

Forward-Based X-band Transportable-Radar (FBX-T)

Executive Summary

- The first Forward-Based X-band Transportable-radar (FBX-T) unit is on schedule to make an initial deployment in early 2006.
- FBX-T has not yet demonstrated its ability to act as the primary engagement sensor during a flight test intercept.
- To reduce performance risk, the Missile Defense Agency (MDA) has maximized the ground test opportunities to assess FBX-T capability prior to deployment.

System

FBX-T consists of:

- A Terminal High-Altitude Area Defense (THAAD) radar with modified software
- Associated power and cooling equipment
- An interface for communication with the Ballistic Missile Defense System (BMDS)

Mission

U.S. Strategic Command will use the FBX-T, an air transportable X-band radar to:



- Search, detect, track, and assess threat ballistic missiles in their boost and midcourse phases of flight
- Enhance battle space awareness and engagement options for the BMDS
- Provide combatant commanders with additional theater radar surveillance

Activity

- The first FBX-T unit was delivered from Raytheon in Kansas, to Vandenberg Air Force Base, California, for integration and testing in 1QFY05.
- Initial Capability Release software (CR 0) went through basic integration and test activities. CR 1, the first deployable software, is currently being tested and integrated with the Command, Control, Battle Management, and Communications (C2BMC) system. Verification of CR 1 requirements was completed in October 2005.
- The FBX-T unit at Vandenberg Air Force Base, California, observed four Targets of Opportunity from July to September 2005: SERV-1, SERV-2, and Glory Trip-187 were elemental-level tests, and Glory Trip-189 was a system test with other BMDS elements. FBX-T data is being used for post-flight playback to evaluate FBX-T/C2BMC messaging and simulated performance of the Ground-Based Midcourse Defense (GMD) element based on FBX-T data. During SERV-1, tracks were forwarded by FBX-T and received by the TPS-X radar in Hawaii.
- To prepare for possible deployment in early 2006, MDA plans to use the first FBX-T unit in two BMDS-level hardware-in-the-loop exercises in 1QFY06. The FBX-T hardware-in-the-loop facility in Woburn, Massachusetts, has been used to prepare the inputs for the exercises. This facility has identical hardware to FBX-T, but does not have an operationally realistic connection to the C2BMC. As a result, one of these exercises may interface directly with the FBX-T at Vandenberg Air Force Base, California.
- FBX-T participated in the BMDS-level wargame IMD 5.4 in 1QFY06.
- CR 2 software is in development. MDA plans to deploy it by FY07. Key portions of CR 2 capability are in developmental testing using the TPS-X, an early version of the THAAD radar, at the Pacific Missile Range Facility. These elements were exercised in July and August 2005 during the MDA flight test FT04-2 and SERV-1.
- Developed, integrated, and tested a deployable C2BMC shelter suite to support FBX-T.
- Nine months of FBX-T data and a year of THAAD radar operations supports a potential early deployment.

Assessment

- MDA plans to deploy the first FBX-T in early 2006. Prior to deployment, MDA will not accomplish any flight testing to directly verify the operational concept of the GMD element engaging a threat based on FBX-T data.
- MDA plans to demonstrate this concept with a flight test in 2007.
- MDA's rapid deployment of FBX-T allows little time for integration with C2BMC in operational configurations.

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Rapid deployment also precludes rigorous ground qualification testing of the radar, including environmental and electromagnetic environmental effects testing.

Recommendations

1. MDA should place priority on conducting the dedicated flight test for FBX-T, C2BMC, and GMD, as soon as possible.
2. Once FBX-T is in the deployed location, MDA should conduct further hardware-in-the-loop testing using the fielded FBX-T unit to assess latency.
3. MDA should examine ways to leverage combined ground testing and data collection in light of the similarities between FBX-T and the THAAD radar.