10,950 | 1Q | 22,975 |
| Subtotal Support Costs | | | 0 | 80,277 | | 90,921 | | 171198 |

**Remarks**

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Systems Engineering and Integration (SE&I)** | | | | | | | | |
| Requirements Engineering (UARC) | SS/CPFF | JHU/APL/ MD | 0 | 2,210 | 1/2Q | 2,271 | 1Q | 4,481 |
| M&S Architecture (FFRDC) | SS/MIPR | MIT/LL/ MA | 0 | 1,471 | 1/2Q | 1,596 | 1Q | 3,067 |
| Program Plans (FFRDC) | SS/CPFF | MITRE/ VA | 0 | 2,210 | 1/2Q | 2,261 | 1Q | 4,471 |
| Gov`t Personnel | | MDA/ VA | 0 | 1,124 | 1Q | 1,149 | 1Q | 2,273 |
| Travel | | MDA/ VA | 0 | 100 | 1Q | 104 | 1Q | 204 |
| Gov`t Personnel | | SMDC/ AL | 0 | 2,443 | 1Q | 2,277 | 1Q | 4,720 |
| Travel | | SMDC/ AL | 0 | 250 | 1Q | 262 | 1Q | 512 |
| SETA | C | SMDC/ AL | 0 | 1,792 | 1/2Q | 1,845 | 1Q | 3,637 |
| SETA | C | SRS/ JNIC / CO | 0 | 700 | 1/2Q | 733 | 1Q | 1,433 |
| Subtotal Management Services | | | 0 | 12,300 | | 12,498 | | 24798 |

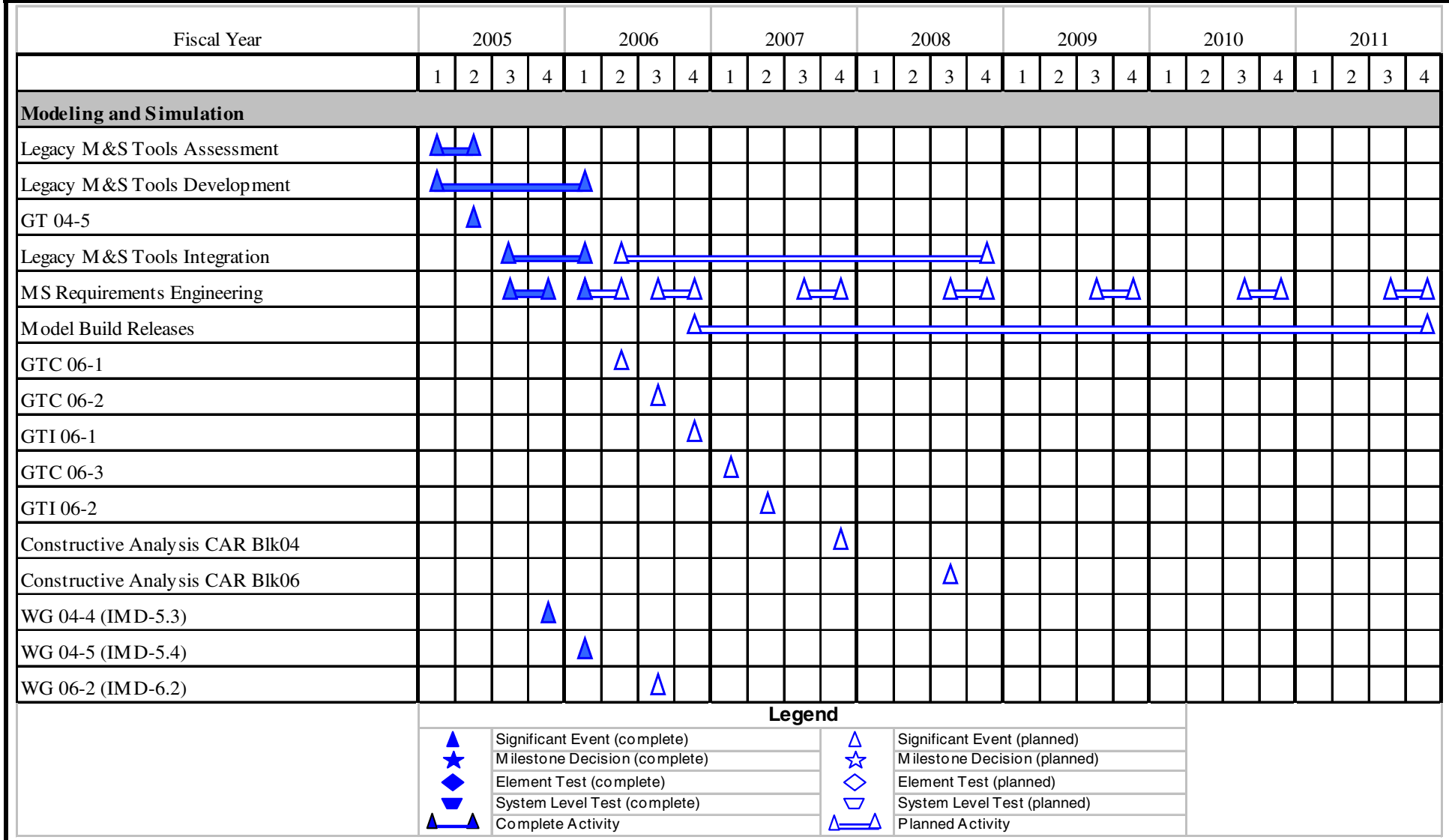
**Remarks**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 0 | 92,577 | | 103,419 | | 195,996 |

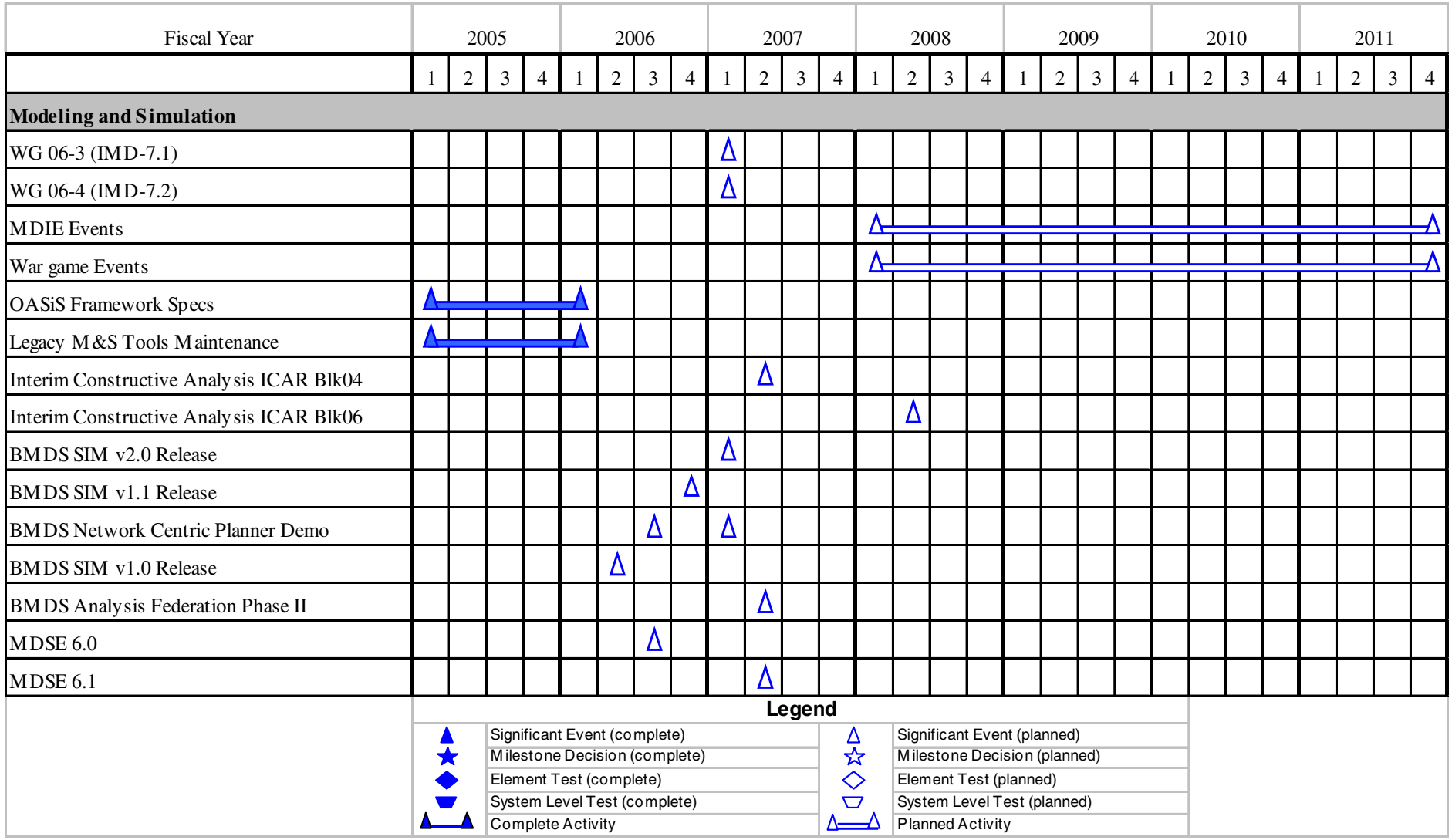
**Remarks**

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 2006 |
|---|---|
| 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 2006 |
|---|---|
| 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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Modeling and Simulation** | | | | | | | |
| Legacy M&S Tools Assessment | 1Q-2Q | | | | | | |
| Legacy M&S Tools Development | 1Q-4Q | 1Q | | | | | |
| GT 04-5 | 2Q | | | | | | |
| Legacy M&S Tools Integration | 3Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | | | |
| MS Requirements Engineering | 3Q-4Q | 3Q-4Q | 3Q-4Q | 3Q-4Q | 3Q-4Q | 3Q-4Q | 3Q-4Q |
| Model Build Releases | | 4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q |
| GTC 06-1 | | 2Q | | | | | |
| GTC 06-2 | | 3Q | | | | | |
| GTI 06-1 | | 4Q | | | | | |
| GTC 06-3 | | | 1Q | | | | |
| GTI 06-2 | | | 2Q | | | | |
| MS O&F | 1Q-4Q | 1Q | | | | | |
| Strategic Plan | 2Q-4Q | | | | | | |
| M&S SEMP | 1Q-4Q | | | | | | |
| Needs Statement | 3Q-4Q | | | | | | |
| Capabilities Requirements Document | 4Q | 1Q | | | | | |
| Implementation Plan | 4Q | 1Q | | | | | |
| International Seminar | | 1Q | | | | | |
| Vigilent Shield Event | | 1Q | | | | | |
| USFJ Demo | | 2Q | | | | | |
| JPOW | | 2Q | | | | | |
| JEFX -Event | | 3Q | | | | | |
| Constructive Analysis CAR Blk04 | | | 4Q | | | | |
| Constructive Analysis CAR Blk06 | | | | 3Q | | | |
| WG 04-4 (IMD-5.3) | 4Q | | | | | | |
| WG 04-5 (IMD-5.4) | | 1Q | | | | | |
| WG 06-2 (IMD-6.2) | | 3Q | | | | | |
| WG 06-3 (IMD-7.1) | | | 1Q | | | | |
| WG 06-4 (IMD-7.2) | | | 1Q | | | | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| MDIE Events | | | | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q |
| War game Events | | | | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q |
| OASiS Framework Specs | 1Q-4Q | 1Q | | | | | |
| Legacy M&S Tools Maintenance | 1Q-4Q | 1Q | | | | | |
| Interim Constructive Analysis ICAR Blk04 | | | 2Q | | | | |
| Interim Constructive Analysis ICAR Blk06 | | | | 2Q | | | |
| BMDS SIM v2.0 Release | | | 1Q | | | | |
| BMDS SIM v1.1 Release | | 4Q | | | | | |
| BMDS Network Centric Planner Demo | | 3Q | 1Q | | | | |
| BMDS SIM v1.0 Release | | 2Q | | | | | |
| BMDS Analysis Federation Phase II | | | 2Q | | | | |
| MDSE 6.0 | | 3Q | | | | | |
| MDSE 6.1 | | | 2Q | | | | |

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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0107 Safety, Quality and Mission Assurance | 3,206 | 17,833 | 25,900 | 31,800 | 41,100 | 40,100 | 40,500 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: The prior year (PY) and the FY05 funding for Safety, Quality, and Mission Assurance the amount of $12 million is captured in PE 0603882C Project 0602.*

**A. Mission Description and Budget Item Justification**

As a critical activity in the Ballistic Missile Defense System (BMDS), the Safety, Quality and Mission Assurance Directorate has the mission of ensuring the successful implementation throughout all Missile Defense Programs. This Directorate serves as the Missile Defense Agency's agent responsible for establishing and maintaining safety, quality and mission assurance throughout all aspects of the Ballistic Missile Defense System. The Safety, Quality and Mission Assurance Directorate provides Mission Assurance support for all Missile Defense Agency organizations and Elements to ensure and verify Capability, Testability, Reliability, Maintainability, Availability, Suitability, Producibility, and Supportability of the Ballistic Missile Defense System and compliance with all relevant laws and regulations. Other critical and essential activities for the Safety, Quality and Mission Assurance Directorate's includes advising senior management on the viability of industry, develop and implement policies, perform engineering and technical assessments and ensure Missile Defense Agency system-wide safety, quality and mission assurance (SQMA) throughout the design, development, production and operation of the Ballistic Missile Defense System. Within the Safety, Quality and Mission Assurance Directorate, responsibilities are functionally allocated to four groups; Assurance Integration, Mission Assurance, Quality Assurance and Safety.

In addition, the Safety, Quality and Mission Assurance Directorate 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. The safety, quality and mission assurance, 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. SQMA has also been given the responsibility for developing and implementing an MDA High Reliability Parts (HRP) management program to identify key parts/materials issues to ensure overall MDA and BMDS success.

Safety, Quality and Mission Assurance efforts enable the development, testing and fielding of an effective, reliable, and safe missile defense capability. To ensure the BMDS can meet its performance, schedule, quality, safety, and mission assurance requirements, MDA SQMA principles and disciplines are being applied throughout each individual element and the BMDS as a whole. These functions include establishment of BMDS safety plans, development and maintenance of the MDA Mission Assurance Provisions (MAP), BMDS development and maintenance of Mission

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense System Core** |

Assurance Provision Implementation Plans (MAIPs), independent technical assessments of BMDS element SQMA efforts, establishing relationships with DOD and Military Service SQMA organizations, instituting SQMA in MDA acquisitions and establishing a Quality-centric culture and implementation to ensure mission success. Implementation and maintenance of SQMA disciplines are key to providing an effective war-fighting capability and ensuring all phases, including life-cycle support, are addressed within the confines on the BMDS. Once SQMA disciplines and techniques are established throughout MDA, it is essential to maintain those efforts throughout the BMDS life cycle.

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 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Safety, Quality and Mission Assurance | 3,206 | 17,833 | 25,900 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

The prior year (PY) and the FY05 funding Safety, Quality, and Mission Assurance the amount of $12 million is captured in PE 0603882C Project 0602.

MDA/QS has significantly enhanced the mission success of the BMDS by implementing advanced SQMA concepts and techniques to effectively integrate Capability, Testability, Reliability, Maintainability, Availability, Suitability, Producibility, and Supportability into all phases of the BMDS life cycle. Our embedded/on-site Quality and Safety personnel have provided significant improvements to all aspects of BMDS design, production and testing.

FY05 Accomplishment:

- Conducted four unannounced Agency Mission Assurance audits at Raytheon - Tucson, AZ; Lockheed Martin - Troy, AL; Lockheed Martin - Sunnyvale, CA; Orbital - Chandler, AZ; and Boeing - Brownsville, TX that significantly enhanced the quality of BMDS products and systems
- Developed Mission Assurance Provisions for all BMDS Elements to standardize BMDS design, development, production, testing, fielding and operations.
- Coordinated implementation of Mission Assurance Implementation Provisions (MAIPS) for all BMDS Elements
- Safety, Quality and Mission Assurance (SQMA) Functions
  - Conducted four SQMA forums with DOD and industry to develop and disseminate SQMA Lessons Learned
  - Provided SQMA technical support to MDA Elements that improved their SQMA efforts.

- Established MDA Metrics Program to provide information on the health of the BMDS to MDA management
- Embedded SQMA personnel in Elements to provide needed expertise to guarantee that safety and quality was incorporated in their efforts
- Participated in the BMDS Joint Reliability, Availability, Maintainability Evaluation Team (JRMET) that determined BMDS effectiveness
- Implemented MDA's Safety and Quality Concerns Hotline as required by DOD regulation

- MDA Safety Functions
  - Established MDA safety policies and requirements as required by law and DOD regulations
  - Developed Capability Verification and Assessment addendum detailing the capability of the BMDS to operate safely in Block 2004
  - Established an MDA Safety Review Board, MDA Range Safety Council and BMDS Safety Working Groups that ensured that all BMDS activities are conducted safely.
  - Implemented an MDA Safety and Occupational Health (SOH) Mishap Investigation Program
  - Developed Agency-wide Range safety mediation, augmentation and commonality program to enhance BMDS safety.
  - Developed and implemented the MDA BMDS Safety Officer Program to ensure that the BMDS is operated safely when in test or operational modes.
  - Conducted required Occupational Safety and Health Inspections
- Software Acquisition (As required by Law - Section 804)
  - Developed a Software Acquisition Program Improvement Plan (SAIIP)
  - Developed initial MDA Software Readiness Level documents (SWRLs)
  - Revised and implemented the MDA Software Acquisition Process Framework (MSAPF)

FY06 Planned Program:

- Conduct up to 6 unannounced Agency Mission Assurance audits to continue enhancement of quality in BMDS products
- Implement the MDA Assurance Provisions via prime contracts to standardize BMDS design, development, production, testing, fielding and operations.
- Safety, Quality and Mission Assurance (SQMA) Functions
  - Schedule quarterly BMDS Safety, Quality and Mission Assurance forums to develop and disseminate SQMA Lessons Learned
  - Maintain embedded QS personnel in MDA organizations and elements to provide Quality and Mission Assurance expertise to enhance their SQMA efforts
  - Provide technical support to MDA programs to meet all Safety, Quality and Mission Assurance requirements to ensure that safety and quality is incorporated in their efforts.
  - Manage the integrated MDA Metrics Program to provide information on the health of the BMDS to MDA management

- Continue participation in the BMDS Joint Reliability, Availability, Maintainability Evaluation Team (JRMET) to determine BMDS effectiveness
- Maintain MDA's Safety and Quality Concerns Hotline as required by DOD regulation

- MDA Safety Functions
  - Maintain and update MDA safety policies and requirements
  - Develop Capability Verification and Assessment addendum detailing the capability of the BMDS to operate safely in Block 2006
  - Maintain the MDA Safety Review Board, MDA Range Safety Council and BMDS Safety Working Groups to ensure that all BMDS activities are conducted safely.
  - Manage the MDA Safety and Occupational Health Mishap Investigation Program
  - Conduct independent Safety Assessments/Reviews of MDA programs and Elements to enhance BMDS safety
  - Maintain the Range Safety mediation, augmentation and commonality program
  - Manage the MDA BMDS Safety Officer Program to ensure that the BMDS is operated safely when in test or operational modes.
  - Perform all required Occupational Safety and Health Inspections of MDA facilities
- Software Acquisition ((As required by Law - Section 804))
  - Implement the Software Acquisition Program Improvement Plan (SAIIP)
  - Complete the MDA Software Readiness Level documents (SWRLs)
  - Implement the MDA Software Acquisition Process Framework (MSAPF)
  - Develop an MDA Software Acquisition Training/Education Program (SAT/EP)
  - Develop an MDA Software Verification and Validation Program

FY07 Planned Program:

- Conduct up to 8 unannounced Agency Mission Assurance audits to enhance the quality of BMDS products
- Continue to implement the MDA Assurance Provisions via prime contracts to standardize BMDS design, development, production, testing, fielding and operations.
- Safety, Quality and Mission Assurance (SQMA) Functions
  - Assess degree of MAP implementation through Supplier and Program assessments
  - Conduct quarterly BMDS Safety, Quality and Mission Assurance forums to develop and disseminate SQMA Lessons Learned
  - Maintain embedded QS personnel in MDA organizations and elements to provide Quality and Mission Assurance expertise to enhance their SQMA efforts

- Continue to provide technical support to MDA programs to develop and implement necessary Safety, Quality and Mission Assurance requirements.
- Maintain/update the integrated MDA Metrics Program to provide information on the health of the BMDS to MDA management
- Continue active participation in the BMDS Joint Reliability, Availability, Maintainability Evaluation Team (JRMET) to determine BMDS effectiveness
- Maintain MDA's Safety and Quality Concerns Hotline as required by DOD regulation
- Maintain and revise are necessary MDA safety policies and requirements
- Develop Capability Verification and Assessment addendum detailing the capability of the BMDS to operate safely in Block 2006

- MDA Safety Functions
  - Continue the MDA Safety Review Board to ensure that all BMDS activities are conducted safely.
  - Continue the MDA Range Safety Council and BMDS Safety Working Groups to ensure that all BMDS test and operational activities are conducted safely.
  - Continue the MDA Safety and Occupational Health Mishap Investigation Program
  - Conduct independent Safety Assessments/Reviews of MDA programs and Elements to enhance BMDS safety
  - Conduct independent Mission Assurance Assessments/Reviews of MDA programs and Elements
  - Maintain the Range Safety mediation, augmentation and commonality program
  - Maintain the MDA BMDS Safety Officer Program to ensure that the BMDS is operated safely when in test or operational modes.
  - Perform all required Occupational Safety and Health Inspections of MDA facilities
- Software Acquisition ((As required by Law - Section 804))
  - Implement the Software Acquisition Program Improvement Plan (SAIIP)
  - Complete the MDA Software Readiness Level documents (SWRLs)
  - Implement the MDA Software Acquisition Process Framework (MSAPF)
  - Develop an MDA Software Acquisition Training/Education Program (SAT/EP)
  - Develop an MDA Software Verification and Validation Program
- High Reliability Parts Program
  - Finalize MDA HRP Program Plan
  - Begin implementation of MDA HRP Program
  - Establish Long Term Plan and Requirements

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| 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 from 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 2006 |
|---|---|
| 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 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 | C/FFP | Sparta/ AL, MD, VA | 0 | 300 | 1/2Q | 500 | 1/2Q | 800 |
| Subtotal Product Development | | | 0 | 300 | | 500 | | 800 |

## Remarks

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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/Audits | SS/MIPR | NSWC Corona/ CA, VA | 0 | 2,500 | 1/2Q | 3,000 | 1/2Q | 5,500 |
| Safety & Quality/Audits | C/FFP | SRS Tech/ VA, MD | 0 | 4,200 | 1/2Q | 5,600 | 1/2Q | 9,800 |
| Mission Assurance/Audits | C/FFP | Swales/ VA, MD, NM, CA | 0 | 2,800 | 1/2Q | 3,550 | 1/2Q | 6,350 |
| Metrics/S/W Acq | C/FFP | BAE/SMDC/ AL, VA, MD | 0 | 1,708 | 1/2Q | 600 | 1/2Q | 2,308 |
| OGA Spt | SS/MIPR | NSWC Crane/ IN, VA | 0 | 585 | 1/2Q | 600 | 1/2Q | 1,185 |
| Govt Spt | SS/MIPR | NSWC VA Beach/ VA | 0 | 200 | 1Q | 200 | 1Q | 400 |
| S/W Acquisition | C/FFRDC | SEI/ PA, VA | 0 | 300 | 1Q | 300 | 1Q | 600 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Engrng Review Board | C/FFRDC | Aerospace, SEI/ PA, CA, VA | 0 | 0 | N/A | 730 | 1/2Q | 730 |
| Parts Material Prog | SS/MIPR | NSWC, Crane/ IN, VA | 0 | 0 | N/A | 2,700 | 1/2Q | 2,700 |
| Subtotal Support Costs | | | 0 | 12,293 | | 17,280 | | 29573 |

**Remarks**

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 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 | 5,240 | N/A | 7,320 | N/A | 12,560 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603890C Ballistic Missile Defense System Core** |

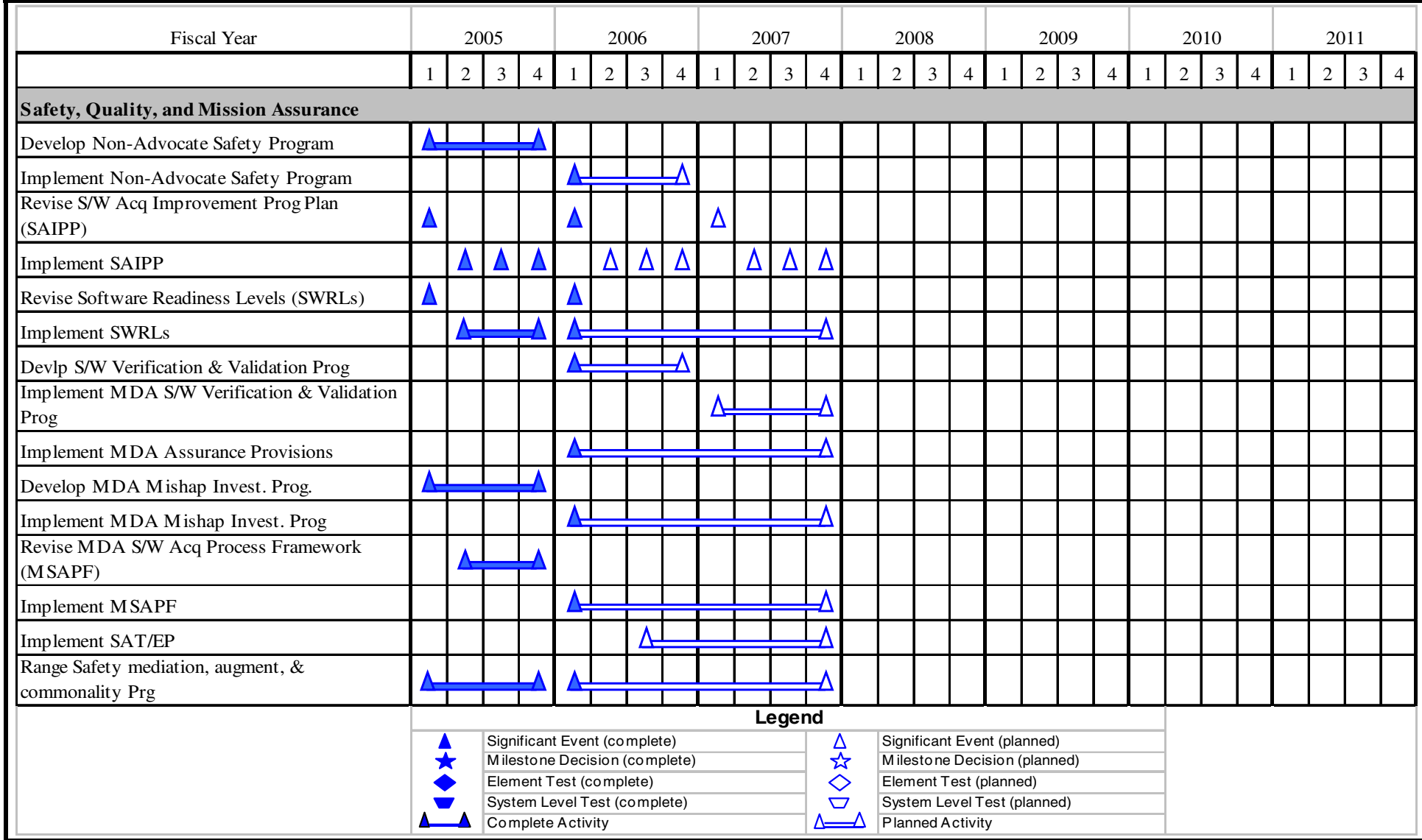
| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Travel | TM | MDA/ VA, MD, AL, CA, AZ, HI, AK, MA, NJ, FL, AR, UT, MH | 0 | 0 | N/A | 800 | N/A | 800 |
| Subtotal Management Services | | | 0 | 5,240 | | 8,120 | | 13360 |

**Remarks**

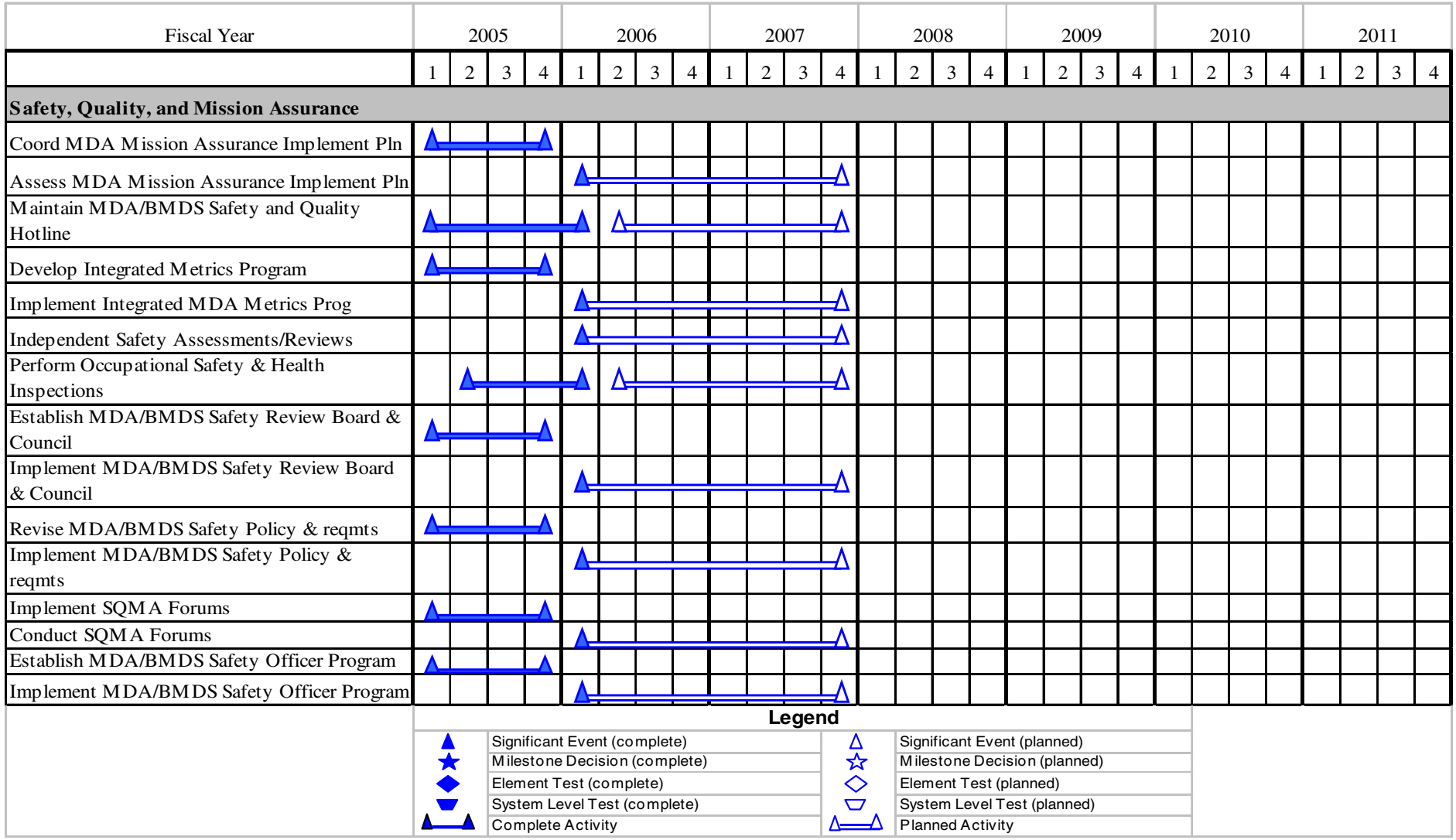
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 0 | 17,833 | | 25,900 | | 43,733 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| 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 2006 |
|---|---|
| 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 2006 |
|---|---|
| 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 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 | | | | |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| Establish MDA/BMDS Safety Review Board & Council | 1Q-4Q | | | | | | |
| Implement MDA/BMDS Safety Review Board & Council | | 1Q-4Q | 1Q-4Q | | | | |
| 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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0602 Program-Wide Support | 16,185 | 12,278 | 21,414 | 26,343 | 29,549 | 33,627 | 25,714 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## A. Mission Description and Budget Item Justification

Program-Wide Support provides funding for common non-headquarters support functions across the entire program such as strategic planning, program integration, business management, 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 outside services and support contractors that augment government staff in these areas. Many of these costs reside within the Missile Defense Agency 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, although some functions and costs within this program element are performed by MDA employees assigned within the National Capital Region (NCR). Other costs included herein provide facility capabilities for MDA Executing Agent locations, such as physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses. Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Civilian Salaries and Support | 16,185 | 12,278 | 21,414 |
| RDT&E Articles (Quantity) | 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 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

| COST ($ in Thousands) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| Total PE Cost | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 |
| 0709 AEGIS Block 2004 Test Bed | 0 | 145,112 | 28,000 | 20,000 | 0 | 0 | 0 |
| 0809 AEGIS BMD Block 2006 | 0 | 455,635 | 482,500 | 87,600 | 76,100 | 47,800 | 3,500 |
| 0909 AEGIS BMD Block 2008 | 0 | 266,158 | 418,345 | 680,796 | 557,545 | 91,763 | 50,595 |
| 0009 AEGIS BMD Block 2010 | 0 | 0 | 29,000 | 52,800 | 171,600 | 471,900 | 341,200 |
| R109 AEGIS BMD Block 2012 | 0 | 0 | 16,000 | 21,100 | 39,800 | 158,000 | 167,500 |
| 0402 Japanese Cooperative Program | 0 | 36,234 | 44,000 | 75,000 | 125,000 | 193,000 | 225,000 |
| 0602 Program-Wide Support | 0 | 12,525 | 14,029 | 14,264 | 10,453 | 10,690 | 11,425 |
| | | | | | | | |
| Amount Included in PE 0904903D | 0 | 0 | 0 | -112,350 | -126,245 | -254,063 | -106,431 |
| Total PE Cost Reflected in R-1 | 0 | 915,664 | 1,031,874 | 839,210 | 854,253 | 719,090 | 692,789 |

*Note: This PE is established per Congressional direction. All projects previously funded in FY05 in PE 0603882C, BMD Midcourse Defense.*

## A. Mission Description and Budget Item Justification

The Aegis Ballistic Missile Defense (Aegis BMD) mission is to deliver an enduring, operationally effective and supportable Ballistic Missile Defense Capability in Aegis cruisers and destroyers to defend the nation, deployed forces, friends and allies, and to incrementally increase this capability by delivering evolutionary spiral improvements as part of BMDS block upgrades.

The Aegis BMD element of the BMDS builds upon the existing Aegis Weapons System (AWS) and Standard Missile (SM) infrastructures deployed in Aegis cruisers and destroyers. Aegis BMD provides a forward-deployable, mobile capability to detect and track Ballistic Missiles of all ranges, and the ability to destroy Short-Range Ballistic Missile (SRBM), Medium-Range Ballistic Missile (MRBM), Intermediate-Range Ballistic Missile (IRBM), and selected long-range class threats in the midcourse phase of flight. Spiral upgrades to both the Aegis BMD Weapon System and the SM-3 configurations will enable Aegis BMD to provide effective, supportable defensive capability against more difficult threats, including Long Range Ballistic Missiles (LRBMs).

## A.1 System Element Description

Aegis BMD Block 2004 provides Long Range Surveillance and Track (LRS&T) capability to the BMDS against Ballistic Missile threats of all ranges. It also provides initial engagement capability against SRBM to MRBM-class threats. Aegis BMD is fielding the Block 2004 capability in three spirals: The first spiral provides an early LRS&T capability (BMD 3.0E Weapon System) to support BMDS engagements in support of Homeland Defense; The second spiral provides an initial engagement capability against SRBMs and MRBMs on Aegis BMD cruisers with the BMD

3.0 Weapon System and SM-3 Blk I missile that can be used for emergency activation; Spiral three will provide an operationally certified LRS&T and engagement capability on Aegis BMD cruisers and destroyers configured with the BMD 3.6 Weapon System which is capable of firing SM-3 Blk I and IA missiles using organic and external sensors.

