

Space-Based Infrared System, High Component (SBIRS HIGH)

Executive Summary

- The Air Force Operational Test and Evaluation Center (AFOTEC) completed a two-part Operational Utility Evaluation (OUE) of the Highly Elliptical Orbit (HEO)-1 and HEO-2 payloads of the Space-Based Infrared System, High Component (SBIRS-HIGH) Increment 2. AFOTEC published the HEO OUE final report in August 2009. The OUE was adequate to determine that the SBIRS HEO capability is effective and suitable.
- Both HEO payloads are now operational. U.S. Strategic Command (USSTRATCOM/J65) Integrated Tactical Warning / Attack Assessment system and technical intelligence data have been certified for both HEO payloads.
- The Air Force still does not have an approved long term solution for the SBIRS ground architecture or operational requirements to support development of an integrated test strategy for the ground system.

System

The SBIRS program is being developed to replace the Defense Support Program (DSP) satellites and is being developed in two system increments:

- Increment 1 uses the SBIRS Control Segment and User Segment, operating with DSP satellites, to provide current military capability. Initial Operational Capability for Increment 1 was attained in December 2001, consolidating the operations of the DSP and Attack and Launch Early Reporting to Theater missions.
- Increment 2 will include a space segment consisting of two hosted payloads in HEO and four satellites in geostationary (GEO) orbit. Currently, only the two HEO payloads have been launched. Increment 2 also provides new software and hardware to process data from both the DSP and the SBIRS space segment.

Activity

- AFOTEC completed a two-part OUE of the HEO-1 and HEO-2 payloads on July 22, 2009. The AFOTEC Commander released the HEO OUE final report in August 2009. The OUE results informed USSTRATCOM/J65 Integrated Tactical Warning/Attack Assessment certification for missile warning, missile defense, and battlespace awareness, as well as National Geospatial-Intelligence Agency's certification for technical intelligence data. Both HEO payloads are now operational.
- Deficiencies in the Flight Software Subsystem (FSS) development continue to delay the SBIRS GEO program. The



Mission

- Combatant Commanders, deployed U.S. military forces, and allies intend to use SBIRS to conduct missions that require improved space sensors and operational launch detection capabilities.
- Commanders will use SBIRS to enhance support to joint combat forces in four key areas:
 - Timely and responsive space-based missile warning and detection
 - Launch detection for missile defense operations
 - Technical intelligence
 - Battlespace awareness

Prime Contractor

- Lockheed Martin Space Systems, Sunnyvale, California

current projected launch date for GEO-1 is September 2010, contingent on successful FSS dry run completion in early 2010.

- The SBIRS Program Office and AFOTEC have begun writing a Test and Evaluation Master Plan (TEMP) annex to support testing of GEO-1. The TEMP annex is expected to be completed in FY10.

Assessment

- The SBIRS Increment 1 system, operating with the current DSP satellites and two HEO payloads, continues to

demonstrate improved performance over the legacy DSP system.

- The AFOTEC OUE was conducted in accordance with the DOT&E-approved TEMP and operational test plans. Testing was adequate to determine that the SBIRS HEO system is effective and suitable. However, testing identified areas of concern in missile defense, technical intelligence, and information assurance.
- HEO data did not degrade existing missile warning capabilities.
- SBIRS demonstrated the ability to collect accurate technical intelligence data. However, significant operator intervention and maintenance is required to execute many of the technical intelligence functions. In addition, many key software processes were found to be unstable, requiring frequent rebooting and higher levels of operator training than expected.
- The overall information assurance posture was assessed to have potentially significant vulnerabilities to an internal threat. The Air Force has implemented a Plan of Action and Milestones to resolve or substantially mitigate these deficiencies.
- The Air Force still does not have an approved long term solution for the SBIRS ground architecture or operational

requirements to support development of an integrated test strategy for the ground system.

- While the original December 2009 launch date put the test planning for GEO-1 under significant time pressure, program delays have provided additional time to complete the GEO-1 TEMP annex.
- The Air Force has made significant progress identifying modeling and simulation requirements; however, refined Concepts of Operation and operational requirements for each SBIRS increment are still needed.
- AFOTEC aggressively applied an integrated test methodology to HEO OUE, including combining the planned AFOTEC OUE duration with the Air Force Space Command Trial Period. DOT&E expects that GEO testing will be conducted in a similar fashion.

Recommendations

- Status of Previous Recommendations. The Air Force continues to make progress on the FY05 DOT&E recommendations, yet two of the original four recommendations remain valid. One of the two FY07 recommendations and both FY08 recommendations remain valid.
- FY09 Recommendations. None