The Armored Brigade Combat Team 2014-2024: Improving Abrams Lethality

by MAJ Robert Brown

The primary mission of the M1A2 System Enhancement Package (SEP) v2 Abrams main battle tank (MBT) is to provide mobile, protected firepower for combined-arms maneuver and wide-area security. The Abrams must be capable of engaging the enemy in any weather, day or night, on the multi-dimensional, non-linear battlefield using firepower, maneuver and shock effect.

An increasing array of threat tactics and weapons – including advanced explosive reactive armor (AERA), Active Protection Systems (APS) and improvised explosive devices – necessitate continual improvement to the Abrams platform so it can meet this mission.

For current and recent operations, the Abrams underwent many upgrades and configuration changes in response to evolving threats. Upgrades like the Tank Urban Survivability Kit (TUSK) – which includes advanced reactive armor, upgraded belly armor and crew armored gunshields – greatly enhanced platform survivability, especially in the complex urban terrain prevalent in Iraq.

However, in response to requirements for 2014-2024, the Abrams' lethality must continue to be improved. This improvement in lethality for the Abrams M1A2 SEPv3 will derive from the combination of developmental upgrades and the addition of mature technologies that include the Ammunition DataLink (ADL), improved 120mm ammunition, Improved Forward-Looking Infrared (IFLIR) and the low-profile (LP) Common Remotely Operated Weapon System (CROWS).

Improved 120mm ammunition

The M829E4 (soon to be type-classified as the M829A4) is the fifth-generation kinetic-energy anti-tank (AT) round. This new round provides heavy-armor defeat capability at extended ranges. It uses a depleted-uranium penetrator and anti-armor design advancements to defeat threat targets equipped with AERA and APS.

The advanced multi-purpose (AMP) round is a line-of-sight munition with three modes of operation: point detonate, delay and airburst. This essential capability required in urban environments allows the tank crew to defeat AT guided-missile teams at ranges of 50 to 2,000 meters with a precision lethal airburst. The point-detonate and delay modes allow for obstacle reduction (OR), bunker defeat and a wall-breach capability for dismounted infantry. The AMP round also reduces the logistics burden by replacing four existing rounds (M830 high-explosive (HE) AT, M803A1 multipurpose HEAT, M1028 canister and M908 HE-OR).

ADL

These enhanced munitions rely on the ADL to provide communications with the platform's fire-control system. The ADL consists of a modified breech-block, upgraded Improved Fire-Control Electronics Unit and upgraded Abrams

tank software.

IFLIR

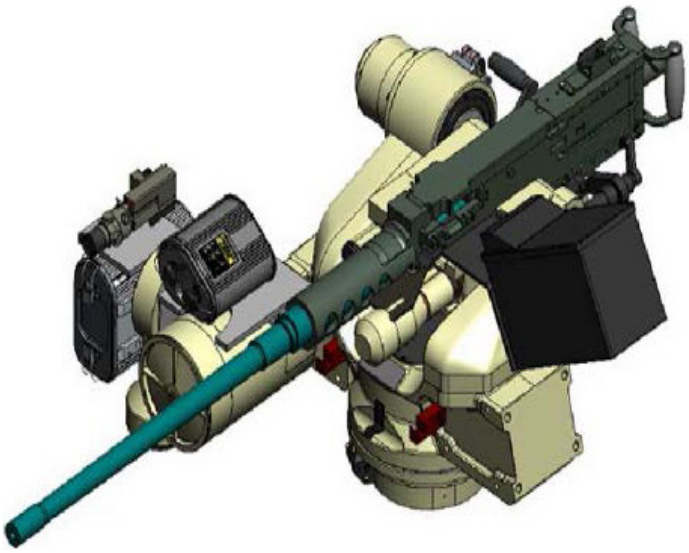
The ability to identify targets prior to engagement remains one of the biggest obstacles to improving Abrams lethality. The new IFLIR solves this problem using long- and mid-wave infrared technology in both the gunner's primary sight and the commander's independent thermal viewer. The IFLIR will provide four fields of view (FOV) displayed on high-definition displays, greatly improving target acquisition, identification and engagement times – compared to the current second-generation FLIR – under all conditions, including fog / obscurants.

LP CROWS

The Abrams' lethality is further improved through a product improvement to LP CROWS. This effort improves the tank commander's situational awareness without compromising capability. LP CROWS significantly lowers the profile of the weapon station, returning both open- and closed-hatch FOV. Also, LP CROWS will be equipped with an upgraded day camera that uses picture-in-picture technology to combine different FOVs, and it offers a 340 percent larger scene in the wide FOV.

The Army's strategy for modernizing the Abrams fleet revolves around incrementally upgrading aspects of the platform through a combination of technological insertion and product improvements based on evolving threats and available technologies. The advances in Abrams lethality stem from a synergistic combination of technological efforts. The IFLIR will enable early and accurate target detection and identification. Once identified, the crew can then engage those targets with either of the two new enhanced rounds via the ADL with a high probability of hit / kill.

Recent and continued upgrades to the Abrams MBT will ensure the armored force maintains overmatch and battlefield dominance for the near future. The M1A2 SEPv3 will provide future armored formations an unmatched combination of lethality, mobility and survivability.



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Acronym Quick-Scan

ADL – Ammunition DataLink
AERA – advanced explosive reactive armor
AMP – advanced multi-purpose
APS – Active Protection Systems
AT – anti-tank
CROWS – Common Remotely Operated Weapon System
FOV – fields of view
HE – high explosive
HEAT – high-explosive anti-tank
IFLIR – Improved Forward-Looking Infrared
LP – low profile
MBT – main battle tank
OR – obstacle reduction
SEP – System Enhancement Package
TRADOC – (U.S. Army) Training and Doctrine Command