

C-17A – Globemaster III Aircraft

Executive Summary

- Live Fire testing demonstrated that the C-17 composite horizontal tail can survive impacts from threats tested and that the damaged tail could fully support expected flight loads during egress.
- The Traffic Collision Avoidance System (TCAS) overlay offers a limited increase in operational capability.
- The new combat lighting system increases C-17 capability supporting tactical and covert/night vision required missions.
- The On-Board Inert Gas Generating System (OBIGGS) II met both effectiveness and suitability requirements.

System

- The C-17 is a four-engine turboprop 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

Units equipped with the C-17:

- Provide worldwide theater and strategic airlift and airdrop



- Augment aero-medical evacuations and special operations
- Deliver loads to austere airfields, including:
 - Passengers
 - Bulk, oversize, and outsize cargo
 - Special equipment

Activity

- A Live Fire report documented the results of testing conducted by the 780th test squadron at Wright-Patterson Air Force Base and contractor conducted analyses.
- The Air Mobility Command (AMC) Test and Evaluation Squadron (TES) conducted a Force Development Evaluation of a TCAS overlay system, in accordance with the FY07 DOT&E-approved plan, in October 2006. The TCAS overlay is designed to remove current Instrument Meteorological Conditions (IMC) formation flight restrictions on the C-17 fleet. The test was conducted using up to six C-17 aircraft during a multiple day/night, multiple formation Joint Forcible Entry Exercise with Army's XVIII Corp from Fort Bragg, North Carolina.
- AMC TES completed developmental/operational testing of the Combat Lighting System, an embedded upgrade in the Block 17 configuration, in accordance with the FY07 DOT&E-approved plan, during a two-ship training mission in July 2007. The expanded lighting options are designed to

provide expanded capability to covert and special operations missions.

- The AMC TES executed logistics service test of an upgraded OBIGGS II, as required by the current Test and Evaluation Master Plan and in accordance with the FY06 DOT&E-approved plan. Maintenance data was collected on the new system from June 1, 2006, to June 1, 2007. Block 16 and 17 aircraft flew with an upgraded OBIGGS. The 28 aircraft accumulated 24,728.9 flight hours.

Assessment

- Live Fire ballistic testing showed that the threat tested did not produce significant structural damage to the composite horizontal tail. Post-test structural analyses showed that the damaged tail could fully support expected flight loads during egress.
- TCAS overlay offers a limited increase in operational capability. The AMC TES operational test was limited in

AIR FORCE PROGRAMS

scope and did not fully evaluate multi-element formation operations. Previously, AMC released the TCAS overlay procedure for use in IMC for single element formations.

- The combat lighting system increases C-17 capability supporting tactical and covert/night vision imaging system (NVIS)-required missions. The new system permits different modes of NVIS compatibility and covert lighting configurations for both the exterior lighting schemes and the cargo compartment.
- OBIGGS II meets both effectiveness and suitability requirements. The OBIGGS initialized the fuel tanks during flight and maintained inert status throughout various flight profiles. The mean time between removal was over 1,000 hours, exceeding the 500 mean time between removal requirement.

Recommendations

- Status of Previous Recommendations: There were no previous recommendations.
- FY07 Recommendations:
 1. AMC should develop a robust test plan for evaluating formation flight system capability to ensure C-17 can fully support strategic brigade airdrop delivery requirements.
 2. The Air Force should consider planning, scheduling, and funding retrofits for earlier block aircraft to minimize the logistical and operational impact of multiple configured aircraft within the mobility system.