Executive Summary

- The prime contractor continues to construct seven redesigned prototype Expeditionary Fighting Vehicles (EFVs) (“SDD-2” vehicles) to support developmental and operational testing that is scheduled for FY10 through FY14.
- None of the planned operational testing in the Test and Evaluation Master Plan (TEMP) was accomplished in FY10 due to delayed development of the modified hardware and software.
- Poor reliability has been the EFV program’s greatest challenge, and delays in delivering SDD-2 vehicles with the required software have postponed reliability growth testing.

System

- The EFV is an amphibious combat vehicle for the Marine Corps.
- The Marines intend the EFV to be capable of high-speed water transit at over 20 knots and have land mobility capabilities comparable to the M1A1 tank after transitioning out of the water.
- The EFVC (command variant) is operated by a crew of three and transports a commander and a staff of eight Marines.
- The EFVP (personnel variant) is operated by a crew of three and carries a reinforced rifle squad of 17 Marines.
- The EFVP has a stabilized 30 mm chain gun and coaxial 7.62 mm 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.
- Commanders will use the:
  - Personnel variant as an armored fighting vehicle ashore in support of land combat, providing transportation, protection, and direct fire support.
  - Command variant to provide command, control, and communications capabilities to support ground combat tactical command posts.

Major Contractor
General Dynamics Land Systems – Woodbridge, Virginia

Activity

- The Marine Corps did not accomplish any of the planned EFV operational testing specified in the TEMP in FY10.
- The prime contractor, General Dynamics Land systems, continues to construct seven redesigned prototype EFVs (“SDD-2” vehicles) to support developmental and operational testing that is scheduled for FY10 through FY14. These vehicles have been delivered and are in developmental testing.
- The Marine Corps conducted ballistic testing using two early prototype vehicles (“SDD-1” vehicles) during FY10. Threats included roadside and underbody mines and IEDs representing threats encountered in current combat operations. The testing provided valuable insights on the response of the vehicle and crew to these and other large overmatching threats.
- The program conducted System Data Exchange testing on two SDD-1 vehicles in support of Net-Ready certification.
- The EFV Program Office announced its intention to incorporate a new, different aluminum alloy in the hull structure of the vehicle. This design change will be introduced in the first low-rate initial production (LRIP) vehicles. The hull alloy redesign is being undertaken as an effort to absorb more energy and address crew/vehicle response to emerging underbody threats.

Assessment

- Continuing delays in the modification of SDD-1 vehicles to support testing, the production of SDD-2 vehicles, and the fielding of vehicle software updates significantly delayed/reduced testing in FY10. The program cancelled all SDD-1 vehicle testing on September 23, 2010. Developmental testing continues on SDD-1 vehicles with Marine Corps Operational
Test and Evaluation Activity observing. The program tested
day/night multi-vehicle directional stability and control, and
the effectiveness of an exhaust system redesign.

- Poor reliability has been the EFV program’s greatest challenge,
and delays in delivering SDD-2 vehicles with the required
software have postponed reliability growth testing. Although
there has been no system-level reliability testing since CY06
and none will start until 1QFY11, component-level testing and
other “design for reliability” efforts are ongoing. The program
is required to demonstrate a mean time between operational
mission failure of 22 hours or higher using SDD-2 vehicles
before the Milestone C LRIP decision. The user-required
mean time between operational mission failure for full-rate
production vehicles is 43.5 hours.

- A TEMP-specified developmental testing event using SDD-2
vehicles to examine high-angle firing engagements (such as
those that might be required during fighting in urban areas)
was not conducted due to lack of availability of a suitable
test site. Information from this event was needed to support
DOT&E’s operational assessment for the LRIP decision. The
program continues to seek a feasible test site for the event.

- Three developmental/operational test events that the
program planned to conduct in FY09 using modified SDD-1
vehicles were postponed until FY10. The three events had
been expected to provide information to reduce risk for the
SDD-2 vehicle design, but will not do so. One of these
three postponed events – a Hot Weather developmental/
operational test to examine corrective fixes associated with
the ammunition feed system, the environmental control
system, and specific electronic subsystems – was cancelled in
FY10 because of problems uncovered during the preceding
developmental test. The other two deferred developmental/
operational test events, which will assess weapon station
performance and waterborne directional stability, were
postponed again until 1QFY11.

- The FY11 start date for the next operational assessment (which
will use three SDD-2 personnel variants and one command and
control variant) continues to slip several additional months,
but is still expected to be completed within the Acquisition
Program Baseline’s specified schedule window.

- Introduction of a new hull alloy during LRIP poses
risk of unforeseen fabrication and structure durability
issues. This change also reaffirms the necessity for use of
production-representative LRIP test articles in the IOT&E and
LFT&E program.

Recommendations

- Status of Previous Recommendations. The EFV Program
Office did not address the first FY09 recommendation
concerning the need to demonstrate the weapon system’s
capability in the water in order to meet the user requirement
to support forcible entry operations. In response to the
second FY09 recommendation, the Program Office has begun
designing a protective underbody appliqué for installation
and use during land operations in order to provide increased
protection against IEDs and mines. Given the possible impact
of an underbody appliqué on other aspects of the vehicle’s
performance, the design, construction, integration, and testing
of the appliqué should be completed as soon as possible and
adequately tested.

- FY10 Recommendations.
  1. The program should demonstrate the water gunnery
capability before the Milestone C LRIP decision.
  2. Deferred FY10 OT&E events should be completed as soon
     as possible and before the FY11 operational assessment.
     Implementing this recommendation requires the successful
     completion of planned prerequisite developmental testing.

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