Aegis BMD Block 2006 will develop and test SPY-1 radar tracking, RF discrimination, and Aegis BMD Fire Control improvements to the BMD Weapon System (BMD 4.0E). It will begin development of a limited capability against IRBMs to expand the threat set. Block 2006 will deliver BMD 4.0E and the Aegis BMD Signal Processor (BSP) to the Combat System Engineering Development Site (CSEDS) testbed. Also during this timeframe: The BMD 3.6 Weapon System will be installed on Aegis cruisers and destroyers, tested during at-sea firing test missions, and assessed to determine the direction for future improvements; The SM-3 Blk IA missiles will also be tested, assessed for future improvements, and delivered for deployment.

Aegis BMD Block 2008 improves system effectiveness against an expanding threat set to include a fielded capability against some IRBM and long-range threats. This will be achieved by means of modifications to the Weapon System (BMD 4.0/4.0.1) that focus on the new RF discrimination and tracking capability, and an upgraded SM-3 guided missile. The Aegis BMD 4.0/4.0.1 Weapon System will build on Block 2006 BSP development (BMD 4.0E), integrating it with an updated variant of the SM-3 (SM-3 Blk IB). The SM-3 Blk IB configuration includes a performance-enhancing two-color IR seeker, and a Throttleable Divert and Attitude Control System (TDACS), which provides performance and manufacturing improvements and lowers unit cost. The initial capability (BMD 4.0) will be delivered as a testbed system with the SM-3 Blk IA missile. BMD 4.0.1 will be an operationally certified system firing either the SM-3 Blk IA or IB missile. Also during this timeframe, Aegis BMD will complete the installation of the BMD 3.6 Weapon System on Aegis cruisers and destroyers, complete delivery of SM-3 Blk IA missiles for deployment, and begin delivery of SM-3 Blk IB missiles for at-sea testing and deployment.

Aegis BMD Block 2010 will integrate the BMD mission with the Navy-developed Open Architecture system in order to preserve the sea-based BMD capability as Navy ship modernization plans are executed. The Aegis BMD Weapon System will transition from older, MIL-standard computers to new Commercial Off The Shelf (COTS) computing plants. This integration will allow ships operators to conduct combat missions with a single set of tactical computer programs running on the same computer system. This change will enhance display features and eliminate the need for a separate computing system specific to the BMD mission. This will enable Aegis BMD to maintain compatibility with Surface Navy ships and align with the Navy's modernization plan, while also expanding the number of ships available to serve as candidates for the BMD mission. Future fielded Aegis BMD system improvements will be built in this new architecture. Also during this timeframe, Aegis BMD will begin installations of the BMD 4.0.1 Weapon System on Aegis cruisers and destroyers, continue to deliver SM-3 Blk IB missiles for testing and deployment, and assess weapon system and missile performance to determine the direction for further improvements.

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

Aegis BMD is working with the Japan Defense Agency (JDA) on the U.S./Japan Cooperative Research (JCR) project, which is developing advanced missile technologies in four areas: nosecone, Divert and Attitude Control System (DACS), propulsion, and seeker. In addition, the two countries are undertaking an SM-3 Cooperative Development (SCD) program, which consists of a spiral upgrade to the SM-3 Blk IB missile - a 21-inch diameter SM-3 missile (SM-3 Blk II/IIA). Missile development will be covered under the SCD project prior to the SM-3 Blk IIA incorporation into a spiral Block upgrade to the Aegis Ballistic Missile Defense system.

The Aegis BMD Block 2012 program will integrate and test the SM-3 Blk IIA missile with the Aegis BMD Weapon System, which will expand the battlespace to include IRBM and selected longer-range threats. Weapon System modifications will also be made to accommodate an Engage-on-Remote capability. Also during this timeframe, Aegis BMD will continue to install the BMD 4.0.1 Weapon System on Aegis cruisers and destroyers and assess performance to determine the direction for further improvements.

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

Aegis BMD provides a mobile, forward-deployable LRS&T capability to the BMDS against ballistic missile threats of all ranges. In Block 2004, Aegis BMD also provides an engagement capability against short to medium range threats; in Block 2006, Aegis BMD will begin development of an engagement capability against limited IRBM threats; the Block 2008 fielded configuration will expand engagement capability to include more complex threats including intermediate range threats, and Block 2012 will further expand engagement capability against long-range threats, to include some ICBM-class threats.

Aegis BMD Block upgrades will provide a capability to launch on and engage on cues from remote sensors, such as the FBX-T, via TADIL, as well as provide launch and engage data to other BMDS weapon systems, such as GMD and THAAD. Improvements to the Aegis BMD Signal Processor (BSP) will improve target object discrimination. Further improvements to the missile, such as the SM-3 Blk IB and Blk IIA planned configurations, will increase BMD battlespace by increasing the SM-3 range, speed, and discrimination capability.

Aegis BMD will deliver the following:

- Fifteen (15) Aegis Destroyers equipped with the Aegis BMD Weapon System to conduct the LRS&T and engagement missions
- Three (3) Aegis Cruisers equipped with the Aegis BMD Weapon System to conduct the LRS&T and engagement missions
- SM-3 Missile Deliveries - To Be Used for Testing and/or Deployment
  - Five (5) SM-3 Blk I missiles
  - Six (6) MDP-1 SM-3 Blk I missiles
  - Two (2) "Pathfinder" SM-3 Blk IA Flight Test Rounds (FTRs)

- Nineteen (19) MDP-1 SM-3 Blk IA missiles
- Forty (40) MDP-2 SM-3 Blk IA and IB missiles
- Twenty-four (24) MDP-3 SM-3 Blk IB missiles

## A.3 Major System Element Goals

- Block 2006 - Improve the Weapon System capability to identify and classify Ballistic Missile threat objects from debris and other components: Aegis BSP Engineering Development Model (EDM).
- Block 2008 - Improve missile capability to identify and target the threat object through the All Reflective Optics (ARO), Advanced Signal Processor (ASP), and two-color missile seeker. Improve missile kinetic warhead (KW) kinematic performance: Throttleable Divert and Attitude Controls System (TDACS). Improve BMDS C2BMC performance: engagement coordination with THAAD and Patriot, kill assessment; and missile downlink system for improved kill assessment. Increase battlespace: enhanced Launch on Remote (via TADIL) and Aegis BMD integration with Joint Defense Planner.
- Block 2010 - Broaden program application for U.S. and international Aegis ship population: Open Architecture. Improved BMDS C2BMC performance: migration to Joint Tactical Radio System and Common Link Interface Processor, and Forcenet/GIG compliance
- Block 2012 - Increase battlespace: SM-3 Blk II/IIA integration into the Aegis BMD Weapon System, Engage on Remote, improved feature-aided track correlation, and improved BMDS sensor data fusion.
- JCR/SCD - Complete the U.S./Japan Cooperative Research (JCR) project; Initiate U.S./Japan SM-3 Cooperative Development (SCD) of the SM-3 Blk II/IIA Missile (21-inch diameter SM-3 missile).

## A.4 Major Events Schedule and Description

| Major Event | Project | Timeframe | Description |
|---|---|---|---|
| **Flight Test** | | | |
| **Japan Cooperative Research Project** | | | |
| JCTV-1 | 0402 | 2Q FY 2006 | • Conduct Joint Control Test Vehicle-1 (JCTV-1) Proof-of-Principle flight test to test the lightweight nosecone. |
| **Flight Tests** | | | |
| FTM 04-1 (FM-7) | 0709 | 2Q FY 2005 | • Conducted 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. |
| FTM 04-2 (FM-8) | 0709 | 1Q FY 2006 | • Conducted FTM 04-2 (FM-8) flight test to verify BMD 3.0 emergency engagement capability with an intercept of a Group B (MRBM) target using an SM-3 Blk I missile. |

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

| Major Event | Project | Timeframe | Description |
|---|---|---|---|
| FTM-10 | 0809 | 3Q FY 2006 | • Conduct FTM-10 flight test to verify BMD 3.6 engagement capability with an intercept of a Group B (MRBM) target using an SM-3 Blk IA missile, supporting BMD 3.6 certification. |
| FTM-11 | 0809 | 1Q FY 2007 | • Conduct FTM-11 flight test to verify BMD 3.6 engagement capability with a near simultaneous multiple engagement and intercept of one low exo-atmospheric Group A (SRBM) target using an SM-3 Blk IA missile, and a BQM-74 aerial target using an SM-2 Blk IIIA missile. |
| FTM-12 | 0809 | 3Q FY 2007 | • Conduct FTM-12 flight test to verify BMD 3.6 engagement capability with an intercept of a Group B target using an SM-3 Blk IA missile. |
| FTM-13 | 0809 | 1Q FY 2008 | • Conduct FTM-13 flight test to verify BMD 3.6 engagement capability with the near-simultaneous multiple engagement and intercept of two Group B (MRBM) targets, using two SM-3 Blk IA missiles. |
| **Critical Design Review** | | | |
| **Development Milestones** | | | |
| BMD 3.0 Engineering Assessment | 0709 | 1Q FY 2005 | • Completed testing BMD 3.0 at the Combat Systems Engineering Development Site (CSEDS), and conducted BMD 3.0 Engineering Assessment to formally characterize the performance of BMD 3.0. |
| BMD 3.6 Engineering Assessment | 0709 | 2Q FY 2006 | • Complete BMD 3.6 Engineering Assessment to provide an operationally-certified system with BMD LRS&T and engagement capability. |
| BMD 3.6 Weapon System Certification | 0709 | 4Q FY 2006 | • Complete BMD 3.6 Weapon System certification following the BMD 3.6 Engineering Assessment. |
| Block 2010 Preliminary Concept Review | 0009 | 3Q FY 2007 | • Conduct a Preliminary Concept Review of Aegis BMD Block 2010 with Open Architecture. |
| Block 2012 System Requirements Review | R109 | 4Q FY 2007 | • Conduct an SRR for Aegis BMD Block 2012 |
| BMD 4.0E Engineering Assessment | 0809 | 1Q FY 2008 | • Complete development of the computer program upgrade BMD 4.0E, culminating with an Engineering Assessment (EA) in December 2007. |
| BMD 4.0 Engineering Assessment | 0909 | 1Q FY 2009 | • Perform an EA of BMD 4.0 to provide a testbed system with the SM-3 Block IA missile. |
| Block 2010 Preliminary Design Review | 0009 | 1Q FY 2009 | • Conduct a Preliminary Design Review of Aegis BMD Block 2010 with Open Architecture. |
| BMD 4.0.1 Engineering Assessment | 0909 | 1Q FY 2010 | • Perform EA of BMD 4.0.1 to provide an operationally-certified system with the SM-3 Blk IA or IB missile. |
| Block 2010 Critical Design Review | 0009 | 1Q FY 2010 | • Conduct CDR for the Aegis BMD Block 2010 with Open Architecture. |
| Block 2012 Preliminary Design Review | R109 | 3Q FY 2010 | • Conduct PDR for the Aegis BMD Block 2012. |
| Block 2010 Engineering Assessment | 0009 | 4Q FY 2011 | • Perform an EA of Aegis BMD Block 2010 with Open Architecture |
| **SM-3 Blk II/IIA Development Milestones** | | | |
| SM-3 Blk II/IIA System Concept Review | 0402 | 4Q FY 2006 | • Conduct SM-3 Blk II/IIA SCR. |

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

| Major Event | Project | Timeframe | Description |
|---|---|---|---|
| SM-3 Blk II/IIA System Requirements Review | 0402 | 4Q FY 2007 | • Conduct SM-3 Blk II/IIA SRR. |
| SM-3 Blk II/IIA System Design Review | 0402 | 3Q FY 2008 | • Conduct SDR for the SM-3 Blk II/IIA missile configurations. |
| SM-3 Blk II Preliminary Design Review | 0402 | 3Q FY 2009 | • Conduct PDR for the SM-3 Blk IIA missile |
| SM-3 Blk IIA System Design Review 2 | 0402 | 2Q FY 2010 | • Conduct SDR for the SM-3 Blk IIA missile to be fielded in Block 2012. |
| **Delivery** | | | |
| **Manufacturing Processes and Advanced Materials** | | | |
| BMD 3.0 Computer Program | 0709 | 1Q FY 2005 | • Delivered BMD 3.0 computer program to support testbed and emergency engagement operations. |

| B. Program Change Summary | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Previous President's Budget (FY 2006 PB) | 0 | 0 | 0 |
| Current President's Budget (FY 2007 PB) | 0 | 915,664 | 1,031,874 |
| Total Adjustments | 0 | 915,664 | 1,031,874 |
| Congressional Specific Program Adjustments | 0 | 929,076 | 0 |
| Congressional Undistributed Adjustments | 0 | -13,412 | 0 |
| Reprogrammings | 0 | 0 | 0 |
| SBIR/STTR Transfer | 0 | 0 | 0 |
| Adjustments to Budget Years | 0 | 0 | 1,031,874 |

FY05 funding for projects 0709, 0809, 0909, 0009, and 0402 is accounted for in PE 0603882C, BMD Midcourse Defense Segment. For comparison, the FY05 amounts for those projects totaled $1,092,362 thousand.

FY06 increase of $915.664 million implements the Congressionally directed transfer of the Sea-based Midcourse Defense Segment from the BMD Midcourse Defense Segment Program Element (PE #0603882C) to a unique Program Element and includes a portion of the MDA Congressional undistributed adjustment.

FY07 Increase of $1.032 billion follows through with implementation of the Congressionally directed Sea-based Midcourse Defense Segment transfer and includes adjustments to achieve overhead/infrastructure reductions.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

| COST ($ in Thousands) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0709 AEGIS Block 2004 Test Bed | 0 | 145,112 | 28,000 | 20,000 | 0 | 0 | 0 |
| RDT&E Articles Qty | 0 | 4 | 0 | 0 | 0 | 0 | 0 |

*Note: This PE was created per Congressional direction for FY06 and beyond. Project 0709 was previously funded and described in PE 0603882C, BMD Midcourse Defense.*

*RDT&E Articles for FY06: Three (3) SM-3 missiles, and the installation of BMD 3.0E on one (1) DDG.*

**A. Mission Description and Budget Item Justification**

Aegis BMD Block 2004 supports the BMDS mission of intercepting ballistic missiles in all regions, in all phases, and of all ranges, as follows:

- In all regions: Provide sea-based surveillance, tracking, and engagement capabilities in international waters.
- In all phases of ballistic missile flight: Long Range Surveillance and Track (LRS&T) capability against missile threats in all flight stages; engagement capability against missile threats in the midcourse flight stage
- Against all ranges:
  - Against long-range ballistic missiles by providing surveillance and tracking support as part of the Block 2004 Limited Defensive Capability (LDC).
  - Against short and medium range ballistic missiles by providing engagement support as part of Block 2004.

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

The Aegis BMD Block 2004 program will:

- Defeat unitary and simple separating threats (Short Range Ballistic Missiles (SRBMs) and Medium Range Ballistic Missiles (MRBMs)) with Aegis BMD configured cruisers and destroyers using SM-3 Blk I or IA guided missiles.
- Provide Long Range Ballistic Missile (LRBM) surveillance and track data through the BMDS to the GMD element to cue and initiate fire control Weapons Task Plans.
- Provide Aegis BMD surveillance and track data to the BMDS to support Combatant Commander situational awareness.
- Expand the engagement battle space by using remote (Aegis AN/SPY-1) 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 an operational, engagement-capable system.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

Aegis BMD Block 2004 develops three incremental capabilities:

- LRS&T (BMD 3.0E computer program) support as part of LDC;
- A preliminary engagement capability (BMD 3.0 with SM-3 Blk I) for test bed operations and for emergency use, if required; and
- An operationally certified BMD capability that combines the engagement capability with the LRS&T capability (BMD 3.6 with SM-3 Blk I and IA). The final Block 2004 is fully compliant with the Element Capability Specification.

In collaboration with the MDA Systems Engineer, Aegis BMD is contributing to the BMDS in development of engagement sequence groups (ESGs). Aegis BMD supports an autonomous engagement against SRBMs and MRBMs without requiring external cueing.

Aegis BMD Block 2004 will support SM-3 Engage on AN/SPY-1, SM-3 Launch on Remote (AN/SPY-1), GBI Engage on AN/SPY-1, and GBI Launch on AN/SPY-1.

**B. Accomplishments/Planned Program**

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Weapon System Engineering | 0 | 84,112 | 5,000 |
| RDT&E Articles (Quantity) | 0 | 1 | 0 |

In Block 2004, the Aegis BMD Weapon System Engineering group developed BMD 3.0E to provide LRS&T capability to the BMDS; BMD 3.0 to support testbed and emergency engagement operations; and BMD 3.6 to provide an operationally-certified system. Aegis BMD met the President's LDC objectives by deploying BMD 3.0E in Block 2004.

FY06 Planned Program:
RDT&E Articles: Aegis DDG configured with BMD 3.0E (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.
  - Perform computer program maintenance modifications to BMD 3.0E to implement lessons learned from FTM 04-2 (FM-8) and GT-189.
  - Participate in Aegis BMD flight missions.

- For engagement capability:
  - Provide BMD 3.0 support on operational Aegis cruisers for testbed operations and emergency deployment.
  - Complete development of BMD 3.6 Weapon System.
    - Complete multi-element integration and testing of BMD 3.6.
    - Complete BMD 3.6 Weapon System certification following the BMD 3.6 Engineering Assessment. (Actual installs occur in CY06, and are captured under Block 2006, Project 0809).
  - Temporarily install BMD 3.6 test load on an Aegis cruiser to support an engagement flight mission as part of the certification of BMD 3.6.
  - Conduct waterfront integration testing of BMD 3.6.
  - Gain approval for fielding BMD 3.6 at the SSSTRP and WSESRB reviews.
  - Participate in Aegis BMD flight missions and other BMDS test events.
  - Complete integration of CDLMS v. 3.4 into BMD 3.6 to accomplish multiple satellite data paths (UHF, SHF, and EHF) for improved BMDS interoperability.
  - Continue to participate in the improvement of BMDS C2BMC interface control specifications requirements with other BMDS elements.

Vertical Launching System (VLS):

- For engagement capability:
  - Provide BMD 3.0 support on operational Aegis cruisers for testbed operations and emergency deployment.
  - Support Mk 41 VLS Phase I computer program and equipment during the transition to Mk 41 VLS Phase II implementation.
  - 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.

FY07 Planned Program:

Aegis BMD Weapon System:

- Monitor the operational performance of BMD 3.0E, 3.0, and 3.6 Weapon Systems for potential improvements and corrections to future Weapon System development versions.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| SM-3 Missile | 0 | 51,000 | 4,000 |
| RDT&E Articles (Quantity) | 0 | 3 | 0 |

Aegis BMD Block 2004 provides the SM-3 Blk I missile that can be used for emergency activation; completed the design efforts of the SM-3 Blk IA and completes component and section level testing of the SM-3 Blk IA. Completed initial non-recurring engineering preparation for rate manufacturing of SM-3 components at various manufacturing facilities.

FY06 Accomplishments/Planned Program:
RDT&E Articles: SM-3 Blk I Missiles (3)

- Participated in Flight Test Mission (FTM) 04-2 (FM-8) with one (1) SM-3 Blk I missile.
  - Completed pre-flight analysis to verify mission scenarios and to predict flight performance.
  - Prepared and completed missile delivery package for the Mission Control Panel reviews.
  - Performed post-flight analysis to validate high fidelity models and simulations.
  - Conduct post-flight analysis to support Mission Data Reviews (MDRs).
- Complete SM-3 Value Engineering Change Proposal (VECP) implementation efforts to ensure service life requirement compliance.
- Complete SM-3 Blk IA Hazard Assessment and Safety compliance tests.
- Complete Third Stage Rocket Motor obsolete material replacement design verification testing and qualification of the Blk IA design.
- Complete SM-3 Blk IA sustain DACS design qualification tests.
- Conduct SDACS pulse capability engineering, design verification and qualification tests (safety and environmental).
- 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 SM-3 Blk IA HERO test.
- Complete test equipment modifications and facility upgrades to expand missile manufacturing rate.
- Monitor All-Up-Round obsolete material replacement effort.
- Complete assembly and delivery of three (3) SM-3 Blk I missiles.
- 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, AZ.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Fleet Intro/Operations & Support | 0 | 10,000 | 19,000 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

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

FY06 Planned Program:

- Provide In-Service Engineering support to Aegis BMD: 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 Aegis BMD: Weapon System, SM-3, and Vertical Launching System.
- Achieve Integrated Logistics Support (ILS) for BMD 3.6 Aegis Destroyers.
- Respond to Fleet issues. Provide analysis to respond to operational tasking. Support the development of CONOPS and COCOM taskers.

FY07 Planned Program:

- Provide In-Service Engineering support to Aegis BMD: 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 Aegis BMD: Weapon System, SM-3, and Vertical Launching System.
- Respond to Fleet issues.

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## D. Acquisition Strategy

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

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

## I. Product Development Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 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 | 324,685 | 63,320 | 1Q | 5,000 | 1Q | 393,005 |
| AWS | FFRDC | MIT/LL/ MA | 5,325 | 400 | 1Q | 0 | N/A | 5,725 |
| AWS | SS/CPFF | JHU/APL/ MD | 7,600 | 424 | 1Q | 0 | N/A | 8,024 |
| AWS | MIPR | NSWC/DD/ VA | 28,836 | 9,100 | 1Q | 0 | N/A | 37,936 |
| AWS | MIPR | MITRE/ VA | 1,400 | 0 | N/A | 0 | N/A | 1,400 |
| AWS | MIPR | NSWC/PHD/ CA | 13,824 | 0 | N/A | 0 | N/A | 13,824 |
| AWS | | MDA | 13,586 | 3,177 | 1/2Q | 0 | N/A | 16,763 |
| AWS | Various | VARIOUS | 19,016 | 775 | 1Q | 0 | N/A | 19,791 |
| AWS | MIPR | NAVSEA/ VA | 0 | 2,000 | 1Q | 0 | N/A | 2,000 |
| **SM-3 Missile** | | | | | | | | |
| MISSILE | SS/CPIF | RAYTHEON/AZ | 704,637 | 36,362 | 1Q | 4,000 | 1Q | 744,999 |
| MISSILE | SS/CPIF | JHU/APL/MD | 21,693 | 4,000 | 2Q | 0 | N/A | 25,693 |
| MISSILE | FFRDC | MIT/LL/MA | 1,650 | 155 | 1Q | 0 | N/A | 1,805 |
| MISSILE | MIPR | NSWC/DD/VA | 16,667 | 2,959 | 1Q | 0 | N/A | 19,626 |
| MISSILE | MIPR | NSWC/PHD/CA | 9,665 | 1,706 | 1Q | 0 | N/A | 11,371 |
| MISSILE | MIPR | WSMR/NM | 1,642 | 765 | 1Q | 0 | N/A | 2,407 |
| MISSILE | MIPR | NSWC/CD/CA | 4,168 | 450 | 1Q | 0 | N/A | 4,618 |
| MISSILE | MIPR | NSWC/IH/MD | 3,013 | 640 | 1Q | 0 | N/A | 3,653 |
| MISSILE | MIPR | NAWC/CL/CA | 1,755 | 389 | 1Q | 0 | N/A | 2,144 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| MISSILE | | MDA/VA | 24,676 | 0 | 1Q | 0 | N/A | 24,676 |
| MISSILE | Various | VARIOUS/ VA/CA/NJ | 6,280 | 2,016 | 1Q | 0 | N/A | 8,296 |
| MISSILE | MIPR | NAVSEA | 0 | 931 | 1Q | 0 | N/A | 931 |
| MISSILE | MIPR | NSWC Corona | 0 | 627 | 1Q | 0 | N/A | 627 |
| Subtotal Product Development | | | 1,210,118 | 130,196 | | 9,000 | | 1349314 |

**Remarks**

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 | 7,902 | 424 | 1Q | 0 | N/A | 8,326 |
| | SS/CPAF | Lockheed Martin/ NJ | 10,500 | 0 | N/A | 0 | N/A | 10,500 |
| | MIPR | NSWC/DD/ VA | 11,324 | 4,022 | 1Q | 0 | N/A | 15,346 |
| | MIPR | NSWC/PHD/ CA | 6,807 | 0 | N/A | 0 | N/A | 6,807 |
| | MIPR | SPAWAR/ CA | 4,734 | 0 | N/A | 0 | N/A | 4,734 |
| | | MDA | 2,489 | 0 | N/A | 0 | N/A | 2,489 |
| | MIPR | NAVSEA/ DC | 3,700 | 233 | 1/2Q | 0 | N/A | 3,933 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| | MIPR | SupShip Pascagoula/ MS | 4,635 | 0 | N/A | 0 | N/A | 4,635 |
| | MIPR | SupShip Bath/ ME | 1,965 | 0 | N/A | 0 | N/A | 1,965 |
| | MIPR | VARIOUS/SSES Philadelphia/ VARIOUS | 220 | 237 | 1/2Q | 0 | N/A | 457 |
| **Fleet Intro/Operations & Support** | | | | | | | | |
| | MIPR | NSWC/DD/ VA | 0 | 695 | 1Q | 3,400 | 1Q | 4,095 |
| AWS | MIPR | NSWC/PHD/ CA | 0 | 3,381 | 1Q | 250 | 1Q | 3,631 |
| AWS | | Lockheed Martin/ NJ | 0 | 3,003 | 1/2Q | 14,000 | 1Q | 17,003 |
| | | MIT/ MA | 0 | 0 | N/A | 350 | 1/2Q | 350 |
| | | JHU/APL/ MD | 0 | 250 | 1/2Q | 500 | 1/2Q | 750 |
| | Various | Various | 0 | 336 | 1Q | 500 | 1Q | 836 |
| | MIPR | NSWC Corona/ CA | 0 | 860 | 1Q | 0 | N/A | 860 |
| | MIPR | CSCS (ATRC)/ VA | 0 | 1,475 | 1Q | 0 | N/A | 1,475 |
| Subtotal Support Costs | | | 54,276 | 14,916 | | 19,000 | | 88192 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Weapon System Engineering** | | | | | | | | |
| | | NAVSEA/ DC | 26,435 | 0 | N/A | 0 | N/A | 26,435 |
| | SS/CPFF | JHU/APl/ MD | 2,834 | 0 | N/A | 0 | N/A | 2,834 |
| | MIPR | NSWC/DD/ VA | 2,398 | 0 | N/A | 0 | N/A | 2,398 |
| | C/CPFF | Anteon/ VA | 46,749 | 0 | N/A | 0 | N/A | 46,749 |
| | SS/CPFF | Paradigm/ VA | 4,175 | 0 | N/A | 0 | N/A | 4,175 |
| | SS/CPAF | Lockheed Martin/ NJ | 1,700 | 0 | N/A | 0 | N/A | 1,700 |
| | SS/CPAF | Raytheon/ AZ | 2,000 | 0 | N/A | 0 | N/A | 2,000 |
| | | MDA | 14,922 | 0 | N/A | 0 | N/A | 14,922 |
| | Various | Various/ Various | 8,517 | 0 | N/A | 0 | N/A | 8,517 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| | | MDA (Salaries) | 1,763 | 0 | N/A | 0 | N/A | 1,763 |
| Subtotal Management Services | | | 111,493 | 0 | | 0 | | 111493 |

**Remarks**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 1,375,887 | 145,112 | | 28,000 | | 1,548,999 |

**Remarks**

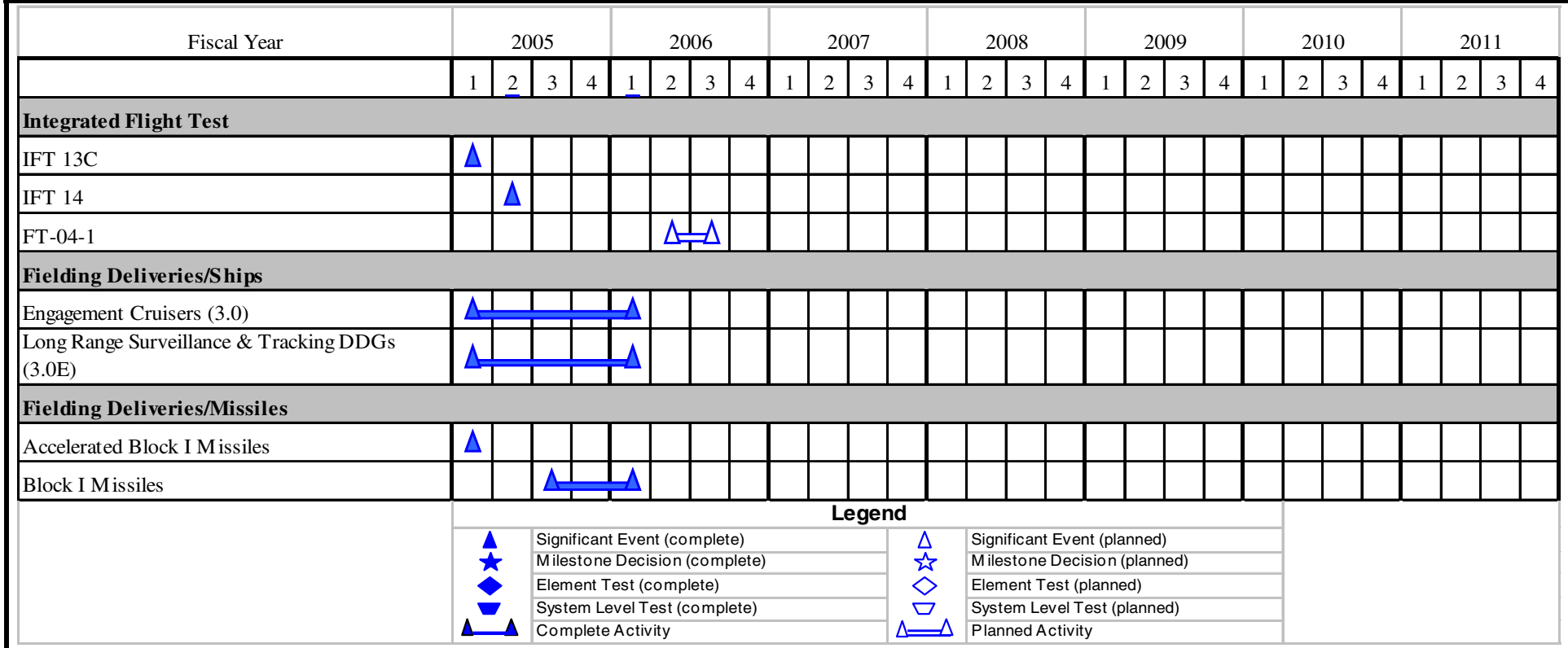
| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

| Fiscal Year | 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 |
| **Testing Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| At-Sea Demo 3.0 (Concurrent with FM-7) | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SM-3 Blk IA HERO Test | | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | |
| **Manufacturing Processes and Advanced Materials** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BMD 3.0 Computer Program | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aegis BMD FTM 04-1 configuration | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Development Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| VLS 3.1 Critical Design Review | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BMD 3.0 Engineering Assessment | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BMD 3.6 Engineering Assessment | | | | | | △ | | | | | | | | | | | | | | | | | | | | | | |
| SM-3 Block IA Critical Design Review | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SM-3 Blk IA SDACS CDR | | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | |
| BMD 3.6 Weapon System Certification | | | | | | | | △ | | | | | | | | | | | | | | | | | | | | |
| **Flight Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FTM 04-1 (FM-7) | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FTM 04-2 (FM-8) | | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲▬▲ | Complete Activity | △▬△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |



| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

| Schedule Profile | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Testing Milestones** | | | | | | | |
| At-Sea Demo 3.0 (Concurrent with FM-7) | 2Q | | | | | | |
| Third Stage Rocket Motor DVT-3 | 3Q | | | | | | |
| SM-3 Blk IA HERO Test | | 1Q | | | | | |
| **Manufacturing Processes and Advanced Materials** | | | | | | | |
| BMD 3.0 Computer Program | 1Q | | | | | | |
| Aegis BMD FTM 04-1 configuration | 2Q | | | | | | |
| **Development Milestones** | | | | | | | |
| VLS 3.1 Critical Design Review | 1Q | | | | | | |
| BMD 3.0 M&S Performance Assessment | 2Q | | | | | | |
| BMD 3.0 Engineering Assessment | 1Q | | | | | | |
| BMD 3.6 Engineering Assessment | | 2Q | | | | | |
| SM-3 Block IA Critical Design Review | 1Q | | | | | | |
| SM-3 Blk IA SDACS CDR | | 1Q | | | | | |
| BMD 3.6 Weapon System Certification | | 4Q | | | | | |
| **Flight Tests** | | | | | | | |
| FTM 04-1 (FM-7) | 2Q | | | | | | |
| FTM 04-2 (FM-8) | | 1Q | | | | | |
| **Integrated Flight Test** | | | | | | | |
| IFT 13C | 1Q | | | | | | |
| IFT 14 | 2Q | | | | | | |
| FT-04-1 | | 2Q-3Q | | | | | |
| **Fielding Deliveries/Ships** | | | | | | | |
| Engagement Cruisers (3.0) | 1Q-4Q | 1Q | | | | | |
| Long Range Surveillance & Tracking DDGs (3.0E) | 1Q-4Q | 1Q | | | | | |
| **Fielding Deliveries/Missiles** | | | | | | | |
| Accelerated Block I Missiles | 1Q | | | | | | |
| Block I Missiles | 3Q-4Q | 1Q | | | | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

| COST ($ in Thousands) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0809 AEGIS BMD Block 2006 | 0 | 455,635 | 482,500 | 87,600 | 76,100 | 47,800 | 3,500 |
| RDT&E Articles Qty | 0 | 15 | 29 | 5 | 0 | 0 | 0 |

*Note: This PE was created per Congressional direction for FY06 and beyond. Project 0809 was previously funded in PE 0603882C, BMD Midcourse Defense.*

*RDT&E Articles: FY06 - Three (3) SM-3 missiles, three (3) ARAVs, two (2) targets, installation of BMD 3.0E on two (2) DDGs, installation of BMD 3.0 on one (1) CG, delivery of the BMD 3.6 computer program, installation of BMD 3.6 on one (1) DDG, installation of BMD 3.6 on two (2) CGs. FY07 - Sixteen (16) SM-3 missiles, three (3) ARAVs, one (1) target, installation of BMD 3.0E on two (2) DDGs, installation of BMD 3.6 on one (1) DDG (LRS&T only), installation of BMD 3.6 on five (5) DDGs, installation of BMD 3.6 on one (1) CG. FY08 - Three (3) SM-3 missiles, installation of BMD 3.6 on one (1) DDG, delivery of the BMD 4.0E computer program to CSEDS.*

## A. Mission Description and Budget Item Justification

Aegis BMD Block 2006 supports the BMDS mission of intercepting ballistic missiles in all regions, in all phases, and of all ranges, as follows:

- In all regions: provide sea-based surveillance, tracking, and engagement capabilities.
- In all phases of ballistic missile flight: Long Range Surveillance and Track (LRS&T) capability against missile threats of all ranges; engagement capability against Short Range Ballistic Missile (SRBM) to Dedium Range Ballistic Missile (MRBM)-class missile threats
  - Develop engagement capability against Intermediate range Ballistic Missile (IRBM)-class targets.
- Against all ranges:
  - Enhanced LRS&T capability against Ballistic Missile threats of all ranges through Aegis BMD Signal Processor (BSP) improvements.

Aegis BMD supported LDC by providing Long Range Surveillance and Track (LRS&T) data to other elements of the BMDS. Aegis BMD improved 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 from other Aegis ships in Block 2004. Through development and testing of the Aegis BMD Signal Processor (BSP) in Block 2006, Aegis BMD will provide significant improvements in discrimination capability and performance against more diverse and longer range threats in Block 2008.

The Aegis BMD Block 2006 4.0E Weapon System will continue the evolutionary spiral development of Block 2004 by performing the initial integration of the BSP into the Aegis BMD Weapon System. BMD 4.0E will improve discrimination and tracking capability against more robust

threats for BMDS engagements. BMD 4.0E LRS&T upgrades using BSP will go through an Engineering Assessment and be delivered to the testbed (CSEDS) in Block 2006.

BMD 4.0E will continue to evolve into the BMD 4.0 and 4.0.1 configurations; these are to be delivered during Block 2008.

