Armed Reconnaissance Helicopter (ARH)

Executive Summary

- This report is submitted in accordance with Title 10 to document testing that occurred in FY08; however, on October 16, 2008, the DoD notified Congress and Bell Helicopter that it will not certify the Armed Reconnaissance Helicopter (ARH) program for continuation. DoD officials determined through the Nunn-McCurdy certification process that the fundamental cost and schedule basis underlying the award of the ARH contract is no longer valid.
- DOT&E published an operational assessment (OA) on January 23, 2008. The OA concluded that the correction of identified Target Acquisition Sensor System (TASS) and Common Avionics Architecture System (CAAS) cockpit integration deficiencies and successful integration of remaining mission equipment are required before the Armed Reconnaissance Helicopter (ARH) can be an effective and suitable replacement for the OH-58D armed reconnaissance helicopter.
- The ARH program completed live fire testing of the main transmission, flight control system, tail rotor blades, controls and hub, and main rotor mast. The Army conducted testing under static conditions and submitted final test reports. Subsystems still requiring test and evaluation include: engine armor, aircraft structure, and the propulsion system. The Program Office deferred all dynamic Full-Up System-Level (FUSL) testing to FY09.

System

- The Army planned for the ARH to replace the OH-58D helicopter. The ARH is based on the commercial Bell Helicopter 407 and 417 designs and incorporates new designs for several major components.
- The ARH integrates the CAAS cockpit with a TASS for day, night, and marginal weather operations.
- The ARH will have a 50-caliber machine gun and be able to fire 2.75-inch aerial rockets and Hellfire missiles. The ARH plan was to have armored crew seats and cockpit floor, and engine armor. The ARH would employ Aircraft Survivability Equipment, to include radar, laser, and missile warning systems and chaff/flare dispensers.
- The acquisition objective was set at 512 aircraft (increased from the original objective of 368) with a full-rate production decision in 3QFY10. The increase would have equipped Army National Guard Apache Helicopter units with ARHs. The Army planned to have 10 ARH per troop and 30 per squadron.

Mission

- A Regimental Aviation Squadron, as part of Combat Aviation Brigades, employs ARH to conduct aerial armed reconnaissance for collection of combat information and intelligence about enemy and terrain.
- ARH squadrons provide security and early warning against enemy observation or attack for ground maneuver forces.
- ARH troop missions include:
  - Command and control
  - Communications relay
  - Convoy security
  - Nuclear/chemical surveys

Prime Contractor

- Bell Helicopter

Activity

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- The Army submitted a revised ARH program deviation report on June 24, 2008, stating that due to unit cost growth exceeding critical Nunn-McCurdy thresholds, the program will require Nun-McCurdy certification.
- DOT&E approved the ARH LUT test plan on October 22, 2007.
- The Army conducted LUT 1 at Yuma Proving Grounds, Arizona, in November 2007, flying two SDD aircraft

approximately 16 hours each. Experimental Test Pilots with extensive operational and test experience executed five daytime and four nighttime missions focused on employing the aircraft's TASS and enhancing the ability of the ARH team to locate and report stationary and moving vehicular and personnel targets.

- A combined contractor and government test team continued developmental flight and ground testing on three SDD aircraft. These tests included nearly 1,200 developmental flight test hours and focused on the Advanced Flight Control System development, integration of the Forward Looking Infrared (FLIR) and CAAS software, firing/non-firing load surveys, and low altitude performance testing. Ground testing included environmental and electromagnetic compatibility testing and qualification at the component level.
- Live fire component testing completed to date includes main and tail rotor servo actuators, main rotor pitch links, main rotor swash plate assembly, tail rotor blade, hub and controls, main transmission, main rotor mast and hub, the proposed cockpit armor system, and the fuel cell. The Army conducted tests on components under static conditions and will use the test results in planning for the more realistic FUSL dynamic testing later in the program. The program is not testing the main rotor blades because the same blades were previously tested during OH-58D LFT&E.
- The program's initial fuel cell ballistic qualification testing conducted in 1QFY08 indicated self-sealing problems with the fuel bladder. A second set of ballistic tests conducted in 2QFY08 evaluated three additional design configurations. As a result of these tests the program selected a new material configuration for the fuel bladder that successfully demonstrated the required ballistic self-sealing for the fuel cell.

Assessment

- Correction of identified TASS/CAAS integration deficiencies and successful integration of remaining mission equipment is required before the ARH can be an effective and suitable replacement for the OH-58D helicopter.
- Experimental test pilots achieved mission success on four of the five day missions and two of the four night missions during LUT 1.
- Flight handling qualities of the ARH were better than the Kiowa Warrior during LUT 1, but the pilots operated with a limited power margin during tactical maneuvers.
- The integration of the TASS and CAAS software for the reconnaissance/attack application is not mature. TASS tracking and laser target location error performance is not acceptable. The combined TASS/CAAS workload is high for highly experienced experimental test pilot crews flying operational scenarios.
- The ARH platform achieved user desired reliability during flight training and testing. Both LUT 1 aircraft completed all nine missions without a system abort.
- LUT 2 will be more demanding than LUT 1, consistent with production-representative aircraft and the increased capabilities available to the ARH.
- Developmental and integration testing delays have caused more than a two-year lapse for the Army to update the ARH Test and Evaluation Master Plan (TEMP). The TEMP update is ongoing. The current ARH program is schedule-driven leaving limited time to adequately address problems that may result from developmental testing prior to the IOT&E.
- The LFT&E Strategy includes FUSL testing. Component/subsystem live fire testing is providing an adequate understanding of ballistic impact and damage results.

Recommendations

- Status of Previous Recommendations. The Army was adequately addressing the FY07 recommendations.
- FY08 Recommendations. In light of the cancellation of the program, there are no recommendations.