C-17 Globemaster III Advanced Cargo Aircraft

Executive Summary
- DOT&E approved the C-17 Test and Evaluation Master Plan in October 2004.
- Combined developmental test and evaluation and follow-on test and evaluation involving the contractor, the Air Force Flight Test Center, the Air Mobility Command (AMC), and the Air Force Operational Test and Evaluation Center (AFOTEC) have occurred on a nearly continuous basis since the production decision in 1995.
- The operational test plan should be revised and resubmitted.

System
- The C-17 is a four-engine turbofan cargo aircraft with a crew of three (two pilots and one loadmaster).
- The C-17 has 18 pallet positions to carry cargo, and can carry payloads up to 170,900 pounds.
- Planned improvements include:
  - New inert gas generation system
  - Upgraded communications, navigation, and surveillance for air traffic management
  - Improved formation flight capability
  - Enhanced landing system

Mission
- The C-17 provides worldwide theater and strategic airlift and airdrop.

- The C-17 can augment aero-medical evacuations and special operations.
- Units equipped with the C-17 can deliver loads to austere airfields:
  - Passengers
  - Bulk, oversize, and outsize cargo
  - Special equipment

Activity
- DOT&E is monitoring C-17 follow-on tests to verify correction of deficiencies and improvements in capabilities. These include:
  - The redesign of the Onboard Inert Gas Generating System
  - Introduction of the composite material horizontal tail
  - Improvement of station-keeping equipment for formation flying
  - An extended range fuel containment system
  - Liquid Oxygen Bottle containment/protection
  - Semi-prepared Runway Operations performance improvements
- Developmental test and evaluation continues at Edwards Air Force Base, California, as part of the follow-on flight test program. The C-17 is currently undergoing developmental testing with a Block 17 configuration (required navigation performance, high frequency datalink, formation flying, and combat lighting).
- Air Force Flight Test Center performed testing to increase the maximum gross weight in the summer of 2005.
- Block 16 aircraft, with Onboard Inert Gas Generating System II, are being produced and are in contractor system testing at Edwards Air Force Base. The first production aircraft with the redesigned Onboard Inert Gas Generating System II is aircraft P-138.
- AMC's test and evaluation squadron remains involved and for future block upgrades will perform Force Development Evaluation.
- Live Fire ballistic testing of the new Composite Horizontal Tail has been completed. Residual structural strength analyses of the Composite Horizontal Tail under flight loading with observed ballistic damage are being conducted.

Assessment
- AMC is responsible for all major follow-on operational test and evaluation. AFOTEC completed follow-on operational test and evaluation in 1998.
- AMC plans to conduct a Force Development Evaluation on large formation flying operations in FY06. The draft test plan has a developmental testing focus, addressing quantitative measures of position and aircraft spacing rather than traditional operational requirements. Human factors, reliability, and

operational effectiveness were to be minimally tested. AMC should submit a revised plan.

- AMC plans follow-on operational testing with Onboard Inert Gas Generating System II and Block 17 in late 2006.

Recommendation

1. AMC should submit plans for follow-on test of formation flight operations and the onboard inert gas generating system.