Ongoing missile development in the Block 2006 timeframe is listed and described under Block 2008, project 0909. Block 2006 missile efforts will complete testing of the SM-3 Blk IA missile with the BMD 3.6 Weapon System.

Aegis BMD Block 2006 will:

- Defeat unitary and more complex SRBM and MRBM threats with Aegis BMD configured cruisers, destroyers and Standard Missile-3 (SM-3) Blk I and IA guided missiles.
- Develop a limited IRBM capability.
- Complete development and engineering assessment of BMD 4.0E - testbed capability that provides improved ballistic missile threat tracking, discrimination, and object classification via the BSP Engineering Development Model (EDM).
- Continue installations of the BMD 3.0E surveillance and tracking capability and the BMD 3.6 engagement capability on additional Aegis destroyers, and deliver 22 SM-3 Blk IA missiles.

In collaboration with the MDA Systems Engineer, Aegis BMD is contributing to the BMDS in development of engagement sequence groups (ESGs). Aegis BMD supports an autonomous engagement against SRBMs and MRBMs without external cueing. Aegis BMD also supports an engagement against SRBMs and MRBMs using data from other BMDS elements and external sensors.

Aegis BMD Block 2006 will support SM-3 Engage on/Launch on AN/SPY-1, SM-3 Launch on FBX-T, GBI Engage on AN/SPY-1 Mod. 1,and GBI Launch on AN/SPY-1 Mod 1.

**B. Accomplishments/Planned Program**

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Weapons System Engineering | 0 | 162,079 | 174,200 |
| RDT&E Articles (Quantity) | 0 | 7 | 9 |

In Block 2006, the Aegis BMD Weapon System Engineering group will develop BMD 4.0E to provide LRS&T capability to the BMDS (CSEDS only).

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

FY06 Planned Program:
RDT&E Articles: BMD 3.6 Computer Program (1), BMD 3.0 Aegis Cruiser (1), BMD 3.6 Aegis Cruisers (2), BMD 3.0E Surveillance and Tracking Aegis Destroyers (2), BMD 3.6 Aegis Destroyer (1)

- 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
- Install BMD 3.6 on two (2) Aegis Cruisers and one (1) Aegis Destroyer.
- Commence baseline consolidation effort:
  - Design documentation and system modeling analysis for the Block 2006 Aegis BMD Weapon System (BMD 4.0E/4.0/4.0.1).
- Improve ballistic missile tracking, characterization, discrimination, feature extraction, object classification, and kill assessment as a part of the BMD 4.0E development, to include:
  - Real-time feature extraction capability and classification algorithm development.
  - At-sea testing of the BSP Advanced Development Model (medium-band tracking, and medium-band and wide-band discrimination)
- Continue development of the computer program upgrade BMD 4.0E in order to achieve a CY07 Engineering Assessment.
- Commence studies to improve Lethal Object Designation in a clutter environment.

FY07 Planned Program:
RDT&E Articles: BMD 3.0E Aegis LRS&T Destroyers (2), BMD 3.6 Aegis Cruiser (1), BMD 3.6 LRS&T Destroyer (1), BMD 3.6 Aegis Engagement Destroyers (5)

- 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 3.6 on one (1) Aegis Cruiser.
- Install BMD 3.6 (engagement capability) on five (5) Aegis destroyers.
- Install BMD 3.6 (LRS&T capability) on one (1) Aegis destroyer.
- Continue improvement to ballistic missile tracking, characterization, discrimination, feature extraction, object classification, and kill assessment as a part of BMD 4.0E development, to include:
  - Real-time feature extraction capability and classification algorithm development.

- At-sea testing of the BSP Advanced Development Model (medium-band tracking, and medium-band and wide-band discrimination)
- Complete development of the computer program upgrade BMD 4.0E culminating with an Engineering Assessment (EA) in CY 2007.
- Install BMD 4.0E at the testbed site (CSEDS) for testing.
- Continue studies to improve Lethal Object Designation in a cluttered environment.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| SM-3 Missile | 0 | 186,137 | 130,800 |
| RDT&E Articles (Quantity) | 0 | 3 | 16 |

During Block 2006 the SM-3 Blk IA missiles will be tested, monitored for improvements, and delivered for deployment.

FY06 Planned Program:
RDT&E Articles: SM-3 Block IA Missiles (3)

- Participate in FTM-10 (first SM-3 Blk IA test, using the Blk IA Pathfinder round)
  - Complete pre-flight analysis to verify scenarios and performance assessment.
  - Prepare and complete missile delivery package for Mission Control Panel reviews.
  - Perform post-flight analysis to validate high-fidelity simulations.
  - Conduct post-flight analysis to support Mission Data Reviews (MDRs).
  - Perform analysis of SM-3 Blk IA Hardware/Software based on flight results.
- Review data analysis and requirements to update the missile, as required, to pace threat and weapon system changes.
- 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.
- Continue to review manufacturing practices to lower unit cost of SM-3 Blk IA via improved manufacturing processes.
- Complete assembly and deliver three (3) SM-3 Blk IA missiles, including one (1) Pathfinder Flight Test Round.
- Continue component level assembly build-up for succeeding SM-3 Blk IA missiles.
- Continue material engineering to monitor parts obsolescence.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

FY07 Planned Program:
RDT&E Articles: SM-3 Block IA Missiles (16)

- Continue assembly and delivery of SM-3 Blk IA missiles.
  - Deliver one (1) SM-3 Blk IA Pathfinder test round
  - Deliver fifteen (15) SM-3 Blk IA missiles
- Continue material engineering to monitor parts obsolescence.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| System Test & Evaluation | 0 | 77,300 | 115,000 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort provides funding for Aegis BMD test and evaluation Block 2006 flight test missions, as well as other system-wide BMDS tests to support the development of the BMDS.

FY06 Accomplishments/Planned Program:
- Conduct STELLAR PREDATOR campaign, consisting of a Ballistic Missile Tracking Exercise, FTM-10, and BMD 3.6 Multi-Mission Operations:
  - Conduct an ARAV-A simulated engagement to verify BMD 3.6 capability.
  - Conduct FTM-10 flight test to verify BMD 3.6 engagement capability with an intercept of a Group B (MRBM) target using an SM-3 Blk IA missile.
  - Conduct a simulated, near-simultaneous engagement of a low exo-atmospheric ARAV-A and a BQM-74 aerial target to assess BMD 3.6 multiple simultaneous engagement capability in a multi-warfare environment.
  - Conduct BMD 3.6 Certification Test with a live engagement of two BQM-74 targets using two SM-2 Blk IIIA missiles.
- Continue to test interoperability with other BMDS elements.
- Participate in BMDS tests to include CMCM-2, SERV-3, Glory Trip 191, FT-3, FT-4, and Determined Sentinel (DS)-1.
- Continue test planning for FTM-11, and begin test planning for FTM-12 and FTM-13.

FY07 Planned Program:
- Conduct campaign consisting of a Ballistic Missile Tracking Exercise and FTM-11 Multiple Simultaneous Engagements:
  - Conduct an ARAV-B simulated engagement to verify BMD 3.6 capability.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

- Conduct FTM-11 flight test to verify BMD 3.6 engagement capability with a near simultaneous multiple engagement and intercept of one low exo-atmospheric Group A (SRBM) target using an SM-3 Blk IA missile, and a BQM-74 aerial target using an SM-2 Blk IIIA missile.

- Conduct campaign consisting of a Ballistic Missile Tracking Exercise and FTM-12:
  - Conduct multiple simultaneous simulated engagement of two (2) ARAV-Bs to verify BMD 3.6 capability.
  - Conduct FTM-12 flight test to verify BMD 3.6 engagement capability with an intercept of a Group B (MRBM) target using an SM-3 Blk IA missile.
- Continue to test interoperability with other BMDS elements.
- Participate in BMDS test to include CMCM-4, GT-194, FT-6, and THAAD missions.
- Begin test planning for FTM-13: prepare target, develop models and simulations, and ready the range for a test.
- Begin test planning for FTM-14; prepare target, develop models and simulations, and ready the range for test.
- Conduct critical experiments using the MK-99 Doppler Data Collection System or similar equipment as a risk mitigation for Block 2008 implementation.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Block 2006 Targets | 0 | 18,024 | 40,000 |
| RDT&E Articles (Quantity) | 0 | 5 | 4 |

This effort provides ballistic missile target hardware, target range support, logistic support, target integration, and associated launch services to support Aegis BMD Block 2006 flight tests, as well as other system-wide tests to support the development and integration of Aegis BMD into the BMDS.

FY06 Planned Program:
RDT&E Articles: Targets (2), Aegis Readiness Assessment Vehicles (ARAVs) (3)

- Acquired one (1) ARAV-A for the FTM-11 campaign.
- Completed design, manufacture, and delivery of one (1) Modified Ballistic Re-entry Vehicle (MBRV) and one (1) Bulk Chemical Lethality Front Section (BCLFS) payload insert in support of FTM-10.
- Acquire two (2) ARAV-As for the STELLAR PREDATOR campaign.
- Begin procurement of two (2) ARAV-B targets for FTM-12.
- Complete design, manufacture and delivery of one (1) MBRV-2 and one (1) Integrated Reactive Lethality Payload insert in support of FTM-12.
- Conduct Medium Range Target (MRT) presentation and post-flight analyses in support of FTM-10.

- Conduct two ARAV-A presentations and post-flight analyses in support of FTM-10 Trackex.

FY07 Planned Program:
RDT&E Articles: ARAVs (3), targets (1)

- Acquire one (1) target for FTM-11.
- Acquire two (2) ARAV-B targets for FTM-12.
- Acquire one (1) ARAV-B targets for FTM-13.
- Conduct TTV presentation in support of FTM-11.
- Conduct one ARAV-B presentation and post-flight analyses in support of FTM-11 Trackex.
- Conduct MRT presentation and post-flight analyses in support of FTM-12.
- Conduct two ARAV-B presentations and post-flight analyses in support of FTM-12 Trackex.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| SE&I and BMDS Integration | 0 | 3,495 | 4,900 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort provides funding to work in collaboration with the BMDS System Engineer to develop requirements flowdown for Aegis BMD Block 2006; and participate in definition of appropriate Engagement Sequence Groups to best utilize Aegis BMD capability in the overall BMDS.

FY06 Planned Program:

- Complete Block 2006 Element Capability Specifications (ECS) requirements analysis for flow down to Aegis BMD top-level requirements and contribution to the BMDS mission.
- Complete Block 2006 capability performance assessment studies.
- Participate in BMDS ESG planning and monitoring.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Aegis BMD Fire Control (BMC3) | 0 | 8,600 | 8,600 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

This effort provides funding for BMC3 improvements, including establishment of alternate BMD data paths and enhancements, supported increased interoperability with other BMDS elements.

FY06 Planned Program:

- Commence Block 2006 Aegis BMD Weapon System integration and test.
- Incorporate CDLMS upgrades, including:
  - 
  - Interoperability improvements to support Long Range Surveillance and Track, enhanced Launch on TADIL, and engagement coordination missions
- Conduct definition, planning and initial implementation to upgrade the Aegis BMD system in coordination with other BMDS elements (engagement coordination).
- Conduct definition planning and initial implementation for Aegis BMD planning exchange with Joint Defense Planner via Global Command and Control System - Maritime.
- Conduct definition, planning and initial implementation of Aegis BMD Link certification requirements.
- Initiate analyses supporting the migration of Aegis BMD Fire Control (BMC3) architecture into future BMDS networks.

FY07 Planned Program:

- Complete CDLMS upgrades to incorporate:
  - Enhanced Launch on TADIL J design and development to increase the battle space.
- Complete implementation of Aegis BMD planning exchange with Joint Defense Planner via Global Command and Control System - Maritime.
- Complete definition, planning, and initial implementation of Aegis BMD Link certification requirements.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Operations & Support/ Fleet Introduction | 0 | 0 | 9,000 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

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

FY07 Planned Program:

- Provide In-Service Engineering support to Aegis BMD components, including the Aegis BMD Weapon System, SM-3 missile, and Vertical Launching System.
- Provide operational and maintenance training for Aegis BMD crews.
- Provide logistics support (including technical manuals, equipment spares, and Reliability, Maintainability, and Availability data) for Aegis BMD components, including the Aegis BMD Weapon System, SM-3 missile, CDLMS, Joint Tactical Terminal, and Vertical Launching System.

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## D. Acquisition Strategy

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

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

## I. Product Development Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Weapons System Engineering** | | | | | | | | |
| | SS/CPAF | Lockheed Martin/ NJ | 0 | 44,330 | 1Q | 57,455 | 1Q | 101,785 |
| | CPFF | JHU/APL/ MD | 0 | 712 | 1Q | 1,750 | 1Q | 2,462 |
| | MIPR | NSWC/DD/ VA | 0 | 878 | 1Q | 1,750 | 1Q | 2,628 |
| | MIPR | NSWC/PHD/ CA | 0 | 405 | 1Q | 1,400 | 1Q | 1,805 |
| | MIPR | SPAWAR/ CA | 0 | 455 | 1Q | 1,400 | 1Q | 1,855 |
| | FPI | VA Sites/ VA | 0 | 0 | N/A | 1,732 | 1Q | 1,732 |
| SBAR | SS/CPAF | Lockheed Martin/ NJ | 0 | 5,150 | 1/2Q | 0 | N/A | 5,150 |
| Deployment | SS/CPAF | Lockheed Martin/ NJ | 0 | 26,520 | 1Q | 10,175 | 1Q | 36,695 |
| Deployment | MIPR | NAVSEA/ VA | 0 | 3,030 | 1Q | 3,300 | 1Q | 6,330 |
| Deployment | MIPR | NSWC/DD/ VA | 0 | 3,370 | 1Q | 3,018 | 1Q | 6,388 |
| Deployment | MIPR | NSWC/PHD/ CA | 0 | 5,242 | 1Q | 5,089 | 1Q | 10,331 |
| Deployment | MIPR | SPAWAR/ CA | 0 | 1,275 | 1Q | 1,525 | 1Q | 2,800 |
| Deployment | MIPR | SUPSHIP/BATH/ ME | 0 | 853 | 1Q | 2,325 | 1Q | 3,178 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Deployment | FPI | SUPSHIP/PASC/ MS | 0 | 3,930 | 1Q | 770 | 1Q | 4,700 |
| Deployment | Various | Various | 0 | 2,175 | 1/2Q | 1,898 | 1Q | 4,073 |
| SBAR | Various | Various | 0 | 500 | 1/2Q | 0 | N/A | 500 |
| **SM-3 Missile** | | | | | | | | |
| Missile | SS/CPIF | Raytheon/ AZ | 0 | 155,352 | 1Q | 95,447 | 1Q | 250,799 |
| Missile | SS/CPIF | JHU/APL/ MD | 0 | 3,503 | 1Q | 3,588 | 1Q | 7,091 |
| Missile | FFRDC | MIT/LL/ MA | 0 | 325 | 1Q | 196 | 1Q | 521 |
| Missile | MIPR | NSWC/DD/ VA | 0 | 1,841 | 1Q | 3,000 | 1Q | 4,841 |
| Missile | MIPR | NSWC/PHD/ CA | 0 | 1,224 | 1Q | 1,493 | 1Q | 2,717 |
| Missile | MIPR | WSMR/ NM | 0 | 0 | N/A | 791 | 1Q | 791 |
| Missile | MIPR | NAWC/CL/ CA | 0 | 280 | 1Q | 341 | 1Q | 621 |
| Missile | MIPR | NSWC/IH/ MD | 0 | 460 | 1Q | 561 | 1Q | 1,021 |
| Missile | Various | Various/ MD, CA, VA | 0 | 718 | 1Q | 1,148 | 1Q | 1,866 |
| | MIPR | NSWC Corona/ CA | 0 | 0 | N/A | 549 | 1Q | 549 |
| **Block 2006 Targets** | | | | | | | | |
| | MIPR | MDA/ VA | 0 | 18,024 | N/A | 40,000 | 1Q | 58,024 |
| Subtotal Product Development | | | 0 | 280,552 | | 240,701 | | 521253 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Weapons System Engineering** | | | | | | | | |
| | SS/CPAF | MIT/LL/ MA | 2,570 | 945 | 1Q | 1,750 | 1Q | 5,265 |
| | SS/MIPR | NSWC/Coronarona / CA | 225 | 0 | N/A | 88 | 1Q | 313 |
| | SS/CPFF | SEG/ VA | 2,095 | 875 | 2Q | 1,050 | 2Q | 4,020 |
| | Various | VARIOUS/ US | 0 | 0 | N/A | 525 | 1Q | 525 |
| | MIPR | MDA/ VA | 0 | 11,000 | 1Q | 20,840 | 1Q | 31,840 |
| **SM-3 Missile** | | | | | | | | |
| | MIPR | NSWC/DD/ VA | 0 | 1,000 | 1Q | 465 | 1Q | 1,465 |
| | MIPR | JHU/APL/ MD | 0 | 500 | 1Q | 1,000 | 1Q | 1,500 |
| | | MIT/LL/ MA | 0 | 100 | 1Q | 100 | 1/2Q | 200 |
| | MIPR | NSWC/CD/ MD | 0 | 450 | 1Q | 459 | 1Q | 909 |
| | MIPR | NAVSEA/ VA | 0 | 669 | 1Q | 815 | 1Q | 1,484 |
| | Various | Various | 0 | 276 | 1/2Q | 847 | 1/2Q | 1,123 |
| | MIPR | MDA/ VA | 0 | 19,439 | 1Q | 20,000 | 1Q | 39,439 |
| **SE&I and BMDS Integration** | | | | | | | | |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| | MIPR | JHU/APL/ MD | 0 | 260 | 1Q | 335 | 1Q | 595 |
| | MIPR | NSWC Corona/ CA | 0 | 305 | 1Q | 400 | 1Q | 705 |
| | MIPR | NSWC DD/ VA | 0 | 2,291 | 1Q | 2,950 | 1Q | 5,241 |
| | MIPR | NSWC PHD/ CA | 0 | 540 | 1Q | 700 | 1Q | 1,240 |
| | Various | Various | 0 | 99 | 1/2Q | 515 | 1/2Q | 614 |
| **Aegis BMD Fire Control (BMC3)** | | | | | | | | |
| | MIPR | JHU/APL/ MD | 0 | 1,565 | 1Q | 1,600 | 1Q | 3,165 |
| | FPI | MIT/LL/ MA | 0 | 663 | 1/2Q | 663 | 1/2Q | 1,326 |
| | | MITRE | 0 | 548 | 1Q | 548 | 1Q | 1,096 |
| | MIPR | NSWC PHD/ CA | 0 | 656 | 1Q | 656 | 1Q | 1,312 |
| | MIPR | SPAWAR/ CA | 0 | 4,628 | 1Q | 4,628 | 1Q | 9,256 |
| | Various | Various | 0 | 540 | 1/2Q | 505 | 1/2Q | 1,045 |
| **Operations & Support/ Fleet Introduction** | | | | | | | | |
| | MIPR | JHU/APL/ MD | 0 | 0 | N/A | 450 | 1Q | 450 |
| | MIPR | CSCS (ATRC)/ VA | 0 | 0 | N/A | 1,975 | 1Q | 1,975 |
| | FPI | NSWC Corona/ CA | 0 | 0 | N/A | 1,060 | 1Q | 1,060 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| | FPI | NSWC/DD/ VA | 0 | 0 | N/A | 795 | 1Q | 795 |
| | MIPR | NSWC/PHD/ CA | 0 | 0 | N/A | 3,881 | 1Q | 3,881 |
| | Various | Various | 0 | 0 | N/A | 839 | 1/2Q | 839 |
| Subtotal Support Costs | | | 4,890 | 47,349 | | 70,439 | | 122678 |

**Remarks**

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **System Test & Evaluation** | | | | | | | | |
| Test & Eval | MIPR | PMRF/ HI | 0 | 6,700 | 1Q | 7,800 | 1Q | 14,500 |
| Test & Eval | MIPR | SMDC/ AL | 2,100 | 1,300 | 1Q | 2,200 | 1Q | 5,600 |
| Test & Eval | MIPR | NSWC/DD/ VA | 0 | 8,200 | 1Q | 9,600 | 1Q | 17,800 |
| Test & Eval | SS/CPFF | JHU/APL/ MD | 0 | 13,200 | 1Q | 16,700 | 1Q | 29,900 |
| Test & Eval | | NAWC/WPNS | 0 | 3,100 | 1Q | 4,500 | 1Q | 7,600 |
| Test & Eval | MIPR | NSWC/PHD/ CA | 0 | 5,100 | 1Q | 6,800 | 1Q | 11,900 |
| Test & Eval | MIPR | MIT/LL/ MD | 0 | 1,100 | 1Q | 2,100 | 1Q | 3,200 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Test & Eval | MIPR | AIRPAC/ HI | 0 | 1,100 | 1Q | 2,400 | 1Q | 3,500 |
| Test & Eval | MIPR | SPAWAR/ CA | 0 | 2,500 | 1Q | 3,800 | 1Q | 6,300 |
| Test & Eval | Various | Various | 0 | 3,800 | 1/2Q | 8,600 | 1Q | 12,400 |
| Test & Eval | MIPR | WSMR/ CA | 0 | 800 | 1/2Q | 1,700 | 1Q | 2,500 |
| | MIPR | NSWC/Corona/ CA | 0 | 2,900 | 1Q | 3,800 | 1Q | 6,700 |
| | | Raytheon/ AZ | 0 | 2,800 | 1Q | 4,500 | 1Q | 7,300 |
| | | Lockheed Martin/ NJ | 0 | 15,700 | 1Q | 20,500 | 1Q | 36,200 |
| | | MDA/ VA | 0 | 9,000 | 1Q | 20,000 | 1Q | 29,000 |
| Subtotal Test and Evaluation | | | 2,100 | 77,300 | | 115,000 | | 194400 |

**Remarks**

## IV. Management Services Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Weapons System Engineering** | | | | | | | | |
| | MIPR | NAVSEA | 0 | 13,867 | 1/2Q | 13,867 | 1Q | 27,734 |
| | C/CPFF | Anteon/ VA | 0 | 28,266 | 1/2Q | 30,000 | 1Q | 58,266 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| | C/CPFF | Paradigm/ VA | 0 | 1,638 | 1/2Q | 3,750 | 1Q | 5,388 |
| | SS/CPFF | JHU/APL/ MD | 0 | 1,330 | 1Q | 2,519 | 1Q | 3,849 |
| | SS/CPAF | Raytheon/ AZ | 0 | 1,000 | 1Q | 1,542 | 1Q | 2,542 |
| | SS/CPAF | Lockheed Martin/ NJ | 0 | 1,000 | 1Q | 1,336 | 1Q | 2,336 |
| | MIPR | NSWC/DD/ VA | 0 | 1,285 | 1Q | 1,851 | 1Q | 3,136 |
| | Various | Various | 0 | 2,048 | 1/2Q | 1,495 | 1/2Q | 3,543 |
| Subtotal Management Services | | | 0 | 50,434 | | 56,360 | | 106794 |

**Remarks**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 6,990 | 455,635 | | 482,500 | | 945,125 |

**Remarks**

**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date: **February 2006**

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

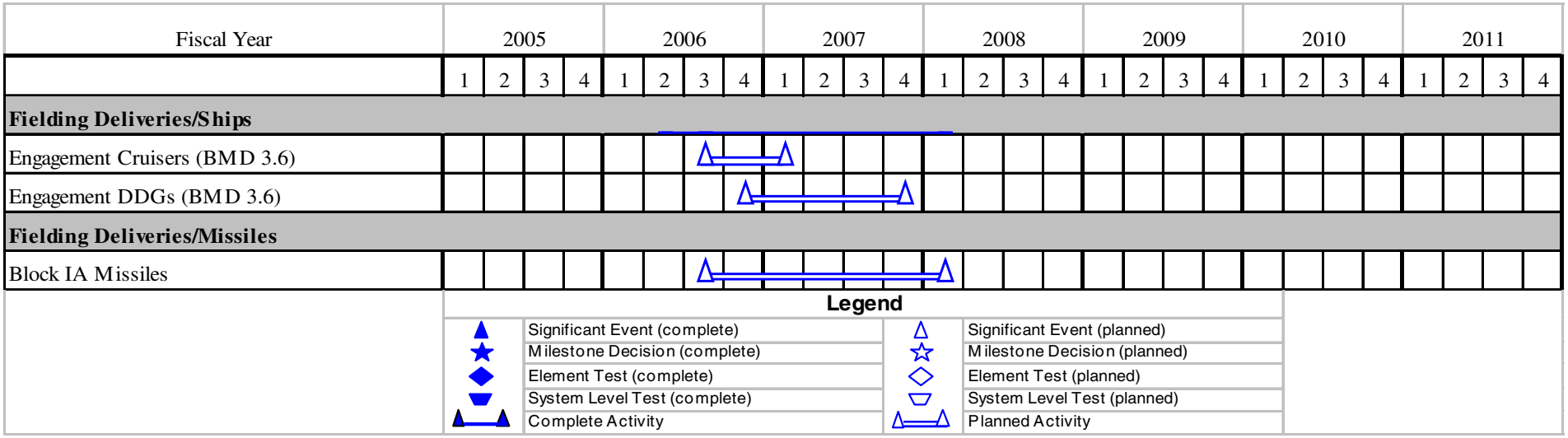
R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis**

| Fiscal Year | 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 |
| **Manufacturing Processes and Advanced Materials** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BSP Engineering Development Model (CSEDS) | | | | | | | | | | | △ | | | | | | | | | | | | | | | | | |
| **Development Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Block 2006 System Requirements Review | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Block 2006 System Design Review | | | | | | △ | | | | | | | | | | | | | | | | | | | | | | |
| BMD 4.0 Preliminary Design Review | | | | | | | | | △ | | | | | | | | | | | | | | | | | | | |
| BMD 4.0 Critical Design Review | | | | | | | | | | | △ | | | | | | | | | | | | | | | | | |
| BMD 4.0E Engineering Assessment | | | | | | | | | | | | | △ | | | | | | | | | | | | | | | |
| **Flight Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FTM-10 | | | | | | | △ | | | | | | | | | | | | | | | | | | | | | |
| FTM-11 | | | | | | | | | △ | | | | | | | | | | | | | | | | | | | |
| FTM-12 | | | | | | | | | | | △ | | | | | | | | | | | | | | | | | |
| FTM-13 | | | | | | | | | | | | | △ | | | | | | | | | | | | | | | |
| **Fielding Deliveries/Ships** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Long Range Surveillance & Tracking DDGs (BMD 3.0E) | | | | | | △ | | | | | | | △ | | | | | | | | | | | | | | | |
| Engagement Cruisers (BMD 3.0) | | | | | | | △ | | | | | | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| △——△ | Complete Activity | △——△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |



| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

| Schedule Profile | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Manufacturing Processes and Advanced Materials** | | | | | | | |
| BSP Engineering Development Model (CSEDS) | | | 3Q | | | | |
| **Development Milestones** | | | | | | | |
| Block 2006 System Requirements Review | 2Q | | | | | | |
| Block 2006 System Design Review | | 2Q | | | | | |
| BMD 4.0 Preliminary Design Review | | | 1Q | | | | |
| BMD 4.0 Critical Design Review | | | 3Q | | | | |
| BMD 4.0E Engineering Assessment | | | | 1Q | | | |
| **Flight Tests** | | | | | | | |
| FTM-10 | | 3Q | | | | | |
| FTM-11 | | | 1Q | | | | |
| FTM-12 | | | 3Q | | | | |
| FTM-13 | | | | 1Q | | | |
| **Fielding Deliveries/Ships** | | | | | | | |
| Long Range Surveillance & Tracking DDGs (BMD 3.0E) | | 2Q-4Q | 1Q-4Q | 1Q | | | |
| Engagement Cruisers (BMD 3.0) | | 3Q | | | | | |
| Engagement Cruisers (BMD 3.6) | | 3Q-4Q | 1Q | | | | |
| Engagement DDGs (BMD 3.6) | | 4Q | 1Q-4Q | | | | |
| **Fielding Deliveries/Missiles** | | | | | | | |
| Block IA Missiles | | 3Q-4Q | 1Q-4Q | 1Q | | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

| COST ($ in Thousands) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0909 AEGIS BMD Block 2008 | 0 | 266,158 | 418,345 | 680,796 | 557,545 | 91,763 | 50,595 |
| RDT&E Articles Qty | 0 | 0 | 0 | 22 | 25 | 7 | 0 |

*Note: This PE was created per Congressional direction for FY06 and beyond. Project 0909 was previously funded in PE 0603882C, BMD Midcourse Defense.*

*RDT&E Articles: FY08 - Nine (9) SM-3 missiles, three (3) ARAVs, two (2) targets, installation of BMD 3.0E on one (1) DDG, installation of BMD 3.6 (LRS&T capability only) on one (1) DDG, installation of BMD 3.6 on six (6) DDGs. FY09 - Eighteen (18) SM-3 missiles, two (2) ARAVs, one (1) target, installation of BMD 3.6 on two (2) DDGs, delivery of the BMD 4.0 computer program, one (1) BSP EDM (BMD 4.0) delivered to a CG. FY10 - Six (6) SM-3 missiles, delivery of the BMD 4.0.1 computer program.*

## A. Mission Description and Budget Item Justification

Aegis BMD Block 2008 supports the BMDS mission of intercepting ballistic missiles in all regions, in all phases, and of all ranges, as follows:

- In all regions: provide enhanced, sea-based Long Range Surveillance and Track (LRS&T) and engagement capabilities.
- In all phases of ballistic missile flight: LRS&T capability against missile threats in all flight stages; engagement capability against missile threats in the midcourse flight stage
- Against all ranges:
  - LRS&T capability against Ballistic Missiles threats of all ranges
  - Enhanced engagement capability: battlespace expanded to include Intermediate-Range Ballistic Missile (IRBM)-class threats

Aegis BMD supported LDC by providing Long Range Surveillance and Track (LRS&T) data to other elements of the BMDS. Aegis BMD will further improve both national and international security with its ability to launch Standard Missile 3 (SM-3) missiles based upon data received via the Tactical Digital Information Link (TADIL) network. Through development and fielding of the Aegis BMD Signal Processor and upgrades to the SM-3 Blk IA missile (SM-3 Blk IB) in Block 2008, Aegis BMD will improve discrimination capability and performance against more diverse and longer range threats.

Aegis BMD Block 2008 will build on BSP development in Block 2006 to expand Aegis BMD effectiveness against the threat base. It will provide a full upgrade to the Aegis BMD Weapon System (BMD 4.0/4.0.1) and an upgraded SM-3 missile, SM-3 Blk IB.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

Block 2008 includes improvements to the kinetic warhead's seeker and Divert and Attitude Control System (DACS). Seeker improvements will include the introduction of seeker All-Reflective-Optics (ARO) to improve optics performance, and a Kinetic Warhead Advanced Signal Processor (ASP) to mitigate diminished manufacturing source issues in SM-3 Blk IA missiles. Additionally, the increased processing capability of the ASP will support new discrimination algorithms. The optics and processing improvements will enhance the Aegis BMD contribution to the BMDS missions by providing greater sensitivity and seeker discrimination capability. Other missile improvements include the integration of a two-color seeker and development of the Throttleable Divert and Attitude Control System (TDACS). These enhancements will be tested and verified for the SM-3 Block IB configuration in the Block 2008 timeframe.

Aegis BMD Block 2008 will deliver in two spirals:

- Spiral one (BMD 4.0) will deliver an initial testbed system capability with the SM-3 Blk IA missile. It will build on Block 2006 BSP enhancements to the LRS&T mission by adding improvements to the engagement mission.
- Spiral two (BMD 4.0.1) will be an operationally-certified system capable of firing the SM-3 Blk IA or IB missile.

Other Block 2008 capability enhancements include:

- 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 expand battlespace and improve discrimination, divert, and probability of mission success.

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

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Weapon System | 0 | 82,158 | 127,900 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

In Block 2008, the Aegis BMD Weapon System Engineering group will develop BMD 4.0 to support testbed operations; and BMD 4.0.1 to provide an operationally-certified system with either the SM-3 Block IA or IB.

FY06 Planned Program:

- Prepare a Specification Change Notice (SCN) to the Block 2006 Element Capability Specification (ECS) to incorporate Block 2008 requirements.
- Perform System level trade-off studies based on the updated Block 2006 ECS.
- Prepare an SCN to the Block 2008 A-Spec., to define the Aegis Weapon System design requirements to meet Block 2008 system-level requirements.
- Conduct a Delta System Requirements Review (SRR).
- Commence studies to improve Lethal Object Designation in a cluttered environment.

FY07 Planned Program:

- Support the MDA System Engineering's Update of the Test Bed System Specification (TBSS) to reflect Block 2008 requirements.
- Update the Block 2006/2008 Element Capability Specification (ECS) based on the approved TBSS.
- Conduct the Delta System Design Review (SDR), based on the updated ECS, to present Block 2008 requirements.
- Conduct the Preliminary Design Review (PDR), based SDR direction to the prime contractor, to review and gain approval for the contractor's approach to meeting Block 2006/2008 requirements.
- Complete work to improve Lethal Object Designation in a cluttered environment.
- Conduct critical experiments using Aegis BMD Signal Processor testbed equipment.
- Conduct studies on RF/IR sensor fusion for a Block 2008 implementation.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| SM-3 Missile | 0 | 184,000 | 290,445 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Block 2008 missile improvements includes improvements to the kinetic warhead's seeker and Divert and Attitude Control System (DACS). Seeker improvements will include the introduction of seeker All-Reflective-Optics (ARO) to improve optics performance, and a Kinetic Warhead Advanced Signal Processor (ASP). Other missile improvements include the integration of a two-color seeker and development of the Throttleable Divert and Attitude Control System (TDACS). Also during this timeframe, Aegis BMD will complete delivery of SM-3 Blk IA missiles for deployment, and begin delivery of SM-3 Blk IB missiles for testing and deployment.

FY06 Planned Program:

- Continue SM-3 Blk IB IR discrimination risk reduction and algorithm development.
- Continue SM-3 Blk IB All Reflective Optics (ARO) engineering for improved missile discrimination capabilities.
- Continue SM-3 Blk IB Advanced Signal Processor (ASP) design efforts for improved missile discrimination and to mitigate diminished manufacturing source issues.
- Complete development and begin integration of the SM-3 Blk IB two-color seeker.
- Continue SM-3 Blk IB TDACS design efforts.
- Procure Long Lead Material for SM-3 Blk IA Missiles with delivery beginning in FY09.

