Abrams M1A2 System Enhancement Package version 3 (SEPv3) Tank with Trophy Active Protection System (APS)

In FY21, the Army initiated testing of the Trophy Active Protection System (APS) installed on Abrams M1A2 System Enhancement Package version 3 (SEPv3) tanks to inform the urgent materiel release. Preliminary analysis indicates that the Trophy APS effectively detects, identifies, tracks, and intercepts most of the incoming threats in basic range conditions and engagements. The Army needs to address the identified Trophy APS-equipped Abrams' operational suitability concerns. Abrams tank base armor configurations have the potential to provide adequate force protection against the debris generated by a successful intercept.

M1A2 Abrams System Enhancement Package version 2 With Trophy Active Protection System

System Description

The Abrams M1A2 is a tracked, land combat, assault vehicle equipped with a 120mm main gun, enabling maneuverability across the full range of military operations to destroy the enemy by fire. The Army intends to equip the Abrams M1A2 with a 5,000 pound Trophy APS to offer additional defense and improved survivability against anti-tank guided missiles and rocket-propelled grenades. The Trophy APS is designed to search, detect, identify, track, and then intercept such threats with its inherent kinetic countermeasures.

Program

The Abrams M1A2 is an Acquisition Category IC program. In response to directed requirements from the Army G-8 issued in October 2016 and again in March 2018, the Army is installing the non-developmental Trophy APS on the Abrams M1A2. The Army has not documented any Trophy APS operational requirements, which has affected the test planning process and the assessment of adequate warfighting capability.

Software upgrade delays from General Dynamics Land Systems caused the Army to reschedule the urgent materiel release from December 2021 to June 2022.

Major Contractors

General Dynamics Land Systems – Sterling Heights, Michigan. DRS/Rafael – St. Louis, Missouri.

Test Adequacy

The Army Test and Evaluation Command is currently testing the Abrams M1A2 SEPv3 equipped with Trophy APS in accordance with the DOT&E-approved test plan. Test results will inform an update to the DOT&E classified report published in June 2020 to support the urgent materiel release scheduled for June 2022.

Performance

Effectiveness

Preliminary analysis indicates that the Trophy APS effectively detects, identifies, tracks, and intercepts most of the incoming threats in basic range conditions and engagements. The system as installed on SEPv3 appears to retain operational effectiveness limitations noted in the Abrams SEPv2 APS test report published in June 2020. Final assessment of the performance of the Trophy APS equipped Abrams SEPv3 tank will be detailed in a classified report in 2QFY22, after the completion of live fire testing, to support the urgent materiel release scheduled for June 2022.

Suitability

Preliminary analysis indicates that Army has to overcome several challenges to demonstrate the operational suitability of the Trophy APS-equipped tanks. The M1A2 SEP v2 and v3 overall weight growth with full combat load and Trophy APS has introduced transportability and recovery challenges. The Army intends to restore the ability to recover a Trophy APS equipped Abrams with an upgrade to the M88 recovery vehicle.

Survivability

The survivability of the Trophy APS equipped Abrams SEPv3 tank is largely proportional to the operational effectiveness of the Trophy APS to search, detect, identify, track, and intercept the incoming threats. Survivability is also dependent on the capability of the Abrams base armor to absorb the threat by-products generated after a successful intercept. Preliminary analysis indicates that Abrams SEP v2 and v3 base armor configurations have the potential to provide adequate force protection against the threat and countermeasure debris generated by a successful intercept.

Recommendation

1. The Army should develop a requirements document for the Abrams M1A2 tank with Trophy APS.