

Light Armored Vehicle (LAV) Upgrade

Executive Summary

- The Marine Corps completed ballistic and fuel cell upgrade tests in October 2013 at Aberdeen Test Center, Maryland.
- The emerging data indicate that the upgraded fuel cells for the mission role variants (MRVs) meet technical specifications.

System

- The Family of Light Armored Vehicles (LAVs) shares a common base platform configuration (eight wheels, armored hull, suspension, power plant, drive train, and auxiliary automotive subsystem) among eight MRVs. The LAV-25 is the predominant MRV.
- The Marine Corps completed a Service Life Extension Program in FY05 primarily to address obsolescence deficiencies.
- The Marine Corps undertook the Survivability Upgrade I program based on an FY04 Urgent Need Statement from the operating forces.
 - This upgrade became the LAV A2 configuration standard, and involved developing and installing a Ballistic Protection Upgrade Package (BPUP), power pack enhancements, upgraded suspension, and other modifications.
 - The BPUP system consists of three kits, two of which provide additional protection against threats, while the third provides an internal and external stowage system.
- In 2007, the LAV Program Office designed an underbody kit (known as a D-Kit) that can be incorporated to counteract under-vehicle blasts. The D-kit has been fielded since 2009.
- The LAV A2 D-Kit is designed to work with the previously installed BPUP system and is a special purpose mission kit used in theater at the discretion of the operational commander. The BPUP provides armor protection to the sides and front



LAV-25 A2 Variant

of the vehicle, whereas the D-Kit provides additional armor protection with a V-shaped hull attachment under the vehicle.

Mission

Marine Corps commanders will use LAVs to provide combined arms reconnaissance, security missions, and mobile electronic support.

Major Contractors

- General Dynamics Land Systems – Canada
- Conversion of a LAV A1 to a LAV A2 is conducted at Marine Corps Logistics Base – Albany, Georgia, and Marine Corps Logistics Base – Barstow, California

Activity

- The program manager initiated a Survivability Upgrade program that includes improvements to the fuel cell (MRV and LAV-25) and the occupant seating. The program manager plans to conduct a subsequent Mobility and Obsolescence Upgrade program to improve the suspension (adjustable ride height) and address obsolescence issues (driveline, powerpack, steering, electrical) of the LAV platforms.
- Phase I ballistic specification tests began in August 2013 at Aberdeen Proving Ground, Maryland. The LAV Program Office provided three self-sealing fuel cells for testing.
- Phase II system-level tests utilized a previously used LAV-25 personnel carrier asset as a test stand to relocate the new fuel cell design for testing. The fuel cell location was consistent with the other MRVs.

- DOT&E approved the Ballistic and Live Fire Event Design Plan for the Family of LAVs Fuel Cell Upgrade in August 2013.

Assessment

- Testing and analysis confirm that the LAV-25 A2 D-Kit increases crew protection against some under-vehicle mine and IED strikes. The details are available in the January 2013 classified DOT&E LFT&E report.
- Emerging results from the Phase I fuel cell upgrade tests indicate the technical specifications have been met.
- Emerging results from the Phase II system-level tests indicate that the relocated LAV MRV fuel cell is survivable up to a threshold-level underwheel blast.

Recommendations

- Status of Previous Recommendations. The Marine Corps acted upon the recommendation to consider relocating the fuel cell of the LAV-25 A2, by utilizing the LAV MRV fuel cell relocation program as a pre-cursor to a LAV-25 A2 fuel cell relocation program. The results of the MRV fuel cell relocation program will aid the program manager with engineering analysis for the subsequent LAV-25 A2 fuel cell relocation.
- FY13 Recommendation.
 1. Despite the reduction to the Survivability Program in the Alternative Program Objective Memorandum 2015, the program manager should continue to analyze the LAV-25 fuel cell relocation effort along with ballistic seat upgrades.