FY07 Planned Program:

- Continue SM-3 Blk IB All Reflective Optics (ARO) engineering for improved missile discrimination capabilities.
- Continue SM-3 Blk IB Advanced Signal Processor (ASP) design efforts for improved missile discrimination.
- Continue testing of SM-3 Blk IB two-color seeker upgrade.
- Continue SM-3 Blk IB TDACS development.
- Produce initial SM-3 Blk IB proof-of-design units.
- Complete SM-3 Blk IB IR discrimination risk reduction and algorithm development.
- Upgrade SM-3 Blk IA Virtual and Inert Operational Missile to SM-3 Blk IB configuration to validate interface integrity within the missile and across weapon system interfaces.
- Conduct SM-3 Blk IB PDR and CDR.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

**D. Acquisition Strategy**

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

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

## I. Product Development Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Weapon System** | | | | | | | | |
| | SS/CPAF | Lockheed Martin/ NJ | 0 | 72,510 | 1Q | 106,645 | 1Q | 179,155 |
| | MIPR | NSWC/DD/ VA | 0 | 1,632 | 1Q | 3,250 | 1Q | 4,882 |
| | | NSWC/PHD/ CA | 0 | 751 | 1Q | 2,600 | 1Q | 3,351 |
| | MIPR | JHU/APL/ MD | 0 | 1,322 | 1Q | 3,250 | 1Q | 4,572 |
| | MIPR | SPAWAR/ CA | 0 | 845 | 1Q | 2,600 | 1Q | 3,445 |
| | MIPR | Va Sites/ VA | 0 | 0 | N/A | 3,055 | 1Q | 3,055 |
| **SM-3 Missile** | | | | | | | | |
| | | Raytheon/ AZ | 0 | 182,000 | 1Q | 279,434 | 1Q | 461,434 |
| | MIPR | NSWC DD/ VA | 0 | 0 | N/A | 2,061 | 1Q | 2,061 |
| | MIPR | JHU/APL/ MD | 0 | 0 | N/A | 2,164 | 1Q | 2,164 |
| | MIPR | NSWC/CR/ MD | 0 | 0 | N/A | 184 | 1Q | 184 |
| | MIPR | NSWC/CL/ CA | 0 | 0 | N/A | 350 | 1/2Q | 350 |
| | MIPR | NSWC/IH/ MD | 0 | 0 | N/A | 576 | 1Q | 576 |
| | MIPR | NSWC Corona/ CA | 0 | 0 | N/A | 564 | 1Q | 564 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| | MIPR | MIT/LL/ MA | 0 | 0 | N/A | 204 | 1Q | 204 |
| | MIPR | NSWC/PHD/ CA | 0 | 0 | N/A | 1,534 | 1Q | 1,534 |
| | Various | Various | 0 | 0 | N/A | 336 | 1/2Q | 336 |
| Subtotal Product Development | | | 0 | 259,060 | | 408,807 | | 667867 |

**Remarks**

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Weapon System** | | | | | | | | |
| | MIPR | ATRC/ VA | 0 | 0 | N/A | 650 | 1Q | 650 |
| | CPFF | SEG/ MD | 0 | 1,625 | 1Q | 1,950 | 1Q | 3,575 |
| | FFRDC | MIT/LL/ MA | 0 | 1,755 | 1Q | 3,250 | 1Q | 5,005 |
| | FFRDC | MITRE/ VA | 0 | 0 | N/A | 325 | 1Q | 325 |
| | MIPR | NSWC/Corona/ CA | 0 | 0 | N/A | 163 | 1Q | 163 |
| | | Various | 0 | 1,718 | 1Q | 162 | 1Q | 1,880 |
| **SM-3 Missile** | | | | | | | | |
| | MIPR | NSWC DD/ VA | 0 | 1,000 | 1Q | 500 | 1Q | 1,500 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| | MIPR | JHU/APL/ MD | 0 | 1,000 | 1Q | 1,000 | 1Q | 2,000 |
| | FPI | MIT/LL/ MA | 0 | 0 | N/A | 100 | 1/2Q | 100 |
| | MIPR | NSWC/CD/ MD | 0 | 0 | N/A | 471 | 1Q | 471 |
| | MIPR | NAVSEA/ VA | 0 | 0 | N/A | 838 | 1Q | 838 |
| | Various | Various | 0 | 0 | N/A | 129 | 1Q | 129 |
| Subtotal Support Costs | | | 0 | 7,098 | | 9,538 | | 16636 |

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

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

## IV. Management Services Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 | 266,158 | | 418,345 | | 684,503 |

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

| Fiscal Year | 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 |
| **Development Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BMD 4.0/4.0.1 Development | | | | | △ | | | | | | | | | | | | | | | | △ | | | | | | | |
| Block 2008 Preliminary Design Review | | | | | | | | | △ | | | | | | | | | | | | | | | | | | | |
| Block 2008 Critical Design Review | | | | | | | | | | | △ | | | | | | | | | | | | | | | | | |
| BMD 4.0 Engineering Assessment | | | | | | | | | | | | | | | | | △ | | | | | | | | | | | |
| BMD 4.0.1 Engineering Assessment | | | | | | | | | | | | | | | | | | | | | △ | | | | | | | |
| **Manufacturing Processes and Advanced Materials** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BSP Engineering Development Model (cruiser) | | | | | | | | | | | | | | | | | | △ | | | | | | | | | | |
| **Testing Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RIMPAC 08 | | | | | | | | | | | | | | | | △ | | | | | | | | | | | | |
| **Flight Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FTM-14 | | | | | | | | | | | | | | | △ | | | | | | | | | | | | | |
| FTM-15 | | | | | | | | | | | | | | | | | | △ | | | | | | | | | | |
| **Fielding Deliveries/Ships** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LRS&T destroyers | | | | | | | | | | | | | | △ | | | | | | | | | | | | | | |
| Engagement DDGs (BMD 3.6) | | | | | | | | | | | | | | △ | | | | | | △ | | | | | | | | |
| BMD 4.0 Cruiser | | | | | | | | | | | | | | | | | | △ | | | | | | | | | | |
| **Fielding Deliveries/Missiles** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Block 1A Missiles | | | | | | | | | | | | | | △ | | | | | | △ | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲——▲ | Complete Activity | △——△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

| Schedule Profile | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Development Milestones** | | | | | | | |
| BMD 4.0/4.0.1 Development | | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q | |
| Block 2008 Preliminary Design Review | | | 1Q | | | | |
| Block 2008 Critical Design Review | | | 3Q | | | | |
| BMD 4.0 Engineering Assessment | | | | | 1Q | | |
| BMD 4.0.1 Engineering Assessment | | | | | | 1Q | |
| **Manufacturing Processes and Advanced Materials** | | | | | | | |
| BSP Engineering Development Model (cruiser) | | | | | 2Q | | |
| **Testing Milestones** | | | | | | | |
| RIMPAC 08 | | | | 4Q | | | |
| **Flight Tests** | | | | | | | |
| FTM-14 | | | | 3Q | | | |
| FTM-15 | | | | | 2Q | | |
| **Fielding Deliveries/Ships** | | | | | | | |
| LRS&T destroyers | | | | 2Q | | | |
| Engagement DDGs (BMD 3.6) | | | | 2Q-4Q | 1Q-3Q | | |
| BMD 4.0 Cruiser | | | | | 2Q | | |
| **Fielding Deliveries/Missiles** | | | | | | | |
| Block 1A Missiles | | | | 2Q-4Q | 1Q-4Q | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

| COST ($ in Thousands) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0009 AEGIS BMD Block 2010 | 0 | 0 | 29,000 | 52,800 | 171,600 | 471,900 | 341,200 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 24 | 18 |

*Note: This PE was created per Congressional direction for FY06 and beyond. Project 0009 was previously funded in PE 0603882C, BMD Midcourse Defense.*

*RDT&E Articles: FY10 - Eighteen (18) SM-3 missiles, one (1) ARAV, one (1) target, installation of BMD 4.0.1 on one (1) CG, installation of BMD 4.0.1 on three (3) DDGs. FY11 - Twelve (12) SM-3 missiles, one (1) ARAV, one (1) target, installation of BMD 4.0.1 on one (1) CG, installation of BMD 4.0.1 on three (3) DDGs.*

## A. Mission Description and Budget Item Justification

Aegis BMD Block 2010 supports the BMDS mission of intercepting ballistic missiles in all regions, in all phases, and of all ranges, as follows:

- In all regions: provide sea-based surveillance, tracking, and engagement capabilities.
- In all phases of ballistic missile flight: Long Range Surveillance and Track (LRS&T) capability against missile threats in all flight stages; engagement capability against missile threats in the midcourse flight stage
- Against all ranges:
  - LRS&T capability against Ballistic Missile threats of all ranges
  - Engagement capability against SRBM to IRBM-class threats

Aegis BMD supported LDC by providing Long Range Surveillance and Track (LRS&T) data to other elements of the BMDS. Aegis BMD will further improve both national and international security with its ability to launch Standard Missile 3 (SM-3) missiles based upon autonomous data and upon data received via the Tactical Digital Information Link (TADIL) network. Through development and fielding of the Aegis BMD Signal Processor and upgrades to the SM-3 Blk IA missile in Block 2006/2008, Aegis BMD will significantly improve discrimination capability and performance against more diverse and longer range threats.

The Aegis BMD Block 2010 program will integrate Aegis BMD Block 2008 and the BMD mission with the Navy-developed Open Architecture system. This effort will transition Aegis BMD from older, MIL-standard computers to newer Commercial Off The Shelf (COTS) computing plants. This change is necessary for Aegis BMD to remain compatible with Navy assets as Navy ship modernization plans are executed. This change will improve human-systems interface through display enhancements and eliminate the need for a separate computing system specific to the BMD

mission. This will also enable more ships to serve as candidates for the BMD mission as the threat projection changes. Open architecture will be included in future fielded BMD system improvements.

In collaboration with the MDA Systems Engineer, Aegis BMD is contributing to the BMDS in development of engagement sequence groups (ESGs). Aegis BMD Block 2010 will support an autonomous engagement against Short Range Ballistic Missiles (SRBMs), Medium Range Ballistic Missiles (MRBMs) and Intermediate-Range Ballistic Missiles (IRBMs) without external cueing. It will support an engagement against SRBM to IRBM- class targets using data from other BMDS elements and external sensors.

Aegis BMD will also provide target track data to support Ground Based Interceptor Launch and Engagement against Long Range Ballistic Missiles (LRBMs) and Intermediate Range Ballistic Missiles (IRBMs) via input for the Ground-based Midcourse Defense (GMD) Sensor Task Plan (STP) and Weapons Task Plan (WTP).

**B. Accomplishments/Planned Program**

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Weapon System Engineering | 0 | 0 | 5,000 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

For Block 2010, Aegis BMD will begin performance and threat analysis in FY07.

FY07 Planned Program:

- Perform preliminary analysis in support of Engineering Capability Specification (ECS) development.
  - Evaluate U.S. Navy Open Architecture computer program code.
  - Review U.S. Navy cruiser modernization and destroyer modernization hardware suites for future incorporation of Aegis BMD Block 2010 computer programs.
  - Begin drafting Block 2010 ECS.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| SM-3 Missile | 0 | 0 | 24,000 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Aegis BMD Block 2010 will continue the procurement of SM-3 Block IB missiles.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

FY07 Planned Program:

- Procure Long Lead Material for SM-3 Blk IB missiles with delivery beginning in FY10.

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## D. Acquisition Strategy

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

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

## I. Product Development Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Weapon System Engineering** | | | | | | | | |
| AWS | | Lockheed Martin/ NJ | 0 | 0 | N/A | 5,000 | 1Q | 5,000 |
| **SM-3 Missile** | | | | | | | | |
| Missile | | Raytheon/ AZ | 0 | 0 | N/A | 24,000 | 1Q | 24,000 |
| Subtotal Product Development | | | 0 | 0 | | 29,000 | | 29000 |

**Remarks** Funding for this Budget Project does not commence until FY07

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 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<br>**February 2006** |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>**RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE<br>**0603892C Ballistic Missile Defense Aegis** |

## IV. Management Services Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 | | 29,000 | | 29,000 |

**Remarks**

**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date: **February 2006**

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

R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis**

| Fiscal Year | 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 |
| **Development Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Block 2010 System Requirements Review | | | | | | | | | | | | | △ | | | | | | | | | | | | | | | |
| Block 2010 Preliminary Design Review | | | | | | | | | | | | | | | | | △ | | | | | | | | | | | |
| Block 2010 Critical Design Review | | | | | | | | | | | | | | | | | | | | | △ | | | | | | | |
| Block 2010 Preliminary Concept Review | | | | | | | | | | | △ | | | | | | | | | | | | | | | | | |
| Block 2010 Engineering Assessment | | | | | | | | | | | | | | | | | | | | | | | | | | | | △ |
| **Flight Tests** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FTM-16 | | | | | | | | | | | | | | | | | | | | | | | △ | | | | | |
| FTM-17 | | | | | | | | | | | | | | | | | | | | | | | | | | | △ | |
| **Fielding Deliveries/Ships** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BMD 4.0.1 Cruiser | | | | | | | | | | | | | | | | | | | | | | | | | △ | | | △ |
| BMD 4.0.1 Destroyers | | | | | | | | | | | | | | | | | | | | | | | | | △ | | | △ |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲—▲ | Complete Activity | △—△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

| Schedule Profile | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Development Milestones** | | | | | | | |
| Block 2010 System Requirements Review | | | | 1Q | | | |
| Block 2010 Preliminary Design Review | | | | | 1Q | | |
| Block 2010 Critical Design Review | | | | | | 1Q | |
| Block 2010 Preliminary Concept Review | | | 3Q | | | | |
| Block 2010 Preliminary Concept Review | | | 3Q | | | | |
| Block 2010 Engineering Assessment | | | | | | | 4Q |
| **Flight Tests** | | | | | | | |
| FTM-16 | | | | | | 3Q | |
| FTM-17 | | | | | | | 3Q |
| **Fielding Deliveries/Ships** | | | | | | | |
| BMD 4.0.1 Cruiser | | | | | | | 1Q-4Q |
| BMD 4.0.1 Destroyers | | | | | | | 1Q-4Q |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

| COST ($ in Thousands) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| R109 AEGIS BMD Block 2012 | 0 | 0 | 16,000 | 21,100 | 39,800 | 158,000 | 167,500 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: This PE was created per Congressional direction for FY06 and beyond. All previous projects were funded in PE 0603882C, BMD Midcourse Defense.*

**A. Mission Description and Budget Item Justification**

Aegis BMD Block 2012 supports the BMDS mission of intercepting ballistic missiles in all regions, in all phases, and of all ranges, as follows:

- In all regions: provide sea-based surveillance, tracking, and engagement capabilities. 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 Limited Defensive Capability (LDC).
  - Against short and medium range ballistic missiles by providing engagement support as part of Block 2004.
  - Against limited intermediate range ballistic missiles by providing engagement support as part of Block 2008.
  - Against long-range ballistic missiles, to include some Intercontinental Ballistic Missile (ICBM) threats, using the upgrade SM-3 Blk IIA missile.

Aegis BMD supported LDC by providing Long Range Surveillance and Track (LRS&T) data to other elements of the BMDS. Aegis BMD will further improve both national and international security with its ability to launch Standard Missile 3 (SM-3) missiles based upon autonomous data and upon data received via the Tactical Digital Information Link (TADIL) network. Through development and fielding of the Aegis BMD Signal Processor and upgrades to the SM-3 Blk IA missile in Block 2006/2008, Aegis BMD will significantly improve discrimination capability and performance against more diverse and longer range threats.

The Aegis BMD Block 2012 program will integrate Aegis BMD Weapon System improvements, including Engage on Remote, and the SM-3 BLK IIA missile. Other Aegis BMD Block 2012 improvements include:

- Defeat a wide variety of ballistic missiles in the presence of counter countermeasures (Short Range Ballistic Missiles (SRBMs), Medium Range Ballistic Missiles (MRBMs), Intermediate Range Ballistic Missiles (IRBMs), Long Range Ballistic Missiles (LRBMs), including limited Inter-Continental Ballistic Missiles (ICBMs).
- Feature Aided Track Correlation (FATC)

- Forcenet/GIG Compliance
- Improvements to BMDS Multi-Element Sensor Data Fusion.

In collaboration with the MDA systems engineer, Aegis BMD is contributing to the BMDS in development of engagement sequence groups (ESGs). Aegis BMD Block 2012 will support an autonomous engagement against SRBMs, MRBMs, IRBMs, LRBMs and some ICBMs without requiring external cueing. It will also support an engagement against SRBMs, MRBMs, IRBMs and LRBMs using data from other BMDS elements and external sensors. Aegis BMD will also provide target track data to support Ground Based Interceptor Launch and Engagement against IRBMs and ICBMs via input for the Ground-based Midcourse Defense (GMD) Sensor Task Plan (STP) and Weapons Task Plan (WTP).

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Weapon System Engineering | 0 | 0 | 16,000 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Block 2012 will integrate SM-3 Blk II/IIA missile improvements (developed under project 0402) with the Aegis BMD Weapon System, leveraging on improvements achieved under Block 2010, to include Open Architecture.

FY07 Planned Program:

- Perform preliminary analysis in support of Block 2012 Element Capability Specification (ECS) development.
- Begin modification of Block 2008 simulation programs to model Block 2012 performance.
- Conduct analyses of Block 2012 threat set.
- Perform initial Block 2012 requirements development in support of SM-3 Blk IIA top-level requirement generation.

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## D. Acquisition Strategy

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

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

## I. Product Development Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Weapon System Engineering** | | | | | | | | |
| | | Lockheed Martin/ NJ | 0 | 0 | N/A | 16,000 | 1/2Q | 16,000 |
| Subtotal Product Development | | | 0 | 0 | | 16,000 | | 16000 |

**Remarks**

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 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<br>**February 2006** |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>**RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE<br>**0603892C Ballistic Missile Defense Aegis** |

## IV. Management Services Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 | | 16,000 | | 16,000 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

| Fiscal Year | 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 |
| **Development Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Block 2012 System Requirements Review | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| Block 2012 System Design Review | | | | | | | | | | | | | | △ | | | | | | | | | | | | | | |
| Block 2012 Preliminary Design Review | | | | | | | | | | | | | | | | | | | | | | | △ | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲—▲ | Complete Activity | △—△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

| Schedule Profile | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Development Milestones** | | | | | | | |
| Block 2012 System Requirements Review | | | 4Q | | | | |
| Block 2012 System Design Review | | | | 2Q | | | |
| Block 2012 Preliminary Design Review | | | | | | 3Q | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

| COST ($ in Thousands) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0402 Japanese Cooperative Program | 0 | 36,234 | 44,000 | 75,000 | 125,000 | 193,000 | 225,000 |
| RDT&E Articles Qty | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

*Note: This PE was created per Congressional direction for FY06 and beyond. Project 0402 was previously funded in PE 0603882C, BMD Midcourse Defense.*

*RDT&E Article for FY06: One (1) SM-3 missile.*

**A. Mission Description and Budget Item Justification**

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 the development of advanced missile technologies in four components of the SM-3 guided missile: sensor, advanced kinetic warhead, second stage propulsion and lightweight nosecone. In FY06, the JCR project will flight test the lightweight nosecone in Joint Control Test Vehicle-1 (JCTV-1).

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

Both work share and cost will be equitably shared by the U.S. and Japan.

The Scope of Work of the SCD project will be conducted through a three-phased engineering approach which completes by 2014. Phase I will consist of requirements definition for the SM-3 Blk II and IIA missile configurations, concurrent with initial risk reduction efforts related to the 21-inch propulsion components, lightweight nosecone, advanced seeker, larger Divert and Attitude Control System (DACS), and preliminary test plans.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

Also in Phase I, information exchange related to production and maintenance of the SM-3 Blk IIA missile will be initiated. Upon completion of requirements definition, a schedule for development and testing, and work share and cost share for development and testing will be refined. Phase II will define the performance allocation and component configuration for the development and testing of the SM-3 Blk II missile; Phase III will define the performance allocation and component configuration for the development and testing of the SM-3 Blk IIA missile.

The SM-3 Blk II/IIA missile will increase the area that can be defended by Aegis BMD and increase the probability of kill against a larger threat set. It will leverage enhanced capability provided by BMDS sensor upgrades.

The SCD project will:

- Develop components for the SM-3 Blk II/IIA missile and integrate them into an All Up Round (AUR)
  - 21" 2nd and 3rd stage components:
    - 21" nosecone
    - Advanced kinetic warhead
    - Advanced Seeker
    - Improved Large Diameter Divert and Attitude Control System
- Modify the Aegis Weapon System to exploit the capability of the SM-3 Blk II/IIA missile and use of threat track data from BMDS sensors.
- Integrate the SM-3 Blk IIA missile and VLS with Aegis ship systems
  - Includes development of a light weight VLS canister
- Conduct test and evaluation using ground and flight tests
  - SM-3 Blk II/IIA missile
  - Aegis BMD ship systems
  - Aegis BMD weapon systems

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Japanese Cooperative Research | 0 | 24,234 | 0 |
| RDT&E Articles (Quantity) | 0 | 1 | 0 |

FY06 Planned Program:
RDT&E Articles: SM-3 Missile (1)

- Conduct a Critical Design review (CDR) of the SM-3 missile for use in JCTV-1 PoP flight test.
- Deliver one (1) SM-3 missile for use in JCTV-1 flight test.
- Conduct JCTV-1 Proof-of-Principle (PoP) flight test.
- Conduct analysis of JCTV-1 PoP flight test.
- Conduct Captive Carry Testing (CCT) with QWIP sensor on WASP.
- Complete 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 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| SM-3 Blk II/IIA Development | 0 | 12,000 | 44,000 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

FY06 Planned Program:

- Begin requirements definition for the SM-3 Blk II/IIA missile configurations.
- Perform risk reduction efforts related to the 21-inch missile components, advanced seeker, and DACS.

FY07 Planned Program:

- Initiate Phase I of the SM-3 Cooperative Development project
- Finalize Joint System Concept for the SM-3 Blk II/IIA missile configurations.
- Continue risk reduction efforts related to the 21-inch missile components, seeker, and DACS.
- Prepare preliminary test plans for the SM-3 Blk II/IIA missile.
- Initiate information exchange with Japan related to the production and maintenance of the SM-3 Blk IIA missile.
- Initiate Aegis Weapon System design studies for the SM-3 Blk II/IIA missile effort.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

**D. Acquisition Strategy**

The major near-term focus of activity for the Japan Cooperative Research Project will be preparation for and execution of the JCTV-1 flight test. The JCTV-1 flight test 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 SM-3 Cooperative Program for the SM-3 Blk II/IIA missile will utilize a performance based approach that ties program decision milestones to the performance of development prototypes, as well as Control Test Vehicle (CTV) and Guidance Test Vehicle (GTV) flight test article performance.

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

## I. Product Development Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Japanese Cooperative Research** | | | | | | | | |
| JCR | SS/CPAF | Raytheon/ AZ | 77,482 | 10,869 | 1Q | 0 | N/A | 88,351 |
| JCR | SS/CPAF | Lockheed Martin/ NJ | 15,073 | 6,000 | 1Q | 0 | N/A | 21,073 |
| JCR | | Various | 278 | 75 | 1Q | 0 | N/A | 353 |
| **SM-3 Blk II/IIA Development** | | | | | | | | |
| SCD | | Raytheon/ Tucson, AZ | 0 | 2,000 | 1/2Q | 37,670 | 1Q | 39,670 |
| SCD | | Lockheed Martin/ NJ | 0 | 2,000 | 1Q | 3,000 | 1Q | 5,000 |
| SCD | | JHU/APL/ MD | 0 | 2,000 | 1/2Q | 500 | 1Q | 2,500 |
| SCD | MIPR | NSCW/DD/ VA | 0 | 2,000 | 1/2Q | 500 | 1Q | 2,500 |
| SCD | | MIT/ MA | 0 | 1,000 | 1/2Q | 0 | N/A | 1,000 |
| SCD | Various | Various | 0 | 1,500 | 1/2Q | 0 | N/A | 1,500 |
| Subtotal Product Development | | | 92,833 | 27,444 | | 41,670 | | 161947 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Japanese Cooperative Research** | | | | | | | | |
| | SS/CPFF | NSWC/DD/ VA | 4,812 | 0 | N/A | 0 | N/A | 4,812 |
| | SS/CPFF | NSWC/PHD/ CA | 895 | 0 | N/A | 0 | N/A | 895 |
| | SS/CPFF | JHU/APL/ MD | 5,493 | 0 | N/A | 0 | N/A | 5,493 |
| | Various | Various/ Various | 2,280 | 337 | 1Q | 0 | N/A | 2,617 |
| | SS/MIPR | NAWC/CL/ CA | 725 | 0 | N/A | 0 | N/A | 725 |
| | SS/MIPR | ANTEON/ VA | 4,297 | 1,010 | 1Q | 0 | N/A | 5,307 |
| | SS/CPFF | PARADIGM/ VA | 443 | 85 | 1Q | 0 | N/A | 528 |
| | | MDA/ VA | 2,994 | 2,134 | 1/2Q | 0 | N/A | 5,128 |
| | SS | NAVSEA/ DC | 1,531 | 225 | 1Q | 0 | N/A | 1,756 |
| | SS/CPAF | Lockheed Martin/ NJ | 3,032 | 500 | 1Q | 0 | N/A | 3,532 |
| **SM-3 Blk II/IIA Development** | | | | | | | | |
| SCD | MIPR | NSWC/DD/ VA | 0 | 250 | 1/2Q | 250 | 1Q | 500 |
| SCD | MIPR | JHU/APL/ MD | 0 | 250 | 1/2Q | 250 | 1Q | 500 |
| SCD | | Anteon/ VA | 0 | 500 | 1/2Q | 500 | 1Q | 1,000 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| SCD | Various | Various | 0 | 500 | 1/2Q | 1,330 | 1Q | 1,830 |
| Subtotal Support Costs | | | 26,502 | 5,791 | | 2,330 | | 34623 |

**Remarks**

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Japanese Cooperative Research** | | | | | | | | |
| Test & Evaluation | MIPR | PMRF/ HI | 190 | 0 | N/A | 0 | N/A | 190 |
| | MIPR | NSWC/PHD/ CA | 1,159 | 0 | N/A | 0 | N/A | 1,159 |
| | MIPR | NAWC/PM/ CA | 610 | 0 | N/A | 0 | N/A | 610 |
| | MIPR | NSWC/Corona/ CA | 735 | 0 | N/A | 0 | N/A | 735 |
| | MIPR | NSWC/DD/ VA | 368 | 0 | N/A | 0 | N/A | 368 |
| | SS/CPFF | JHU/APL/ MD | 260 | 0 | N/A | 0 | N/A | 260 |
| | Various | Various | 401 | 0 | N/A | 0 | N/A | 401 |
| | MIPR | NAWC/CL | 0 | 750 | 1/2Q | 0 | N/A | 750 |
| | MIPR | Kirtland AFB | 0 | 2,249 | 1/2Q | 0 | N/A | 2,249 |
| Subtotal Test and Evaluation | | | 3,723 | 2,999 | | 0 | | 6722 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

## IV. Management Services Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 | | | 123,058 | 36,234 | | 44,000 | | 203,292 |

**Remarks**

**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date: **February 2006**

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

R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis**

| Fiscal Year | 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 |
| **Japan Cooperative Research Project** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Proof of Principle System CDR | | | | | ▲ | | | | | | | | | | | | | | | | | | | | | | | |
| JCTV-1 | | | | | | △ | | | | | | | | | | | | | | | | | | | | | | |
| JCTV-1 Mission Data Review | | | | | | | △ | | | | | | | | | | | | | | | | | | | | | |
| Captive Carry Testing | | | | | | | | △ | | | | | | | | | | | | | | | | | | | | |
| **SM-3 Blk II/IIA Development Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SM-3 Blk II/IIA System Concept Review | | | | | | | | △ | | | | | | | | | | | | | | | | | | | | |
| SM-3 Blk II/IIA System Requirements Review | | | | | | | | | | | | △ | | | | | | | | | | | | | | | | |
| SM-3 Blk II/IIA System Design Review | | | | | | | | | | | | | | | △ | | | | | | | | | | | | | |
| SM-3 Blk II Preliminary Design Review | | | | | | | | | | | | | | | | | | | △ | | | | | | | | | |
| SM-3 Blk IIA System Design Review 2 | | | | | | | | | | | | | | | | | | | | | | △ | | | | | | |
| SM-3 Blk II Critical Design Review | | | | | | | | | | | | | | | | | | | | | | | △ | | | | | |
| SM-3 Blk IIA Preliminary Design Review | | | | | | | | | | | | | | | | | | | | | | | | | | | △ | |
| **Japan Cooperative Research Project** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ship System and VLS Critical Design Review | | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲—▲ | Complete Activity | △—△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

| Schedule Profile | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Japan Cooperative Research Project** | | | | | | | |
| Proof of Principle System CDR | | 1Q,1Q | | | | | |
| JCTV-1 | | 2Q | | | | | |
| JCTV-1 Mission Data Review | | 3Q,3Q | | | | | |
| Captive Carry Testing | | 4Q,4Q | | | | | |
| **SM-3 Blk II/IIA Development Milestones** | | | | | | | |
| SM-3 Blk II/IIA System Concept Review | | 4Q | | | | | |
| SM-3 Blk II/IIA System Requirements Review | | | 4Q | | | | |
| SM-3 Blk II/IIA System Design Review | | | | 3Q | | | |
| SM-3 Blk II Preliminary Design Review | | | | | 3Q | | |
| SM-3 Blk IIA System Design Review 2 | | | | | | 2Q | |
| SM-3 Blk II Critical Design Review | | | | | | 3Q | |
| SM-3 Blk IIA Preliminary Design Review | | | | | | | 3Q |
| **Ship System and VLS Critical Design Review** | 2Q | | | | | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603892C Ballistic Missile Defense Aegis** |

| COST ($ in Thousands) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0602 Program-Wide Support | 0 | 12,525 | 14,029 | 14,264 | 10,453 | 10,690 | 11,425 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## A. Mission Description and Budget Item Justification

Program-Wide Support provides funding for common non-headquarters support functions across the entire program such as strategic planning, program integration, business management, 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 outside services and support contractors that augment government staff in these areas. Many of these costs reside within the Missile Defense Agency 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, although some functions and costs within this program element are performed by MDA employees assigned within the National Capital Region (NCR). Other costs included herein provide facility capabilities for MDA Executing Agent locations, such as physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses. Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Civilian Salaries and Support | 0 | 12,525 | 14,029 |
| RDT&E Articles (Quantity) | 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 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603892C Ballistic Missile Defense Aegis |

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| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System** |

| COST ($ in Thousands) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| Total PE Cost | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 |
| 0812 Space Tracking and Surveillance System (STSS) Block 2006 | 0 | 227,848 | 247,519 | 73,700 | 92,000 | 89,200 | 41,200 |
| 0912 Space Tracking and Surveillance System (STSS) Block 2008 | 0 | 0 | 35,000 | 29,300 | 24,100 | 14,100 | 13,800 |
| R112 Space Tracking and Surveillance System (STSS) Block 2012 | 0 | 0 | 97,000 | 309,150 | 635,250 | 836,690 | 816,500 |
| 0602 Program-Wide Support | 0 | 3,640 | 11,066 | 15,024 | 20,528 | 18,291 | 13,976 |
| | | | | | | | |
| Amount Included in PE 0904903D | 0 | 0 | 0 | -32,570 | -284,669 | -300,116 | -189,870 |
| Total PE Cost Reflected in R-1 | 0 | 231,488 | 390,585 | 394,604 | 487,209 | 658,165 | 695,606 |

*Note: STSS funding in FY05 was held in the Sensors PE 0603884C. Per Congressional direction in the FY06 Defense Authorization Bill, funding moved to separate PE in FY06 for increased visibility.*

*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 FY07, STSS will upgrade the ground segment and data processing algorithms to take advantage of on-orbit experience (STSS Block 2008 -- Project 0912). MDA is beginning to plan for a constellation of STSS satellites (STSS Block 2012 -- Project R112).*

## 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 2004, the United States fielded an initial defense capability to address known threats. 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. In FY05, the Space Tracking and Surveillance System (STSS) was funded with Ballistic Missile Defense Radars in the Sensors (0606884C) Program Element. Beginning in FY06, STSS will be in this Program Element.

## A.1 System Element Description

STSS is the evolutionary development of satellite based infrared and visible sensors to provide global tracking of ballistic missiles. The program consists of a ground operating station and pair of demonstration satellites to be launched in Block 2006 (0812), a ground station and software upgrade effort in Block 2008 to best take advantage of the Block 2006 sensor system (0912), and an operational constellation development effort (R112).

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System** |

Lessons learned from the Block 2006 and 2008 efforts will feed the development of the operational constellation. The STSS Block 2012 effort will replace the two Block 2006 satellites in the testbed and form the basic for growth to an operational constellation.

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

- STSS extends sensor coverage to a global level. STSS enables global tracking of ballistic missiles, and will provide accurate tracking information to the BMDS battle manager, close the global fire control loop with BMDS interceptors, and extend the effective range of BMDS interceptors and other sensors.
- Space based sensors are not limited by basing rights issues or deployment decisions, and will allow coverage of countries not accessible from ground based sensors. STSS's visible and Infrared (IR) sensors will complement radars and contribute to a sensor architecture more robust to countermeasures.
- Global sensor coverage contributes to the BMDS' ability to counter threats from any location, on any trajectory.

**A.3 Major System Element Goals**

Block 2006

- Launch two low earth orbit satellites
- Demonstrate capability to acquire, track, discriminate and report ballistic missile and intercept events from lift-off through midcourse to reentry
- Demonstrate capability to perform autonomous acquisition-to-track handover within a satellite
- Demonstrate capability to perform track handover to a satellite
- Demonstrate capability to uplink commands and downlink mission, health, and status data both directly and via cross link between two satellites
- Explore approaches to close the global fire control loop for BMDS weapons and methods to conduct integrated operations with other BMDS elements

Block 2008

- Upgrade Block 2006 Ground Segment, Spacecraft/Payload software and Ground Segment hardware
- Improve the Block 2006 experiment through enhancement or added capabilities necessary to implement lessons learned in design and development of Block 2006 hardware and software development
- Provide Block 2012 utility through proof of concept for algorithms, system design and BMDS interfaces to be used in the operational constellation (Block 2012)
- Improve Operational Capability through system upgrade that will enable use of Block 2006/2008 system during contingency operations

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System** |

Block 2012

- Provide accurate and timely global midcourse object tracking and reporting of long-range missile attacks against the United States, its allies and deployed forces
- Provide accurate, near-real time launch-on/engage data for use by BMDS
- Support BMDS threat data acquisition efforts

## A.4 Major Events Schedule and Description

| Major Event | Project | Timeframe |
|---|---|---|
| **Contract Activity** | | |
| **BLOCK 2008** | | |
| Contract Modification | 0912 | 2Q FY 2007 |
| **STSS Constellation** | | |
| RFP Release | R112 | 2Q FY 2006 - 3Q FY 2006 |
| Contract Award | R112 | 1Q FY 2007 |
| **Critical Design Review** | | |
| **STSS Constellation** | | |
| Critical Design Review | R112 | 2Q FY 2009 |
| **Other** | | |
| **BLOCK 2006** | | |
| Ground Segment Integration & Test | 0812 | 2Q FY 2005 - 4Q FY 2006 |
| Satellite Integration and Test | 0812 | 2Q FY 2005 - 1Q FY 2007 |
| Launch (2 Satellites) | 0812 | 3Q FY 2007 |
| STSS On-Orbit Operations | 0812 | 3Q FY 2007 - 3Q FY 2009 |
| **BLOCK 2008** | | |
| Ground Station Upgrades | 0912 | 2Q FY 2007 - 4Q FY 2008 |
| **STSS Constellation** | | |
| System Test & Integration | R112 | 1Q FY 2011 - 4Q FY 2011 |

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System** |

| B. Program Change Summary | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Previous President's Budget (FY 2006 PB) | 0 | 0 | 0 |
| Current President's Budget (FY 2007 PB) | 0 | 231,488 | 390,585 |
| Total Adjustments | 0 | 231,488 | 390,585 |
| Congressional Specific Program Adjustments | 0 | 234,998 | 0 |
| Congressional Undistributed Adjustments | 0 | -3,510 | 0 |
| Reprogrammings | 0 | 0 | 0 |
| SBIR/STTR Transfer | 0 | 0 | 0 |
| Adjustments to Budget Years | 0 | 0 | 390,585 |

FY06 increase of $231.488 million implements the Congressionally directed transfer of the Space Surveillance and Tracking System from the BMD Sensors Program Element (PE #0603884C) to a unique Program Element and includes a portion of the MDA Congressional undistributed adjustment.

FY07 increase of $390.585 million follows through with implementation of the Congressionally directed Space Surveillance and Tracking System transfer and includes adjustments to achieve overhead/infrastructure reductions.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System** |

| COST ($ in Thousands) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0812 Space Tracking and Surveillance System (STSS) Block 2006 | 0 | 227,848 | 247,519 | 73,700 | 92,000 | 89,200 | 41,200 |
| RDT&E Articles Qty | 0 | 1 | 2 | 0 | 0 | 0 | 0 |

*Note: Note: Beginning in FY06, funding for the Space Tracking and Surveillance System (STSS) program was moved to this Program Element per Congressional. FY05 costs can be located within PE 0603884C.*

*RDT&E Articles: FY06 - One STSS ground station; FY07 - two STSS Block 2006 Research and Development Satellites*

**A. Mission Description and Budget Item Justification**

Block 2006 STSS is a 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 global BMDS interceptor fire control loop with data from the Block 2006 satellites.

To provide STSS with appropriate test opportunities, MDA is procuring four dedicated ballistic missile targets for on-orbit testing, two in FY07 and two in FY08. The STSS-centric tests conducted with these targets will also include opportunities for secondary participation from other BMDS Elements. STSS is contracting with NASA for launch services for the two Block 2006 satellites using a single Delta II launch vehicle.

