Battle Control System – Fixed (BCS-F)

Executive Summary
- The Air Force is finalizing developmental and operational testing on the Battle Control System – Fixed (BCS-F) Increment 3, Release 3.1 (referred to as Increment 3.1) at all U.S. air defense sites.
- Interim results from operational testing at the two continental U.S. sectors found Increment 3.1 supports North American Aerospace Defense Command (NORAD) air defense operations with shortfalls in training and technical system documentation, in system security management, information assurance, data link, and system combat identification operations.
- A complete assessment of Increment 3.1 performance will not be available until all testing is completed in FY11.

System
- The BCS-F is a tactical air battle management command and control system that provides NORAD air defense sectors, as well as the Hawaii and Alaska regional air operation centers, with common commercial off-the-shelf hardware based on an open architecture software configuration.
- BCS-F Increment 2 replaced the legacy AN/FYQ-93 system. The BCS-F Increment 3.1 upgrade provides a new air defense operating system that integrates the National Capital Region (NCR) Sentinel radars and replaces the NORAD Contingency Suite (NCS) at the two continental U.S. sectors. The DoD employed the NCS system following 9/11 to allow the integration of continental U.S. interior radar data and to meet the expanded mission requirements of Homeland Defense.
- The Increment 3.1 upgrade transitions the system to a Linux operating system and integrates an improved human-machine interface through the Raytheon-Solipsys Tactical Display Framework.
- The Increment 3.1 upgrade also provides internet protocol-based radar and flight plan interfaces and a remote tactical air picture to Headquarters NORAD.
- BCS-F is employed by the U.S. and Canada.

Mission
- BCS-F provides NORAD and Pacific Command commanders with the capability to execute command and control and air battle management in support of air sovereignty and air defense missions for Homeland 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 – Fullerton, California

Activity
- The Air Force completed operational testing of Increment 3.1 at all four U.S. sites and the Canadian site in May 2010. The testing was executed in accordance with the DOT&E-approved test plan. Only system security penetration testing remains outstanding in order to complete all operational testing specified in the DOT&E-approved test plan.
- The Air Force approved Increment 3.1 for operations at the two continental U.S. sectors following initial operational testing and a Full Deployment Decision Review (FDDR) in February 2010. The FDDR also approved deployment and testing of the system at the remaining U.S. air defense sites.
- The Joint Interoperability Test Command (JITC) completed a Joint Interoperability Test data link certification for Increment 3.1 in August 2009. The JITC reported in February 2010 that Increment 3.1 conforms to required joint and DoD standards. A final JITC Interoperability Certification is pending data collection and analysis from operational testing in FY11.

- The Air Force conducted interoperability testing between Increment 3.1 and the NCR Sentinel radars in March 2010.
- The Air Force conducted operational testing of the Increment 3.1 Remote Tactical Air Picture (RTAP) and Remote Workstations (RWS) in June 2010. Five RWS have currently replaced the NCS remote suites at Headquarters NORAD facilities and are providing the RTAP from the two continental air defense sectors.
- The Air Force canceled initial operational level security penetration testing of BCS-F scheduled for November 2009 due to outstanding system information assurance deficiencies. Penetration testing is rescheduled for 1QFY11.
- The Air Force began system development for BCS-F Increment 3.2 to meet operational requirements as defined in the 2003 Operational Requirements Document (ORD) and to address emerging user requirements. The program is working on the Increment 3.2 Test and Evaluation Master Plan.
- The Air Force plans to develop a new Joint Capabilities Integration and Development System (JCIDS) document to accurately reflect the user's current and future requirements and support a follow-on Increment 4 upgrade.

Assessment

- A complete assessment of Increment 3.1 performance will not be available until all testing is completed in FY11 and the data have been analyzed. However, DOT&E preliminary analyses indicate:
  - BCS-F Increment 3.1 is able to support NORAD air defense operations, providing the ability to adequately perform core competencies and tasks required to accomplish the air defense mission.
  - BCS-F Increment 3.1 provides an improved functionality and capability over the legacy Increment 2 system. Operators from each sector overwhelmingly stated Increment 3.1 enhanced situational awareness and ability to perform their missions.
  - Shortfalls in system security management and deficiencies in all information assurance assessment areas jeopardize secure system operations. The Air Force has implemented some corrections but the final suitability determination will not be complete until initial penetration testing and additional information assurance tests are completed and analyzed.

  - Test data collected to-date indicates Increment 3.1 has demonstrated adequate reliability, maintainability, and availability with an average system availability of 99.89 percent with over 1,930 hours of system operation during operational test.
  - Deficiencies exist in Increment 3.1 training and technical system documentation for data link operations, the intrusion detection system, the firewall, the local area network, the gateway manager, system doctrine, and combat identification. Additionally, Increment 3.1 lacked adequate security plans specifically in system vulnerability management.
  - The data transferred from the Sentinel Radars and received on the BCS-F Increment 3.1 are timely and accurate.
  - Results from RWS testing highlight major deficiencies with training, documentation, logistics/spares, help desk support, and information assurance that may significantly affect RWS long-term sustainment.
- The program conducts some developmental and operational testing at the operational sites due to limitations of its test-bed, the System Support Facility (SSF), and uniqueness of each air defense site. If the Air Force upgraded the SSF to more accurately represent the air defense sites, it would support more robust BCS-F developmental and operational testing capability at the SSF and would minimize the overall impact of testing on the operational sites.

Recommendations

- Status of Previous Recommendations. The Air Force satisfactorily addressed one of the three FY09 recommendations. The Air Force still needs to upgrade the SSF to support more robust BCS-F developmental and operational testing capability in order to minimize the impact of overall testing on the operational sites and document current and future user requirements through a new JCIDS document.
- FY10 Recommendations. The Air Force should:
  1. Develop a plan to track all information assurance deficiencies to resolution. Operational users should prioritize those deficiencies with the greatest operational impact.
  2. Correct and formalize all BCS-F Increment 3 system documentation and training deficiencies.