Ballistic Missile Defense System (BMDS)

Executive Summary

- Testing is successfully moving from element-centric to Ballistic Missile Defense System (BMDS)-centric.
- Three successful Ground-Based Midcourse Defense (GMD) flight tests culminated with a live target intercept using an operational interceptor, kill vehicle, and primary radar sensor for the first time.
- Terminal High-Altitude Area Defense (THAAD) and Aegis Ballistic Missile Defense (BMD), theater elements of the BMDS, made good progress this year. A warfighter procedural error prevented a successful engagement during the December 2006 Aegis BMD test.
- Command, Control, Battle Management, and Communications (C2BMC) continues to improve display accuracy and situational awareness.
- Sensor fusion remains untested with end-to-end intercept tests; battle management capability is in early development.

System

- The current BMDS architecture integrates ballistic missile defense capabilities against all ranges of threats.
- BMDS is a distributed system currently composed of four elements and six sensor systems:
  - Elements
    - Aegis BMD
    - C2BMC
    - GMD
    - PATRIOT Advanced Capability 3 (PAC-3)
  - Sensors
    - Cobra Dane
    - Upgraded Early Warning Radars (UEWR) – Beale and Fylingdales
    - Forward-Based X-band Transportable (FBX-T) Radar
    - Sea-Based X-Band (SBX) Radar
    - Space-Based Infrared System (SBIRS)/Defense Support Program (DSP)
- BMDS is employed as part of an integrated strategic defense plan
- Future blocks of the BMDS may include:
  - Airborne Laser (ABL)
  - Kinetic Energy Interceptor (KEI)
  - Multiple Kill Vehicle (MKV)
  - Space Tracking and Surveillance System (STSS)
  - THAAD

Mission

- U.S. Strategic Command is responsible for overall ballistic missile defense and will employ the BMDS to defend the U.S. territory, deployed forces, friends, and allies against ballistic missile threats of all ranges, in all phases of flight. Initial capability will permit defending the U.S. territory against ballistic missile threats.
- U.S. Strategic Command and U.S. Pacific Command will maintain situational awareness across the full mission space using the C2BMC system.
- The Army employs PAC-3 to provide theater defense for the deployed forces against short- and intermediate-range threats. The Missile Defense Agency (MDA) transitioned PAC-3 to the Army; PAC-3 is reported as an Army program.

Activity

- MDA conducted seven BMDS-centric ground tests during FY06.
- Aegis BMD completed two successful intercept flight tests against simple-separating medium-range targets in November 2005 and June 2006. It also participated in two target-of-opportunity events to test its long-range surveillance and track capabilities.
- C2BMC conducted developmental and integration testing and participated in three war games and eight Aegis BMD, GMD, PATRIOT, and other inter- and intra-agency flight tests.
- GMD had several "firsts:"
  - December 2005 - Launched the operational Ground-Based Interceptor (GBI) for the first time in Flight Test 1 (FT-1)

  - April 2006 - Flew a threat representative target missile through the Beale UEWR search volume for the first time during FT 04-1
  - September 2006 - Completed the first intercept with an operational GBI and operational radar sensor during Flight Test GBI 02 (FTG-02)
- PATRIOT conducted five flight tests from November 2005 to June 2006; three were successful.
- The Army conducted a Limited User Test of the PATRIOT Post Deployment Build 6 software (PDB-6), August - November 2006.
- THAAD returned to flight testing after a five-year hiatus. The program completed three successful tests, two without targets, and the third culminating with a successful intercept of a unitary target in July 2006.

Assessment

- BMDS defensive capability is still very basic, but is increasing as it matures and is demonstrating capability through disciplined ground and flight testing.
- GMD flight tests are providing data to verify, validate, and accredit models and simulations. The robust ground test campaign series is demonstrating BMDS capability and interoperability. The program still needs additional flight test data under stressing conditions to validate models and simulations and to increase confidence in the models, simulations, and assessment of system capability.
- C2BMC continues to add new functionality. Communications and situational awareness deficiencies have improved, but adding new sensors and shooters creates new challenges.
- Significant changes in both test and evaluation philosophy and structure should result in a more stable, efficient, and effective test program.

Recommendations

- Status of Previous Recommendations. MDA has addressed all but one of the FY05 DOT&E recommendations. The following recommendation requires further attention: FY05 #5: MDA is slowly improving reliability, availability, and maintainability data collection for the BMDS, as recommended by DOT&E. Improvement is still needed in this area.
- FY06 Recommendations. None.