Command, Control, Battle Management, and Communications (C2BMC) System

Executive Summary
- The Command, Control, Battle Management, and Communications (C2BMC) system capabilities and interactions with other elements continued to grow in FY07.
- The Missile Defense Agency (MDA) continues to correct C2BMC display inaccuracies and improve data presentation.
- Although C2BMC is still only used as a situational awareness tool, the MDA is starting to implement planning, battle management, and sensor network tools as well.

System
- C2MBC is the warfighter's interface to the fully integrated Ballistic Missile Defense System (BMDS).
- Initial configuration includes C2BMC data terminals at the Missile Defense Integration and Operations Center (MDIOC), Schriever Air Force Base, Colorado; Cheyenne Mountain, Colorado; Fort Greely, Alaska; U.S. Strategic, Northern, and Pacific Commands, and the National Command Authority.
- The current C2BMC system provides situational awareness data only. The C2BMC terminals provide warfighters and the National Command Authority with information on missile events, BMDS status, and system coverage. Aegis Ballistic Missile Defense (Aegis BMD) and Ground-based Midcourse Defense (GMD) elements use their own command, control, battle management systems, and mission planning tools.
- The Block 06 C2MBC is intended to provide situational awareness for the Block 06 BMDS, and command and control for the AN/TPY-2 radar.

Mission
U.S. Strategic, Northern, and Pacific Commands currently use the C2MBC to provide communications necessary to support ballistic missile defense engagements, as follows:
- Deliberate planning
- Collaborative dynamic planning
- Situational awareness
- Consequence management
- Network management

Activity
- Software Spiral 6.0 became fully operational in June 2007. Meanwhile, the MDA developed Spiral 6.2 and tested it throughout FY07. The MDA expects this software version to be used in a Live Fire test event and a ground test in the fall of 2007, with installation at all the Combatant Commands by December 2007. Spiral 6.2 improves the capabilities of C2BMC in a number of areas, including:
  - AN/TPY-2 radar management and track forwarding functions, which allow the user to task the radar as well as forward selected tracks to Aegis BMD via a new communications architecture
  - A new communications architecture, which provides a two-way satellite interface with Aegis BMD for the exchange of data
  - A Parallel Staging Network to enable fielding of software and hardware upgrades without impacting the operational system
- Most BMDS system-level tests now involve C2BMC participation. During FY07, this included participation in four ground tests (integrated hardware-in-the-loop tests and distributed tests that used operational hardware and software) and seven flight tests. During these flight tests, C2BMC demonstrated the ability to provide situational awareness by receiving and displaying data from a variety of sensors. Additionally, the Space-Based Infrared System (SBIRS) demonstrated its capacity to provide early warning data to the BMDS through C2BMC.
- C2BMC participated in the Vigilant Shield/Terminal Fury 07 wargame in December 2006.
- The MDA used the C2BMC Joint Defense Planner in the U.S. Forces Japan bilateral Keen Edge exercise, in February 2007 and July 2007.
- Ground Test Integrated-02 (GTI-02) in September 2007 used hardware-in-the-loop systems to test the interaction between

Aegis BMD, GMD, Terminal High-Altitude Area Defense, Patriot, and other sensors and command and control interfaces.

Assessment

- C2BMC is a critical component of the BMDS. Its capabilities and interactions with other elements continued to increase and improve during FY07.
- Although shortcomings in C2BMC situational awareness capabilities continue to exist, the MDA has taken steps to reduce these. Warfighters are experiencing better data accuracy and, based on data from ground and flight tests, have noticed improvements in access and display content.
- C2BMC demonstrated some interoperability with theater assets, but requires more extensive tests in order to support development of tactics, techniques, and procedures.
- C2BMC battle management capability currently only functions with the AN/TPY-2 radar.

Recommendations

- Status of Previous Recommendations. Two of the three FY06 DOT&E recommendations still remain unfulfilled.
  The MDA needs to continue multi-radar testing at the theater level in addition to developing appropriate tests at the BMDS level in order to fully assess C2BMC track accuracies and correlations of data received from multiple radar sensors (FY06). The MDA should also include assessments of Information Assurance during BMDS-centric C2BMC testing (FY06).
- FY07 Recommendation.
  1. The MDA should include further ground and/or flight testing to verify C2BMC management of the AN/TPY-2 radar in Shariki, Japan, following the recent move of the radar to its objective site.