

Amphibious Assault Vehicle (AAV) Survivability Upgrade (AAV-SU)

Executive Summary

- The Amphibious Assault Vehicle (AAV) – Survivability Upgrade (AAV-SU) program initiated prototype build and test planning in FY15. The Marine Corps started test execution in FY16.
 - Ballistic testing of new external armor coupons completed in June 2016. Preliminary results demonstrate specification-level performance against direct and indirect fire threats, but additional testing is required to fully characterize all areas of the crew-occupied space against the expected range of threats.
 - System-level live fire testing to assess the survivability of the AAV-SU and its crew against mines and IEDs began in September 2016 and will be followed by ballistic exploitation testing to further assess all vulnerable areas.
- Operational testing is scheduled to commence in 2QFY17.

System

- The AAV Family of Vehicles is the U.S. Marine Corps' principal amphibious lift system and armored personnel carrier. It is designed to provide combat support, armor-protected firepower, and mobility for a reinforced rifle squad and associated combat equipment for operations on land or at sea.
- After-action reports from Operation Iraqi Freedom highlighted AAV shortfalls in survivability against explosive threats such as landmines and IEDs. These shortfalls limited the employment of AAVs in Iraq after 2007 and precluded employment in Afghanistan.
- The Marines intend for the AAV-SU program to improve force protection against underbelly explosive threats and maintain land and water mobility performance.
 - The survivability upgrades include new external armor, added spall liner, underbelly protection, lower sidewall protection, integrated blast-mitigating seats, and improved fuel tanks.
 - The performance upgrades account for the added weight due to survivability upgrades and include improvements to the powertrain and suspension in order to maintain or increase the vehicle's land and water mobility performance compared to the current vehicle.
- Initial Operational Capability for the AAV-SU is planned for FY19. It will reach Full Operational Capability in FY23 and it must be sustained until at least 2030. The remainder of the legacy AAVs will be phased out as Amphibious Combat Vehicle increments are fielded. The Marine Corps will field AAV-SU vehicles to each of its two active-component Assault Amphibian Battalions, as well as to the Combat Assault Battalion, 3rd Marine Division, and the Combat Assault



Company, 3rd Marine Regiment. Additional vehicles will be utilized for training, testing, and supporting the maintenance cycle.

Mission

- Commanders employ Assault Amphibian Battalions to provide task organized forces to transport assault elements, equipment, and supplies ashore; execute ship-to-shore, shore-to-shore, and riverine operations; support breaching of barriers and obstacles; and provide embarked infantry with armor-protected firepower, communication assets, and mobility.
- AAV-SU-equipped units support surface power projection and, if necessary, forcible entry against a defended littoral region.

Major Contractor

- SAIC – McLean, Virginia

FY16 NAVY PROGRAMS

Activity

- The Marine Corps conducted armor coupon testing from May to June 2016 in accordance with a DOT&E-approved test plan.
- DOT&E approved the detailed live fire test plan for the AAV-SU Engineering Manufacturing Development (EMD) Phase in April 2016. The plan includes system-level live fire testing scheduled to occur from September through December 2016 followed by ballistic exploitation testing intended to assess targeted damage tolerance of unique and anticipated system design weaknesses (e.g., armor seams).
- Operational testing is scheduled to begin in 2QFY17.

Assessment

- Preliminary analysis of armor coupon testing confirms that the armor is on track to meet its specifications but additional testing is required to fully characterize all areas of the crew-occupied space against the expected range of threats. Due to the lack of sufficient quantity of armor coupons, the Program Office deferred the additional armor characterization to the ballistic exploitation phase of testing. Armor

characterization at this stage in the program could complicate design changes if testing reveals significant armor shortfalls.

- Preliminary evaluation of the first underbody event data, conducted against the AAV-SU at the end of FY16, revealed a system design vulnerability that the Program Office is already investigating and addressing. Analysis of all four system-level live fire events is ongoing and will be reported in the FY17 DOT&E LFT&E report.

Recommendations

- Status of Previous Recommendations. This is the first annual report for this program.
- FY16 Recommendation.
 1. The Marine Corps should ensure that enough test assets (e.g., armor coupons) are allocated for the appropriate phases of test for both the AAV-SU and Amphibious Combat Vehicle 1.1 programs.