

Expeditionary Fighting Vehicle (EFV)

Executive Summary

- The Expeditionary Fighting Vehicle (EFV) is intended to replace the aging Amphibious Assault Vehicle.
- A recent operational assessment demonstrated poor system reliability, availability, and maintainability.
- The operational assessment also indicated an inability to get the EFV on plane reliably at high operating weights.
- Because the test vehicles are rapidly aging, new developmental vehicles should be produced and tested. Only if improved reliability can be demonstrated should the program proceed into low-rate initial production (LRIP).

System

- The EFV is an amphibious combat vehicle for the U. S. Marine Corps.
- The EFV is intended to be capable of high-speed water transit at over 20 knots and have land mobility capabilities comparable to the M1A1/2 tank after transitioning out of the water.
- The EFVP (personnel variant) is operated by a crew of 3 and carries a reinforced rifle squad of 17 Marines.
- The EFVC (command variant) is operated by a crew of three and transports a commander and his staff (nine Marines).
- The EFVP carries a stabilized 30 mm chain gun and coaxial machine gun in the turret.

Mission

- Units equipped with EFVs will transport elements of an amphibious assault force from ships over the horizon to inland objectives.



- The personnel variant will act as an armored fighting vehicle ashore in support of land combat providing transportation, protection, and direct fire support.
- The command variant will provide command, control, and communications capabilities to support ground combat tactical command posts.

Activity

- The Marine Corps Operational Test and Evaluation Activity conducted an operational assessment in 2006 using three EFVPs and one EFVC, all System Development and Demonstration prototypes. Operational assessment events included gunnery, amphibious operations, sustained operations on land, and force-on-force engagements against a simulated threat unit.
- LFT&E activities in FY06 included technical and validation testing of redesigned armor components and subsystem technical testing.

Assessment

- EFV did not demonstrate successful mission performance during the operational assessment. The system was rarely able to complete planned end-to-end operational mission

- profiles during the amphibious operations, land mobility, and gunnery phases of the operational assessment.
- Low reliability and the resultant poor system availability were major factors contributing to the unsuccessful mission performance. Reliability and availability were well below user requirements and program office predictions derived from the EFV's reliability growth plan. In addition, the maintenance burden was very high, despite significant and unplanned levels of contractor maintenance personnel augmentation during the test. Poor vehicle performance precluded gaining expected operational insight into tactics, techniques, and procedures for the EFV.
- Water performance, a Key Performance Parameter, is questionable. Despite the removal of approximately 2,000 pounds of armor before the start of the operational assessment,

EFVs could not consistently get on plane when combat-loaded unless the drivers employed a “hands-free” procedure in which vehicle drivers had to accelerate without steering. This technique typically led to large, unpredictable turns in the water. This is an unsafe condition for combat. The program has not demonstrated that the vehicle design can be modified to both get on plane and maintain the required ballistic protection.

- There were some encouraging results in the operational assessment, however. Once on plane, the EFV was able to meet the high-water speed requirement. Once ashore, the vehicle was able to keep up with M1A1 tanks. If poor reliability is fixed, the EFV’s 30 mm autocannon and thermal sight could provide an improvement in combat capability compared to the currently fielded amphibious assault vehicle. However, the EFV did not show that it could dependably provide these capabilities in an operational environment.

Recommendations

- Status of Previous Recommendations. The Marine Corps took effective action on DOT&E’s FY05 recommendation.
 - FY06 Recommendations.
 1. Although the complete results from the EFV operational assessment are not yet available, enough information is known that DOT&E does not recommend that the program proceed now into production in accordance with the approved acquisition strategy.
 2. Before proceeding into LRIP, the Marine Corps should conduct a second operational assessment on the current System Development and Demonstration-phase prototypes, modified with planned reliability-related upgrades, to demonstrate improved reliability, availability, and maintainability (RAM).
 - The operational assessment would not have to be as lengthy as the first operational assessment, but should include the same type of end-to-end missions.
 - Results of this operational testing will be directly comparable to data from the recently completed operational assessment, allowing informed decisions to be made concerning the effectiveness of the fixes applied, and the likelihood of the system ultimately achieving the required reliability.
3. If ongoing programming and budget discussions dictate production of new developmental prototypes in the latest design configuration, then an operational assessment on those vehicles should also be conducted to confirm correction of RAM and weight/power issues before a Milestone C.
 - This lot of vehicles may not be capable of demonstrating the full required performance specified in the Capability Production Document, but should demonstrate measurable growth in performance and reliability towards the required values.
 - Vehicle fabrication, acceptance, and developmental test schedules should support completion of this operational assessment, and reporting on its results, in time to support the subsequent production decision point.
 4. Following successful completion of an operational assessment and verification of entrance criteria into LRIP, 14 LRIP vehicles should be provided to conduct IOT&E and 3 LRIP vehicles provided to support LFT&E. Prototype vehicles fabricated in the FY07-08 timeframe may not be production-representative and therefore not adequate for IOT&E or LFT&E.
 5. The Marine Corps and the EFV program should appoint an executive-level independent review panel, like the Blue-Ribbon Panel for the V-22. The panel should examine at least the following:
 - Vehicle RAM
 - Vehicle design stability and producibility
 - Vehicle weight and balance
 - Program schedule realism