The Block 2006 program will develop and demonstrate most of the functions and interfaces required for Engagement Sequence Groups (ESGs): GBI Launch-On and Engage-On STSS and SM-3 Launch-On and Engage-On STSS 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.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603893C Space Tracking & Surveillance System |

**B. Accomplishments/Planned Program**

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Space | 0 | 138,330 | 119,366 |
| RDT&E Articles (Quantity) | 0 | 0 | 2 |

Designs, develops, builds and tests two satellites for launch in 2007 in support of the MDA mission to launch and sustain the Space Tracking Surveillance System

FY06 Planned Program:

- Continue payments to NASA for launch services for the 2 Block 2006 satellites
- Conduct payload and satellite bus integration for satellite 2
- Deliver payloads 1 and 2 to space vehicle integration
- Conduct systems integration for Satellite 1 and 2
- Begin integration of the two satellites with NASA booster and Orbital Insertion Stage (OIS)
- Initiate hardware development in support of the STSS flight tests: SPT-06, SPT-10, SPT-15 and SPT-16
- Conduct range integration activities with Reagan Test Site (RTS), Vandenberg Air Force Base (VAFB) and the Pacific Missile Range Facility (PMRF) for STSS flight tests
- Initiate procurement of boosters, develop reentry vehicles and develop countermeasures to support STSS flight tests

FY07 Planned Program:
RDT&E Articles: Two satellites

- 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
- Conduct tests with resident space objects, ground based and airborne targets
- Complete hardware development in support of STSS flight tests: SPT-06 and SPT-10
- Finalize range integration activities with RTS, VAFB and PMRF for STSS flight tests SPT-06 and SPT-10
- Conduct first dedicated flight tests with ballistic missile targets

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System** |

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Ground | 0 | 9,184 | 1,118 |
| RDT&E Articles (Quantity) | 0 | 1 | 0 |

Designs, develops, builds and maintains a robust ground system for the STSS constellation in support of MDA as well as to integrate elements of the MDA Space Layer that will ensure synergistic use of our space assets.

FY06 Planned Program:
RDT&E Article: One STSS Ground Station

- Complete the installation and checkout of the 4 Front End Processors (FEPs) capability at the Missile Defense Space Experimentation Center (MDSEC) which provides the ability to contact both satellites simultaneously and also provide a redundant capability as a back-up. The FEPs are the interface from our processing strings of equipment to the satellites.
- Complete the first of two Operational Readiness Demonstrations which demonstrate how effective the first iteration of operations procedures that were completed in FY05 operate on the qualified Build 1 ground system.
- Complete Code and Unite Test for software Build 2.4 which will be the qualified version of the Build 2 software.
- Complete software qualification testing of version 2.4 which includes increased capability to the same five software items from Build 1.
- Conduct Ground Acceptance Test 2 to demonstrate the full capability of the ground segment using the qualified Build 2 software to command and control two simulated STSS Satellites.
- Complete the second and final iteration of operations procedures along with the on-line training system which support test rehearsals throughout the year for ground crew operations. The second iteration of procedures capture the additional capability that was developed with the second software build.
- Complete the second of two Operational Readiness Demonstrations which demonstrates the full capability of the developed ground system. This demonstration is executed on the final Build 2 qualified baseline.

FY07 Planned Program:
- Archive relevant ground segment documentation and artifacts, and revise as required, to ensure their effective retrieval for subsequent use.
- Provide sustainment of ground operational and backup hardware sets at the MDSEC.
- Provide maintenance of qualified software.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System** |

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Government | 0 | 28,490 | 26,323 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Provides all necessary and continuous personnel, technology, and administrative support for the Space Tracking Surveillance System Program Office

FY06 Planned Program:
- Continued program management FFRDC support to manage execution of the STSS program
- Provided Program Office Support to Travel, Cost Estimating Support, Administrative Management Services, Hardware and Software purchases and maintenance, Computer Network Support, Supplies, Reimbursement for AF Civilian positions and costs associated with the organizational move to new base buildings in the 2nd quarter of FY06

FY07 Planned Program:
- Continued program management FFRDC support to manage execution of the STSS program
- Provided Program Office Support to Travel, Cost Estimating Support, Administrative Management Services, Hardware and Software purchases and maintenance, Computer Network Support, Supplies, and Reimbursement for AF Civilian positions

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Systems Engineering | 0 | 48,644 | 68,923 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

Oversees system level requirement and specification development, configuration development, integration, test, and verification for two satellites for launch in FY07. Interfaces with other MDA elements to ensure proper integration into the Ballistic Missile Defense System (BMDS).

FY06 Planned Program:
- Continue System Compatibility Tests (Ground to Satellite and Satellite to Satellite communication)
- Continue Advanced Tracking and Discrimination Algorithm Development
- Conduct BMDS Integration
- Begin Launch & On-orbit Flight Test Preparations

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603893C Space Tracking & Surveillance System |

FY07 Planned Program:

- Complete Launch & On-orbit Flight Test Preparations
- Conduct Launch
- Staff and operate the STSS satellite operations center in the MDSEC
- Continue Advanced Tracking and Discrimination Algorithm Development
- Conduct initial satellite check out and testing with Resident Space Objects, Airborne and Ground based targets and dedicated ballistic missile targets

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| IR Engagement Sequence | 0 | 3,200 | 6,589 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

FY06 Planned Program:

- Develop stronger STSS surrogate sensor interfaces aboard the High Altitude Observatories (HALO) II aircraft, the Widebody Airborne Sensory Platform (WASP) aircraft, and the Air Force Maui Optical and Supercomputing Site (AMOS) telescopes in order to advance near-real-time multi-sensor track fusion techniques.
- Demonstrate the utility of STSS advanced tracking and discrimination algorithms to the BMDS community utilizing surrogate InfraRed (IR) sensor data in preparation of the STSS Block 2006 satellite launch

FY07 Planned Program:

- Continue to utilize the STSS Surrogate Testbed (SSTB) Fusion Workstation (FW) located at the MDSEC to collect, process and distribute live and archived IR surrogate and Block 2006 satellite for distribution throughout the BMDS community for testing, verification, validation and accreditation of STSS and BMDS advanced algorithms
- Continue to demonstrate the utility of STSS advanced tracking and discrimination algorithms to the BMDS community utilizing surrogate InfraRed (IR) sensor data in preparation of the STSS Block 2006 satellite launch

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Near Field Infrared Experiment (NFIRE) | 0 | 0 | 25,200 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

NOTE: FY06 funding for NFIRE was directed by Congressional action to move from the Ballistic Missile Defense System Interceptors program element (PE 0603886C) to the BMD Technology program element (PE 0603175C). The FY07 funding was reviewed and deemed insufficient for the

current schedule and requirements to complete the NFIRE satellite launch that will include not only the Track Sensor Payload, but an additional communications payload, the Laser Communications Terminal (LCT) from the German government. It was determined that additional funding in FY07 to support the NFIRE program would be assigned to the STSS PE in anticipation of a request to move this and any future funding for NFIRE from this PE and PE 0603175C to the new BMD System Space Program PE 0603895C. PE 0603893C and PE 0603895C will become the two core program elements under the auspices of the newly formed MDA Space Applications Center of Excellence in FY08. In FY07, NFIRE funding is located in PE 0603175C ($10.8 million) and $25.2 million in PE 0603893C, for a total of $36 million to conduct the planned program.

FY07 Planned Program

- Conduct Initial On-Orbit Operations to ensure the functionality and performance of the Track Sensor Payload (TSP) prior to executing a mission
- Accept delivery of two Multi-stage Boost Targets
- Conduct Target of Opportunity Missions to collect low resolution plume data and validate the tracking performance of the TSP
- Conduct Near Field Boosting Target Fly-by mission to collect high resolution plume data
- Conduct Hyper-Temporal Experiment to assess early launch detect and tracking capability
- Conduct laser communications experiments to assess the viability of the technology for use by the BMDS and STSS Block 2012 (O)

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603893C Space Tracking & Surveillance System |

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## 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), with the subcontractor Raytheon providing the sensor payload. 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 third quarter FY02. 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 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603893C Space Tracking & Surveillance System |

## I. Product Development Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 | 224,763 | 87,335 | 1/4Q | 69,801 | 1/4Q | 381,899 |
| Launch Vehicle Integration | C/MIPR | NASA/ FL | 27,329 | 31,300 | 1/4Q | 19,500 | 1/4Q | 78,129 |
| Target Acquisition | Various | MDA/ Various | 0 | 19,695 | 1/4Q | 30,065 | 1/4Q | 49,760 |
| **Ground** | | | | | | | | |
| Capability Based R&D Contract | SS/CPAF | NGST/ CA | 69,469 | 7,834 | 1/4Q | 578 | 1/4Q | 77,881 |
| Government Furnished Equipment | MIPR | Joint National Integration Center (JNIC) / Schriever AFB CO | 0 | 1,350 | 1/4Q | 540 | 1/3Q | 1,890 |
| **Systems Engineering** | | | | | | | | |
| Capability Based R&D Contract | SS/CPAF | NGST/ CA | 125,247 | 39,834 | 1/4Q | 56,698 | 1/4Q | 221,779 |
| Advanced Algorithm Development | MIPR | MIT/LL, Lockheed Martin,Xontech,Sparta,CSC Nichols/ Hanscom AFB MA,LAAFB CA | 4,765 | 3,500 | 1/4Q | 6,936 | 1/4Q | 15,201 |
| Risk Reduction Analysis | MIPR | AFRL/ NM | 0 | 5,310 | 1/4Q | 5,289 | 1/4Q | 10,599 |
| **IR Engagement Sequence** | | | | | | | | |
| Data Collection and Analysis | MIPR | MIT/LL, AFRL / Hanscom AFB MA,Kirtland AFB NM | 8,202 | 3,200 | 1/4Q | 6,589 | 1/4Q | 17,991 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System** |

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Near Field Infrared Experiment (NFIRE)** | | | | | | | | |
| NFIRE | C/CPAF | General Dynamics, AFRL, JNIC/ AZ, NM,CO | 0 | 0 | N/A | 25,200 | N/A | 25,200 |
| Subtotal Product Development | | | 459,775 | 199,358 | | 221,196 | | 880329 |

**Remarks**

- Advanced Algorithm Development is accomplished by a team of multiple contractors or government organizations to include, but not limited to, the Massachusetts Institute of Technology/Lincoln Laboratory (MIT/LL), Defense Microelectronics Activity, NGST, Lockheed Martin, Photon Research Association, SPARTA and Computer Science Corporation/Nichols Research Corporation (CSC/Nichols). Determination of funding requirements will be made upon completion of prior fiscal year activities.
- Data Collection and Analysis demonstrates STSS performance characteristics and testing of STSS advanced algorithms. Funding is forwarded to several government organizations to include, but not limited to, MIT/LL and AFRL. Determination of funding requirements will be made upon completion of prior fiscal year activities, and testing schedules of partnering activities.
- NFIRE funding will be forwarded to several Contractors and government organizations to include, but not limited to General Dynamics, AFRL and the JNIC. For FY07, STSS will propose to the Agency that the NFIRE program funding in this program element be moved to the new program element established in FY06 for the Space Test Bed (PE 0306895C). PE 0603893C and PE 0603895C will become the two core program elements within the MDA Space Applications Center of Excellence

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Government** | | | | | | | | |
| Shared Mission Support | Various | SMC/ CA | 19,951 | 9,224 | 2/4Q | 9,613 | 2/4Q | 38,788 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603893C Space Tracking & Surveillance System |

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| OGA Civilian | Various | SMC/ CA | 2,815 | 2,195 | 2/4Q | 2,262 | 2/4Q | 7,272 |
| Subtotal Support Costs | | | 22,766 | 11,419 | | 11,875 | | 46060 |

**Remarks** All Shared Mission Support costs and OGA Civilian costs have been allocated to Block 2006, through the launch in FY07.

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

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

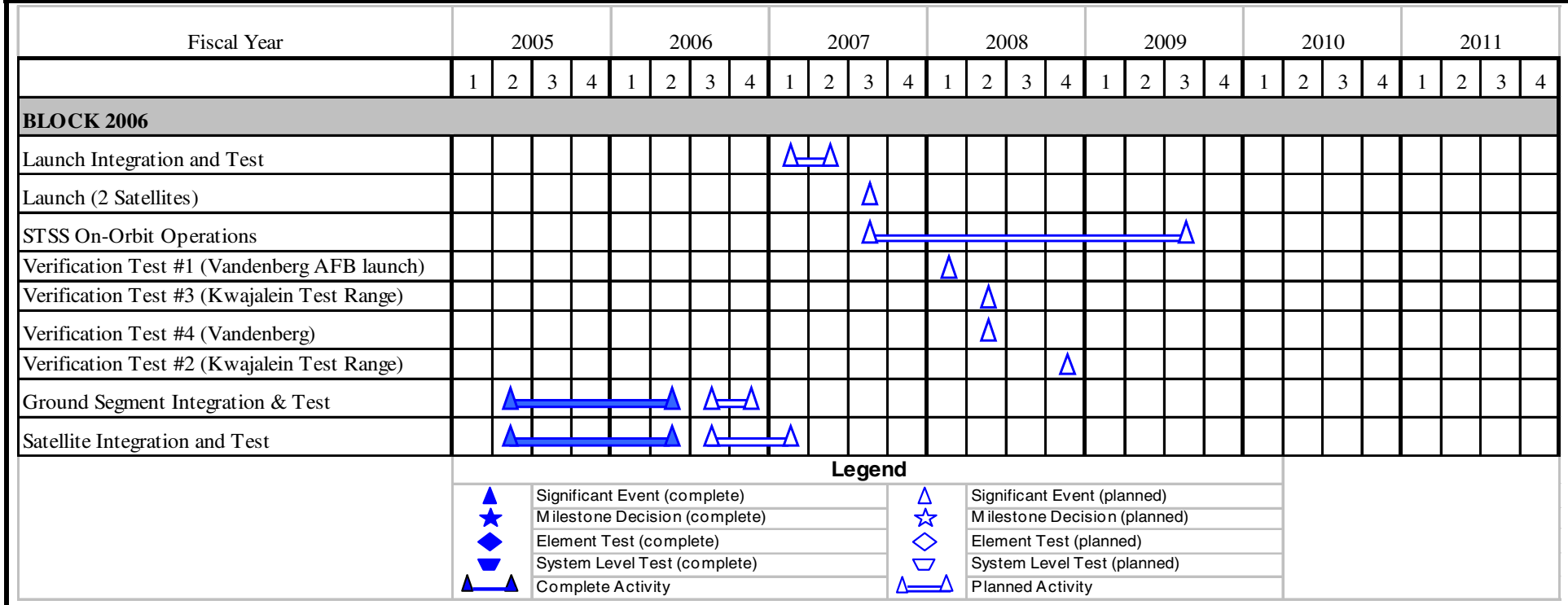
## IV. Management Services Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Government** | | | | | | | | |
| FFRDC | FFRDC | AEROSPACE/ CA | 23,862 | 16,450 | 2/3Q | 14,123 | 2Q | 54,435 |
| SETA | FFRDC | MITRE/ Wash DC | 584 | 321 | 2Q | 325 | 2Q | 1,230 |
| UARC | FFRDC | SDL/ UT | 200 | 300 | 2Q | 0 | N/A | 500 |
| Subtotal Management Services | | | 24,646 | 17,071 | | 14,448 | | 56165 |

**Remarks** All FFRDC costs have been allocated to Block 2006, through the launch in FY07.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 507,187 | 227,848 | | 247,519 | | 982,554 |

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System** |



| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System** |

| Schedule Profile | 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 | | | | |
| Operational and Test Readiness | 3Q-4Q | 1Q-4Q | 1Q-3Q | | | | |
| Spacecraft Integration and Test | 1Q-4Q | | | | | | |
| Payload Fabrication and Integration & Test | 1Q-4Q | 1Q-2Q | | | | | |
| Launch Integration and Test | | | 1Q-2Q | | | | |
| Launch (2 Satellites) | | | 3Q | | | | |
| STSS On-Orbit Operations | | | 3Q-4Q | 1Q-4Q | 1Q-3Q | | |
| Verification Test #1 (Vandenberg AFB launch) | | | | 1Q | | | |
| Verification Test #3 (Kwajalein Test Range) | | | | 2Q | | | |
| Verification Test #4 (Vandenberg) | | | | 2Q | | | |
| Additional System Flight Tests | | | 4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q | 1Q-4Q |
| Verification Test #2 (Kwajalein Test Range) | | | | 4Q | | | |
| System Compatibility Tests | 3Q,4Q | 1Q | | | | | |
| Ground Segment Integration & Test | 2Q-4Q | 1Q-4Q | | | | | |
| Satellite Integration and Test | 2Q-4Q | 1Q-4Q | 1Q | | | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System** |

| COST ($ in Thousands) | 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 | 35,000 | 29,300 | 24,100 | 14,100 | 13,800 |
| RDT&E Articles Qty | 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 provides for upgrades to the Block 2006 ground station hardware and software and Spacecraft/Payload software. The Block 2008 upgrade effort will incorporate lessons learned from design and development in Block 2006 and experiences of other BMD elements to improve the performance of the STSS system and its utility to the BMDS. These improvements will provide additional knowledge points 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 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Ground and Software Upgrades | 0 | 0 | 35,000 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

FY07 Planned Program:

- Modify Block 2006 contract to upgrade or add to Ground Segment's Build 2 software completed in FY06, Ground Segment hardware and Spacecraft/Payload software. These upgrades include enhancements as well as new capabilities necessary to implement lessons learned in design and development in Block 2006 hardware and software development, and those necessary to refine the Ground Segment to increase the utility of Block 2006 satellites to the BMDS. Specific examples are:
  - Provide further automation of the Ground Mission Data Processing and Mission Management software to reduce latency, eliminate person in loop, enable real time data processing, and , for contingency operations, automate planning and tracking
  - Upgrade existing software and hardware at the Missile Defense Space Experimentation Center (MDSEC) to enhance interface and utility to BMDS elements
  - Develop algorithms and upgrade Ground Mission Data Processing Build 2 software to generate additional midcourse track features and improve systems ability to discriminate tracks

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System** |

- Provide proof of concept for algorithms, system design and BMDS interfaces to be used in the operational constellation (Block 2012)
- Complete hardware development in support of STSS flight tests: SPT-15 and SPT-16
- Finalize range integration activities with Reagan Test Site (RTS), Vandenberg Air Force Base (VAFB) and the Pacific Missile Range Facility (PMRF) in support of the STSS flight tests: SPT-15 and SPT-16

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System** |

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## 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 2006 activity was awarded in third quarter FY02. 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 FY07 timeframe.

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System** |

## I. Product Development Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 | 35,000 | 1Q | 35,000 |
| Subtotal Product Development | | | 0 | 0 | | 35,000 | | 35000 |

**Remarks**

As the Ground and Software upgrades activity is a refinement of the Block 2006 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 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 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 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603893C Space Tracking & Surveillance System |

## IV. Management Services Cost ( $ in Thousands )

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

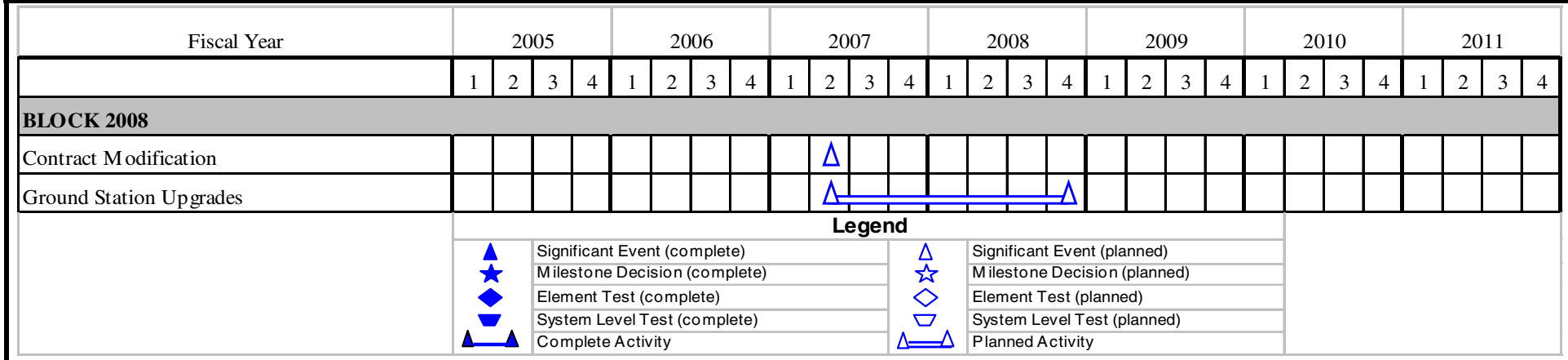
**Remarks**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 0 | 0 | | 35,000 | | 35,000 |

**Remarks**

As the Ground and Software upgrades activity is a refinement of the Block 2006 ground segment, no funding or activity is planned until FY07.

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System** |



| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System** |

| Schedule Profile | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **BLOCK 2008** | | | | | | | |
| Contract Modification | | | 2Q | | | | |
| Ground Station Upgrades | | | 2Q-4Q | 1Q-4Q | | | |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System** |

| COST ($ in Thousands) | 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 | 97,000 | 309,150 | 635,250 | 836,690 | 816,500 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Note: The OSD Cost Analysis Improvement Group (OSD CAIG) is on track to complete an independent cost estimate for the STSS Block 2012 (Operational) program for delivery to the congressional defense committees.*

## A. Mission Description and Budget Item Justification

The STSS Block 2012 (Operational) program initiates STSS's operational capability spiral. Block 2012 (O) satellites represent the next spiral of STSS, providing operational functionality, increased global coverage, improved system performance, and near real time capability. The first two STSS Block 2012 (O) satellites replace the Block 2006 satellites, which are expected to reach the end of their mission life by the launch of the Block 2012 (O) satellites.

Mission Objectives for the Block 2012 (O) satellite constellation are the following:

- Provide accurate and timely global midcourse object tracking and reporting of long-range missile attacks against the United States, its allies and deployed forces
- Provide accurate, near launch-on/engage-on data for use by BMDS weapons systems
- Support BMDS threat data acquisition efforts
- Provide a cost-effective, initial operational spiral meeting near-term performance goals

To support the funding request, the OSD CAIG is currently conducting an independent cost estimate. Results are anticipated to be available in the April/May 2006 time frame. Delivery of the first Block 2012 (O) satellite is expected to be in the 2012-2013 time frame.

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Block 2012 Constellation | 0 | 0 | 97,000 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

FY07 Planned Program:

- Complete Acquisition Strategy Development
- Conduct system trades
- Award prime contract

- Refine system requirements then conduct System Requirements Review
- Develop initial design then conduct a System Design Review (SDR)

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System** |

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## D. Acquisition Strategy

Per the January 2002 Missile Defense Directive, STSS adopted a spiral development, capability-based acquisition approach. The STSS Program Office will build and deploy satellites of increasing performance and technical sophistication. The Block 2012 (O) satellite constellation represents the next spiral of STSS, providing operational functionality, increased coverage, improved system performance, and near real time capability. The acquisition strategy is under development, with contract award anticipated in 1Q FY07. Initial procurement will be for two Block 2012 (O) satellites with unpriced options for an additional three satellites.

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603893C Space Tracking & Surveillance System |

## I. Product Development Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Block 2012 Constellation** | | | | | | | | |
| Capability Based R&D Contract | | TBD/ TBD | 0 | 0 | N/A | 94,000 | 1/4Q | 94,000 |
| Subtotal Product Development | | | 0 | 0 | | 94,000 | | 94000 |

**Remarks**

Acquisition Strategy for the Block 2012 (O) program is under development -- contract details will be available in 2nd or 3rd quarter FY07.

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Block 2012 Constellation** | | | | | | | | |
| Shared Mission Support | Various | SMC/ CA | 0 | 0 | N/A | 3,000 | 1/4Q | 3,000 |
| Subtotal Support Costs | | | 0 | 0 | | 3,000 | | 3000 |

**Remarks**

Shared Mission Support Costs will be paid with funds from Block 2006 and Block 2012. These costs include travel, training, computer services and hardware and software costs.

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

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System** |

## IV. Management Services Cost ( $ in Thousands )

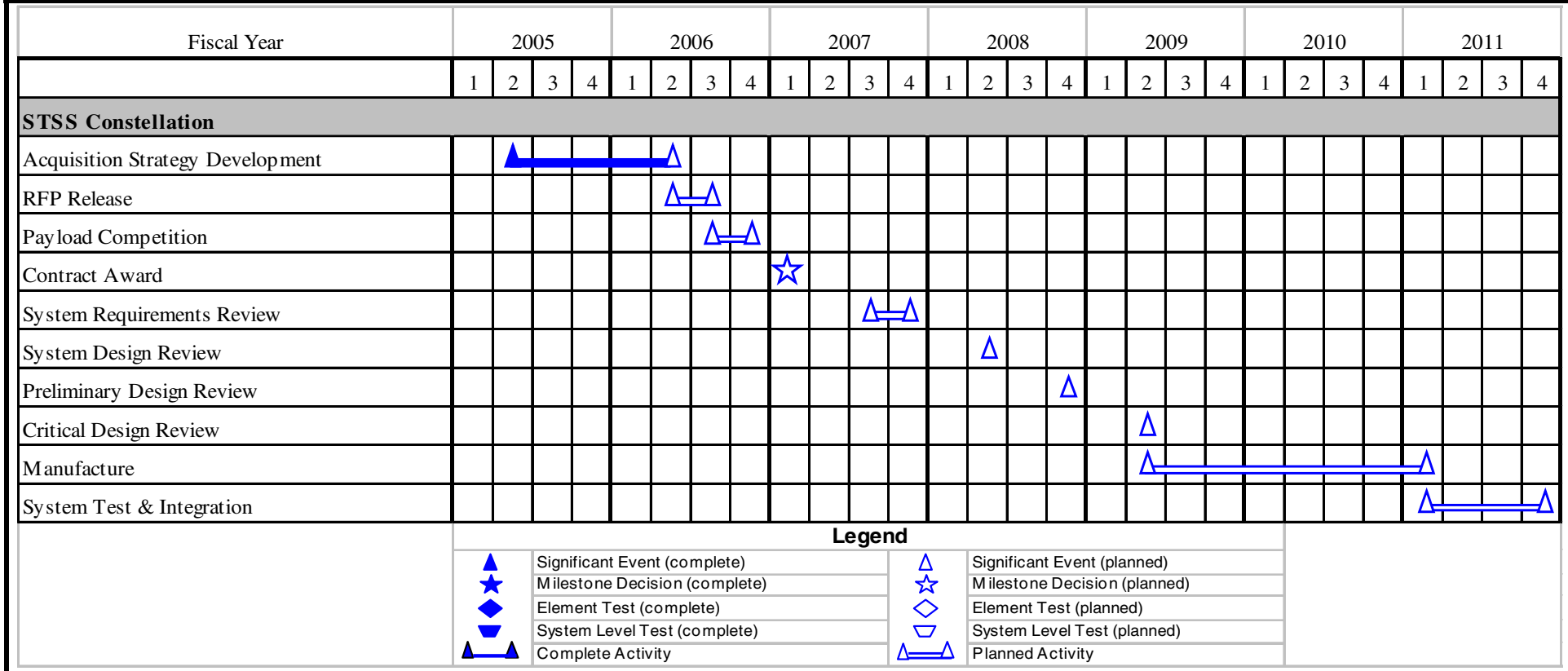
| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| Subtotal Management Services | | | | | | | | |

**Remarks**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 0 | 0 | | 97,000 | | 97,000 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System** |



| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System** |

| Schedule Profile | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **STSS Constellation** | | | | | | | |
| Acquisition Strategy Development | 2Q-4Q | 1Q-2Q | | | | | |
| RFP Release | | 2Q-3Q | | | | | |
| Payload Competition | | 3Q-4Q | | | | | |
| Proposal Review and Evaluations | | 4Q | 1Q | | | | |
| Contract Award | | | 1Q | | | | |
| Refine Requirements | | | 2Q-3Q | | | | |
| System Requirements Review | | | 3Q-4Q | | | | |
| Develop Initial Design | | | 4Q | 1Q-2Q | | | |
| System Design Review | | | | 2Q | | | |
| Preliminary Design Review | | | | 4Q | | | |
| Critical Design Review | | | | | 2Q | | |
| Manufacture | | | | | 2Q-4Q | 1Q-4Q | 1Q |
| System Test & Integration | | | | | | | 1Q-4Q |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603893C Space Tracking & Surveillance System** |

| COST ($ in Thousands) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0602 Program-Wide Support | 0 | 3,640 | 11,066 | 15,024 | 20,528 | 18,291 | 13,976 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## A. Mission Description and Budget Item Justification

Program-Wide Support provides funding for common non-headquarters support functions across the entire program such as strategic planning, program integration, business management, 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 outside services and support contractors that augment government staff in these areas. Many of these costs reside within the Missile Defense Agency 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, although some functions and costs within this program element are performed by MDA employees assigned within the National Capital Region (NCR). Other costs included herein provide facility capabilities for MDA Executing Agent locations, such as physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses. Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Civilian Salaries and Support | 0 | 3,640 | 11,066 |
| RDT&E Articles (Quantity) | 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 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603893C Space Tracking & Surveillance System |

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603894C Multiple Kill Vehicle** |

| COST ($ in Thousands) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| Total PE Cost | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 |
| 0515 Multiple Kill Vehicles (MKV) | 0 | 49,324 | 162,250 | 278,900 | 356,500 | 412,157 | 504,500 |
| 0602 Program-Wide Support | 0 | 1,000 | 2,725 | 6,905 | 840 | 690 | 917 |

*Note: This PE is established per Congressional direction. 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 Multiple Kill Vehicles (MKV) mission is to negate ICBM threat clusters in midcourse with a single engaging interceptor missile. The MKV system consists of a Carrier Vehicle (CV) loaded with a complement of small intercepting kill vehicles (KVs), each about the size of a loaf of bread. MKV development activities are focused on achieving the following program objectives. At the system level, MKV shall be capable of intercepting multiple midcourse targets from one interceptor and will be fully integrated with the Ballistic Missile Defense System (BMDS). The CV shall be capable of weapon to target assignment and management of KVs. The KVs shall be capable of navigation and flight to assigned acquisition baskets, target acquisition, aimpoint selection and terminal homing. The program's initial focus is on achieving the KV objectives with CV development following closely behind.

## A.1 System Element Description

The Multiple Kill Vehicles (MKV) program is the Missile Defense Agency's transformational weapon system development program to deal with the midcourse discrimination challenge: target selection amid uncertainty and countermeasures. The MKV system consists of a Carrier Vehicle (CV) loaded with a complement of small intercepting kill vehicles (KVs), each about the size of a loaf of bread. The exact number of kill vehicles carried is classified, but can be substantially greater than 10 when MKV is launched by a Ground-Based Interceptor (GBI) booster. During flight, the CV 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 KVs autonomously acquire, hit, and destroy them using their on-board seekers and divert motors. MKV uses the existing Ground-based Midcourse Defense (GMD) sensors, fire control, and communications infrastructure. Advancements in sensors, propulsion, computers, and inertial navigation have enabled such KVs, which are small but lethal, due to the vast kinetic energies involved in midcourse hit-to-kill engagements. The MKV payload is anticipated to be ready for initial fielding in the 2014 time frame and will go through a rigorous development and test program. MKV is designed to be compatible with the GMD boosters, such as the Orbital Sciences Boost Vehicle. Trade studies for integration with the Kinetic Energy Interceptor boost vehicle and the SM-3 (21") are also being conducted.

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603894C Multiple Kill Vehicle** |

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

MKV has the ability to destroy multiple targets using a single engaging interceptor missile. When integrated with the BMD System's (BMDS's) sensors and algorithms, MKV's firepower enables the selection of many targets instead of 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. MKV addresses the advanced emerging threats detailed in the Adversary Capabilities Document.

MKV's firepower makes it cost effective. With MKV, the BMDS can add well over 10 midcourse engagements per booster. The resulting reduction in booster, silo and associated infrastructure costs to field MKV is thus significantly less than that for a single-KV interceptor force of equivalent capability.

The BMD System Engineering Process has developed Engagement Sequence Groups (ESGs) for MKV in the Block 2012 and beyond time frame that will fully leverage the GMD investments being made today. In these ESGs, the Sea-Based X-Band Radar acts as the commit sensor for a GBI modified to carry the MKV payload. Fire Control and discrimination logic are similar to what is planned for the Exo-Atmospheric Kill Vehicle, but will incorporate the MKV's many vs. many capability instead of the current one vs. many logic now in use. Efforts to develop software for this capability improvement are underway at both the MKV prime contract and under Project Hercules. Other ESGs, using a wider range of launch platforms and sensors assets are being examined and developed.

The MKV test program will progress from Hardware in the Loop (HWIL) testing to KV Hover Test, KV flight tests, and finally BMDS system level flight tests in the Pacific test bed with a CV and KVs. 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.

**A.3 Major System Element Goals**

FY06-FY07

- Hover Test KV Divert and Attitude Control System Hot Fire Test
- Hover Test KV seeker demonstration
- Hover Test KV seeker, avionics, and software hardware-in-the-loop initiated
- Demonstration CV component trade studies and analyses.

FY08-FY09

- System Requirements Review (SRR) for MKV System
- KV Hover Test
- MKV System Preliminary Design Review (PDR)
- Flight Test KV PDR
- Flight test KV seeker, propulsion, and avionics brassboard demonstrations
- Demonstration CV SRR
- Demonstration CV PDR

FY10-FY11

- MKV System Critical Design Review (CDR)
- Flight Test KV CDR
- KV and CV (Bus) Flight Tests
- Demonstration CV CDR

FY12-FY13

- KV and CV (Bus) Flight Tests
- CV and KVs Level 2 System Flight Tests in Pacific Test Bed

## A.4 Major Events Schedule and Description

| Major Event | Project | Timeframe |
|---|---|---|
| **Flight Test** | | |
| **Assembly, Integration and Test** | | |
| KV FT 1 | 0515 | 1Q FY 2011 - 4Q FY 2011 |
| **Ground Test** | | |
| **Kill Vehicle** | | |
| KV HWIL & Ground Test | 0515 | 3Q FY 2006 - 3Q FY 2008 |
| KV HWIL & Ground Test | 0515 | 3Q FY 2009 - 1Q FY 2011 |
| **Carrier Vehicle** | | |
| HWIL & Ground Test | 0515 | 2Q FY 2010 - 4Q FY 2011 |
| **Assembly, Integration and Test** | | |
| Hover Test | 0515 | 1Q FY 2009 |

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603894C Multiple Kill Vehicle** |

| Major Event | Project | Timeframe |
|---|---|---|
| **Critical Design Review** | | |
| **System Engineering** | | |
| System CDR | 0515 | 2Q FY 2011 |
| **Kill Vehicle** | | |
| Hover Test Kill Vehicle CDR | 0515 | 2Q FY 2005 |
| Flight Test Kill Vehicle CDR | 0515 | 2Q FY 2010 |
| **Carrier Vehicle** | | |
| Carrier Vehicle CDR | 0515 | 2Q FY 2010 |
| **Delivery** | | |
| **Kill Vehicle** | | |
| Kill Vehicle Flight Test Deliveries | 0515 | 1Q FY 2010 - 4Q FY 2011 |
| **Carrier Vehicle** | | |
| Carrier Vehicle Flight Test Deliveries | 0515 | 1Q FY 2011 - 4Q FY 2011 |
| **Other** | | |
| **Program Milestones** | | |
| Design Readiness Review | 0515 | 4Q FY 2007 |
| Design Readiness Review | 0515 | 2Q FY 2009 |
| Design Readiness Review | 0515 | 3Q FY 2010 |
| Design Readiness Review | 0515 | 3Q FY 2011 |
| **System Engineering** | | |
| IPR | 0515 | 3Q FY 2006 |
| IPR | 0515 | 3Q FY 2007 |
| System PDR | 0515 | 2Q FY 2009 |
| IPR | 0515 | 2Q FY 2011 |
| IPR | 0515 | 4Q FY 2011 |
| **Carrier Vehicle** | | |
| Carrier Vehicle PDR | 0515 | 3Q FY 2009 |

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603894C Multiple Kill Vehicle** |

| B. Program Change Summary | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Previous President's Budget (FY 2006 PB) | 0 | 0 | 0 |
| Current President's Budget (FY 2007 PB) | 0 | 50,324 | 164,975 |
| Total Adjustments | 0 | 50,324 | 164,975 |
| Congressional Specific Program Adjustments | 0 | 83,000 | 0 |
| Congressional Undistributed Adjustments | 0 | -32,676 | 0 |
| Reprogrammings | 0 | 0 | 0 |
| SBIR/STTR Transfer | 0 | 0 | 0 |
| Adjustments to Budget Years | 0 | 0 | 164,975 |

This PE is established per Congressional direction. This effort is an outgrowth of earlier technology efforts funded from Program Element 0603175C (Project 0502).

