

AIR FORCE PROGRAMS

KC-135 Global Air Traffic Management Upgrade

SUMMARY

- The KC-135 is the lead DoD platform for Communications, Navigation and Surveillance for Air Traffic Management (CNS/ATM) modifications, formerly called Global Air Traffic Management (GATM).
- The test team conducted two distinct Integrated Systems Evaluations in operationally realistic civil-controlled, oceanic, and reduced separation airspace to demonstrate readiness for Initial Operational Test and Evaluation (IOT&E).
- DOT&E approved the Test and Evaluation Master Plan (TEMP) and Operational Test Plan in September 2003.
- DOT&E evaluated the KC-135 GATM as not operationally effective for its global mobility mission because of information assurance limitations (detailed in the beyond low-rate initial production report).
- The KC-135 GATM aircraft is operationally suitable.



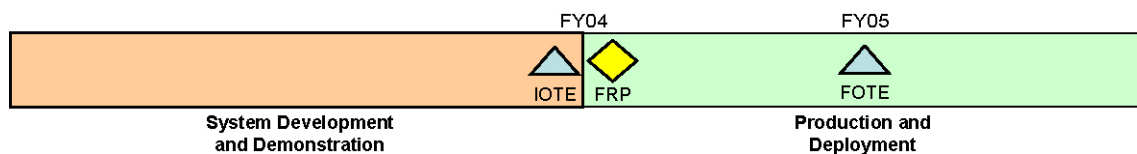
By incorporating digital technology, the airline industry and civil aviation authorities expect to increase the capacity, safety, and efficiency of airspace use.

SYSTEM DESCRIPTION AND MISSION

The purpose of the Air Traffic Management upgrade program is to preserve DoD access to efficient global air traffic routes and airfields into the 21st century. CNS/ATM modifications will equip DoD aircraft to meet the requirements of worldwide civil aviation authorities' air traffic management systems. The KC-135R is the lead DoD upgrade platform.

In the new CNS/ATM environment, aircraft must maintain highly accurate position, and transmit aircraft position and intent to ground Air Traffic Control facilities and other aircraft via a data link. The Federal Aviation Administration and other civil air traffic control entities, encouraged by the commercial airline industry, have a strategy to equip international air carriers with state of the art CNS/ATM technology. By incorporating digital technology, the airline industry and civil aviation authorities expect to increase the capacity, safety, and efficiency of airspace use, particularly in trans-oceanic and other areas lacking ground radar surveillance. These technologies and capabilities allow reduced aircraft separations and new procedures to be introduced maximizing the use of desirable airspace while maintaining safety standards.

TEST AND EVALUATION ACTIVITY



The KC-135 GATM test and evaluation program occurred in three phases during the initial fielding of key elements: Phase I and Phase II/IIA were Qualification Tests and Evaluations (QT&Es), while Phase III was a dedicated IOT&E. Phase I (October 2001 to January 2002) involved laboratory testing of the prototype configuration. Phase II (January 2002 to November 2002) involved ground and flight test of the installed communications, navigation, and surveillance

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equipment on prototype aircraft. Phase IIA (October 2002 to August 2003) involved the installation of the production representative changes on prototype aircraft, as well as ground and flight testing.

The Air Force Flight Test Center conducted developmental test and evaluation; laboratory, ground, and flight tests included the prime contractor. During Phase II/IIA, the Air Force Operational Test and Evaluation Center (AFOTEC) participated in order to determine system readiness for IOT&E. Two distinct Integrated Systems Evaluations in operationally realistic civil-controlled, oceanic, and reduced separation airspace finally confirmed readiness for IOT&E. DOT&E approved the TEMP and Operational Test Plan in September 2003. The AFOTEC conducted the IOT&E in September and October 2003, using aircraft from the initial operational unit located at Fairchild Air Force Base, Washington. The modified tankers participated in global, as well as local, air refueling sorties, maintenance demos, and information assurance testing. Operational pilots flew one aircraft around the world to demonstrate capability across a typical range of air traffic control centers, including operation in 10 of the 17 worldwide Flight Information Regions.

TEST AND EVALUATION ASSESSMENT

A detailed evaluation of the IOT&E results can be found in the beyond low-rate initial production report published by DOT&E in 2004. IOT&E was an adequate and comprehensive evaluation of the KC-135 modifications. The operational testing included ground tests on three aircraft.

DOT&E evaluated the KC-135 as not operationally effective for its global mobility mission because of information assurance limitations, which are detailed in the beyond low-rate initial production report. Throughout testing, the navigation database produced by the National Geospatial-Intelligence Agency was not certified by civil aviation authorities. Hence, some of the expected KC-135 procedures and capabilities could not be authorized for testing or operational use. The navigation database is now certified and will be re-evaluated during follow-on operational test and evaluation (FOT&E), planned to begin in February 2005.

The KC-135 GATM aircraft is operationally suitable; however, some training is in need of improvement. The instructors were not familiar with civil procedures and equipment, but implementing recommendations from AFOTEC should improve future training. In general, the installed communications, navigation, and surveillance equipment is reliable and maintainable.

Formation flying with both modified and unmodified KC-135 aircraft is planned for evaluation during FOT&E. Additionally, flight and ground crew training, the navigation database, and information assurance testing should be repeated during FOT&E to ensure that documented deficiencies are adequately corrected.