

## CH-47F – Cargo Helicopter

### Executive Summary

- DOT&E found that the CH-47F was operationally effective and survivable, but not operationally suitable in FY05.
- In January 2006, the Army modified its previous plan and combined the Phase II IOT&E and Phase III IOT&E into a single 60-flight-hour Phase II IOT&E using two production aircraft. Efforts to update the approved Test and Evaluation Master Plan are ongoing for the Phase II IOT&E to take place from March 12 - April 11, 2007.
- The CH-47F program completed 140 developmental test flight hours to integrate a new Digital Automatic Flight Control System and the Common Avionics Architecture System cockpit. The Army completed developmental testing in July 2006 and the CH-47F meets airworthiness and aircraft handling quality standards needed to enter Phase II IOT&E.

### System

- The CH-47F is a remanufactured and modernized CH-47D model Chinook Helicopter.
- The CH-47F is designed to transport artillery and light equipment up to 16,000 pounds, or 31 combat troops.
- The CH-47F program fulfills the Army Aviation Transformation Chinook requirement for upgraded aircraft with both remanufactured and new aircraft. The acquisition objective is 452 CH-47Fs (397 rebuilt aircraft and 55 new aircraft).
- The CH-47F incorporates:
  - A common digital cockpit to increase crew situational awareness and increase cockpit commonality with other Army aircraft
  - A Digital Automated Flight Control System to improve handling qualities and decrease pilot workload



- Engine upgrades for increased power
- Fuselage stiffening, corrosion protection, and a new monolithic airframe structure to reduce cockpit vibration and increase airframe durability

### Mission

- The CH-47F provides lift capability to the commander to accomplish critical tasks by rapidly projecting tactical airlift support and supply sustainment.
- General Support Battalions of the Multi-Functional Aviation Brigades equipped with the CH-47F will:
  - Conduct air assault missions to transport ground forces
  - Conduct resupply operations to move fuel, ammunition, and other battle-critical cargo
  - Conduct mass casualty evacuation
- CH-47F equipped units will execute air assault and resupply operations as an integrated element of a combined arms team.

### Activity

- In January 2006, the Army decided to schedule a 60-flight-hour IOT&E Phase II using two production aircraft from March - April 2007.
- A combined contractor and government test team conducted developmental testing to include the System Integration Laboratory, flight testing on one prototype aircraft, and ground testing. Flight testing focused on integration of a new Digital Automatic Flight Control System and Common Avionics Architecture System. Ground testing included electromagnetic compatibility and vulnerability component testing.
- Software Block I Intra-Army Interoperability Certification Testing was conducted from February 28 - March 2, 2006.

Joint Interoperability testing began in February 2006 and is currently ongoing.

- The Army approved the CH-47F Operational Requirements Document on June 6, 2006. This latest requirements document included revisions to clarify the Net Ready Key Performance Parameters, to include digital messaging thresholds and beyond line-of-sight voice communications.
- Live Fire testing during March - May 2006 examined the effectiveness of the CH-47F fire extinguishing system. The test indicated a need for additional testing that is planned for FY07. An analysis of the vulnerability of the CH-47F to man-portable air defense systems began in 2006 and is ongoing. In addition, the Army is studying the changes to

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CH-47F vulnerability resulting from the redesign of the cockpit and monolithic airframe structure.

## Assessment

- DOT&E published its combined OT&E/LFT&E report during FY05 and found that the CH-47F was operationally effective and survivable, but not operationally suitable. The CH-47F did not demonstrate adequate communications systems integration, improved digital interoperability, or system reliability during IOT&E Phase I.
- Remaining technical risks include system-level integration, digital interoperability, reliability, and monolithic airframe integration.
- Recent developmental testing resulted in an airworthiness certification and demonstration of acceptable aircraft handling qualities for entry into IOT&E Phase II.
- The digital communications capabilities of the CH-47F during the Software Block 1 testing were encouraging. The CH-47F successfully exchanged digital messages via Blue Force Tracker with various Army aircraft and operations centers in Delaware, Texas, and Alabama.

- Planning for IOT&E Phase II is progressing as scheduled and adequately addresses operational test and evaluation concerns. IOT&E Phase II will include approximately 60 flight hours with two production aircraft conducting realistic cargo missions in an operational environment.
- Plans are in progress for additional developmental testing of the Common Missile Warning System aircraft survivability equipment and for the Net Ready Key Performance Parameter.
- In recent developmental flight testing, improvements in reliability were not observed. The test aircraft did not have the planned improvements to airframe and component reliability expected on the production aircraft.

## Recommendations

- Status of Previous Recommendations. The Army has effectively resolved both previous FY05 recommendations regarding CMWS and interoperability issues, and revision of the Test and Evaluation Master Plan to incorporate these plans is ongoing.
- FY06 Recommendations. None.