

## Battle Control System – Fixed (BCS-F)

### Executive Summary

- The Battle Control System - Fixed (BCS-F) Spirals 1 and 2 have satisfied many BCS-F requirements. Spiral 3 will transition to a Linux system and increase capability.
- The Air Force tested and fielded interim software builds to correct deficiencies within Spiral 2 in an Increment 2.2 software release.

### System

- BCS-F is a tactical air battle management command and control system.
- The North American Aerospace Defense Command (NORAD) intends for BCS-F to replace the legacy AN/FYQ-93 and NORAD Contingency Suite. The DoD put the NORAD Contingency Suite system in place after 9-11 to help with the increased operator workload. However, BCS-F (the system of record) provides the mainland U.S. air defense sectors and Hawaii and Alaska regional air operation centers with common commercial off-the-shelf hardware and an open architecture software configuration.
  - Spirals 1 and 2, developed through September 2008, have satisfied many of the BCS-F requirements. These spirals relied upon a 9-11 contingency system to do much of the over land analysis.
  - Spiral 3 will transition to a Linux operating system and use the Raytheon-Solipsys Tactical Display Framework. This spiral will eliminate the need for the contingency system. Additionally, this spiral will share much of the software used on a similar ground-based system, BCS-Mobile.
- Each BCS-F system requires some customization due to the different interfaces required at each of the sites.
- BCS-F is a binational program with Canada.
- The DoD established the National Capital Region Integrated Air Defense System (NCR IADS) after 9-11 to coordinate air defense of the NCR. In addition to the civilian aviation system, it added Sentinel radars and optical/infrared sensors



for detection and identification of air traffic. The NCR IADS includes both pedestal-mounted Stingers and ground-based Advanced Medium-Range Air-to-Air Missiles for defense.

### Mission

- NORAD forces and Homeland Defense forces use BCS-F to monitor and control U.S. and Canadian airspace.
- Forces use the BCS-F to monitor air traffic in and approaching U.S. airspace, and to pass information regarding air traffic onto air defense and national command authorities.
- The Air Force uses the BCS-F to control air defense assets, including fighters, to intercept and identify potential air threats to U.S. airspace.
- The DoD charged the NCR IADS with defending the NCR from air threats.

### Prime Contractor

- Thales-Raytheon

### Activity

- The Air Force tested and fielded two interim software builds to correct deficiencies in the Increment 2.2 software release.
- The Air Force began developmental testing of Spiral 3, Increment 3.1.
- The Air Force is finalizing the Increment 3.1 Test and Evaluation Master Plan (TEMP).

### Assessment

- The Increment 2.3 and 2.4 releases corrected the deficiencies they targeted.

- Increment 2.3 corrected 45 deficiencies in the BCS-F tracking functions identified by operators at the air defense sectors and regional air operations sectors.
- Increment 2.4 improved BCS-F's automatic tracking capabilities in circumstances with very large numbers of tracks and sensors during complex tracking circumstances (greater than 15,000 track families).
- The first phase of developmental testing on Increment 3.1 uncovered a large number of problems that the program is working to correct prior to the start of the second phase of

# AIR FORCE PROGRAMS

developmental testing. This resulted in the Program Office delaying interoperability certification testing.

- The program tested with models and simulations that the Operational Test Agency had not verified and validated. Until the Program Office validates and verifies the models, test agencies cannot accredit the models used in testing or provide informed assessments.
- The program is suffering from the accumulation of additional warfighter requirements. Although the system meets many of the requirements in the approved Operational Requirements Document (ORD), users have used the deficiency reporting and review process to create new requirements, effectively increasing thresholds for some requirements. This is happening in part because the ORD no longer reflects the user's actual requirements.
- The program must conduct some developmental testing at the operational sites due to limitations of its test-bed, the BCS-F System Support Facility, and lack of test personnel.

## Recommendations

- Status of Previous Recommendations. The Air Force is making progress on all but one of the two previous recommendations from FY07.
- FY08 Recommendations. The Air Force should:
  1. Verify and validate all models and simulations used prior to IOT&E, so that the Operational Test Agency can accredit and use modeling data for operational assessments.
  2. Update the ORD to reflect the system's current requirements.
  3. Upgrade the BCS-F System Support Facility to minimize the impact of developmental testing on operational sites.