Black Hawk Upgrades (UH-60M) – Utility Helicopter Upgrade

Executive Summary
- On May 24, 2006, the Defense Acquisition Executive designated the follow-on UH-60M Upgrade program as a pre-planned product improvement.
- IOT&E was completed in December 2006.
- Technical risks include system-level integration, digital interoperability, and reliability. The UH-60M Upgrade Test and Evaluation Master Plan (TEMP) is adequate to evaluate these technical issues and determine the operational effectiveness, survivability, and suitability of the UH-60M Black Hawk.

System
- The UH-60M is a modernized UH-60 A or L model Black Hawk medium-lift helicopter.
- The Assault Helicopter Battalion is organized as three companies of ten aircraft each.
- The acquisition objective is for 1,806 UH-60M Black Hawks, with 1,227 projected to be UH-60M variant and the remaining will be UH-60Ls. The program projects that 123 aircraft will be UH-60M Baseline aircraft and the remaining 1,104 will be UH-60M Upgrade aircraft.
- The UH-60M Baseline aircraft include:
  - A Digital Cockpit with Blue Force Tracker
  - Power and airframe improvements with the 701D engine, wide chord blades for enhanced performance, and monolithic machined parts that show improvement over the A/L model Black Hawk
  - Improved survivability with enhanced laser warning and infrared suppression for anti-missile defense
- The planned UH-60M Upgrade design adds:
  - A Common Avionics Architecture System and networked digital connectivity for enhanced commonality with other Army aircraft

  - Improved handling qualities optimized for minimum pilot workload and increased safety in degraded environments
  - Composite Tailcone and Driveshafts

Mission

Assault Aviation and General Support Aviation Battalions will use this aircraft to conduct the following missions:
- Resupply the force through internal and external cargo lift capability
- Provide Air Assault lift for 11 combat soldiers or equipment less than 9,000 pounds
- Conduct aero medical evacuation
- Execute command and control

Activity
- A combined contractor and government test team continued developmental flight and ground testing on seven production-representative aircraft. These tests included more than 1,400 training and developmental flight hours and focused on:
  - Integration of the Automated Flight Control System and the Flight Management System
  - Additional flight testing to include icing tests, as well as Blue Force Tracker, Integrated Vehicle Health Management System, and AVR-2B Laser Detection Set integration
  - Ground testing to include Electromagnetic Compatibility testing and crashworthy external fuel system integration
- A simulation-based exercise, conducted May 22-25, 2006, demonstrated UH-60M digital cockpit functionality and interoperability.
- DOT&E approved the UH-60M Upgrade TEMP on December 13, 2005, and the UH-60M test plan on October 4, 2006. The 248-hour IOT&E was completed in December 2006.

- The Defense Acquisition Executive designated the UH-60M Upgrade as a Preplanned Product Improvement program (and not a separate increment of capability) on May 24, 2006.
- The LFT&E strategy approved by DOT&E in May 2000 includes a waiver from full-up system-level testing. An alternate strategy combines efforts with the Navy's MH-60R and MH-60S programs, as well as DOT&E's Joint Live Fire program. Joint Live Fire testing of the UH-60 engine compartments, crashworthy external fuel system, and onboard oxygen generation system completed in FY05. Testing of the improved gear box completed in FY06. Testing of the new wide chord main rotor blades is the only remaining test under the original Army Live Fire program and is planned for 1QFY07. The Army is extending the LFT&E program to address pre-planned product improvement changes that may affect vulnerability, including changes to the tail cone, tail rotor drive shaft, flight control system, and cockpit.
- The integration of a satellite-based communications system compatible with Army digital architecture matured and is currently planned for the IOT&E. Blue Force Tracker completed developmental testing and has been installed on the IOT&E aircraft.

Assessment

- The UH-60M met or exceeded the Milestone C entrance criteria for troop lift, external lift, and digitization, but did not meet the reliability entrance criterion during the August 2005 Limited User Test. Since then, reliability has improved and currently exceeds requirements, as demonstrated during developmental testing and scored training hours.
- The simulation-based exercise in May 2006 identified pilot interface and workload issues, which are receiving continued attention in the ongoing IOT&E.
- The UH-60M continued to demonstrate improved handling qualities over the UH-60 A/L aircraft during developmental flight testing.
- Technical risks include system-level integration and digital interoperability. The UH-60M Upgrade TEMP is adequate to evaluate these technical issues and determine the operational effectiveness and suitability of the aircraft.
- IOT&E progressed as scheduled and adequately addressed test and evaluation efforts. The IOT&E included five production-representative aircraft conducting realistic combat utility helicopter missions in an operational environment.
- The Army will evaluate the impact of the Common Missile Warning System, the mission equipment packages for medical evacuation and the mine emplacement system, and new communications equipment on the UH-60M in separate test events.
- LFT&E results to date indicate improved survivability over the UH-60 A/L aircraft.

Recommendations

- Status of Previous Recommendations. The Army has effectively resolved issues from FY05 recommendations.
- FY06 Recommendations. None.