

CV-22 Osprey

Executive Summary

- There are two variants of the V-22: the Marine Corps MV-22 and the Air Force and U.S. Special Operations Command (USSOCOM) CV-22.
- The CV-22 IOT&E took place in four phases from August 2007 through April 2008. The testing included a validation phase for special operations tactics, end-to-end missions with Special Operations teams, simulator missions, and electronic warfare testing. The CV-22 Block 20/B aircraft demonstrated that it is operationally capable of supporting the required Special Operation Forces (SOF) missions. Deficiencies with the Suite of Integrated Radio Frequency Countermeasures, Directional Infrared Countermeasures, ice protection system, and Multi-Mission Advance Tactical Terminal system should be addressed as soon as possible.
- The CV-22 FOT&E will address: installation of a new high-power jammer and the remaining threat systems, deferred testing for cold weather operations, strategic refueling capability and self-deployment, mission planning system, and fixes to the ice protection system and engine sub-assemblies.

System

- The CV-22 is the replacement for aging Special Forces MH-53D helicopters.
- It is a tilt-rotor aircraft capable of conventional fixed-wing flight and vertical takeoff and landing over the entire range of Special Operations missions.
- Its speed and range enable the ability to support Special Operations mission demands that were not possible with legacy rotary or fixed-wing aircraft.
- It can carry 18 combat-ready Special Operators 228 nautical miles (nm) and return.
- The CV-22 can self-deploy up to 2,100 nm with one aerial refueling.



- The CV-22 will augment Air Force Special Operations MC-130 aircraft. It has terrain-following, terrain-avoidance radar, an advanced multi-frequency communication suite, and a more robust electronic defense suite.
- Future capability includes engine sub-assembly upgrades, strategic refueling capability, and various fixes to shortfalls identified in IOT&E.

Mission

Special Forces detachments equipped with the CV-22 provide high-speed, long-range insertion and extraction of SOF to and from operational objectives across the full range of military operations, from operations other than war to major theater campaign support.

Prime Contractors

- Bell Helicopter and Boeing Joint Venture

Activity

- The CV-22 testing has been in accordance with the DOT&E-approved Test and Evaluation Master Plan.
- Air Force Operational Test and Evaluation Center (AFOTEC) executed CV-22 IOT&E from September 2007 through April 2008. AFOTEC performed USSOCOM missions with the CV 22-unique radar and defensive electronic countermeasures systems. The IOT&E included a robust set of end-to-end SOF missions at Eglin AFB, Florida, that incorporated participation of operational Army, Navy, and Air Force Special Forces troops in a wide range of realistic simulated missions.
- The IOT&E also included a dedicated electronic warfare phase conducted at the Nellis Air Force Base, Nevada, and China Lake, California, range complexes.
- AFOTEC conducted an Operational Utility Evaluation to develop operational tactics and included the initial electronic warfare assessments.
- The IOT&E included a simulation phase to evaluate aircrew ability to execute missions in a high-threat environment that were not feasible for open-air testing.
- AFOTEC planned to conduct cold-weather testing in Alaska, as well as a long-range deployment outside the continental

United States. AFOTEC cancelled both deployments with DOT&E concurrence in order to maximize test productivity. The test objectives will be incorporated into FOT&E. The cold-weather deployment was cancelled due to performance and reliability issues with the ice protection system. The long-range deployment was cancelled due to operational scheduling conflicts.

Assessment

- The speed and range of the CV-22 enable the SOF to expand the operational ability to support troops at much greater ranges and in scenarios that are not possible with legacy aircraft. The ability of the Osprey to reach compromised teams or injured troops and extract them is a capability increase and is unique to the V-22.
- The turbo-prop class maneuverability and cruise speeds enable deployment options and scenarios previously not reachable with legacy helicopters and greatly expands options for covert and clandestine action.
- The CV-22 demonstrated the ability to support troop high-altitude parachute, water, fastrope, and airland infiltration tactics, as well as hoist recovery from various day and night scenarios and troop resupply.
- The ability of the CV-22 to perform Special Operations missions from a ship will be limited. Gross takeoff weight restrictions will limit its ability to perform long-range missions. Directed Infrared Countermeasure (DIRCM), Suite of Integrated Radio-Frequency Countermeasures (SIRFC), and radar system restrictions in the vicinity of the ship will limit overwater missions (such as search and seizure events). The missile warning sensor was found to have electromagnetic

compatibility problems with the shipboard environment and must be reconfigured to operate at the ship. This deficiency is under investigation.

- The electronic warfare defensive suite is still facing challenges. Flight testing in Nova Scotia during FY05 showed that the SIRFC antenna accumulates ice when the aircraft is flown in icing conditions. A redesign to correct the problem has still not been identified. The interim solution was to install a flat plate in place of the radome during a portion of the CV-22 IOT&E.
- The IOT&E testing documented significant problems with: ice protection system, engine air particle separator assembly, DIRCM performance, SIRFC performance, communication reliability, and several small hardware issues. In addition, the lack of a strategic refueling capability from KC-135 and KC-10 tankers demands operational support from limited MC-130/KC-130 aircraft.

Recommendations

- Status of Previous Recommendations. The program addressed four of the seven previous V-22 annual report recommendations. Two from FY06 and one from FY07 remain valid.
- FY08 Recommendations. The program should:
 1. Work to ensure that the CV-22 defensive suite problems are fully corrected and tested before the aircraft reaches Initial Operational Capability.
 2. Address the deficiencies documented in IOT&E.
 3. Plan and demonstrate long-range deployment and cold-weather operational capability.