FY07 increase of $164.975 million follows through with implementation of the Congressionally directed Multiple Kill Vehicles transfer and includes adjustments to achieve overhead/infrastructure reductions.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603894C Multiple Kill Vehicle** |

| COST ($ in Thousands) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0515 Multiple Kill Vehicles (MKV) | 0 | 49,324 | 162,250 | 278,900 | 356,500 | 412,157 | 504,500 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*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 Multiple Kill Vehicles (MKV) mission is to negate Inter-Continental Ballistic Missiles (ICBM) threat clusters in midcourse with a single engaging interceptor missile. The MKV system consists of a Carrier Vehicle (CV) loaded with a complement of small intercepting kill vehicles (KVs), each about the size of a loaf of bread. MKV development activities are focused on achieving the following program objectives. At the system level, MKV shall be capable of intercepting multiple midcourse targets from one interceptor and will be fully integrated with the Ballistic Missile Defense System (BMDS). The CV shall be capable of weapon to target assignment and management of KVs. The KVs shall be capable of navigation and flight to assigned acquisition baskets, target acquisition, aimpoint selection and terminal homing. The program's initial focus is on achieving the KV objectives with CV development following closely behind.

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Multiple Kill Vehicles | 0 | 49,324 | 162,250 |
| RDT&E Articles (Quantity) | 0 | 0 | 0 |

FY05 Accomplishments: (Funded in the BMD Technology Program Element, 0603175C in Engagement Systems Project 0502).

FY06 Planned Program:

- Continue KV seeker, divert propulsion, and avionics brassboard demonstrations.
- Conduct hover test KV seeker/avionics/software hardware-in-the-loop testing.
- Continue hover test KV mission and seeker processor software development.
- Continue MKV system engineering studies and analyses.
- Conduct carrier vehicle (CV) sensor component trade studies and analyses.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603894C Multiple Kill Vehicle** |

FY07 Planned Program:

- Continue systems engineering studies and analyses.
- Conduct hover test KV seeker, propulsion, and avionics design verification tests.
- Continue hover test KV seeker/avionics/software hardware-in-the-loop testing.
- Continue hover test KV mission and seeker processor software development.
- Continue CV component trade studies and analyses.

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603894C Multiple Kill Vehicle |

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## 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 after demonstrating sufficient maturity. The program will also be controlled through decision-based acquisition. An integrated Design Readiness Review will be conducted at the end of FY07 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 FY04. 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 covered approximately one year of system development effort and culminated in the Hover Test Kill Vehicle (KV) Critical Design Review (CDR) in Mid-February 2005. Task Order 2 started in January 2005 and continued KV component and subsystem development with seeker, avionics, and propulsion breadboard and brassboard demonstrations. It completed in late November 2005. Task Order 3 was a six-week effort to fund a vendor proposal. It completed in March 2005. Task Order 4 started in October 2005 and will cover KV integration and hover test as well as carrier vehicle development. Subsequent task orders will be issued dependent on the contractor's performance.

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 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603894C Multiple Kill Vehicle |

## I. Product Development Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 | 43,794 | 1Q | 151,351 | 1Q | 195,145 |
| Subtotal Product Development | | | 0 | 43,794 | | 151,351 | | 195145 |

## Remarks

## II. Support Costs Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 | 481 | 1Q | 500 | 1Q | 981 |
| Support Contracts | FFP | Computer Sciences Corp/ Arlington, VA | 0 | 700 | 1Q | 700 | 1Q | 1,400 |
| Support Contracts | CPFF | Aero Thermo Technology/ Huntsville, AL | 0 | 992 | 1Q | 1,050 | 1Q | 2,042 |
| Support Contracts | CPFF | Gray Research/ Huntsville, AL | 0 | 400 | 1Q | 550 | 1Q | 950 |
| Support Contracts | CPAF | ITT/ Huntsville, AL | 0 | 150 | 1Q | 500 | 1Q | 650 |

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603894C Multiple Kill Vehicle |

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | 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 | 317 | 1Q | 334 | 1Q | 651 |
| Support Contracts | CPFF | Various/ Various | 0 | 150 | 1Q | 480 | 1Q | 630 |
| Support Contracts | FFRDC | Sandia/ Albuquerque, NM | 0 | 100 | 1Q | 250 | 1Q | 350 |
| Support Contracts | FFRDC | MIT/LL/ Lexington, MA | 0 | 300 | 1Q | 300 | 1Q | 600 |
| Subtotal Support Costs | | | 0 | 3,590 | | 4,664 | | 8254 |

**Remarks**

Base contract awarded January 2004. Task orders on the contract awarded approximately annually. Task order 2 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 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 | NHTF, Pacific Missile Range & Vandenberg AFB/ HI & CA | 0 | 60 | 1Q | 3,530 | 1Q | 3,590 |
| Subtotal Test and Evaluation | | | 0 | 60 | | 3,530 | | 3590 |

**Remarks**

| Missile Defense Agency (MDA) Exhibit R-3 RDT&E Project Cost Analysis | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603894C Multiple Kill Vehicle** |

## IV. Management Services Cost ( $ in Thousands )

| Cost Categories: | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY 2006 Cost | FY 2006 Award/ Oblg Date | FY 2007 Cost | FY 2007 Award/ Oblg Date | Total Cost |
|---|---|---|---|---|---|---|---|---|
| **Multiple Kill Vehicles** | | | | | | | | |
| Management Support | Various | SMDC & Various/ Huntsville, AL & Various | 0 | 1,880 | 1Q | 2,705 | 1Q | 4,585 |
| Subtotal Management Services | | | 0 | 1,880 | | 2,705 | | 4585 |

**Remarks**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Total Cost | | | 0 | 49,324 | | 162,250 | | 211,574 |

**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 2006**

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

R-1 NOMENCLATURE: **0603894C Multiple Kill Vehicle**

| Fiscal Year | 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 |
| **Program Milestones** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Design Readiness Review | | | | | | | | | | | | ☆ | | | | | | ☆ | | | | | ☆ | | | | | ☆ | |
| **System Engineering** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IPR | | | | | | | △ | | | | △ | | | | | | | | | | | | | | | △ | | △ |
| System PDR | | | | | | | | | | | | | | | | | | △ | | | | | | | | | | |
| System CDR | | | | | | | | | | | | | | | | | | | | | | | | | | △ | | |
| **Kill Vehicle** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hover Test Kill Vehicle CDR | | △ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Seeker Software CDR | | | △ | | | | | | | | | | | | | | | | | | | | | | | | | |
| KV HWIL & Ground Test | | | | | | | △ | | | | | | | | △ | | | | △ | | | | | △ | | | | |
| Kill Vehicle Flight Test Deliveries | | | | | | | | | | | | | | | | | | | | | △ | | | | | | | △ |
| Flight Test Kill Vehicle CDR | | | | | | | | | | | | | | | | | | | | | | △ | | | | | | |
| Kill Vehicle (KV) Flight Qual Tests | | | | | | | | | | | | | | | | | | | | | | | | △ | | | | |
| Kill vehicle integrated ground test | | | | | | | | | | | | | | | | | | | | | | | | | △ | | | |
| **Carrier Vehicle** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Carrier Vehicle PDR | | | | | | | | | | | | | | | | | | | △ | | | | | | | | | |
| Develop algorithms for MKV | | | | | | | | | | | | | | | | | | | | △ | | | | | | | | △ |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲——▲ | Complete Activity | △——△ | Planned Activity |

**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date: **February 2006**

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

R-1 NOMENCLATURE: **0603894C Multiple Kill Vehicle**

| Fiscal Year | 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 |
| **Carrier Vehicle** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Carrier Vehicle CDR | | | | | | | | | | | | | | | | | | | | | | △ | | | | | | |
| HWIL & Ground Test | | | | | | | | | | | | | | | | | | | | | | △ | — | — | — | — | △ | △ |
| Carrier Vehicle Flight Test Deliveries | | | | | | | | | | | | | | | | | | | | | | | | | △ | — | — | △ |
| **Assembly, Integration and Test** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hover Test | | | | | | | | | | | | | | | | | △ | | | | | | | | | | | |
| KV FT 1 | | | | | | | | | | | | | | | | | | | | | | | | | △ | — | — | △ |
| **Program Management** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Contract Award (Annual Task Orders) | | △ | | | △ | | | | △ | | | | △ | | | | △ | | | | △ | | | | △ | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲—▲ | Complete Activity | △—△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603894C Multiple Kill Vehicle** |

| Schedule Profile | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| **Program Milestones** | | | | | | | |
| Design Readiness Review | | | 4Q | | 2Q | 3Q | 3Q |
| **System Engineering** | | | | | | | |
| IPR | | 3Q | 3Q | | | | 2Q,4Q |
| System PDR | | | | | 2Q | | |
| System CDR | | | | | | | 2Q |
| **Kill Vehicle** | | | | | | | |
| Hover Test Kill Vehicle CDR | 2Q | | | | | | |
| Seeker Software CDR | 3Q | | | | | | |
| KV HWIL & Ground Test | | 3Q-4Q | 1Q-4Q | 1Q-3Q | 3Q-4Q | 1Q-4Q | 1Q |
| Kill Vehicle Flight Test Deliveries | | | | | | 1Q-4Q | 1Q-4Q |
| Flight Test Kill Vehicle CDR | | | | | | 2Q | |
| Kill Vehicle (KV) Flight Qual Tests | | | | | | 4Q | |
| Kill vehicle integrated ground test | | | | | | | 1Q,1Q |
| **Carrier Vehicle** | | | | | | | |
| Carrier Vehicle PDR | | | | | 3Q | | |
| Develop algorithms for MKV | | | | | 4Q | 1Q-4Q | 1Q-4Q |
| Carrier Vehicle CDR | | | | | | 2Q | |
| HWIL & Ground Test | | | | | | 2Q-4Q | 3Q |
| Carrier Vehicle Flight Test Deliveries | | | | | | | 1Q-4Q |
| **Assembly, Integration and Test** | | | | | | | |
| Hover Test | | | | | 1Q | | |
| KV FT 1 | | | | | | | 1Q-4Q |
| **Program Management** | | | | | | | |
| Contract Award (Annual Task Orders) | 2Q | 1Q | 1Q | 1Q | 1Q | 1Q | 1Q |

FY05 funded within the BMD Technology Program Element, 0603175C, Project 0515.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603894C Multiple Kill Vehicle** |

| COST ($ in Thousands) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0602 Program-Wide Support | 0 | 1,000 | 2,725 | 6,905 | 840 | 690 | 917 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## A. Mission Description and Budget Item Justification

Program-Wide Support provides funding for common non-headquarters support functions across the entire program such as strategic planning, program integration, business management, 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 outside services and support contractors that augment government staff in these areas. Many of these costs reside within the Missile Defense Agency 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, although some functions and costs within this program element are performed by MDA employees assigned within the National Capital Region (NCR). Other costs included herein provide facility capabilities for MDA Executing Agent locations, such as physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses. Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

## B. Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Civilian Salaries and Support | 0 | 1,000 | 2,725 |
| RDT&E Articles (Quantity) | 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 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603894C Multiple Kill Vehicle |

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603895C BMD System Space Program** |

| COST ($ in Thousands) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| Total PE Cost | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 |
| 0517 Space Test Bed | 0 | 0 | 0 | 45,000 | 150,000 | 166,000 | 206,100 |
| 0602 Program-Wide Support | 0 | 0 | 0 | 300 | 600 | 700 | 1,000 |

*Note: The Agency transitioned the Space Test Bed Program (Project R216) from the BMDS Interceptors PE (0603886C) to the Ballistic Missile Defense System Space Program (Project 0517, PE 0603895C).*

## A. Mission Description and Budget Item Justification

The Ballistic Missile Defense System Space Program will integrate a variety of MDA existing and future space efforts to assess the technical risk and viability of developing the BMDS space layer capability. The Space Test Bed will begin to exploit the natural advantages of space systems and integrate them into the BMDS. These advantages include a 24/7 global presence to defend against asymmetric threats, provide access to geographically denied areas, an ability to close a global fire control loop for the BMDS and to complement existing terrestrial capabilities.

## A.1 System Element Description

The Space Test Bed is an essential element of the BMDS acquisition plan. A Space Layer will complement the forward-based, boost and midcourse capabilities of the BMDS, mitigating limitations imposed by geography and basing availability. A Space Layer helps protect the United States and our Allies against asymmetric threats designed to exploit coverage and engagement gaps in our terrestrial defenses. We plan to explore the addition of a space-based defensive layer to complement the evolutionary BMDS. We believe that a mix of terrestrial and space-basing offers the most effective global defense against ballistic missiles.

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

The current effort under this program element is limited to the Space Test Bed. Potentially, under the management of the Space Applications Center of Excellence, this Ballistic Missile Defense Space System program element will integrate multiple space-dependent tests, demonstrations, integration efforts and experiments that provide capability improvements, reduce developmental cycle times and/or improve integrated BMDS performance. Known programs/projects include the Space Test Bed, the Near Field Infrared Experiment (NFIRE), and the Missile Defense Space Experimentation Center (MDSEC). In FY06, the NFIRE program is transferred from the Kinetic Energy Interceptor program element (PE 0603886C) to the Advanced Technology program element (PE 0603175C). In FY07, MDA will request the NFIRE program and all associated funding be moved into this program element.

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Budget Item Justification | Date<br>**February 2006** |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>**RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE<br>**0603895C BMD System Space Program** |

In FY07, the MDSEC will begin development under the STSS program element (PE 0603893C) and in FY08 is expected to be merged into this program element along with associated funding from PE 0603893C. The MDSEC is a collaborative experimentation environment for all BMDS elements that rely on, experiment with, or seek to improve the BMDS capability by utilizing space-based, systems-derived data. Programs currently interacting within the MDSEC activity are: STSS, NFIRE, External Sensors Laboratory (ESL), Project HERCULES, Microsatellites, CONUS Kinetic Energy Interceptor (CKEI), C2BMC and others.

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603895C BMD System Space Program |

| COST ($ in Thousands) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0517 Space Test Bed | 0 | 0 | 0 | 45,000 | 150,000 | 166,000 | 206,100 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## A. Mission Description and Budget Item Justification

The Space Test Bed is an essential element of the BMDS acquisition plan. The forward-based boost intercept capabilities of the Airborne Laser (ABL) and Kinetic Energy Interceptor (KEI) are affected by geography and basing availability. A space-based intercept layer allows us 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 explore the addition of 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 several hundred satellites. We believe that a mix of terrestrial and space-basing offers the most effective global defense against ballistic missiles.

Funds identified will be used to conduct focused experiments demonstrating the viability of space based interceptors for the BMDS

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603895C BMD System Space Program |

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

## D. Acquisition Strategy

Beginning in FY07, the Space Applications Center of Excellence will explore potential acquisition strategies.

**Missile Defense Agency (MDA) Exhibit R-4 Schedule Profile**

Date: **February 2006**

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

R-1 NOMENCLATURE: **0603895C BMD System Space Program**

| Fiscal Year | 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 |
| **Space Test Bed** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Concept Definition Award to 2-3 Contractors | | | | | | | | | | | | | | ▲ | | | | | | | | | | | | | | |
| Concept Definition Competition | | | | | | | | | | | | | ▲ | | | | | | | | | | | | | | | |
| Development | | | | | | | | | | | | | | | | | | ▲ | | | | | | ▲ | | | | |
| Development and Test Award | | | | | | | | | | | | | | | | | | ▲ | | | | | | | | | | |
| Technology Investments | | | | | | | | | | | | | ▲ | | | | | | | | | | | ▲ | | | | |

**Legend**

| | | | |
|---|---|---|---|
| ▲ | Significant Event (complete) | △ | Significant Event (planned) |
| ★ | Milestone Decision (complete) | ☆ | Milestone Decision (planned) |
| ◆ | Element Test (complete) | ◇ | Element Test (planned) |
| ▼ | System Level Test (complete) | ▽ | System Level Test (planned) |
| ▲——▲ | Complete Activity | △——△ | Planned Activity |

| Missile Defense Agency (MDA) Exhibit R-4A Schedule Detail | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603895C BMD System Space Program** |

| Schedule Profile | 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 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P)** | R-1 NOMENCLATURE: **0603895C BMD System Space Program** |

| COST ($ in Thousands) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| 0602 Program-Wide Support | 0 | 0 | 0 | 300 | 600 | 700 | 1,000 |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## A. Mission Description and Budget Item Justification

Program-Wide Support provides funding for common non-headquarters support functions across the entire program such as strategic planning, program integration, business management, 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 outside services and support contractors that augment government staff in these areas. Many of these costs reside within the Missile Defense Agency 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, although some functions and costs within this program element are performed by MDA employees assigned within the National Capital Region (NCR). Other costs included herein provide facility capabilities for MDA Executing Agent locations, such as physical and technical security, legal services, travel and training, office and equipment leases, utilities and communications, supplies and maintenance, and similar operating expenses. Also includes funding for charges on canceled appropriations in accordance with Public Law 101-510, legal settlements, and foreign currency fluctuation on a limited number of foreign contracts.

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |

| Missile Defense Agency (MDA) Exhibit R-2A RDT&E Project Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: RDT&E, DW/04 Advanced Component Development and Prototypes (ACD&P) | R-1 NOMENCLATURE: 0603895C BMD System Space Program |

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3,628 | 7,640 | 8,332 | 8,535 | 8,826 | 9,129 | 46,090 |
| PE Air Force Operations and Maintenance | 17,600 | 7,964 | 11,712 | 33,830 | 33,080 | 34,119 | 35,398 | 173,703 |
| PE Air Force Other Procurement | 0 | 2,400 | 1,453 | 11,279 | 386 | 17,710 | 25,709 | 58,937 |
| PE Army Operations and Maintenance | 49,597 | 66,974 | 68,246 | 69,809 | 71,472 | 73,325 | 75,230 | 474,653 |
| PE Army Natl Guard Military Personnel | 21,000 | 17,648 | 24,432 | 24,952 | 25,591 | 25,591 | 25,591 | 164,805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11,300 | 12,900 | 24,100 | 24,400 | 24,600 | 23,300 | 23,700 | 144,300 |
| PE PAC-3/MEADS Missile Procurement | 574,972 | 581,924 | 578,579 | 660,584 | 616,020 | 509,032 | 738,679 | 4,259,790 |
| PE PAC-3/MEADS RDT&E | 344,978 | 304,973 | 336,959 | 465,395 | 521,791 | 522,418 | 502,961 | 2,999,475 |

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/06 RDT&E Management Support** | R-1 NOMENCLATURE: **0605502C Small Business Innovative Research - MDA** |

| COST ($ in Thousands) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| Total Program Element (PE) Cost | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0510 Statutory & Mandated Programs | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 |

## A. Mission Description and Budget Item Justification

This project explores innovative concepts pursuant to Public Law 106-554 (Small Business Reauthorization Act of 2000) and Public Law 107-50 (Small Business Technology Transfer Program Reauthorization Act of 2001), 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 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 will award and manage the contracts with assistance from our executing agents.

## Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| SBIR Awards | 124,024 | 0 | 0 |

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| STTR Awards | 14,883 | 0 | 0 |

| B. Program Change Summary Table | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Previous President's Budget (FY 2006 PB) | 0 | 0 | 0 |
| Current President's Budget (FY 2007 PB) | 138,907 | 0 | 0 |
| Total Adjustments | 138,907 | 0 | 0 |
| Congressional Specific Program Adjustments | 0 | 0 | 0 |
| Congressional Undistributed Adjustments | 0 | 0 | 0 |
| Reprogrammings | 0 | 0 | 0 |
| SBIR/STTR Transfer | 138,907 | 0 | 0 |
| Adjustments to Budget Years | 0 | 0 | 0 |

FY05 Increase of $138.907 includes the mandatory SBIR/STTR transfer.

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Item Justification | Date: February 2006 |
|---|---|
| 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 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3628 | 7640 | 8332 | 8535 | 8826 | 9129 | 46090 |
| PE Air Force Operations and Maintenance | 17600 | 7964 | 11712 | 33830 | 33080 | 34119 | 35398 | 173703 |
| PE Air Force Other Procurement | 0 | 2400 | 1453 | 11279 | 386 | 17710 | 25709 | 58937 |
| PE Army Operations and Maintenance | 49597 | 66974 | 68246 | 69809 | 71472 | 73325 | 75230 | 474653 |
| PE Army Natl Guard Military Personnel | 21000 | 17648 | 24432 | 24952 | 25591 | 25591 | 25591 | 164805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11300 | 12900 | 24100 | 24400 | 24600 | 23300 | 23700 | 144300 |
| PE PAC-3/MEADS Missile Procurement | 574972 | 581924 | 578579 | 660584 | 616020 | 509032 | 738679 | 4259790 |
| PE PAC-3/MEADS RDT&E | 344978 | 304973 | 336959 | 465395 | 521791 | 522418 | 502961 | 2999475 |

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/06 RDT&E Management Support** | R-1 NOMENCLATURE: **0901585C Pentagon Reservation** |

| COST ($ in Thousands) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| Total Program Element (PE) Cost | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 |
| 0605 Pentagon Reservation Maintenance Reserve Fund (PRMRF) | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 |

## A. Mission Description and Budget Item Justification

This DoD directed Program Element started in FY01 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 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| PRMRF | 11,001 | 14,886 | 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 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Previous President's Budget (FY 2006 PB) | 13,761 | 17,386 | 15,586 |
| Current President's Budget (FY 2007 PB) | 11,001 | 14,886 | 15,586 |
| Total Adjustments | -2,760 | -2,500 | 0 |
| Congressional Specific Program Adjustments | 0 | 0 | 0 |
| Congressional Undistributed Adjustments | 0 | -2,500 | 0 |
| Reprogrammings | -2,760 | 0 | 0 |
| SBIR/STTR Transfer | 0 | 0 | 0 |
| Adjustments to Budget Years | 0 | 0 | 0 |

FY05 reduction of $2.76 million includes MDA reprogrammings.

FY06 reduction of $2.50 million includes a portion of the MDA Congressional undistributed adjustment.

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/06 RDT&E Management Support** | R-1 NOMENCLATURE: **0901585C Pentagon Reservation** |

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901598C Management Headquarters - MDA | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 | 610,357 |
| PE Air Force Military Personnel | 0 | 3628 | 7640 | 8332 | 8535 | 8826 | 9129 | 46090 |
| PE Air Force Operations and Maintenance | 17600 | 7964 | 11712 | 33830 | 33080 | 34119 | 35398 | 173703 |
| PE Air Force Other Procurement | 0 | 2400 | 1453 | 11279 | 386 | 17710 | 25709 | 58937 |
| PE Army Operations and Maintenance | 49597 | 66974 | 68246 | 69809 | 71472 | 73325 | 75230 | 474653 |
| PE Army Natl Guard Military Personnel | 21000 | 17648 | 24432 | 24952 | 25591 | 25591 | 25591 | 164805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11300 | 12900 | 24100 | 24400 | 24600 | 23300 | 23700 | 144300 |
| PE PAC-3/MEADS Missile Procurement | 574972 | 581924 | 578579 | 660584 | 616020 | 509032 | 738679 | 4259790 |
| PE PAC-3/MEADS RDT&E | 344978 | 304973 | 336959 | 465395 | 521791 | 522418 | 502961 | 2999475 |

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/06 RDT&E Management Support** | R-1 NOMENCLATURE: **0901598C Management Headquarters - MDA** |

| COST ($ in Thousands) | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|---|
| Total Program Element (PE) Cost | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 |
| 0601 Management Headquarters | 110,662 | 99,327 | 87,389 | 86,471 | 85,894 | 70,250 | 70,364 |

*Note: FY06 funds appropriated within this PE pay for a portion of the Agency's expenditures to manage the Small Business Innovative Research program, and the costs to perform technical assessments of missile defense programs, architectures, and technologies, both of which are funded in FY07 - FY11 within Project 0602 (Program-Wide Support).*

*Technical Security and Security Operations efforts, at a total of approximately $19 million per year, were transferred beginning in FY06 to Project 0602 (Program Wide Support). In FY05, two-thirds of the effort is funded within this PE, with the balance funded under Project 0102 in the BMDS Core PE.*

*In concert with the ongoing efforts to reduce Agency infrastructure, the funding amounts within this PE for FY07 through 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 decreasing to reflect anticipated savings as a result of the consolidation.*

## A. Mission Description and Budget Item Justification

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, training, professional development, and travel for Agency personnel, rents, supplies and services for Agency facilities, facility and administrative support functions, specialized headquarters contract support, and international support.

## Accomplishments/Planned Program

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Civilian Salaries | 25,743 | 26,918 | 29,387 |

Funds the basic costs for government civilian salaries, payroll, and benefit costs for all personnel within this Program Element. Civilian 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, centralized oversight of classified programs, and civilian management of

all MDA facility, maintenance, and housekeeping activities. Total staff funded by these dollars is approximately 180 civilians, with historical costs forming a firm basis for estimating future costs for this function.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Training, Professional Development and Travel | 2,888 | 3,234 | 3,257 |

This effort provides funding required for training and professional development required to maintain mandatory Acquisition Certifications for the MDA workforce, essential mission travel, and relocation costs for new government civilian employees hired from outside the NCR. Historical cost trends, an emphasis on enhanced use of video teleconferencing in lieu of travel, and known requirements for civilian workforce acquisition certification and training are all used to allow for accurate budgeting of costs for this function.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Rents, Supplies and Services | 20,301 | 21,104 | 19,480 |

This effort provides funds required to operate the MDA plant and related operational costs. This includes leases for commercial office space, as well as utilities and communications expenses at both the leased facilities and Federal Office Building 2 (FOB-2). The expansion of the MDA mission and associated growth of the Agency during the last several years has the Agency currently residing in FOB-2, Crystal Square II, Sequoia Plaza, and the Suffolk Building, and the Agency has warehousing space for storage of items needed for daily operations. Given the current size of the agency, virtually all of the costs within this project remain fixed: costs for utilities, commercial building leases, backup generator and HVAC maintenance and operations, and alarm systems and minor carpentry, electrical, and painting work requests consume 80% of the funding, with the remaining represented by fixed costs related to Metro transit subsidies, operational requirements to transport key leadership personnel, the costs of postage and express mail, and copier service/maintenance contracts. Rent costs for the MDA use of FOB-2 are included in Program Element 0901585C, Pentagon Reservation Maintenance Reserve Fund.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Facility and Administrative Support | 27,577 | 16,420 | 18,729 |

A large and fixed base of costs are required to perform Logistics and Administrative support of Agency operations - the transportation, janitorial and maintenance services, travel office staffing, mail room operations, and contract secretarial support that allow the civilian staff of the Agency to perform their operational mission.

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/06 RDT&E Management Support** | R-1 NOMENCLATURE: **0901598C Management Headquarters - MDA** |

The FY07 budgeted amount of $19 million represents the fixed, steady-state costs required to pay for these vital services, as the historical FY05 and FY06 cost trends are not reflective of the fixed cost basis for these services. Two-thirds of the costs within this category represent fixed costs for transit services to shuttle MDA employees between the various Agency buildings, monthly purchasing, logistics, and telecommunications costs, fitness, cleaning, and maintenance contractual costs, and the costs to perform detailed planning and design associated with the relocation of Agency functions. The remaining costs represent contractor staffing costs to operate MDA supply and mailroom operations at multiple MDA facilities in the National Capital region, to provide contract secretarial support within various two-letter MDA offices, and to provide management analysis in the areas of management headquarters account processes and assess facilities, logistics, and administrative operations to identify opportunities to improve performance and customer service, and to introduce capability for enhancing effectiveness and efficiency.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Specialized HQ Contract Support | 22,258 | 16,807 | 14,551 |

This effort provides specialized, critical contractual services required to augment the government civilian staff performing Agency-wide Management Headquarters functions within a host of offices within the Missile Defense Agency:

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 support 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, develop, improve, and enhance the MDA financial process leading to a clean opinion on the audited MDA financial statement.

Office of the Chief of Staff Support - provides for direct costs and an augmentation to government staffing associated with MDA-wide protocol, major events and offsite meetings and their planning and management, the execution of Occupational Safety and Health programs to include staff training and purchase of emergency escape masks, and contractual staff to respond to congressional and interdepartmental requests for information, to include researching background information for use in answering Freedom of Information Act requests.

Legislative Affairs/Communications/General Counsel Support provides for purchases of outside services critical to the implementation of staff actions for these three areas. This includes the purchases and use of databases, publications, and proprietary information critical to these highly

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/06 RDT&E Management Support** | R-1 NOMENCLATURE: **0901598C Management Headquarters - MDA** |

specialized headquarters functions, the use of an MDA Booth, as well as augmented contractor staff to compile research information and to develop archiving systems and databases for use by civilian staff.

Small and Disadvantaged Business Utilization - while the majority of funding for Small Business efforts are funded within Project 0602 (Program-Wide Support), a small amount of funding from this project pays for the continuing development of policy initiatives for use in implementing the Agency's Small Business goals.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| International Support | 0 | 2,497 | 1,985 |

This effort provides specialized, critical contractual services required to augment the government civilian staff performing Agency-wide International Management Headquarters support functions within the Missile Defense Agency, with particular emphasis on Israeli and Japanese cooperative efforts. Specifically, support is provided for developing the strategy, analysis, planning and implementation for all strategic (international and interagency) programs which requires program specialists with unique skills and experience in these key cooperative areas.

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Technical Security/Security Operations | 11,895 | 0 | 0 |

Technical Security and Security Operations efforts, at a total of $19 million per year, were transferred beginning in FY06 to Project 0602 (Program Wide Support). In FY05, two-thirds of the effort is funded within this PE, with the balance funded under Project 0102 in the BMDS Core PE.

These efforts serve to protect life, property, and program information at MDA facilities. Develops integrated security policy, overseeing security applications across the Agency's broad mission areas. Designs security countermeasures where appropriate and implements procedures that minimize the risk of loss or compromise of critical MDA information, programs, personnel and infrastructure, including the round the clock manning of all security operations centers within MDA that allow building access to both visitors and MDA staff. Serves as the principal advisor to the Agency on all security and program protection issues.

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/06 RDT&E Management Support** | R-1 NOMENCLATURE: **0901598C Management Headquarters - MDA** |

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Technical Assessments | 0 | 7,887 | 0 |

FY06 funds appropriated within this PE also pay for the costs to perform technical assessments of missile defense programs, architectures, and technologies, efforts which are funded in fiscal years 2007 - 2011 within Project 0602 (Program-Wide Support).

| | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Small Business Innovative Research | 0 | 4,460 | 0 |

FY06 funds appropriated within this PE pay for two-thirds of the Agency's expenditures to manage the Small Business Innovative Research program, efforts which are funded in fiscal years 2007 - 2011 within Project 0602 (Program-Wide Support).

| **B. Program Change Summary Table** | FY 2005 | FY 2006 | FY 2007 |
|---|---|---|---|
| Previous President's Budget (FY 2006 PB) | 113,777 | 99,327 | 95,443 |
| Current President's Budget (FY 2007 PB) | 110,662 | 99,327 | 87,389 |
| Total Adjustments | -3,115 | 0 | -8,054 |
| Congressional Specific Program Adjustments | 0 | 0 | 0 |
| Congressional Undistributed Adjustments | 0 | 0 | 0 |
| Reprogrammings | -3,115 | 0 | 0 |
| SBIR/STTR Transfer | 0 | 0 | 0 |
| Adjustments to Budget Years | 0 | 0 | -8,054 |

FY05 reduction of $3.115 million includes MDA reprogrammings.

