

MH-60S Multi-Mission Combat Support Helicopter

Executive Summary

- Combined MH-60R/S FOT&E on Pre-Planned Product Improvement (P3I) components commenced in FY08 and is expected to continue into the latter half of FY11. The first phase of P3I components completed operational testing in September 2009.
- The MH-60S with tested P3I components is operationally effective for all missions with the following exception: the Block 3A Armed Helicopter with the installed AN/AAS-44C(V) Multi-spectral Targeting System (MTS) upgrades is not operationally effective for Surface Warfare (SUW).
- The MH-60S, with tested P3I components, is operationally suitable for all missions.
- The MH-60S is survivable for all missions. No dedicated LFT&E events were conducted in support of the MH-60S P3I testing. The incorporation of P3I systems in MH-60S aircraft did not alter the survivability of the aircraft.

System

- The MH-60S is a helicopter modified into three variants (Blocks) from the Army UH-60L Blackhawk. It is optimized for operation in the shipboard/marine environment.
- The Blocks share common cockpit avionics and flight instrumentation with the MH-60R.
- Installed systems differ by Block based on mission:
 - Block 1 – Fleet Logistics. Precision navigation and communications, maximum cargo or passenger capacity
 - Block 2A/B –Airborne Mine Countermeasures (AMCM). AMCM systems operator workstation, tether/towing system, any one of five mine countermeasure systems currently under development
 - Block 3A – Armed Helicopter. Tactical moving map display, forward-looking infrared with laser designator, crew-served side machine guns, dual-sided Hellfire air-to-surface missiles, and defensive electronic countermeasures
 - Block 3B – Armed Helicopter. Block 3A with addition of tactical data link (Link 16)

Activity

- FOT&E on the first phase of P3I components completed in September 2009. Commander, Operational Test and Evaluation Force (COTF) conducted testing in accordance with the DOT&E-approved Test and Evaluation Master Plan and test plan. COTF tested 8 of the 13 components scheduled to be integrated into the MH-60S during this first increment. The following eight MH-60S P3I systems were of sufficient maturity for test during FOT&E:



- P3I components add Link 16 and various communication, navigation, and command and control upgrades.

Mission

The Maritime Component Commander can employ variants of MH-60S from ships or shore stations to accomplish the following missions:

- Block 1 – Vertical replenishment, internal cargo and personnel transport, medical evacuation, Search and Rescue, and Aircraft Carrier Plane Guard
- Block 2 – Detection, classification, and/or neutralization of sea mines depending on which AMCM systems are employed on the aircraft
- Block 3 – Combat Search and Rescue (CSAR), SUW, Aircraft Carrier Plane Guard, Maritime Interdiction Operations, and Special Warfare Support

Major Contractors

- Sikorsky Aircraft Corporation – Stratford, Connecticut
- Lockheed Martin Mission System and Sensors – Owego, New York

- Link 16
- MTS
- Downed Aircrew Locator System (DALIS)
- Selective Availability Anti-spoof Module Embedded GPS/Inertial
- GPS Antenna System

NAVY PROGRAMS

- Modifications to the Avionics Operational Program to control Single Channel Ground and Airborne Radio System operation through the Operator System Interface
- Modifications to the Avionics Operational Program to control satellite communications with Demand Assigned Multiple Access operation through the Operator System Interface
- APX-118 Transponder system that adds a new mode, Mode-S surveillance capability (providing an aircraft-unique 24-bit address identifier), to the existing modes 1, 2, 3/A, C, and 4 of the legacy APX-100. This is not a tactical system and is currently used solely for communication with civilian air traffic control authorities.
- FOT&E for the remaining five components is expected to complete in FY11
- Correction of deficiencies is ongoing, to include some redesign of critical components in the Block 2 AMCM variant, designed primarily to support systems that are part of the new Littoral Combat Ship Mine Countermeasures Mission Package. Developmental testing on Block 2A with the AN/AQS-20A sonar recommenced in 4QFY09. IOT&E is scheduled to commence in February 2011.

Assessment

- The addition of Link 16 allows the MH-60S to share sensor data directly with other battle group participants and provides increased situational awareness for all units participating in the network while conducting SUW and CSAR missions. However, Link 16 employment tactics, techniques, and procedures require further development and refinement to facilitate optimal employment of Link 16 functionality into MH-60S missions.
- The MH-60S with tested P3I components, is operationally effective for all missions, with the following exception: the Block 3A Armed Helicopter with the installed AN/AAS-44C(V) MTS is not operationally effective for SUW.
- The MH-60S helicopter with the upgraded DALS is effective for the CSAR mission. The following DALS deficiencies were observed:
 - An interoperability deficiency between the DALS and the Combat Survival Evader Locator (CSEL) AN/PRQ-7 handheld radio, the current aviation survival radio fielded by deploying battle groups
 - The failure to simultaneously receive Quickdraw situation reports (e.g. GPS location and text messages) and DALS locating information (e.g. precise directional guidance to the survivor), prevented the MH-60S aircrew from receiving time-critical survivor information during the terminal phase of the rescue
- Electromagnetic interference from the DALS infrared searchlight that induced navigational bearing errors.
- APX-118 Mode-S surveillance information fails to meet the Federal Aviation Administration (FAA) threshold for certification by not transmitting accurate track angle information to civilian air traffic controller authorities. As a result, the FAA would not certify the APX-118 Mode-S surveillance capability for communication with traffic controllers.

Recommendations

- Status of Previous Recommendations. The Navy has satisfactorily addressed four of the eight previous recommendations. With regard to the four remaining recommendations, the Navy should:
 1. Demonstrate Block 3A Armed Helicopter Weapons System (AHWS) operational effectiveness in the SUW mission to include sufficient day and night overwater Hellfire missile firings, which would exhibit the aircraft's ability to conduct attacks against threat-representative, evasively maneuvering, seaborne targets from all weapon stations at tactical ranges.
 2. Develop a plan to allow safe shipboard storage of Block 3A AHWS kit components when not installed and in use on the aircraft.
 3. Determine aircraft carrier (CV(N)) shipboard compatibility of the MH-60S Armed Helicopter under operationally realistic conditions.
 4. Improve the APR-39A(V)2 Radar Warning Receiver effectiveness and consider increasing the number of ALE-47 Chaff/Flare dispensers.
- FY10 Recommendations. The Navy should:
 1. Develop and refine Link 16 employment tactics, techniques, and procedures to facilitate optimal employment of Link 16 functionality into MH-60S missions and verify results in future OT&E.
 2. Correct SUW deficiencies and verify correction through subsequent testing.
 3. Investigate and apply corrections to DALS deficiencies and verify corrections in future OT&E. Deficiencies include the inability to simultaneously receive Quickdraw situation reports and DALS location reports; the incompatibility of the CSEL AN/PRQ-7 hand-held radio with DALS; and electromagnetic interference from the DALS infrared searchlight that induces navigational bearing errors.
 4. Investigate and apply corrections to APX-118 Transponder aircraft track angle information disparity deficiency and verify corrections in future OT&E.