

## C-5 Avionics Modernization Program (AMP) and Reliability Enhancement and Re-Engineering Program (RERP)

The current C-5 fleet operates throughout the Active, Reserve, and National Guard components in various missions and environments. C-5 missions include strategic airlift, emergency aeromedical evacuation, airland transport of a brigade-size force in conjunction with other organic aircraft, transport of outsize and oversize cargo, and multi-ship Special Operations Low Level II. The C-5 aircraft must perform missions at night and in adverse weather, and it may employ aerial refueling during intercontinental missions.

The C-5 Avionics Modernization Program (AMP) and Reliability Enhancement and Re-engineering Program (RERP) is denoted as the C-5 AMP/RERP. The C-5 AMP/RERP upgrades the avionics, the aircraft propulsion system and includes a number of reliability improvements. Commercial engines, nacelles, thrust reversers, and pylons will be integrated into the existing C-5 airframe. These performance improvements are designed to optimize cargo carrying capabilities to allow fully loaded take-offs and landings on relatively short runways, and to meet the performance requirements of the Global Air Traffic Management (GATM) initiative. Additionally, re-engineering is intended to provide significant reliability, maintainability, and availability improvements. A commercial engine support concept (two levels of maintenance, warranties, etc.) will be integrated into the C-5 logistics support system infrastructure. Other candidate sub-systems for reliability enhancement include the flight controls, hydraulics, environmental, electrical, and fuel systems. Specific upgrades and the extent of the expected reliability improvement will be identified from recently completed trade studies.

The C-5 was developed and procured prior to the implementation of Live Fire Test and Evaluation (LFT&E) statutory requirements. The basic aircraft has never completed a live fire evaluation. The RERP modification is an Acquisition Category I program and constitutes a covered program for LFT&E. LFT&E testing has begun.

The C-5 AMP/RERP Test and Evaluation Mast Plan (TEMP) was approved October 2001 in support of a Milestone B decision.

### TEST & EVALUATION ACTIVITY

A combined test force (CTF) is located at the contractor facility at Marietta, Georgia. The CTF includes the contractor and government personnel working developmental and operational testing. Co-locating personnel from all three organizations allows for greater test efficiency and less duplication. Both laboratory and flight testing has begun. Test planning has determined the number of ground and flight tests required along with an estimated timeline. DOT&E has been an active participant in the development of the TEMP update, in the review and revision of the acquisition strategy, and in the DoD Integrated Product Team process.

LFT&E activity has focused on identifying potential LFT&E issues, developing an LFT&E strategy, and updating the TEMP to incorporate LFT&E requirements. To support the LFT&E strategy, the Air Force is conducting modeling and simulation to



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evaluate C-5 survivability against man-portable air defense systems (MANPADS). Several models are being used. DOT&E has supported a request for a waiver from full-up, system-level testing since testing a complete, combat configured system would be unreasonably expensive and impractical. The LFT&E plan was approved in October 2001.

The first flight of a C-5 AMP (a B model) aircraft was accomplished on December 21, 2002. A second C-5 (an A model) is currently in modification.

## **TEST & EVALUATION ASSESSMENT**

The schedule risk for the C-5 AMP development and test programs is moderate. Four aircraft were initially designated to be used for both developmental and operational testing. Currently, only three aircraft have been identified due to funding constraints. The C-5 RERP operational test may not be adequate without the fourth aircraft. Four aircraft were to be utilized to conduct a “surge” of the system prior to the full-rate production decision. The operational test team is assessing the schedule risk and test adequacy associated with only using three aircraft for test.