FY07 reduction of $8.054 million includes adjustments to achieve overhead/infrastructure reductions.

| Missile Defense Agency (MDA) Exhibit R-2 RDT&E Item Justification | Date: February 2006 |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY: **RDT&E, DW/06 RDT&E Management Support** | R-1 NOMENCLATURE: **0901598C Management Headquarters - MDA** |

## C. Other Program Funding Summary

| | FY 2005 | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 | Total Cost |
|---|---|---|---|---|---|---|---|---|
| PE 0603175C Ballistic Missile Defense Technology | 224,016 | 149,305 | 206,676 | 183,414 | 214,062 | 222,934 | 228,247 | 1,428,654 |
| PE 0603879C Advanced Concepts, Evaluations and Systems | 166,996 | 0 | 0 | 0 | 0 | 0 | 0 | 166,996 |
| PE 0603881C Ballistic Missile Defense Terminal Defense Segment | 914,063 | 1,139,757 | 1,038,310 | 904,198 | 682,033 | 753,562 | 469,200 | 5,901,123 |
| PE 0603882C Ballistic Missile Defense Midcourse Defense Segment | 4,487,253 | 2,442,172 | 2,876,972 | 2,650,493 | 2,397,340 | 2,148,428 | 1,684,842 | 18,687,500 |
| PE 0603883C Ballistic Missile Defense Boost Defense Segment | 472,543 | 471,673 | 631,616 | 577,442 | 455,800 | 456,664 | 687,048 | 3,752,786 |
| PE 0603884C Ballistic Missile Defense Sensors | 567,193 | 278,168 | 514,510 | 589,395 | 647,382 | 326,364 | 220,349 | 3,143,361 |
| PE 0603886C Ballistic Missile Defense System Interceptors | 272,064 | 209,342 | 405,508 | 425,417 | 895,091 | 1,202,485 | 1,674,699 | 5,084,606 |
| PE 0603888C Ballistic Missile Defense Test and Targets | 700,570 | 613,564 | 599,503 | 594,888 | 628,598 | 635,416 | 655,616 | 4,428,155 |
| PE 0603889C Ballistic Missile Defense Products | 384,935 | 388,830 | 506,840 | 506,352 | 509,984 | 506,717 | 512,582 | 3,316,240 |
| PE 0603890C Ballistic Missile Defense System Core | 398,852 | 407,492 | 473,077 | 501,395 | 523,672 | 554,538 | 573,411 | 3,432,437 |
| PE 0603891C Special Programs - MDA | 0 | 274,877 | 374,532 | 715,459 | 629,986 | 725,451 | 694,574 | 3,414,879 |
| PE 0603892C Ballistic Missile Defense Aegis | 0 | 915,664 | 1,031,874 | 951,560 | 980,498 | 973,153 | 799,220 | 5,651,969 |
| PE 0603893C Space Tracking & Surveillance System | 0 | 231,488 | 390,585 | 427,174 | 771,878 | 958,281 | 885,476 | 3,664,882 |
| PE 0603894C Multiple Kill Vehicle | 0 | 50,324 | 164,975 | 285,805 | 357,340 | 412,847 | 505,417 | 1,776,708 |
| PE 0603895C BMD System Space Program | 0 | 0 | 0 | 45,300 | 150,600 | 166,700 | 207,100 | 569,700 |
| PE 0605502C Small Business Innovative Research - MDA | 138,907 | 0 | 0 | 0 | 0 | 0 | 0 | 138,907 |
| PE 0901585C Pentagon Reservation | 11,001 | 14,886 | 15,586 | 6,058 | 6,376 | 4,490 | 4,725 | 63,122 |
| PE Air Force Military Personnel | 0 | 3628 | 7640 | 8332 | 8535 | 8826 | 9129 | 46090 |
| PE Air Force Operations and Maintenance | 17600 | 7964 | 11712 | 33830 | 33080 | 34119 | 35398 | 173703 |
| PE Air Force Other Procurement | 0 | 2400 | 1453 | 11279 | 386 | 17710 | 25709 | 58937 |
| PE Army Operations and Maintenance | 49597 | 66974 | 68246 | 69809 | 71472 | 73325 | 75230 | 474653 |
| PE Army Natl Guard Military Personnel | 21000 | 17648 | 24432 | 24952 | 25591 | 25591 | 25591 | 164805 |
| PE Army Natl Guard Operations and Maintenance | 0 | 155 | 151 | 150 | 154 | 164 | 167 | 941 |
| PE Navy Operations and Maintenance | 11300 | 12900 | 24100 | 24400 | 24600 | 23300 | 23700 | 144300 |
| PE PAC-3/MEADS Missile Procurement | 574972 | 581924 | 578579 | 660584 | 616020 | 509032 | 738679 | 4259790 |
| PE PAC-3/MEADS RDT&E | 344978 | 304973 | 336959 | 465395 | 521791 | 522418 | 502961 | 2999475 |

| Department of Defense Exhibit R-2 RDT&E Budget Item Justification | Date: February 2006 |
|---|---|
| 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), Aegis BMD (PE 0603892C), and Space Tracking and Surveillance System (PE 0603893C).

| Department of Defense Exhibit R-2 RDT&E Budget Item Justification | Date<br>**February 2006** |
|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>**RDT&E, DW/20** | R-1 NOMENCLATURE<br>**0904903D Defense-Wide Resources** |

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# Missile Defense Agency

## Fiscal Year 2007

## Program and Budget Review

## RDT&E Construction Exhibit

## February 2006

**MISSILE DEFENSE AGENCY**
**FY 2007 RDT&E CONSTRUCTION**
**PROGRAM AND BUDGET REVIEW**

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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 |
| **OCONUS Location** | | | | |
| Ballistic Missile Defense System Missile Defense Plan II, OCONUS Phase I | 640,000 | 9,000 | New | 9 |
| **TOTAL RDT&E CONSTRUCTION** | 640,000 | 123,500 | | |

| 1. COMPONENT | FY 2007 RDT&E CONSTRUCTION PROJECT DATA | 2. DATE |
|---|---|---|
| MDA | | February 2006 |

| 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<br>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 APPROP | | | | (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 Limited Defensive Operations (LDO) Capabilities program at various worldwide locations. This was 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. 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 and the Defense Satellite Communications System 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 (MDP II) Phase III at various locations worldwide 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 2006 |

**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 Limited Defensive Operations. (New Mission)

**CURRENT SITUATION:** The 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 Limited 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 ballistic missile attack under Limited 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 Limited 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 2008 |

| 1. COMPONENT | FY 2007 RDT&E CONSTRUCTION PROJECT DATA | 2. DATE |
|---|---|---|
| MDA | | February 2006 |

**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 |
| | | Total | 250,300 |

| 1. COMPONENT | FY 2007 RDT&E CONSTRUCTION PROJECT DATA | 2. DATE |
|---|---|---|
| MDA | | February 2006 |

| 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<br>Approp 29,000 |

**9. COST ESTIMATES**

| ITEM | U/M (M/E) | QUANTITY | UNIT COST | COST ($000) |
|---|---|---|---|---|
| **PRIMARY FACILITIES** | | | | 28,550 |
| Fort Greely-Missile Silos (10) | EA | 10 | 2,325 | (23,250) |
| 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** | | | | 38,950 |
| CONTINGENCY (5%) | | | | 1,948 |
| SUBTOTAL | | | | 40,898 |
| SUPERVISION, INSPECTION/OH (7.5%) | | | | 3,067 |
| TOTAL CONTRACT COST | | | | 43,965 |
| TOTAL REQUEST ROUNDED | | | | 44,000 |
| INSTALLED EQPT-OTHER APPROP | | | | (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. 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 Upgraded Early Warning Radar (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 Limited Defensive Operations.

| 1. COMPONENT | FY 2007 RDT&E CONSTRUCTION PROJECT DATA | 2. DATE |
|---|---|---|
| MDA | | February 2006 |

**3. INSTALLATION AND LOCATION**
Various Locations

| 4. PROJECT TITLE: | 5. PROJECT NUMBER |
|---|---|
| Ballistic Missile Defense System (BMDS) Missile Defense Plan II Follow-On Part B | 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 LDO 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/Limited 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 |
| UEWR Equipment | RDT&E | 2006 – 2011 | 100,000 |
| | | TOTAL EQUIPMENT COST | 366,000 |

| 1. COMPONENT | FY 2007 RDT&E CONSTRUCTION PROJECT DATA | 2. DATE |
|---|---|---|
| MDA | | February 2006 |

| 3. INSTALLATION AND LOCATION6 | 4. PROJECT TITLE |
|---|---|
| OCONUS Location | Ballistic Missile Defense System Missile Defense Plan II, OCONUS Phase 1 |

| 5. PROGRAM ELEMENT | 6. CATEGORY CODE | 7. PROJECT NUMBER | 8. PROJECT COST ($000) |
|---|---|---|---|
| 0603882C | 312 | MDA 547 | Auth 640,000<br>Approp 9,000 |

**9. COST ESTIMATES**

| ITEM | U/M (M/E) | QUANTITY | UNIT COST | COST ($000) |
|---|---|---|---|---|
| **PRIMARY FACILITIES** | | | | 441,909 |
| Admin/Maintenance/Storage Facility | LS | - | - | (33,105) |
| Back-up Power Generators | LS | - | - | (8,381) |
| DSCS Facility (Dual Antenna) | LS | - | - | (17,325) |
| EKV Fuel Storage Building | LS | - | - | (2,025) |
| EKV Oxidizer Storage Building | LS | - | - | (2,025) |
| Total from Continuation pages | | | | (379,048) |
| **SUPPORTING FACILITIES** | | | | 125,114 |
| Electric Service | LS | - | - | (27,088) |
| Water, Sewer, Gas | LS | - | - | (44,835) |
| Paving, Walks, Curbs and Gutters | LS | - | - | (15,135) |
| Site Imp (25,869)/Demo (000) | LS | - | - | (23,431) |
| Other (Mob/Demob) | LS | - | - | (14,625) |
| **SUBTOTAL** | | | | 567,023 |
| CONTINGENCY (5.0%) | | | | 28,353 |
| SUBTOTAL | | | | 595,376 |
| SUPERVISION, INSPECTION/OH (7.5%) | | | | 44,653 |
| TOTAL CONTRACT COST | | | | 640,029 |
| TOTAL REQUEST ROUNDED | | | | 640,000 |
| INSTALLED EQPT-OTHER APPROP | | | | (565,000) |

**10. DESCRIPTION OF PROPOSED CONSTRUCTION:** This is a single year authorization request with multi-year appropriations. The FY 2007 request is for a total authorization of $640.0 million and an appropriation of $9.0 million. FY 2007 construction effort will be for initial site clearing and preparation. Additional appropriation requests follow in the amount of $176.0, $236.0 and $219.0 million in FY 2008, FY 2009 and FY 2010 respectively. This project extends and enhances the Ballistic Missile Defense System (BMDS) Ground-Based Mid-course Defense (GMD) Test Bed and Limited Defensive Operations (LDO) Capabilities program at various world wide locations. At an OCONUS location, this project provides for a complete GMD system and a GMD Battle Management Fire Control and Communication (GBMFC2) In-Flight Interceptor Communications System (IFICS) Data Terminal. Supporting facilities include: water, sewer, gas and electric service; paving, walks, curbs and gutters; storm drainage; fire protection and alarm systems; site improvements; physical security; and telecommunications systems. Access for the handicapped will be provided.

**11. REQUIRED:** 1 EA ADEQUATE: NONE SUBSTANDARD: NONE

**PROJECT:** Construct a complete GMD system at an OCONUS location to provide an additional layer of defense with increased capabilities consistent with Missile Defense Agency's (MDA) missile defense mission.

| 1. COMPONENT | FY 2007 RDT&E CONSTRUCTION PROJECT DATA | 2. DATE |
|---|---|---|
| MDA | | February 2006 |

**3. INSTALLATION AND LOCATION**
OCONUS Location

**4. PROJECT TITLE:**
Ballistic Missile Defense System, Missile Defense Plan II, OCONUS Phase 1

**5. PROJECT NUMBER**
MDA 547

**9. COST ESTIMATES (CONTINUED)**

| Item | U/M (M/E) | QUANTITY | Unit COST | Cost (000) |
|---|---|---|---|---|
| **PRIMARY FACILITIES (CONTINUED)** | | | | 379,048 |
| Electrical Substation | LS | | | (9,434) |
| Entry Control Station | LS | | | (4,610) |
| Fuel Unload & Storage Facility | LS | | | (7,152) |
| Mechanical-Electrical Building | LS | | | (17,460) |
| Missile Assembly Building | LS | | | (19,346) |
| Missile Launch Silos (10 ea) | LS | | | (68,165) |
| Missile Monitoring/Security Bldg | LS | | | (21,302) |
| Missile Storage Igloos | LS | | | (3,317) |
| Utility Building | LS | | | (17,312) |
| Water Supply Building | LS | | | (7,119) |
| MILSTAR Support System | LS | | | (1,571) |
| Electronic Security System | LS | | | (19,010) |
| Anti-Terrorism/Force Protection | LS | | | (9,987) |
| Security System Level-A Protection | LS | | | (74,311) |
| Fiber Optic Cable Terminal Building | LS | | | (3,003) |
| Power Conversion & Conditioning | LS | | | (90,792) |
| GBMFC2 IFICS Data Terminal | LS | | | (3,683) |
| IDT Support Facility | LS | | | (1,474) |

**11. REQUIRED: (continued)**

**REQUIREMENT:** This project is required to provide a complete GMD system capability OCONUS designed to incrementally improve MDA's ability to conduct and support enhanced Limited Defensive Operations. (New Mission)

**CURRENT SITUATION:** The Missile Defense Agency is developing a Ballistic Missile Defense System (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. This project supplements the GMD Test Bed Program, Capability Enhancements 1 and MDP II Phase I-III for the BMDS and will enhance the ballistic missile defense of the United States and its allies.

**IMPACT IF NOT PROVIDED:** If this project is not provided, planned enhancements of the GMD element in support of MDA's BMDS will not be available for defensive operations. Ultimately, the full potential to defend the United States and its allies against limited ballistic missile attack under LDO 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/Limited 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 measure are being included. All requirements of EO 12114, Environmental Effects Abroad of Major Federal Actions, will be completed prior to start of construction.

| 1. COMPONENT | FY 2007 RDT&E CONSTRUCTION PROJECT DATA | 2. DATE |
|---|---|---|
| MDA | | February 2006 |

**3. INSTALLATION AND LOCATION**
OCONUS Location

| 4. PROJECT TITLE: | 5. PROJECT NUMBER |
|---|---|
| Ballistic Missile Defense System, Missile Defense Plan II OCONUS Phase 1 | MDA 547 |

**12. SUPPLEMENTAL DATA:**

A. Design Data (Estimates)

| | |
|---|---|
| (1) Status | |
| (a) Date Design Started | JUL 2006 |
| (b) Date 35% Design | NOV 2007 |
| (c) Date Design Complete | JUN 2008 |
| (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 | $ 18,478 |
| (b) All other Design Costs | $ 16,566 |
| (c) Total Costs (c)= (a)+(b) or (d)+(e) | $ 35,044 |
| (d) Contract | $ 24,480 |
| (e) In-house | $ 10,564 |
| (4) Construction Contract Award Date | AUG 2007 |
| (5) Construction Start Date | OCT 2007 |
| (6) Construction Complete Date | OCT 2010 |

B. Equipment associated with this project which will be provided from other appropriations:

| Equipment Nomenclature | Procuring Appropriation | Fiscal Year Appropriation Or Requested | Cost ($000) |
|---|---|---|---|
| GBI Launch Equipment | RDT&E | 2007 | 21,000 |
| RIDT/Communications Equip | RDT&E | 2007 | 5,000 |
| GBI Launch Equipment | RDT&E | 2008 | 132,000 |
| RIDT/Communications Equip | RDT&E | 2008 | 18,000 |
| GBI Launch Equipment | RDT&E | 2009 | 117,000 |
| RIDT/Communications Equip | RDT&E | 2009 | 46,000 |
| GBI Launch Equipment | RDT&E | 2010 | 107,000 |
| RIDT/Communications Equip | RDT&E | 2010 | 45,000 |
| GBI Launch Equipment | RDT&E | 2011 | 47,000 |
| RIDT/Communications Equip | RDT&E | 2011 | 27,000 |
| | | TOTAL EQUIPMENT COST | 565,000 |

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# Missile Defense Agency

# Fiscal Year 2007

# Program and Budget Review

# Military Construction Exhibit

# February 2006

**MISSILE DEFENSE AGENCY**
**FY 2007 MILITARY CONSTRUCTION PROGRAM**
**PROGRAM AND BUDGET REVIEW**

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| Military Construction DD Form 1390/1391s | 4 |

**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** | | | | |
| **Kwajalein Atoll, Kwajalein** | | | | |
| Launch Control Facility Life Safety Upgrades, Meck Island | 7,592 | 7,592 | Current | 4 |
| **Unspecified Minor Construction** | 0 | 0 | | |
| **Planning and Design** | 0 | 0 | | |
| **TOTAL MILITARY CONSTRUCTION** | 7,592 | 7,592 | | |

| 1. COMPONENT | FY 2007 MILITARY CONSTRUCTION PROGRAM | 2. DATE |
|---|---|---|
| MDA | | February 2006 |

| 3. INSTALLATION AND LOCATION | 4. COMMAND | 5. AREA CONSTR. COST INDEX |
|---|---|---|
| Kwajalein Atoll, Kwajalein | Missile Defense Agency | 2.33 |

**6. PERSONNEL**

STRENGTH: N/A

Tenant of U.S. Army

| | PERMANENT | | | STUDENTS | | | SUPPORTED | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | OFFICER | ENLISTED | CIVILIAN | OFFICER | ENLISTED | CIVILIAN | OFFICER | ENLISTED | CIVILIAN | TOTAL |
| | | | | | | | | | | |

**7. INVENTORY DATA ($000)**

| | | |
|---|---|---|
| A. TOTAL ACERAGE | ..... | N/A |
| B. INVENTORY TOTAL AS OF | ..... | N/A |
| C. AUTHORIZATION NOT YET IN INVENTORY | ..... | 4,901 |
| D. AUTHORIZATION REQUESTED IN THE FY2007 | ..... | 7,592 |
| E. AUTHORIZATION REQUESTED IN THE FY2008 | ..... | 0 |
| F. PLANNED IN NEXT THREE PROGRAM YEARS | ..... | 0 |
| G. REMAINING DEFICIENCY | ..... | 0 |
| H. GRAND TOTAL | ..... | 12,493 |

**8. PROJECTS REQUESTED IN THE FY2007 PROGRAM:**

| CATEGORY CODE | PROJECT TITLE | SCOPE | COST ($000) | DESIGN STATUS START | DESIGN STATUS COMPLETE |
|---|---|---|---|---|---|
| 3712 | Launch Control Facility Life Safety Upgrades, Meck Island | LS | 7,592 | Mar 05 | Jun 06 |

**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 |

| . COMPONENT | FY 2007 MILITARY CONSTRUCTION PROJECT DATA | 2. DATE |
|---|---|---|
| MDA | | February 2006 |

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| 3. INSTALLATION AND LOCATION/UIC: | 4. PROJECT TITLE |
|---|---|
| Kwajalein Atoll, Kwajalein Islands | Launch Control Facility Life Safety Upgrades, Meck Island |

| 5. PROGRAM ELEMENT | 6. CATEGORY CODE | 7. PROJECT NUMBER | 8. PROJECT COST ($000) |
|---|---|---|---|
| 0603888C | 3712 | MDA-571 | 7,592 |

**9. COST ESTIMATES**

| ITEM | U/M (M/E) | QUANTITY | UNIT COST | COST ($000) |
|---|---|---|---|---|
| **PRIMARY FACILITIES** | | | | 5,891 |
| Emergency Exit Stairway Addition | LS | | | (535) |
| Fire Protection/Life Safety Upgrades | LS | | | (3,169) |
| Replace Roof | SM(SF) | 6,550 (70,500) | 334 (31.02) | (2,187) |
| **SUPPORTING FACILITIES** | | | | 916 |
| Communications | LS | | | (224) |
| Electrical Services | LS | | | (184) |
| Water, Sewer | LS | | | (250) |
| Site Imp (  )/Demo (258) | LS | | | (258) |
| **SUBTOTAL** | | | | 6,807 |
| CONTINGENCY (5.0%) | | | | 340 |
| TOTAL CONTRACT COST | | | | 7,147 |
| SIOH (6.5%) | | | | 445 |
| TOTAL REQUEST | | | | 7,592 |
| TOTAL REQUEST (ROUNDED) | | | | 7,592 |
| EQUIPMENT OTHER APPROP (NON-ADD) | | | | (0) |

**10. DESCRIPTION OF PROPOSED CONSTRUCTION:** Upgrade the fire protection system and life safety requirements for the Launch Control Facility on Meck Island. Work includes installing fire sprinklers, fire alarm, emergency lighting, fire rated doors, and constructing egress corridor walls and stairway emergency egress. Replace 6,550 SM of built up roofing and a rain catchment system composed of 2,586 SM of coral sand fill. Replace flashing and counter-flashing along walls, fascias, roof drains, scuppers, and coral sand fill rain catchment components as part of the new roof system. Supporting facilities include new electrical, communications, and water lines to the building for the new fire protection system. Air conditioning (20 tons) will be provided by self-contained units.

**11. REQUIREMENT:** 6,550 SM ADEQUATE: 0 SM SUBSTANDARD: 6,550 SM

**PROJECT:** Upgrade the fire protection system, correct life safety code deficiencies and replace roof of the Launch Control Facility, Meck Island to bring the building up to current standards. (Current Mission)

**REQUIREMENT:** The Launch Control Facility supports Missile Defense Agency (MDA) testing of the Ballistic Missile Defense System (BMDS). The Launch Control Facility houses the missile launch control room, administrative office space, workshops, storage area, and mechanical rooms. This project will correct fire, life and safety code deficiencies identified in the U.S. Army Corps of Engineers Fire Protection and Risk Assessment, thereby protecting MDA personnel, physical plant and equipment. The Launch Control Facility has 6,550 SM of roof area that leaks and requires replacement. There are approximately (7) seven different roof elevations that make up the total roof system.

**CURRENT SITUATION:** The Launch Control Facility houses the MDA mission control and administrative operations in a 1960's era structure. The MDA Launch Control Facility does not have an adequate fire sprinkler system and has limited emergency lighting, illuminated exit signs, and emergency egress. The existing fire alarm system is

| . COMPONENT | FY 2007 MILITARY CONSTRUCTION PROJECT DATA | 2. DATE |
|---|---|---|
| MDA | | February 2006 |

| 3. INSTALLATION AND LOCATION/UIC: | 4. PROJECT TITLE |
|---|---|
| Kwajalein Atoll, Kwajalein Islands | Launch Control Facility Life Safety Upgrades, Meck Island |

| 5. PROGRAM ELEMENT | 6. CATEGORY CODE | 7. PROJECT NUMBER | 8. PROJECT COST ($000) |
|---|---|---|---|
| 0603888C | 3712 | MDA-571 | 7,592 |

outdated and does not meet current safety codes. The building has numerous fundamental life, safety and fire protection system deficiencies. The roof throughout the building leaks, directly impacting administrative, communications, optics, mission control, and electrical distribution areas. The rain catchment system integrated into the facility's roof has failed and is inoperative, exacerbating the problems. Personnel and equipment are at risk.

**IMPACT IF NOT PROVIDED:** If this project is not provided, MDA test personnel and high dollar value equipment are at risk of significant damage. Personnel and equipment will continue to operate in a high risk environment due to an inadequate fire protection system and emergency egress features. A direct risk to missions exists as new roof leaks develop. These leaks threaten damage to test control equipment and electrical distribution equipment such as main control/breaker panels, communications and optic networks. Loss of this facility would preclude MDA testing of the BMDS at Meck Island until a new structure is constructed or repairs completed, there by delaying the United States in developing a missile defense shield to protect itself and its friends from foreign threats.

**ADDITIONAL:** This project has been coordinated with the installation physical security plan, and no physical security and/or combating terrorism measures are required. An economic analysis was not prepared as there are no feasible alternatives. Sustainable principles will be integrated into the development, design and construction of the project in accordance with Executive Order 13123 and other applicable laws and executive orders. The appropriate environmental analysis will be completed before construction.

**12. SUPPLEMENTAL DATA:**

A. Estimated Design Date

| | |
|---|---|
| (1) Status | |
| (a) Estimated Start Date | MAR 2005 |
| (b) % complete as of 1 Jan 06 | 50% |
| (c) 35% Complete as of | SEP 2005 |
| (d) Date Design Complete | Jun 2006 |
| (e) Parametric Cost Estimating Used to Develop Costs | No |
| (f) Type of Contract | Design-Bid-Build |
| (2) Basis | |
| (a) Standard or Definitive Design | NO |
| (b) Where Design was most recently used | N/A |
| (3) Total Design Cost | ($000) |
| (a) Production of Plans and Specifications | 268 |
| (b) All other Design Costs | 461 |
| (c) Total Cost (c) = (a)+(b) or (d)+(e) | 729 |
| (d) Contract | 513 |
| (e) In-house | 216 |
| (4) Construction Contract Award Date | DEC 2006 |
| (5) Construction Start Date | MAR 2007 |
| (6) Construction Complete Date | OCT 2008 |

B. Equipment associated with this project which will be provided from other appropriations: None

FY 2006 – FY 2011 BASE REALIGNMENT AND CLOSURE DATA
2005 COMMISSION

MISSILE DEFENSE AGENCY
SERVICE OVERVIEW

SCHEDULE:

The BRAC Commission Recommendation # 134 (H&SA #15) entitled Co-locate Missile and Space Defense Agencies includes the relocation of MDA functions from the following National Capital Region (NCR) and Huntsville, Alabama leased facilities:

Suffolk Building, Falls Church, VA

The Commission approved recommendation is to "Close the Suffolk Building, a leased installation in Falls Church, VA. All Missile Defense Agency (MDA) functions, except the Ballistic Missile Defense System Sensors Directorate, will relocate to Redstone Arsenal, AL."

MDA plans do not include any FY 2006 through FY 2008 BRAC related impacts to the Suffolk Building. The moves and Suffolk Building closure/realignment is planned for the FY 2009 to FY 2010 time-frame.

Space and Missile Defense Command (SMDC) Building, Huntsville, AL

The Commission approved recommendation is to "Realign the Space and Missile Defense Command (SMDC) Building, a leased installation in Huntsville, Alabama. Relocate all functions of the Missile Defense Agency to Redstone Arsenal, AL."

MDA plans do not include any FY 2006 through FY 2008 BRAC related impacts to the Space and Missile Defense (SMDC) Building located in Huntsville, AL. The moves and SMDC Building realignment are planned for the FY 2009 to FY 2010 time-frame.

Federal Office Building 2 (FOB 2), Arlington, VA

The Commission approved recommendation is to "Realign Federal Office Building 2, Arlington, VA, by relocating a Headquarters Command Center for the Missile Defense Agency to Fort Belvoir, VA, and by relocating all other functions, except the Command and Control Battle Management and Communications Directorate to Redstone Arsenal, AL." [Note: The Federal Office Building 2 (FOB 2) contains the MDA Headquarters. For reporting purposes common activities and efforts (e.g. construction, environmental, program management, etc.) supporting the entire BRAC implementation will be recorded against FOB 2.]

In FY 2006 MDA plans an initial move of selected functions and positions to Redstone Arsenal Alabama (RSA) /Huntsville, AL. A portion of these initial MDA functions and positions will come from FOB 2. Initial construction efforts are planned to commence in FY 2006 with Planning & Design (P&D) efforts to support a design-build (DB) facility acquisition strategy.

The funds will be used to task the US Army Corps of Engineers, as the construction/design agent, to prepare Statements of Work (SOWs), conduct design charettes, and draft for the Request for Proposals (RFPs) for the Redstone Arsenal, AL MDA facility plus support on the Fort Belvoir, VA facility. FY 2006 one-time/non-recurring Environmental efforts include the one-time share for conducting an air conformity analysis and National Environmental Policy Act (NEPA) compliance activities at Redstone Arsenal, AL and Fort Belvoir, VA. FY 2006 Program Management activities include the development of the initial plans, activities, resource requirements, schedule and associated documentation to successfully implement BRAC. The program management efforts include project planning, human resources, financial, construction, information technology, legal, and security functions.

There are no scheduled BRAC moves for FY 2007 and FY 2008 from FOB 2. FY 2008 activities will include military construction efforts to award the contract for the design-build facility at Redstone Arsenal, AL. Additional Operations & Maintenance (O&M) efforts in FY 2008 include the planning and acquisition efforts for the facilities special equipment, information technology, furnishings, supplies, and miscellaneous resources to support a move of functions and positions to Redstone Arsenal/Huntsville, AL in late FY 2009 and FY 2010. MDA functions and positions are planned to move to Redstone Arsenal/Huntsville, AL in FY 2009 and FY 2010.

The majority of moves from Federal Office Building 2 (FOB 2) are scheduled to occur in the late FY 2009 to FY 2010 time-frame to the Redstone Arsenal/Huntsville, AL facility. The MDA Headquarter positions and functions moves to Fort Belvoir, VA are projected for late FY 2010 into FY 2011.

Crystal Square 2, Arlington, VA

The Commission approved recommendation is to "Realign Crystal Square 2, a leased installation in Arlington, VA, by relocating all functions of the Missile Defense Agency and the Headquarters component of the USA Space and Missile Defense Command to Redstone Arsenal, AL."

In FY 2006 MDA plans to move selected number of MDA functions and positions to Redstone Arsenal/Huntsville, AL. A majority of these moved MDA functions and positions to RSA will come from the Crystal Square 2 facility. The MDA intent is to entirely vacate the CS 2 facility at the earliest convenience projected at the very end of FY 2006. FY 2006 activities will include the movement and related O&M move costs for the affected NCR personnel to Redstone Arsenal (RSA)/Huntsville, Alabama. FY 2006 costs include lease termination costs from the termination of the CS 2 lease and deconstruction and restoration efforts extending into FY 2007, to return the CS 2 facility to its pre-leased condition. Other than the deconstruction and restoration efforts, MDA does not plan any FY 2007 to FY 2011 CS 2 facility efforts. MDA plans to be clear of the CS 2 facility in the 2Q of FY 2007. Lease savings are expected to commence in FY 2007.

2005 COMMISSION

MISSILE DEFENSE AGENCY
SERVICE OVERVIEW

Crystal Mall 4, Arlington VA

The Commission approved recommendation is to "Realign Crystal Mall 4, a leased installation in Arlington, VA, by relocating the Headquarters component of the USA Space and Missile Defense Command to Redstone Arsenal, AL."

MDA plans do not include any FY 2006 through FY 2008 BRAC related impacts to the Crystal Mall 4 Building. The relocation is planned for the FY 2009 to FY 2010 time-frame. MDA is working with the U.S. Army SMDC for housing of specifically defined missile defense functions and positions, as required, within the MDA Redstone Arsenal facilities including the existing Von Braun I and II facilities. (RSA Construction and O&M fit-out costs are included with FOB 2). U.S. Army SMDC personnel move costs are included in the Army BRAC plans.

SUMMARY COST DISPLAYS:

The following tables display the projected FY 2006 – FY 2011 one-time costs ($s in Millions).

| One-Time Costs | FY2006 | FY2007 | FY2008 | FY2009 | FY2010 | FY2011 |
|---|---|---|---|---|---|---|
| Military Construction | 1.200 | 0.000 | 72.000 | 0.000 | 0.000 | 0.000 |
| Family Housing | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Environmental | 0.250 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Operations & Maintenance | 6.858 | 0.000 | 12.819 | 16.128 | 2.850 | 0.000 |
| Military - PCS | 0.000 | 0.000 | 0.000 | 0.365 | .0.000 | 0.000 |
| Other | 0.000 | 0.000 | 0.000 | 0.000 | .0.000 | 0.000 |
| Household Assistance/HAP | 0.000 | 0.000 | 0.000 | 2.607 | .0.000 | 0.000 |
| Total | 8.308 | 0.000 | 84.819 | 19.100 | 2.850 | 0.000 |

Allocated cost per commission building closure/realignment recommendation ($s in Millions).

| One-Time Costs | FY2006 | FY2007 | FY2008 | FY2009 | FY2010 | FY2011 |
|---|---|---|---|---|---|---|
| Suffolk Building | 0.000 | 0.000 | 0.000 | 6.000 | 0.000 | 0.000 |
| SMDC Building | 0.000 | 0.000 | 0.000 | 1.000 | 0.000 | 0.000 |
| Federal Office Bldg 2* | 3.450 | 0.000 | 84.819 | 12.100 | 2.850 | 0.000 |
| Crystal Square 2 | 4.858 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Crystal Mall 4** | 0.000 | 0.000 | 0.000 | 0.000 | .0.000 | 0.000 |
| Total | 8.308 | 0.000 | 84.819 | 19.100 | 2.850 | 0.000 |

* All Construction, Environmental and Program Management costs are included with the MDA Headquarters located in FOB-2.
** Position moves are included in the Army BRAC plan.

Exhibit BC-01 BRAC Service Overview

FY 2006 – FY 2011 BASE REALIGNMENT AND CLOSURE DATA
2005 COMMISSION

MISSILE DEFENSE AGENCY
SERVICE OVERVIEW

MISSION IMPACT:

There will be no adverse impacts on the mission of MDA activities recommended for realignment or closure.

MILITARY CONSTRUCTION:

MDA Military Construction efforts in FY 2006 include Planning & Design (P&D) to support a design-build (DB) facility acquisition strategy. The US Army Corps of Engineers will be tasked as the construction/design agent to prepare Statements of Work (SOWs), conduct design charettes, and draft the Request for Proposals (RFPs) for the Redstone Arsenal, AL facility. There are no projected military construction costs for FY 2007. MDA will expend $72.000 Million in FY 2008 to contract for the construction of the MDA facility at Redstone Arsenal, AL. to house the transferred MDA functions and positions. There are no military construction costs for FY 2009 – FY 2011. All Military Construction costs are shown with the Federal Office Building 2 (FOB 2) which contains the MDA Headquarters.

| One-Time ($s in Millions) | FY2006 | FY2007 | FY2008 | FY2009 | FY2010 | FY2011 |
|---|---|---|---|---|---|---|
| Military Construction | 1.200 | 0.000 | 72.000 | 0.000 | 0.000 | 0.000 |

FAMILY HOUSING:

There are no family housing construction or operations requirements associated with this MDA BRAC action.

| One-Time ($s in Millions) | FY2006 | FY2007 | FY2008 | FY2009 | FY2010 | FY2011 |
|---|---|---|---|---|---|---|
| Family Housing - Construction | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Family Housing - Operations | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

ENVIRONMENTAL CONSIDERATIONS:

MDA will expend $0.250 Million in FY 2006 for one-time/non-recurring environmental analysis support, compliance and coordination for the Redstone Arsenal and Fort Belvoir BRAC moves. As a tenant organization, MDA will coordinate its environmental requirements and issues with the environmental management offices at Redstone Arsenal, AL and Fort Belvoir, VA. The FY 2006 expenditures will fund MDA's one-time share for conducting an air conformity analysis and National Environmental Policy Act (NEPA) compliance activities at Redstone Arsenal and Fort Belvoir. MDA does not expect environmental issues associated with vacating leased space. MDA has not allocated funding for environmental compliance activities at the

losing leased facilities. All environmental costs are shown with the Federal Office Building 2 (FOB 2) which contains the MDA Headquarters. [Additional FY 2007 – FY 2011 environmental costs are included in recurring costs.]

| One-Time ($s in Millions) | FY2006 | FY2007 | FY2008 | FY2009 | FY2010 | FY2011 |
|---|---|---|---|---|---|---|
| Environmental | 0.250 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

OPERATIONS & MAINTENANCE (O&M):

MDA FY 2006 one-time/non-recurring Operations & Maintenance (O&M) costs include the move costs of the FY 2006 NCR personnel moves to Redstone Arsenal/Huntsville, AL. This includes the costs for Permanent Change of Station (PCS), per diem, movement of privately owned vehicles (POV), house hunting, home purchase, the shipment of household goods (HHG), packing, freight, and information technology. In addition FY 2006 includes Program Management (PM) activities of developing the BRAC plans, activities, resource requirements, schedule and associated documentation to successfully implement BRAC. Functional efforts include project planning, human resources, financial, construction, information technology, legal, and security. All program management costs are shown with the Federal Office Building 2 which contains the MDA Headquarters. [Additional FY 2007 – FY 2011 program management costs are included with recurring costs.]

There are no FY 2007 O&M efforts. FY 2008 O&M efforts include the planning and acquisition efforts for the facilities special equipment, information technology, furnishings, supplies, and miscellaneous resources to support a move of functions and positions to Redstone Arsenal/Huntsville, AL.

MDA functions and positions are planned to move from NCR to Redstone Arsenal/Huntsville, AL in late FY 2009. FY 2009 O&M includes the moves of the FOB 2 and Suffolk based personnel from NCR to Redstone Arsenal/Huntsville, AL and the SMDC Building moves to Redstone Arsenal. FY 2010 O&M includes some final moves of NCR personnel to Redstone Arsenal. This includes the costs for Permanent Change of Station (PCS), per diem, movement of Privately Owned Vehicles (POV), house hunting, home purchase, shipment of household goods (HHG), packing, freight, and information technology.

MDA Headquarters functions and positions move to Fort Belvoir, VA are projected for late FY 2010 into possibly FY 2011. O&M costs in FY 2010 support the Fort Belvoir move.

| One-Time ($s in Millions) | FY2006 | FY2007 | FY2008 | FY2009 | FY2010 | FY2011 |
|---|---|---|---|---|---|---|
| Operations & Maintenance | 6.858 | 0.000 | 12.819 | 16.128 | 2.850 | 0.000 |

FY 2006 – FY 2011 BASE REALIGNMENT AND CLOSURE DATA
2005 COMMISSION

MISSILE DEFENSE AGENCY
SERVICE OVERVIEW

MILITARY PERSONNEL – PCS:

Limited Military Personnel – PCS costs are expected with this recommendation. Over the six-year BRAC implementation period MDA plans to use the existing military rotation plans to fill open positions. The majority of MDA military personnel are either associated with the MDA Headquarters which will move to Fort Belvoir or are at field positions unaffected by the NCR BRAC moves. Move-related costs will only affect the NCR to Redstone Arsenal military move projected for late FY 2009 to FY 2010. Moves to Fort Belvoir do not require PCS since both locations are in the same geographical area under the PCS move mileage requirements. All Military Personnel - PCS costs are shown with the Federal Office Building 2 (FOB 2) which contains the MDA Headquarters.

| One-Time ($s in Millions) | FY2006 | FY2007 | FY2008 | FY2009 | FY2010 | FY2011 |
|---|---|---|---|---|---|---|
| Military Personnel - PCS | 0.000 | 0.000 | 0.000 | 0.365 | 0.000 | 0.000 |

HOMEOWNER'S ASSISTANCE PROGRAM:

Homeowner's Assistance Program (HAP) costs are expected with this recommendation. Homeowner's Assistance Program move costs will only affect the NCR to Redstone Arsenal/Huntsville, AL moves projected for late FY 2009 to FY 2010. Moves to Fort Belvoir do not require HAP since both locations are in the same geographical area and are under the PCS mandatory move mileage requirements. All HAP costs are shown with the Federal Office Building 2 (FOB 2) which contains the MDA Headquarters.

| One-Time ($s in Millions) | FY2006 | FY2007 | FY2008 | FY2009 | FY2010 | FY2011 |
|---|---|---|---|---|---|---|
| Homeowner's Assistance Program | 0.000 | 0.000 | 0.000 | 2.607 | 0.000 | 0.000 |

# FY 2006 – FY 2011 BUDGET ESTIMATES
# BASE REALIGNMENT AND CLOSURE ACCOUNT - 2005
# COST AND SAVINGS BY FISCAL YEAR
# MISSILE DEFENSE AGENCY
# DOLLARS IN MILLIONS

| | FY 2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 | FY 2011 |
|---|---|---|---|---|---|---|
| One-Time Implementation Costs: | | | | | | |
| Military Construction - BRAC | 1.200 | 0.000 | 72.000 | 0.000 | 0.000 | 0.000 |
| Family Housing - Construction | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| - Operations | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Environmental | 0.250 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Operations & Maintenance | 6.858 | 0.000 | 12.819 | 16.128 | 2.850 | 0.000 |
| Military Personnel - PCS | 0.000 | 0.000 | 0.000 | 0.365 | 0.000 | 0.000 |
| Other | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Homeowners Assistance Program | 0.000 | 0.000 | 0.000 | 2.607 | 0.000 | 0.000 |
| Total One-Time Costs | 8.308 | 0.000 | 84.819 | 19.100 | 2.850 | 0.000 |
| Estimated Land Revenues | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Budget Request | 8.308 | 0.000 | 84.819 | 19.100 | 2.850 | 0.000 |
| | | | | | | |
| One-Time Costs Funded Outside of the Account: | | | | | | |
| Military Construction | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Family Housing | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Environmental | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Operations & Maintenance | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | | | | | |
| Other | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Homeowners Assistance Program | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Total One-Time Cost Outside of the Account: | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | | | | | |
| Grand Total One-Time Implementation Costs | 8.308 | 0.000 | 84.819 | 19.100 | 2.850 | 0.000 |
| | | | | | | |
| Recurring Costs: (memo non-add) | | | | | | |
| Operations & Maintenance | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Military Personnel | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Other | 0.000 | 2.180 | 2.680 | 2.680 | 6.547 | 5.347 |
| Total Recurring Costs (memo non-add): | 0.000 | 2.180 | 2.680 | 2.680 | 6.547 | 5.347 |
| | | | | | | |
| One-Time Savings: | | | | | | |
| Military Construction | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Family Housing - Construction | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Military PCS Cost Avoidance | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Other | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Total One-Time Savings | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | | | | | |
| Recurring Savings: | | | | | | |
| Civilian Salary: | 0.000 | 0.000 | 0.067 | 0.067 | 1.784 | 4.189 |
| Military Personnel Entitlements: | | | | | | |
| Officer Salary | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Enlisted Salary | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Housing Allowance | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Overhead: | | | | | | |
| Family Housing Operations | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Sustainment | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Recapitalization | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BOS | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Other: | | | | | | |
| Procurement | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Mission Activity | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Miscellaneous | 0.000 | 1.483 | 1.977 | 1.977 | 18.537 | 33.302 |
| Total Recurring Savings | 0.000 | 1.483 | 2.044 | 2.044 | 20.321 | 37.491 |
| | | | | | | |
| Grand Total Savings | 0.000 | 1.483 | 2.044 | 2.044 | 20.321 | 37.491 |
| | | | | | | |
| Net Civilian Manpower Position Changes (+/-) | 0 | 0 | 0 | 0 | (34) | (34) |
| Net Military Manpower Position Changes (+/-) | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | |
| Net Implementation Costs Less Estimated Land Revenues: | 8.308 | (1.483) | 82.775 | 17.056 | (17.471) | (37.491) |

BASE REALIGNMENT AND CLOSURE
2005 COMMISSION
PACKAGE DESCRIPTION

MISSILE DEFENSE AGENCY

Location: Summary (National Capital Region (NCR) and Huntsville, AL)

Closure/Realignment Package:

The BRAC Commission approved Recommendation # 134 (H&SA #15) includes the relocation of MDA functions from the following National Capital Region (NCR) and Huntsville, Alabama leased facilities. The recommendations were to realign specific government leased facilities including the Suffolk Building, Falls Church, VA; Space and Missile Defense Building, Huntsville, AL; Federal Office Building 2, Arlington, VA; Crystal Square 2, Arlington, VA; and Crystal Mall 4, Arlington, VA. This section includes an allocation of costs against these facilities. In addition MDA functions in NCR and Huntsville, AL commercial leased facilities will also be realigned to Redstone Arsenal, AL and Fort Belvoir, VA.

