

Mine Resistant Ambush Protected (MRAP) Vehicles

Executive Summary

The Mine Resistant Ambush Protected (MRAP) Vehicle program procured the total Service and Special Operations Command requirement for 15,838 MRAP vehicles. The majority of this procurement has been delivered to operating forces in Iraq and Afghanistan. Developmental, live fire, and operational testing was completed in FY08 for all six of the MRAP vehicles.

System

- MRAP vehicles are a family of vehicles designed to provide increased crew protection and vehicle survivability against current battlefield threats, such as IEDs, mines, and small arms. DoD initiated the MRAP program in response to an urgent operational need to meet multi-Service ground vehicle requirements. MRAP vehicles provide improved vehicle and crew survivability over the High Mobility Multi-purpose Wheeled Vehicle (HMMWV) and are employed by units in current combat operations in the execution of missions previously executed with the HMMWV.
- This report covers two types of MRAP vehicles. The MRAP Category I (CAT I) vehicle is designed to transport six persons while the MRAP Category II (CAT II) vehicle is designed to transport 10 persons. An ambulance variant of the MRAP vehicle is also being developed.
- MRAP vehicles incorporate current Service command and controls systems and counter-IED systems. MRAP vehicles incorporate gun mounts with gunner protection kits capable of mounting a variety of weapons systems such as the M240B medium, the M2 .50 caliber heavy machine gun, and the MK-19 grenade launcher. The program has developmental efforts underway to integrate improved armor protection against Explosively Formed Penetrators (EFPs) on existing MRAP vehicles.
- Five vendors have been awarded ongoing production contracts for MRAP CAT I and CAT II vehicles: Force Protection Industries (FPI), General Dynamics Land Systems Canada (GDLS-C), International Military and Government (IMG), BAE-Tactical Vehicle Systems (BAE-TVS), and BAE Systems (BAE). Six CAT I and CAT II variants have been purchased:
 - FPI Cougar CAT I
 - FPI Cougar CAT II
 - IMG MaxxPro CAT I
 - BAE RG-33L CAT II
 - GDLS-C RG-31A2 CAT I
 - BAE TVS Caimen CAT I



FPI Cougar Category I



FPI Cougar Category II



IMG MaxxPro Category I



BAE RG-33L Category II



GDLS RG-31A2 Category I



BAE TVS Caimen Category I

Mission

- Units equipped with the MRAP CAT I vehicles conduct small unit combat operations such as mounted patrols and reconnaissance. Many of these operations are conducted in urban areas. Units equipped with MRAP CAT II conduct ground logistics operations including convoy security, troop and cargo transportation, and medical evacuation.
- MRAP vehicles support multi-Service missions and are fielded to units based upon priorities established by the operational commander.

Prime Contractors

- BAE Systems
- Force Protection, Inc.
- General Dynamics
- International Military and Government

Activity

- The MRAP program has procured the total Service and Special Operations Command requirement for 15,838 MRAP vehicles. The majority of this procurement has been delivered to operating forces in Iraq and Afghanistan.
- Developmental, live fire, and operational testing was completed in FY08 for all six of the MRAP vehicles.
- The Army and the Marine Corps conducted a series of four Initial Operational Tests (IOT) for the six MRAP vehicles at Yuma Proving Ground, Arizona, in the period from October 2007 to June 2008.
- The MRAP program initiated two efforts in FY08 to improve base MRAP effectiveness, suitability, and survivability. The first is a program to develop, evaluate, and integrate a series of Engineering Change Proposals (ECP) tailored to each of the individual MRAP base vehicles with the intent of improving vehicle capability. The second effort, the MRAP Expedient Armor Program (MEAP), is intended to provide improved, add-on armor for existing base MRAP vehicles. These two programs are undergoing a developmental and live fire test program to assess their contribution to MRAP vehicle capabilities.
- The program developed MRAP ambulance variants using the MaxxPro and RG-33L. The program completed test planning for these ambulances and began developmental testing. An operational test on both ambulance variants was conducted at Fort Hood, Texas, in October to November 2008.
- The MRAP Program Office conducted an initial assessment of two MRAP II variants. The program intends the MRAP II to provide increased ballistic protection against explosively formed projectiles (EFP). Two vendors delivered MRAP II vehicle prototypes. DoD has made no decision to procure any MRAP II vehicles.
- In September 2008, the program purchased 822 IMG MaxxPro Dash vehicles. The MaxxPro Dash is a smaller and lighter modified version of the IMG MaxxPro. The program intends the MaxxPro Dash to provide improved mobility over current MRAPs.

Assessment

- Based upon analyses of the IOTs and LFT&E programs conducted for the six MRAP I variants, DOT&E's assessment of the operational effectiveness, suitability, and survivability of these vehicles is:
 - FPI Cougar CAT I and CAT II are operationally effective and suitable. They are survivable against the requirement threats.
 - IMG MaxxPro is operationally effective and suitable. It is survivable against the requirement threats.
 - BAE RG-33L is operationally effective, but not operationally suitable. The RG-33L was assessed as not

suitable primarily because of demonstrated low reliability and significant limitations in its ability to be towed. The RG-33L is operationally survivable against the requirement threats.

- BAE-TVS Caimen is operationally effective and suitable. It is survivable against the requirement threats.
- GDLS-C RG-31 is operationally effective, but not operationally suitable. The RG-31 demonstrated low reliability. The RG-31 is operationally survivable against the requirement threats.
- MRAP I vehicles successfully demonstrated in operational testing their primary capability to provide armor-protected tactical mobility to transport units over primary and secondary roads. The size and weight of these vehicles limit their off-road tactical mobility and reduce their maneuverability in urban terrain.
- LFT&E of the six MRAP variants demonstrated that MRAP vehicles provide crew and passenger protection against the immediate effects of the threats identified in the MRAP requirements documents. Testing also revealed automotive vulnerabilities to a wide range of threats, which can affect vehicle mobility. Though all MRAP I variants were assessed as operationally survivable, they did provide different levels of survivability against threats that exceeded the requirements.
- Because of the urgent operational requirement for MRAP vehicles, the program pursued an aggressive acquisition strategy emphasizing rapid procurement and fielding of these vehicles, with minimal testing conducted in advance of these efforts. This approach, while necessitated by operational need, provides little opportunity to incorporate design modifications resulting from lessons learned from more extensive testing prior to operational use.

Recommendations

- Status of Previous Recommendations. The MRAP program continues to address the previous recommendations.
- FY08 Recommendations.
 1. The program should continue to ensure that adequate T&E plans are developed and executed to support future upgrades to MRAP vehicles that may be implemented, such as armor improvements or other ECPs applied to existing MRAPs.
 2. The Army Test and Evaluation Command, in conjunction with the MRAP program, should conduct a detailed operational assessment of all variants of MRAP vehicles based upon data gathered from deployed MRAP-equipped units. This operational assessment would provide information for further vehicle improvements.