Battle Control System – Fixed (BCS-F)

Executive Summary

- The Air Force completed IOT&E and a Force Development Evaluation (FDE) on the Battle Control System – Fixed (BCS-F) Increment 3, Release 3.2 (R3.2) at all U.S. air defense sites in September 2012. R3.2 was not fielded due to a critical software deficiency of not consistently sending air track information via Link 16. R3.2 presented some Information Assurance (IA) improvements and achieved a three-year Authority to Operate.
- Air Combat Command (ACC) completed an FDE on BCS-F Increment 3, Release 3.2.0.1 (R3.2.0.1) and fielded it at all U.S. air defense sites in November and December 2012. R3.2.0.1 corrected the critical deficiency that prevented the fielding of R3.2.
- The Air Force completed developmental testing of R.3.2.2 in August 2013 and Air Force Operational Test and Evaluation Center (AFOTEC) is scheduled to complete the FOT&E in December 2013; however, testing previously planned to occur in October/November 2013 has been delayed due to shutdown of the Federal Government and the lack of a Defense Appropriation.

System

- BCS-F is the tactical air battle management command and control system for the two continental U.S. North American Aerospace Defense Command (NORAD) air defense sectors, as well as the Hawaii and Alaska Regional Air Operations Centers. The system utilizes commercial off-the-shelf hardware within an open-architecture software configuration, and operates within the NORAD and Pacific Command air defense architecture. The system is employed by the U.S. and Canada.
- The R3.2 upgrade includes the following system enhancements:
  - Improved tactical datalinks with additional Link 16 and Link 11 message types that enable the operators to better digitally control fighters, send amplifying intelligence information, and create a more comprehensive air picture
  - Air Tasking Order and Airspace Control Order integration with Theater Battle Management Core Systems data sources that enables the operators to view the most current Air Tasking Order/Airspace Control Order and correlate the information with military aircraft
  - Adaptation data modification tools that enable system administrators to field changes to system adaptation files and to perform error checks with greater fidelity than R3.1
  - System control manager interface improvements that enable the system administrator improved system performance monitoring and diagnostics

  - Global Area Reference System coordinate conversion tool that facilitates a NORAD interface with global search and rescue efforts by using a common set of coordinates
  - Remote Gateway Manager control through the virtual network computing interface that provides the operators a complete picture of the available datalinks and the flexibility to access link information from an operator workstation
  - Auxiliary server for offline training and support capabilities at the U.S. air defense sectors
  - Improved system capacities from 10,300 to 15,000 system tracks to support single sector continental U.S. operations
- The R3.2.2 upgrade includes the following enhancements:
  - Ability to operate with mandatory International Civil Aviation Organization flight plan changes
  - Addition of external firewall/intrusion detection system sensor
  - Implementation of remote administrative management and log server capabilities
  - Audible and visual alert capabilities on the Computer Network Defense components
  - New network switch to support the IA-Demilitarized Zone architecture

Mission

- NORAD and U.S. Pacific Command Commanders use BCS-F to execute command and control and air battle management in support of air sovereignty and air defense missions for North American Homeland Defense and Pacific Command air defense.

- Air defense operators employ BCS-F to conduct surveillance, identification, and control of U.S. sovereign airspace and control air defense assets, including fighters, to intercept and identify potential air threats to U.S. airspace.

Major Contractor
Thales-Raytheon Systems – Fullerton, California

Activity
- The Air Force completed IOT&E and an FDE on the BCS-F Increment 3, R3.2 at all U.S. air defense sites in September 2012. R3.2 was not fielded due to a critical software deficiency of not consistently sending air track information via Link 16. R3.2 presented some IA improvements and achieved a three-year Authority to Operate.
- ACC completed an FDE of R3.2.0.1 at the System Support Facility at Tyndall AFB, Western Air Defense Sector, Eastern Air Defense Sector, Alaska Regional Air Operations Center, and the Hawaii Regional Air Operations Center in December 2012.
- The Air Force fielded R3.2.0.1 to all U.S. air defense sectors in December 2012. Canada fielded the release in March 2013.
- The Air Force conducted developmental testing on R3.2.2 at the System Support Facility at Tyndall AFB from January through August 2013. Additionally, the Air Force accomplished an IA certification test at this time.
- In September 2013, AFOTEC began FOT&E on R3.2.2 at the System Support Facility. Testing previously planned to occur in October/November 2013 has been delayed due to shutdown of the Federal Government and the lack of a Defense Appropriation.
- AFOTEC and ACC conducted operational testing in accordance with a DOT&E-approved Test and Evaluation Master Plan and test plan.

Assessment
DOT&E analyses of R3.2.0.1 concluded:
- R3.2.0.1 is operationally effective and suitable but with significant limitations.
- R3.2.0.1 resolved the R3.2 critical software deficiency of not consistently sending air tracks via Link 16. During 190 hours of testing, BCS-F 3.2.0.1 transmitted 100 percent of track information via Link 16 to other sites including the Joint Air Defense Operations Center at Joint Base Anacostia Bolling, Washington, D.C.
- There were several deficiencies associated with battle management that limited R3.2.0.1 operational effectiveness. Operator workarounds mitigated these deficiencies to an acceptable level.

- R3.2.0.1 was assessed as operationally suitable, although ACC did not collect sufficient operational test data to demonstrate the availability and reliability requirements with statistical confidence. During 190 hours of testing, R3.2.0.1 did not experience any critical failures or downtime. Additionally, as of September 30, 2013, the system has operated at all four U.S. air defense sector sites without a critical failure since fielding in December 2012. This equates to over 7,200 hours at each site without a critical failure. The system requirement for Mean Time Between Critical Failure is greater than or equal to 10,000 hours.
- While R3.2.0.1 is operationally suitable, technical documentation and training for the system administrators was deficient.
- R3.2.0.1 remains deficient in all IA assessment areas. The system is poorly equipped to detect, protect, react, and restore/recover from attacks by current cyber threats. R3.2.2 is designed to resolve many critical IA deficiencies. Operational testing on R3.2.2 is scheduled to conclude in December 2013.

Recommendations
- Status of Previous Recommendations. The Air Force satisfactorily addressed all but three of the previous recommendations. The Air Force still needs to:
  1. Correct and formalize all BCS-F Increment 3 system documentation and training deficiencies.
  2. Develop a plan for remote workstation management to include sustainment, training, documentation, and IA compliance.
  3. Upgrade the System Support Facility to support a more robust BCS-F developmental and operational testing capability in order to minimize the impact of overall testing at the operational sites.
- FY13 Recommendation.
  1. The Air Force should continue to track and correct IA deficiencies.