

Abrams M1A1 System Enhancement Program (SEP) Main Battle Tank (MBT)

Executive Summary

- The Army continues to characterize the survivability of the M1A2 System Enhancement Program (SEP) version 3 (v3) against IEDs, mines, and direct- and indirect-fire threats. In FY18, LFT&E examined the vulnerability of the tank to threat-induced impact to onboard ammunition, and full-up system-level (FUSL) testing. FUSL is scheduled to be completed in 3QFY19.
- DOT&E plans to complete a detailed survivability analysis in 4QFY19 to support the Full Materiel Release decision in 1QFY20.

System

- The Abrams M1A2 Main Battle Tank (MBT) is a tracked, land combat, assault weapon system equipped with a 120 mm main gun designed to possess significant survivability, shoot-on-the-move firepower, joint interoperability (for the exchange of tactical and support information), and a high degree of maneuverability and tactical agility.
- The M1A2 SEPv2 is currently fielded. It upgrades the M1A2 SEP by providing increased memory and processor speeds; full color tactical display; digital map capability; compatibility with the Army Technical Architecture; improved target detection, recognition, and identification through incorporation of second-generation Forward Looking Infrared technology and electronics; Common Remotely Operated Weapon Station (CROWS)-Low Profile (LP); and crew compartment cooling through the addition of a thermal management system.
- M1A2 SEPv3 fielding is planned for FY20. The M1A2 SEPv3 is an upgrade to the M1A2 SEPv2. The upgrades include:
 - Power generation and distribution to support the power demands of future technologies
 - Compatibility with joint battle command network
 - Survivability enhancements including Next Evolution Armor and reduction in vulnerability to IED threats



- Reduction in vulnerability to Remote Controlled Improvised Explosive Devices (RCIEDs)
- Lethality by providing the ability for the fire control system to digitally communicate with the new large caliber ammunition through use of an ammunition datalink
- Energy efficiency (sustainment) due to the incorporation of an auxiliary power unit
- Improved silent watch capability

Mission

- Commanders employ units equipped with the M1A2 SEP MBT to close with and destroy the enemy by fire and maneuver across the full range of military operations.
- The Army intends the M1A2 SEP MBT to defeat and/or suppress enemy tanks, reconnaissance vehicles, infantry fighting vehicles, armored personnel carriers, anti-tank guns, guided missile launchers (ground and vehicle-mounted), bunkers, dismounted infantry, and helicopters.

Major Contractor

General Dynamics Land Systems – Sterling Heights, Michigan

Activity

- The Army conducted all testing in accordance with a DOT&E-approved test plan.
- In FY18, the Army completed the system-level ammunition vulnerability test series intended to quantify the performance of bustle side armor and to assess the vulnerability of the vehicle to threat-induced impact to the onboard M829A4 ammunition.
- The Army started the execution of the FUSL test series in February 2018 to assess the survivability of a combat-ready tank against IEDs, mines, and direct and indirect fire. The FUSL test series includes a total of 21 tests on 3 fully functional tests tanks, and is expected to be completed in 3QFY19.

FY18 ARMY PROGRAMS

- The live fire events are coupled with modeling and simulation to support shot-line selection, pre-shot prediction, test damage, casualty assessment, and generalization of system vulnerabilities over a range of engagement conditions.

Assessment

- DOT&E continues to assess available live fire test data to characterize the protection provided by the M1A2 SE Pv3 against expected operationally realistic threats. DOT&E will use modeling and simulation to support the final assessment.
- The program moved its Full Material Release from 3QFY20 to 1QFY20, potentially posing some challenges to complete

planned testing, modeling and simulation activity, and reporting by the end of 3QFY19.

- The Abrams SE Pv3 does not have a unique requirements document to specify expected survivability and force protection capabilities.

Recommendation

1. The Army should ensure that the SE Pv4 and future Abrams tank upgrades are supported by a comprehensive set of requirements that accurately reflect the operational challenges.