

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

Executive Summary

- The Missile Defense Agency (MDA) improved the usability, multi-mission capabilities, and interoperability of the Command, Control, Battle Management, and Communications System (C2BMC).
- The C2BMC remains a critical developmental element of the Ballistic Missile Defense System (BMDS) and is changing rapidly.
- MDA should maintain their current emphasis on deliberate ground testing.
- Consistency in the presentation of mission information across the entire BMDS is a top priority test objective for C2BMC.

System

- C2BMC is the warfighter's interface to the BMDS.
- Initial configuration includes C2BMC data terminals at the Joint National Integration Center (JNIC), Cheyenne Mountain, Colorado; Fort Greely, Alaska; and the National Command Authority.
- The current C2BMC system provides the Initial Defensive Capability and Block 04 configurations with 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 and Ground-Based Midcourse Defense (GMD) elements use their own command, control, battle management systems and mission planning tools. Beginning in Block 06, the C2BMC should provide integrated command and control for the entire BMDS.



Mission

U.S. Strategic Command and U.S. Pacific Command use the C2BMC to provide communications necessary to support ballistic missile defense engagements, as follows:

- Deliberate planning
- Collaborative dynamic planning
- Situational awareness
- Consequence management
- Network management

Activity

- MDA improved the capabilities of the C2BMC, including:
 - Usability of the dynamic planning function
 - Integration of missile warning/missile defense
 - Interoperability with space-based surveillance assets
- During wargame WG 04-1, C2BMC Spiral 4.3 demonstrated:
 - Communications with Aegis BMD and GMD Fire Control System (GFC)
 - Display of the integrated battle management picture
 - Improved planning and situational awareness features
- Spiral 4.4 consisted of fixes and upgrades based on user inputs and testing results.
 - Installed hardware/software suites at Northern Command, Strategic Command, Pacific Command, Joint National Integration Center, and Fort Greely, Alaska
 - Tested successfully during ground test GT 04-5 in May 2005
- Supported flight testing including FTM 04-1, FT 04-5, GT-189, and SERV-2
- Demonstrated interoperability during a PATRIOT flight test in November 2005. Successfully received messages from PATRIOT, processed and displayed PATRIOT track data, and provided situational awareness data.
- Spiral 4.5 will be installed in December 2005.
 - Incorporates the capability to control the Forward-Based X-band Transportable radar
 - Provides additional situational awareness features
 - Completed integration testing at the JNIC
 - Used C2BMC successfully in wargame WG 04-5, in integrated ground test GT 04-1, and in distributed ground test GT04-2

BALLISTIC MISSILE DEFENSE SYSTEM

Assessment

- C2BMC is a critical developmental component of the BMDS, and is changing rapidly. MDA is following sound developmental testing practices, but remains on an aggressive schedule.
- Additional C2BMC capabilities include mission planning and track displays. Health and status monitoring have improved over the reporting period. These enhancements will continue to be demonstrated in system-level ground and flight testing over the next year.
- Development and testing of the C2BMC spirals, and their installation at the various sites, has been slower than planned. C2BMC Spiral 4.5 was not available for Integrated Missile Defense 5.2 wargame, which resulted in it being downgraded to a Tactical Exercise. It was also unavailable for the Aegis Flight Test Mission FTM 04-2, delaying the demonstration of Forward-Based X-band radar integration.
- Upgrading the C2BMC hardware/software requires dedicated downtime, which may extend the time needed to return to operational status. MDA is implementing a strategy called “dormant mode” that splits the C2BMC architecture into an

operational suite and a test suite. This will allow tests to be conducted with minimal impact on operations.

- During ground testing, C2BMC and GFC consoles have shown discrepancies in how engagement data is displayed.

Recommendations

1. Maintain the emphasis on data integrity and consistency between C2BMC and GFC.
2. Install and maintain GFC screens in all C2BMC areas to include all BITC and X-Lab areas. These screens should have the ability to display all test data as required for test and consistency requirements.
3. As C2BMC expands to integrate the Sea-Based X-band, Forward-Based X-band, and Flyingdales Upgraded Early Warning radars, test objectives should include engagements where the target is viewed by multiple radars.
4. Upgrade GFC to work with C2BMC’s dual suite capability, feeding both operational and test data through redundant control paths.