

## H-1 Upgrades (4BW/4BN) – U.S. Marine Corps Upgrade to AH-1W Attack Helicopter and UH-1N Utility Helicopter

### Executive Summary

- The program to upgrade two U.S. Marine Corps H-1 aircraft is nearing a full-rate production decision after 10 years in development.
- Poor subsystem performance, integration, and availability adversely impacted mission effectiveness and suitability in operational testing.
- Operational testing will continue in FY07 after improvements to the current design are implemented.

### System

- This program upgrades two U.S. 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 (HMDS).
- 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; it can deliver 8 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

- Operational Evaluation Phase One began on May 9, 2006, and is ongoing. The test is using two UH-1Y and two AH-1Z developmental aircraft at the Naval Air Warfare Center, China Lake, California, and western test ranges. Phase Two operational testing will occur in late FY07 to support a full-rate production decision in FY08.
- Live Fire testing for the AH-1Z and UH-1Y completed this year. The LFT&E strategy included testing of both airframes, as well as taking advantage of the significant commonality between aircraft. Full-up system-level Live Fire test of the AH-1Z completed in June 2006. For this test, the Navy shot an operating helicopter, loaded with weapons and fuel, in a captive hover at the Naval Air Warfare Center, China Lake, California. The Navy tested the UH-1Y in a slightly less loaded, “nearly” full-up system-level Live Fire test in March 2006. Analysis of the results continues, and DOT&E

will publish an assessment in a combined Operational Test/Live Fire Test report in FY07.

### Assessment

- While the UH-1Y is capable of substantially better lift capacity than the aircraft it replaces, system availability during OT&E has been unexpectedly low. More analysis is needed, but leading causes of low readiness include parts availability and a significant number of main rotor yoke, tail rotor assembly, and intermediate gearbox failures.
- AH-1Z effectiveness has been limited by poor Targeting Sight System reliability, excessive pilot workload to use the system improvements, and restrictions in rocket delivery rate of fire and airspeed.
- Employment of both aircraft has been limited during OT&E by poor performance of a key weapon system upgrade, the HMDS. The visual acuity of the HMDS does not support

# NAVY PROGRAMS

shipboard landings at night, depth perception cues are misleading, and HMSD components are not reliable. HMSD performance was so poor that the Marine Corps opted to revert to an existing night vision system for future OT&E and fielding.

## Recommendations

- Status of Previous Recommendations. The FY05 recommendations remain valid.

FY05 #1: The program should continue its pursuit to fix HMSD deficiencies as it develops the optimized Topowl configuration HMSD.

FY05 #2: The program should conduct additional developmental testing of infrared signature, radar cross section, and aircraft survivability equipment.

FY05 #3: The program must have appropriate publications available for operational evaluation.

- FY06 Recommendations.
  1. For the UH-1Y, the Navy should identify and correct the sources of low system readiness.
  2. For the AH-1Z, the Navy should identify and correct the sources of Targeting Sight System failures:
    - Develop software that reduces pilot workload, especially during weapons employment
    - Enable the rapid firing of rockets (current restriction is 2 seconds between rockets).