

MV-22 Osprey

Executive Summary

- The Navy conducted OT-IIIK FOT&E from March 2015 through August 2015 to evaluate the Mission Computer Obsolescence Initiative (MCOI) and upgrades to the Defensive Weapon System (DWS), the Ramp Mounted Weapon System (RMWS), and the Blue Force Tracker (BFT).
- Units equipped with the modified MCOI aircraft remain effective and suitable.
- The DWS was not effective because of safety restrictions that limit the use of the DWS during arrival or departure from landing zones and was not suitable due to poor reliability.
- RMWS effectiveness was limited by poor reliability during the operational test.
- BFT-2 is not mature. Text messages were slow and image transfers were unsuccessful.
- The MV-22 and supporting systems are vulnerable to nearsider and insider cybersecurity attacks.
- MV-22 OT-IIIK aircraft demonstrated reliability, availability, and maintainability consistent with the fleet.

System

- There are two variants of the V-22 Osprey: the Marine Corps MV-22 and the Air Force/U.S. Special Operations Command CV-22. The air vehicles for Air Force and Marine Corps missions are nearly identical, with common subsystems and military components sustainable by each Service's logistics system.
- The Marine Corps is replacing the now-retired CH-46 and CH-53D helicopters with the MV-22. The MV-22 is a tilt rotor aircraft capable of conventional wing-borne flight and vertical take-off and landing.
- The MV-22 can carry 24 combat-equipped Marines and operate from ship or shore. It can carry an external load up to 10,000 pounds over 50 nautical miles and can self-deploy 2,363 nautical miles with a single aerial refueling.
- Recent system upgrades include the following:
 - The MCOI computer hardware initiative designed to improve the performance of the existing Advanced Mission Computer architecture by adding greater processing speed and more data storage while maintaining the same functionality as the original computer.
 - GAU-17 DWS improvements (upgraded with a sensor-only mode that allows the gunner to use the



electro-optical sensor when the gun turret is not being used). The DWS is a turreted, remotely operated, all-quadrant 7.62 mm defensive weapon system designed for fire suppression against ground troops and soft targets.

- Updated BFT-2 GPS-enabled system that receives information on friendly, neutral, and hostile forces, as well as sends and receives text and image messages via a federated cockpit display.
- GAU-21 .50 caliber RMWS replaced the GAU-18 RMWS.

Mission

- Squadrons equipped with MV-22s will provide medium-lift assault support in the following operations:
 - Ship-to-Objective Maneuver
 - Sustained operations ashore
 - Tactical recovery of aircraft and personnel
 - Self-deployment
 - Amphibious evacuation

Major Contractors

Bell-Boeing Joint Venture:

- Bell Helicopter – Amarillo, Texas
- The Boeing Company – Ridley Township, Pennsylvania

Activity

- The Navy conducted OT-IIIK FOT&E from March 2015 through August 2015 in accordance with the DOT&E-approved test plan dated February 20, 2015. This

dedicated OT&E accumulated over 130 flight hours, which had been preceded by over 400 flight hours of integrated testing.

FY15 NAVY PROGRAMS

- Marine Corps pilots conducted testing at or near the Marine Corps Air Station New River, North Carolina; Kirtland AFB, New Mexico; and Marine Corps Air Station Yuma, Arizona, using three production-representative Advanced Mission Computer aircraft (which is the original pre-MCOI configuration) and one production representative MCOI aircraft.
- The Navy conducted cybersecurity testing of the MV-22 and its supporting systems at New River, North Carolina, in May 2015. DOT&E observed all operational and cybersecurity testing.
- DOT&E evaluated capabilities of the latest aircraft upgrades to include the MCOI, and upgrades to the DWS, RMWS, and the updated BFT-2.

Assessment

- Units equipped with MCOI aircraft remain effective and suitable. During the test, the unit successfully completed all assigned missions, but discovered deficiencies that hindered, but did not prevent, the ability of the unit to perform its mission.
 - MCOI aircraft are not compatible with the DWS. The program manager has identified a fix to this deficiency that will be implemented and tested in FY16.
 - The DWS was not effective because of safety restrictions that limit the use of the DWS during arrival or departure from landing zones, and was not suitable due to poor reliability demonstrated during the operational test.
 - The presence of the DWS sensor video in the cockpit improved target coordination between the gunner and the pilot. Pilots could now confirm the gunner was aiming at the correct target using the DWS cockpit video, something pilots previously could not confirm and which resulted in instances where the gunner mistakenly shot the wrong target.
 - RMWS effectiveness was limited by poor reliability during the operational test. The mean rounds between an

uncommanded stoppage is 201, well below the requirement of 600 rounds.

- BFT-2 image message capability is not yet mature and text messages can be slow and irrelevant by the time messages arrive at the intended recipient. No images were successfully received during operational testing. Pilot surveys indicated some transmitted text messages were not received
- The MV-22 and supporting systems are vulnerable to nearsider and insider cybersecurity attacks.
- The OT-IIIK MV-22 aircraft met reliability requirements and did not meet maintainability and availability thresholds. Demonstrated reliability, maintainability, and availability performance is consistent with that of the MV-22 fleet.

Recommendations

- Status of Previous Recommendations. The Navy has made progress addressing the previous FY14 recommendations to continue to execute its reliability growth program for the MV-22 fleet; focus on reliability issues with the greatest effect on operational availability and operational cost; and improve the icing protecting system, which will be tested in FY16.
- FY15 Recommendations. The Navy should:
 1. Address failure modes and supply issues that limit aircraft availability.
 2. Use Marine Air-Ground Task Forces to employ tactics, techniques, and procedures to compensate for limitations in the DWS.
 3. Integrate DWS with MCOI and test its capability in an operational test.
 4. Improve BFT-2 message latency.
 5. Investigate and improve RMWS reliability.
 6. Address cyber vulnerabilities of the MV-22 and its supporting systems.