

H-1 Upgrades – Marine Corps Upgrade to AH-1W Attack Helicopter and UH-1N Utility Helicopter

Executive Summary

- The Navy restructured the program to add a fourth low-rate initial production (LRIP) lot and second phase of operational evaluation (OPEVAL) in FY08.
- All scheduled Live Fire tests have completed.

System

- This program upgrades two Marine Corps H-1 aircraft:
 - The AH-1W attack helicopter becomes the AH-1Z
 - The UH-1N utility helicopter becomes the UH-1Y
- The aircraft have identical twin engines, drive trains, four-bladed rotors, tail sections, digital cockpits, and helmet-mounted sight displays (HMSD).
- The AH-1Z has a new high-fidelity targeting sensor for delivery of air-to-ground and air-to-air missiles, rockets, and guns.
- The UH-1Y has twice the payload and range of legacy UH-1N aircraft, and it can deliver eight combat-ready Marines 110 nautical miles and return without refueling.

Mission

- Marine light/attack helicopter squadron detachments are typically deployed with a mixture of UH-1 and AH-1 helicopters.



- Detachments equipped with the AH-1Z attack helicopter conduct rotary-wing close air support, anti-armor, armed escort, armed/visual reconnaissance, and fire support coordination missions.
- Detachments equipped with the UH-1Y utility helicopter conduct command, control, assault support, escort, air reconnaissance, and aeromedical evacuation missions.

Activity

- In FY07, Commander, Operational Test and Evaluation Force (COMOPTEVFOR) conducted the Operational Evaluation Phase One (OT-IIC- 1) at China Lake, Camp Pendleton, and Twentynine Palms, California; Marine Corps Air Station, Yuma, Arizona; and aboard USS *Bonhomme Richard* (LHD 6) at sea, in accordance with a DOT&E-approved Test and Evaluation Master Plan and Test Plan.
- COMOPTEVFOR used two UH-1Y and two AH-1Z helicopters for the test. As planned, test operations were restricted to mostly daytime and land-based operations.
- The LFT&E program is complete. Nearly 300 shots at components, subsystems, and full-up aircraft were performed. Reporting on the results of the LFT&E program is in process.
- Phase Two operational testing (OT-IIC-2) is planned to begin in January 2008 to support a full-rate production decision in FY08.

Assessment

- The OT-IIC-1 test was adequate to identify needed performance improvements and the program is working to correct those deficiencies.

- Encouraging performance:
 - Both the UH-1Y and the AH-1Z provide increased range, payload, speed, and maneuverability over legacy aircraft.
 - The UH-1Y nearly met the planning goal for utility helicopter mission success (71 percent attained versus 75 percent goal).
 - In both aircraft, the digital moving map display and navigation aids improve pilot situational awareness and reduce pilot workload.
- The AH-1Z is not yet on a path to be operationally effective.
 - The assault support mission success was 36 percent (17 of 48).
 - Target sight system reliability was poor and had performance issues.
 - Rocket and Hellfire missile delivery was not effective.
- Problem areas for both aircraft:
 - Poor helmet performance limits operations in the expected low-light operational conditions.
 - Both aircraft had poor reliability, numerous human factors issues, and failed to provide over-the-horizon communications.

NAVY PROGRAMS

- Replacement of composite rotor system components was delayed by the small number of repair parts in the supply system.
 - Main rotor gearbox vulnerability to certain ballistic impacts did not meet requirements.
 - Poor availability of the LRIP test aircraft for developmental test flights has put the DT program in crisis getting ready for OPEVAL completion, with no spare time available.
- Recommendations**
- Status of Previous Recommendations. The program is making progress complying with DOT&E's FY06 recommendations.
 - For the UH-1Y: Identify and correct the sources of low system readiness
 - For the AH-1Z: Identify and correct the sources of Targeting Sight System failures
 - Develop software that reduces pilot workload, especially during weapons employment
 - Eliminate rocket delivery restrictions
 - FY07 Recommendations.
 1. OPEVAL Phase Two (OT-IIC-2) should be structured to complement OPEVAL Phase One. Phase Two should include:
 - Ship-based operations, to include take-off and landing in low light levels
 - Assault support operations, with the majority of those operations taking place at night
 - Improved instrumentation for evaluation of gun and rocket engagement accuracy
 - Adequate numbers of flight hours to evaluate aircraft reliability
 2. The main rotor gearbox improvement should be pursued and tested in additional LFT&E.