

V-22 Osprey

The V-22 Osprey is a tilt-rotor vertical/short takeoff and landing (VSTOL) multi-mission aircraft developed to fill multi-Service combat operational requirements. The MV-22 will replace the current Marine Corps assault helicopters in the medium lift category (CH-46E and CH-53D). The Air Force requires the CV-22 provide a long-range VTOL insertion and extraction capability and to supplement the Special Operations Forces MC-130 aircraft. The tilt-rotor design combines the vertical flight capabilities of a helicopter with the speed and range of a turboprop aircraft, permits aerial refueling, and allows for worldwide self-deployment. The current design also affords a greater degree of survivability than existing medium lift helicopters.

TEST & EVALUATION ACTIVITY

DOT&E completed an independent evaluation of test adequacy, operational effectiveness, suitability, and survivability and submitted the required Beyond Low-Rate Initial Production (BLRIP) and Live Fire Test and Evaluation (LFT&E) reports to the Secretary of Defense and congressional defense committees in time to support the Milestone III decision planned by the Navy in November 2000. Based on the findings in these reports, the Navy delayed the Milestone III decision. The Milestone III decision was delayed indefinitely after a V-22 mishap in December 2000. All V-22 flying was halted following the December 2000 mishap and resumed in May 2002.

During the non-flying period the program conducted complete design reviews of all critical V-22 systems and designed an extensive developmental and operational test program to lead to the Fleet's return to flight. DOT&E participated in these reviews.

The first MV-22 returned to flight on May 18, 2002. Flight progress was deliberate at first, with flights interspersed with a rigorous schedule of inspections for mechanical defects. In August, the CV-22 returned to flight at Edwards Air Force Base, following a similar pattern of flights and inspections. As of December 1, 2002, three aircraft have returned to flight, amassing a total of more than 100 flight-test hours.

The approach to return the V-22 to operational flight is event-based, with high rate of descent (HROD) flight-testing the first order of business after a thorough ground test of the flight control software in laboratories and simulators and flight validation. As soon as the first aircraft was modified with system safety changes, developmental flight-testing resumed. An Operational Assessment will be done in conjunction with that Developmental Test and Evaluation. After confirmation of the safe flight envelope in the HROD tests, the Navy plans to issue a limited flight clearance to operational V-22 units which will allow training flights to prepare for a second phase of operational evaluation (OPEVAL) to address the issues raised in the BLRIP Report (testing not conducted, waived items, and correction of deficiencies). DOT&E plans to issue a second BLRIP and LFT&E Report containing an assessment of test results and the design changes.

The design changes made to the aircraft since November 2000 were reviewed to determine if they affect aircraft survivability. A trade study evaluated various designs to address fires in the mid-wing nacelles, the main landing gear bay, and underfloor areas. Over 20 fire protection configurations and design alternatives were considered to extend onboard fire protection to these areas.



Results from Operational Test-II-E indicate that the V-22 will provide major range, speed, and payload improvements to meet Marine Corps and Special Operations Forces requirements. Overall degree of mission accomplishment by a sea-based Marine Expeditionary Unit equipped with MV-22 aircraft will be evaluated in OPEVAL Phase Two, scheduled to begin in late 2004.

NAVY PROGRAMS

TEST & EVALUATION ASSESSMENT

In the November 2000 BLRIP Report, DOT&E concluded that testing had been adequate to determine the MV-22's operational effectiveness, operational suitability, and survivability. However, additional testing was needed to verify correction of deficiencies, the effectiveness and suitability of waived items, and to investigate the phenomenon of vortex ring state. The MV-22 was assessed by DOT&E as operationally effective, but not operationally suitable. Results from Operational Test-IIIE (OPEVAL) indicate that the V-22 will provide major range, speed, and payload improvements to meet Marine Corps and Special Operations Forces requirements. The V-22 offers significant maneuverability and handling advantages compared to conventional helicopters (e.g., rapid deceleration upon arrival at a landing zone and rapid acceleration during departure). When tactics are fully developed, these capabilities should provide substantive advantages in mission accomplishment and survivability. Overall degree of mission accomplishment by a sea-based Marine Expeditionary Unit equipped with MV-22 aircraft will be evaluated in OPEVAL Phase Two, scheduled to begin in late 2004.

The effectiveness of the V-22's vulnerability reduction features was demonstrated during the LFT&E program. A continuous process of design refinements has been an integral part of the overall system engineering effort since the start of live fire testing, and several design changes have been made based on the test results, such as revising the sponson fuel tank structure. This process continues, with particular emphasis on addressing the concerns outlined in the November 2000 LFT&E report.

Our survivability assessment of the design changes and efforts to address the results of the original LFT&E program are:

- Fire protection can be effectively provided to the mid-wing nacelles, main landing gear dry bays, and underfloor areas.
- The design changes to the hydraulic system made since November 2000 have a negligible impact on the aircraft's vulnerability.
- The aircraft battle damage repair program continues to experience delays due to insufficient funding.
- The addition of internal mission auxiliary fuel tanks and countermeasure dispensers, and improvements to the engine nacelles, require further study.