Suffolk Building, Falls Church, VA

BRAC Commission approved recommendation: "Close the Suffolk Building, a leased installation in Falls Church, VA. Relocate all Missile Defense Agency (MDA) functions, except the Ballistic Missile Defense System Sensors Directorate, to Redstone Arsenal, AL."

MDA plans do not include any FY 2006 through FY 2008 BRAC related impacts to the Suffolk Building. The moves and Suffolk Building closure/realignment is planned for the FY 2009 to FY 2010 time-frame. The construction costs for the Redstone Arsenal facility are included with the FOB 2 Headquarters. FY 2009 includes O&M move costs from the Suffolk Building to Redstone Arsenal, AL. This includes the O&M costs for Permanent Change of Station (PCS), per diem, movement of Privately Owned Vehicles (POV), house hunting, home purchase, the shipment of household goods (HHG), packing, freight, and information technology.

| One-Time Costs | FY2006 | FY2007 | FY2008 | FY2009 | FY2010 | FY2011 |
|---|---|---|---|---|---|---|
| Military Construction | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Family Housing | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Environmental | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Operations & Maintenance | 0.000 | 0.000 | 0.000 | 6.000 | 0.000 | 0.000 |
| Military - PCS | 0.000 | 0.000 | 0.000 | 0.000 | .0.000 | 0.000 |
| Other | 0.000 | 0.000 | 0.000 | 0.000 | .0.000 | 0.000 |
| Household Assistance/HAP | 0.000 | 0.000 | 0.000 | 0.000 | .0.000 | 0.000 |
| Total | 0.000 | 0.000 | 0.000 | 6.000 | 0.000 | 0.000 |

BASE REALIGNMENT AND CLOSURE
2005 COMMISSION
PACKAGE DESCRIPTION

MISSILE DEFENSE AGENCY

Space and Missile Defense Command (SMDC) Building, Huntsville, AL

BRAC Commission approved findings: "Realign the Space and Missile Defense Command (SMDC) Building, a leased installation in Huntsville, AL. Relocate all functions of the Missile Defense Agency to Redstone Arsenal, AL."

MDA plans do not include any FY 2006 through FY 2008 BRAC related impacts to the Space and Missile Defense (SMDC) Building located in Huntsville, AL. The SMDC Building realignment and move of MDA functions from to the MDA facility on Redstone Arsenal, AL is planned for the FY 2009 to FY 2010 time-frame. Furnishings and information technology to support the personnel at the facility is expected to be in place. O&M costs in FY 2009 are for the packing, moving and unpacking of the office materials from the SMDC Building outside the gates of Redstone Arsenal in to the Redstone Arsenal facility.

| One-Time Costs | FY2006 | FY2007 | FY2008 | FY2009 | FY2010 | FY2011 |
|---|---|---|---|---|---|---|
| Military Construction | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Family Housing | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Environmental | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Operations & Maintenance | 0.000 | 0.000 | 0.000 | 1.000 | 0.000 | 0.000 |
| Military - PCS | 0.000 | 0.000 | 0.000 | 0.000 | .0.000 | 0.000 |
| Other | 0.000 | 0.000 | 0.000 | 0.000 | .0.000 | 0.000 |
| Household Assistance/HAP | 0.000 | 0.000 | 0.000 | 0.000 | .0.000 | 0.000 |
| Total | 0.000 | 0.000 | 0.000 | 1.000 | 0.000 | 0.000 |

Federal Office Building 2 (FOB 2), Arlington, VA

BRAC Commission approved recommendation: "Realign Federal Office Building 2, Arlington, VA, by relocating a Headquarters Command Center for the Missile Defense Agency to Fort Belvoir, VA, and by relocating all other functions of the Missile Defense Agency, except the Command and Control Battle Management and Communications Directorate, to Redstone Arsenal, AL."

In FY 2006 MDA plans an initial move of selected functions and positions to Redstone Arsenal Alabama (RSA) /Huntsville, AL. A portion of these initial MDA functions and positions will come from FOB 2. Initial construction efforts are planned to commence in FY 2006 with Planning & Design (P&D) efforts to support a design-build (DB) facility acquisition strategy. The funds will be used to task the US Army Corps of Engineers, as the construction/design agent, to prepare Statements of Work (SOWs), conduct design charettes, and draft the Request for Proposals (RFPS) for the Redstone Arsenal, AL MDA facility and support analysis for the Fort Belvoir, VA move.

BASE REALIGNMENT AND CLOSURE
2005 COMMISSION
PACKAGE DESCRIPTION

MISSILE DEFENSE AGENCY

FY 2006 one-time/non-recurring Environmental efforts include the one-time share for conducting an air conformity analysis and National Environmental Policy Act (NEPA) compliance activities at Redstone Arsenal, AL and Fort Belvoir, VA.

MDA FY 2006 one-time/non-recurring Operations & Maintenance (O&M) costs include the move costs of the FY 2006 FOB 2 based personnel moves to Redstone Arsenal/Huntsville, AL. These initial moves are primarily associated with the establishment of the MDA Centers of Excellence such as the Interceptor Center of Excellence in Huntsville, AL. The affected MDA programs and organizations for FY 2006 moves include the Kinetic Energy Interceptor program, the Ground Based Missile Defense program, the Combined Test Forces organization, and other associated support positions that establish efficient MDA operations. This includes the O&M costs for Permanent Change of Station (PCS), per diem, movement of Privately Owned Vehicles (POV), house hunting, home purchase, the shipment of household goods (HHG), packing, freight, and information technology. In addition FY 2006 includes Program Management (PM) activities of developing the BRAC plans, activities, resource requirements, schedule and associated documentation to successfully implement BRAC. Functional efforts include project planning, human resources, financial, construction, information technology, legal, and security. FY 2006 Program Management activities include the development of the initial plans, activities, resource requirements, schedule and associated documentation to successfully implement BRAC. The program management efforts include project planning, human resources, financial, construction, information technology, legal, and security functions.

There are no scheduled BRAC position moves for FY 2007 and FY 2008 from FOB 2. FY 2008 activities will include military construction efforts to award the contract for the design-build facility at Redstone Arsenal/Huntsville, AL. Additional FY 2008 Operations & Maintenance (O&M) efforts include the planning and acquisition efforts for the facilities special equipment, information technology, furnishings, supplies, and miscellaneous resources to support a move of functions and positions to Redstone Arsenal.

MDA functions and positions are planned to move from NCR to Redstone Arsenal/Huntsville, AL in late FY 2009. The MDA FY 2009 one-time/non-recurring Operations & Maintenance (O&M) costs include the move costs of the FY 2009 FOB 2 based personnel moves to Redstone Arsenal/Huntsville, AL. FY 2010 O&M includes some final moves of NCR personnel to Redstone Arsenal. This includes the costs for Permanent Change of Station (PCS), per diem, movement of Privately Owned Vehicles (POV), house hunting, home purchase, the shipment of household goods (HHG), packing, freight, and information technology.

MDA Headquarters functions and positions move to Fort Belvoir, VA are projected for late FY 2010 into possibly FY 2011. O&M costs in FY 2010 support the Fort Belvoir move.

BASE REALIGNMENT AND CLOSURE
2005 COMMISSION
PACKAGE DESCRIPTION

MISSILE DEFENSE AGENCY

| One-Time Costs | FY2006 | FY2007 | FY2008 | FY2009 | FY2010 | FY2011 |
|---|---|---|---|---|---|---|
| Military Construction | 1.200 | 0.000 | 72.000 | 0.000 | 0.000 | 0.000 |
| Family Housing | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Environmental | 0.250 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Operations & Maintenance | 2.000 | 0.000 | 0.000 | 9.028 | 2.850 | 0.000 |
| Military - PCS | 0.000 | 0.000 | 0.000 | 0.365 | .0.000 | 0.000 |
| Other | 0.000 | 0.000 | 0.000 | 0.000 | .0.000 | 0.000 |
| Household Assistance/HAP | 0.000 | 0.000 | 0.000 | 2.607 | .0.000 | 0.000 |
| Total | 3.450 | 0.000 | 84.819 | 12.000 | 2.850 | 0.000 |

Crystal Square 2, Arlington, VA

BRAC Commission approved recommendation: "Realign Crystal Square 2, a leased installation in Arlington, VA, by relocating all functions of the Missile Defense Agency and the Headquarters component of the USA Space and Missile Defense Command to Huntsville, AL."

In FY 2006 MDA plans to move selected number of MDA functions and positions to Redstone Arsenal/Huntsville, AL. A majority of these moved MDA functions and positions to RSA will come from the Crystal Square 2 facility. The MDA intent is to entirely vacate the CS 2 facility at the earliest convenience projected as the very end of FY 2006. FY 2006 activities will include the movement and related O&M move costs for the affected NCR personnel to Redstone Arsenal (RSA)/Huntsville, Alabama. Another projected FY 2006 efforts include the termination of the CS 2 lease with some expected lease termination costs. In addition deconstruction and restoration costs, extending into FY 2007, are required to return the CS 2 facility to its pre-leased condition.

With the exception of some the CS 2 reconstruction and restoration efforts funded from and carrying over from the 4$^{th}$ Quarter of FY 2006 into the 1$^{st}$ Quarter of FY 2007, MDA does not plan any efforts related to the CS 2 facility for FY 2007 through FY 2011. MDA plans to be clear of the CS 2 facility in the 2Q of FY 2007 with lease savings expected to commence in that time.

| One-Time Costs | FY2006 | FY2007 | FY2008 | FY2009 | FY2010 | FY2011 |
|---|---|---|---|---|---|---|
| Military Construction | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Family Housing | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Environmental | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Operations & Maintenance | 4.858 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Military - PCS | 0.000 | 0.000 | 0.000 | 0.000 | .0.000 | 0.000 |
| Other | 0.000 | 0.000 | 0.000 | 0.000 | .0.000 | 0.000 |
| Household Assistance/HAP | 0.000 | 0.000 | 0.000 | 0.000 | .0.000 | 0.000 |
| Total | 4.858 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

BASE REALIGNMENT AND CLOSURE
2005 COMMISSION
PACKAGE DESCRIPTION

MISSILE DEFENSE AGENCY

Crystal Mall 4, Arlington VA

BRAC Commission approved recommendation: "Realign Crystal Mall 4, a leased installation in Arlington, VA, by relocating the Headquarters component of the USA Space and Missile Defense Command to Redstone Arsenal, AL." There are no FY 2006 impacts. The planned realignment of the Crystal Mall 4 is projected for FY 2009 to FY 2011.

MDA plans do not include any FY 2006 through FY 2008 BRAC related impacts to the Crystal Mall 4 Building. The relocation is planned for the FY 2009 to FY 2010 time-frame. MDA is working with the U.S. Army SMDC for housing of specifically defined missile defense functions and positions, as required, within the MDA Redstone Arsenal facilities including the existing Von Braun I and II facilities (the related Redstone Arsenal Construction and O&M fit-out costs are included in the FOB – 2 summary). U.S. Army SMDC personnel move costs are captured within the Army BRAC plans.

| One-Time Costs | FY2006 | FY2007 | FY2008 | FY2009 | FY2010 | FY2011 |
|---|---|---|---|---|---|---|
| Military Construction* | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Family Housing | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Environmental | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Operations & Maintenance | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Military - PCS | 0.000 | 0.000 | 0.000 | 0.000 | .0.000 | 0.000 |
| Other | 0.000 | 0.000 | 0.000 | 0.000 | .0.000 | 0.000 |
| Household Assistance/HAP | 0.000 | 0.000 | 0.000 | 0.000 | .0.000 | 0.000 |
| Total | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

* Included with FOB 2.

One-Time Implementation Costs:

Military Construction:

| One-Time ($s in Millions) | FY2006 | FY2007 | FY2008 | FY2009 | FY2010 | FY2011 |
|---|---|---|---|---|---|---|
| Military Construction | 1.200 | 0.000 | 72.000 | 0.000 | 0.000 | 0.000 |

Military Construction efforts for FY 2006 include the initial Planning & Design (P&D) efforts for both the Redstone Arsenal, AL and the Fort Belvoir, VA facilities. To support a design-build (DB) facility acquisition strategy the US Army Corps of Engineers, as the construction/design agent, will initiate and prepare Statements of Work (SOWs), conduct design charettes, and draft for future issuance the Request for Proposals (RFPS) for each facility at the gaining installations.

BASE REALIGNMENT AND CLOSURE
2005 COMMISSION
PACKAGE DESCRIPTION

MISSILE DEFENSE AGENCY

Family Housing Construction/Operations:

| One-Time ($s in Millions) | FY2006 | FY2007 | FY2008 | FY2009 | FY2010 | FY2011 |
|---|---|---|---|---|---|---|
| Family Housing - Construction | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Family Housing - Operations | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

There are no family housing construction or operations requirements associated with this base realignment action.

Environmental:

| One-Time ($s in Millions) | FY2006 | FY2007 | FY2008 | FY2009 | FY2010 | FY2011 |
|---|---|---|---|---|---|---|
| Environmental | 0.250 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

As a tenant organization, MDA will coordinate its environmental requirements and issues with the environmental management offices at the gaining BRAC installations (Redstone Arsenal, AL and Fort Belvoir, VA), MDA will expend $0.250 Million in FY 2006 to fund its one-time share for conducting an air conformity analysis and National Environmental Policy Act (NEPA) compliance activities at Redstone Arsenal, AL and Fort Belvoir, VA. MDA does not expect any environmental issues associated with vacating leased space. MDA has not allocated funding for environmental compliance activities at the losing facilities.

There are no additional one-time/non-recurring environmental costs projected for FY 2007 – FY2011.

Operations and Maintenance:

| One-Time ($s in Millions) | FY2006 | FY2007 | FY2008 | FY2009 | FY2010 | FY2011 |
|---|---|---|---|---|---|---|
| Environmental | 6.858 | 0.000 | 12.819 | 16.128 | 2.850 | 0.000 |

O&M efforts for FY 2006 include move related costs ($5.358M), lease termination, restoration and deconstruction costs of the CS 2 facility ($0.500M), and program management ($1.000M). Efforts requiring funding in FY 2006 include the associated costs of moving the affected MDA Federal Office Building 2 (FOB 2) and the Crystal Square 2 (CS 2) positions to Redstone Arsenal/Huntsville, AL. These initial moves are primarily associated with the establishment of the MDA Centers of Excellence such as the Interceptor Center of Excellence in Huntsville, AL. The affected MDA programs and organizations for FY 2006 moves include the Kinetic Energy Interceptor

program, the Ground Based Missile Defense program, the Combined Test Forces organization, and other associated support positions that establish efficient MDA operations. The funding supports Civilian move costs including the Permanent Change of Station (PCS), per diem, movement of Privately Owned Vehicles (POV), house hunting, home purchase, the shipment of household goods (HHG), packing, freight, and information technology. In addition the funding supports the establishment of the new positions at the receiving area. The program management activities include the development of the initial plans, activities, resource requirements, schedule and associated documentation to successfully implement BRAC. The program management efforts include project planning, human resources, financial, construction, information technology, legal, and security functions.

There are no FY 2007 O&M activities projected.

FY 2008 O&M efforts include the planning and acquisition efforts for the facilities special equipment, information technology, furnishings, supplies, and miscellaneous resources to support a move of functions and positions to Redstone Arsenal/Huntsville, AL.

MDA functions and positions are planned to move from NCR to Redstone Arsenal/Huntsville, AL in late FY 2009. FY 2009 O&M costs include the moves costs of the FOB 2 and Suffolk based personnel from NCR to Redstone Arsenal/Huntsville, AL and the SMDC Building moves to Redstone Arsenal. FY 2010 O&M includes some final moves of NCR personnel to Redstone Arsenal. This includes the costs for Permanent Change of Station (PCS), per diem, movement of Privately Owned Vehicles (POV), house hunting, home purchase, shipment of household goods (HHG), packing, freight, and information technology.

MDA Headquarters functions and positions move to Fort Belvoir, VA are projected for late FY 2010 into possibly FY 2011. O&M costs in FY 2010 support the Fort Belvoir move.

MILITARY PERSONNEL – PCS:

| One-Time ($s in Millions) | FY2006 | FY2007 | FY2008 | FY2009 | FY2010 | FY2011 |
|---|---|---|---|---|---|---|
| Military Personnel - PCS | 0.000 | 0.000 | 0.000 | 0.365 | 0.000 | 0.000 |

Limited Military Personnel – PCS costs are expected with this recommendation. Over the six-year BRAC implementation period MDA plans to use the existing military rotation plans to fill open positions. The majority of MDA military personnel are either associated with the MDA Headquarters which will move to Fort Belvoir or are at field positions unaffected by the NCR BRAC moves. Move-related costs will only affect the NCR to Redstone Arsenal military move projected for late FY 2009 to FY 2010. Moves to Fort Belvoir do not require PCS since both locations are in the same geographical area under the PCS move mileage requirements. All Military Personnel - PCS costs are shown with the Federal Office Building 2 (FOB 2) which contains the MDA Headquarters.

BASE REALIGNMENT AND CLOSURE
2005 COMMISSION
PACKAGE DESCRIPTION

MISSILE DEFENSE AGENCY

HOMEOWNER'S ASSISTANCE PROGRAM:

| One-Time ($s in Millions) | FY2006 | FY2007 | FY2008 | FY2009 | FY2010 | FY2011 |
|---|---|---|---|---|---|---|
| Homeowner's Assistance Program | 0.000 | 0.000 | 0.000 | 2.607 | 0.000 | 0.000 |

Homeowner's Assistance Program (HAP) costs are expected with this recommendation. Homeowner's Assistance Program move costs will only affect the NCR to Redstone Arsenal/Huntsville, AL moves projected for late FY 2009 to FY 2010. Moves to Fort Belvoir do not require HAP since both locations are in the same geographical area under the PCS move mileage requirements.

All HAP costs are shown with the Federal Office Building 2 (FOB 2) which contains the MDA Headquarters.

SAVINGS:

Savings, Military Construction:

There are no FY 2006 – FY 2011 savings projected.

Savings, Family Housing:

Not applicable with MDA

Savings, Operations and Maintenance:

Operations and Maintenance savings consist primarily of savings from reduced personnel costs and the savings from lease terminations.

Savings, Operations and Maintenance – Personnel:

| One-Time Costs | FY2006 | FY2007 | FY2008 | FY2009 | FY2010 | FY2011 |
|---|---|---|---|---|---|---|
| Personnel Savings - Reductions | 0.000 | 0.000 | 0.000 | 0.000 | 1.717 | 3.434 |
| Personnel Savings – Locality rate | 0.000 | 0.000 | 0.067 | 0.067 | 0.067 | 0.755 |

BRAC-related Civilian personnel reductions are projected at 34 at the conclusion of the transfer of positions in late FY 2009 with savings starting in the 3rd quarter FY 2010 from the NCR to Redstone Arsenal, AL. The savings are estimated at the composite MDA civilian rate.

BASE REALIGNMENT AND CLOSURE
2005 COMMISSION
PACKAGE DESCRIPTION

MISSILE DEFENSE AGENCY

In addition the Huntsville, AL locality rate is 3% lower than NCR. Savings are projected in the following fiscal year plus one of the planned moves. All personnel savings are captured with the MDA Headquarters at FOB 2.

Savings, Operations and Maintenance – Lease Terminations:

| One-Time Costs | FY2006 | FY2007 | FY2008 | FY2009 | FY2010 | FY2011 |
|---|---|---|---|---|---|---|
| Suffolk Building | 0.000 | 0.000 | 0.000 | 0.000 | 5.983 | 7.977 |
| SMDC Building | 0.000 | 0.000 | 0.000 | 0.000 | 0.389 | 0.519 |
| Federal Office Bldg 2 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 9.281 |
| Crystal Square 2 (CS 2) | 0.000 | 1.483 | 1.977 | 1.977 | 1.977 | 1.977 |
| Crystal Mall 4* | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Contractor Leased** | 0.000 | 0.000 | 0.000 | 0.000 | 10.188 | 13.548 |
| Total | 0.000 | 1.483 | 1.977 | 1.977 | 18.537 | 33.302 |

* Included in Army plan.

Savings from projected cancelled leases include the estimates within the table (in Millions). With the exception of the Crystal Square 2 (CS 2) Building the closure/realignment of the leased facilities are not projected until the end of FY 2009. With approximately a minimum of 3 months of reconstruction and restoration efforts lease savings will not be expected until FY 2010. The realignment of FOB -2 will not occur until after the MDA Headquarters move to Ft Belvoir occurring in late FY 2010. [Realignments are assumed in last month of FY, 3 months reconstruction and restoration, and first year savings at 9 months of the lease].

In addition to the Government leased facility there are MDA functions and positions located in Contractor leased facilities. Technically the BRAC Commission can not realign the facilities, however the supporting language and intent within the COBRA model included the removal of the MDA functions and termination of MDA funded costs from this NCR and Huntsville, AL facilities. The construction of a single MDA facility at Redstone Arsenal does not provide adequate space for the movement of existing MDA Huntsville functions and positions on to Redstone Arsenal. Separately displayed in this table, the costs will be reported within the Federal Office Building 2 (FOB 2) estimates.

Savings, Military Personnel:

There are no FY 2006 – FY 2011 savings projected.

**Missile Defense Agency**
**Fiscal Year (FY) 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 |
| ARAV | Aegis Readiness Assessment Vehicles |
| ARC | Advanced Research Center, US Army, Huntsville, AL |
| ARC/SC | Advanced Research Center/Simulation Center |
| ARL | Army Research Laboratory |
| ARO | All Reflective Optics |
| 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 |
| ASP | Advanced Signal Processor |
| AST | Airborne Surveillance Test Bed |
| ATEC | Army Test and Evaluation Command |
| ATO | Authority To Operate |
| ATP | Authority To Proceed |
| 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 |
| BCFS | Bulk Chemical Front Section |
| BEC | BMC2 Element Capability |

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| 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 |
| 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 |

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| CARD | Cost Analysis Requirements Document |
| CCB | Configuration Control Board |
| CCM | Counter-Countermeasures |
| CCMWG | Common Cost Methodology Working Group |
| CCTV | Closed-Circuit Television |
| 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 |
| CG | Guided Missile Cruiser |
| 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 |
| CLS | Contractor Logistics Support |
| 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 |
| COE | Corps of Engineers |
| 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 |

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| CPIC | Capital Planning and Investment Control |
| CPIF | Cost-Plus-Incentive-Fee |
| CR | Capability Release |
| CRA | Continuing Resolution Authority |
| CSC | Computer Science Corporation |
| CSEDS | Combat Systems Engineering Development Site, Moorestown, NJ |
| C-SiC | Carbon Silicon Carbide |
| CSO | Closely Spaced Object |
| CSOP | Combined Standard Operating Procedures |
| CTF | Controlled Test Flight; Combined Test Force |
| 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 |
| DDCS | Doppler Data Collection System |
| DDG | Guided Missile Destroyer |
| 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 |

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| 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 |
| 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 |
| EDM | Engineering Development Model |
| 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 |

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| 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 |
| ESL | External Sensors Lab |
| ESOH | Environmental Safety and Occupational Health |
| ETDS | Enhanced Target Delivery System |
| ETEDDS | End-to-End Distributed Development System |
| ET | Embedded Test |
| 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 |

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| FPGA | Field Programmable Gate Arrays |
| FS&E | Facilities, Siting & Environment |
| FTE | Full-Time Equivalents |
| FTM | Flight Test Mission |
| FTR | Flight Test Round |
| 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 |
| 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 |
| GMOC | GBMC3 Mission Operations Center; Cheyenne Mountain Operation 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 |

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| 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 |
| 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 |
| 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 |
| IDA | Integrated Dewar Assembly |
| IDC | Initial Defensive Capability |
| IDIQ | Indefinite Delivery Indefinite Quantity |
| 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 |

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| 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 |
| 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 |
| IR/Vis | Infrared Visible |
| 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 |

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| 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 |
| 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 Simulatio |
| Kft | Kilo Feet (1,000 feet) |
| KHILS | Kill Vehicle Hardware-in-the-Loop Simulation |
| KI | Kinetic Interceptor |
| KIA | Key Investment Area |

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| 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 |
| 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 |
| MAB | Missile Assembly Building |
| MAIP | Mission Assurance Implementation Plan |
| MANTECH | Manufacturing Technology |
| MARC | Missile Analysis and Warning Cell |
| MASINT | Measurement and Signature Intelligence |

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| MBRV | Modified Ballistic Re-entry Vehicle |
| 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) |
| MDR | Mission Data Review |
| MDS | Midcourse Defense Segment |
| MDSE | Missile Defense System Exerciser |
| MDSG | Missile Defense Support Group |
| 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 |
| MEB | Missile Equipment Building |
| MI | Minority Institutions |
| MIDS | Management Initiative Decisions |
| MILCON | Military Construction |
| MILSATCOM | Military Satellite Communiattions |
| MILSTAR | Military Strategic and Tactical Relay |
| 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 |

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| 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 |
| MSK | Mechanical Steering Kit |
| 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 |
| 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 |

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| 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 Agency |
| OT&E | Operational Test and Evaluation |
| OTHR | Over The Horizon Radar |
| OUSD (ATL) | Office of Under Secretary of Defense (Acquisition, Technology & Logistics) |
| **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 |

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| PEOAMD | PEO Army Missile Defense |
| PES | Probability of Engagement Success |
| PFS | Partial Full Scale |
| PHB | Plume-to-hard-body |
| PHS&T | Packaging, Handling, Storage, & Transportation |
| 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** | |
| 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 |

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| 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** | |
| SAC | Site Activation Command (Alaska) |
| SADBU | Small And Disadvantaged Business Unit |
| SAIPP | Software Acquisition Improvement Program Plan |
| SAM | Subarray Module |
| SATCOM | Satellite Communications |
| SBAR | S-Band Advanced Radar |
| 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 |

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| 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 |
| SERV-2 | Safety Enhanced Reentry Vehicle 2 |
| SETA | Scientific Engineering and Technical Assistance |
| SHORAD | Short-Range Air Defense System |
| SHotL | Short Hot Launch |
| SI | Software Item |
| 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 |
| SIV | Silo Interface Vault |
| 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 2 |
| SM-3 | Standard Missile 3 |
| 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 |

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| 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 |
| TADIL-J | Tactical Digital Information Link Joint |
| TAMD | Theater Air and Missile Defense |
| TBD | To Be Determined |
| TBDD | Test Bed Description Document |
| TBI | Test Bed Infrastructure |
| 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 |
| TEX | Test Exerciser |
| TFCC | THAAD Fire Control and Communications |
| THAAD | Terminal High Altitude Area Defense |
| TIM | Technical Interchange Meeting |
| TITO | Test Infrastructure and Test Operations |

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| 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 |
| TRM | Transmit/Receive Modules |
| 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 |
| TTV | Tactical Target Vehicle |
| 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 |
| UFL | Ulchi Focus Lens |
| UK | United Kingdom |
| UKMOD | UK Ministry of Defense |
| US | United States |
| USACE | United States Army Corps of Engineers |
| USAF | United States Air Force |
| 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 |

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| 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 Services |
| 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 |

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# MDA Master Test & Evaluation Schedule FY05-11

**Test Nomenclature Key**

The name of each BMD System test will usually consist of (see note 1):

a. A two letter group designating the type of test or name of an operational exercise (see note 2).
FT – flight test
GT – ground test

b. The letter following FT describes the type of flight test and main system participant (other elements/participants may be included in the test). The letter following the GT indicates the construct for that ground tests.

Flight Test
A – Arrow (or may also be designated as AST)
C – Countermeasure (or may also be designated as CMCM)
G – Ground Based Defense (GMD)
K – Kinetic Energy Interceptor (KEI)
L – Airborne Laser (ABL)
M – Aegis
P – Patriot Interceptor (or designated as PAC, ATM, or simply P)
S – Space Tracking and Surveillance System (STSS) (or may also Designated as TMDD or SMDD)
T – Terminal High Area Altitude Defense (THAAD)
Blank or X – Other (sensor characterization, Sea based X-band (SBX), etc.)

Ground Test Construct
D – System level distributed ground testing that includes deployed operational assets.
I – System level integrated, lab testing that doesn't involve operational assets and involves a broad spectrum of objectives.
X – Other ground testing that focuses on hardware and software components to address pair wise test requirements, re-accomplishes prior test shortfalls, validates specific M&S anchor points, etc.
Blank – Old nomenclature simply designating that it was a ground test (replace by construct above).

Note 1: BMDS components participate in numerous tests that are conducted and directed by external agencies. These tests include Targets of Opportunity (TOO) such as Air Force Glory Trips (designated as GT-191 or GT-196 for example) and NASA space launches, and other related exercises such as Pacific Explorer III and Vigilant Shield.

Note 2. Wargames (referred to as Wargames (WG) or Integrated Missile Defense (IMD) in the past) in conjunction with COCOM exercises will use the name of the event followed by the year of the event. (For example: Amalgam Phantom 06).

# Test Nomenclature Cross Reference Matrix
**(CY05 – CY07)**

**Aegis BMD**

| Original Nomenclature | 31 Aug 2004 Nomenclature | Revised Nomenclature |
|---|---|---|
| FM-1 thru FM-8 | | Completed |
| FM-9 (canx) | FTM 04-3 | FTM -09 |
| JCTV-1 | JCTV-1 | JCTV-1 |
| FM-10 | FTM 06-1 | FTM -10 |
| FM-11 | FTM 06-2 | FTM -11 |
| FM-12 | FTM 06-3 | FTM -12 |
| FM-13 | | FTM -13 |
| FM-14 | | FTM -14 |
| FM-15 | | FTM -15 |

**Ground Based Interceptor**

| Original Nomenclature | 31 Aug 2004 Nomenclature | Revised Nomenclature |
|---|---|---|
| IFT-1thru 14 | | Completed |
| | MRTF FT-1 | Completed |
| | MRTF FT-2 | FTG-02 |
| | MRTF FT-3 | FTG-03 |
| | MRTF FT-4 | FTG-04 |
| | FTG 06-1 | FTG-05 |

**THAAD**

| Original Nomenclature | 31 Aug 2004 Nomenclature | Revised Nomenclature |
|---|---|---|
| FT-01 | FT-1 | Completed |
| FT-02 | FT-2 | FTT-02 |
| FT-03 | FT-3 | FTT-03 |
| FT-04 | FT-4 | FTT-04 |
| FT-05 | FTT-04-1 | FTT-05 |
| FT-06 | FTT 06-1 | FTT-06 |
| FT-07 | FTT-06-2 | FTT-07 |
| FT-08 | FTT-06-3 | FTT-08 |
| FT-09 | FTT-06-4 | FTT-09 |
| FT-10 | FTT-06-5 | FTT-10 |

**Measurement Tests**

| Original Nomenclature | 31 Aug 2004 Nomenclature | Revised Nomenclature |
|---|---|---|
| CMCM 1a/b | FT 04-2a/b | Completed |
| CMCM 2a/b | FT 04-4a/b | FTC-02a/b |
| CMCM 3 (canx) | FT 06-3 | FTC-03 |
| CMCM 4 | FT 06-4 | FTC-04 |

**STSS**

| Original Nomenclature | 31 Aug 2004 Nomenclature | Revised Nomenclature |
|---|---|---|
| TMDD-1 | FT 06-7 | FTS-01 |
| SMDD-1 | FT 06-8 | FTS-02 |

**Other Flight Tests**

| Original Nomenclature | 31 Aug 2004 Nomenclature | Revised Nomenclature |
|---|---|---|
| Cobra Dane LRALT | FT 04-5 | Completed |
| | FT 04-1 | FTX-01 |
| | FT 06-1 | FTX-02 |
| | FT 06-2 | FTX-03 |

**Ground Tests**

| Original Nomenclature | 31 Aug 2004 Nomenclature | Revised Nomenclature |
|---|---|---|
| IGT-2 thru 5 | | Completed |
| IGT-6 (canx) | | |
| IGT-7 | GT 04-3 | No Change |
| | GT 06-5 | No Change |
| | GT 06-6 | No Change |
| | GT 06-7 | No Change |
| | GT 06-8 | No Change |
| DGT-1 | DGT 04-2a/b | No Change |
| DGT-2 | GT 04-4 | No Change |
| | GT 06-9 | Canx (MRTF) |
| | GT 06-10 | Canx (MRTF) |
| MDIE05a | GT 04-5 | Completed |
| MDIE05b | GT 04-6 (merged with GT 06-1) | |
| | GTC 06-1 | GTX-1a* |
| | | GTX-1b* |
| MDIE06a | GT 06-1 | GTI-1* |
| | | GTD-1 |
| MDIE06b | GT 06-2 | GTX-2a |
| | | GTI-2 |
| | | GTD-2 |
| MDIE07a | GT 06-3 | GTX-3a |
| | | GTX-3b |
| | | GTI-3 |

*do not change documentation

**Wargames**

| Original Nomenclature | 31 Aug 2004 Nomenclature | Revised Nomenclature |
|---|---|---|
| | WG 04-1 thru 04-5 | Completed |
| | WG 06-1 | |
| | WG 06-2 | Amalgam Phantom 06 BE |
| | WG 06-3 | Vigilant Shield 07 BE |
| | WG 06-4 | PACOM Tier 1 07 BE |
| | WG 06-5 | TBD |
| | WG 06-6 | Vigilant Shield 08 BE |
| | WG 06-7 | PACOM Tier 1 08 BE |