

Mine Resistant Ambush Protected (MRAP) Program Meets Urgent, Changing Requirements

Barbara Hamby



It was last September as Soldiers conducted a mounted combat patrol mission in Afghanistan when their MRAP vehicle was hit by an improvised explosive device (IED). The force of the blast destroyed the MRAP, but the vehicle had functioned according to its design and the Soldiers inside survived.

MRAP vehicles are being re-missioned at the MSF in Kuwait and are being transitioned from the fight in Iraq to support the troop surge in *OEF*. This helps get these lifesaving trucks into the hands of warfighters faster and at considerably less cost to the American taxpayer than if they were shipped back to the U.S. for repair. (U.S. Army photo by Barbara Hamby.)



The MSF in Kuwait was first established as a deprocessing center, supporting the onward movement of more than 11,000 MRAP vehicles. Since then, it has transformed into a first-class sustainment maintenance facility where trucks are being re-missioned as they transition from the fight in Iraq and into the fight in OEF. (U.S. Army photo by Barbara Hamby.)

The MRAP is one of many innovations the U.S. military has developed to stay ahead of insurgents, who readily adapt to American technology. While there is no silver bullet against IEDs, the MRAP Family of Vehicles (FOV) has proven effective in countering the enemy's weapon of choice. "We continue to learn, but we are aligned in our efforts to deliver this capability," said Paul Mann, Joint Program Manager (PM) MRAP Vehicle Program. "It provides greater safety and survivability for U.S. forces."

Equipping the Force

From 2003 to October 2006, the number of casualties caused by IEDs escalated during *Operation Iraqi Freedom*. While a number of countermeasures—to include adding armor to existing vehicles—had some success, there was an urgent need to produce and field a vehicle designed from the ground up to provide troops with a survivable platform from mines and IEDs. With that, they could successfully support mission requirements and safely return to base.

Both the U.S. Army and the U.S. Marine Corps had procured limited numbers of IED-resistant vehicles to support route clearance and explosive ordnance disposal operations. These vehicles had varying degrees of success and demonstrated that survivable vehicles could be built. All of these factors led to establishing the Joint MRAP Vehicle Program.

Since it was established in October 2006, the program's scope has increased dramatically. The initial requirement for 1,185 MRAP vehicles quickly grew to 4,060; then 7,774; to 15,374 by September 2007; and reaching 16,238 by November 2008. With the addition of the MRAP All-Terrain Vehicle (M-ATV) in 2009 and another increase in January 2010, the total requirement has increased to well more than 26,000 MRAP FOV in support of overseas contingency operations in Iraq and Afghanistan. Roughly 19,000 of these trucks are Army assets. As DOD's highest priority acquisition program, this infusion of survivable vehicles is unprecedented since World War II.

"We have placed delivery orders for nearly 25,700 vehicles," said COL Kevin B. Peterson, MRAP Military Principal Deputy PM (DPM). "Bottom line: we are fulfilling requirements set by CENTCOM [U.S. Central Command] and procuring additional vehicles to meet the increasing demand signal for these lifesaving trucks in support of our troops," Peterson said.

As forces draw down in Iraq and surge in Afghanistan, the need to equip warfighters with a more mobile MRAP vehicle meant that the Joint Program Office (JPO) would need to quickly adapt to meet new and emerging requirements. Unlike Iraq, which has a mature infrastructure, Afghanistan has very few paved roads and rugged mountainous terrain that challenge a vehicle's ride quality and off-road mobility. In response to this urgent requirement, the JPO developed a refined rapid-acquisition strategy. "Our greatest focus right now is getting MRAPs to our forces in Afghanistan," Mann said.

Part of this equation included procuring more than 8,100 M-ATVs, which combine MRAP levels of survivability along with the capability to travel off-road. In addition, the JPO put on contract more than 1,300 Category I MRAPs equipped with new

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A mechanic works on MRAP vehicles at the MSF in Kuwait. (U.S. Army photo by Barbara Hamby.)

independent suspension systems (ISS) designed to improve the blast-protected vehicles' off-road performance in Afghanistan. A third piece involves refitting a portion of the baseline MRAP fleet with ISS.

"This decision to go with improved suspensions is part of our ongoing commitment to providing Soldiers the safest, most survivable vehicle possible," Peterson said. "The improved suspension is aimed at providing better off-road capability and has the added benefit of improving the overall ride quality and vehicle performance on the unimproved roads found throughout theater."

Capabilities Insertion (CI)

Just as the number of vehicles required has increased, each service and component also requires unique and evolving vehicle equipment configurations. The MRAP JPO continues to adapt and work toward testing and integrating

effective and enhanced armor solutions as the enemy modifies its means of attack.

The MRAP CI program was developed by the JPO and formally launched in summer 2008, but "we actually started inserting things back into the vehicles almost immediately," said Dave Hansen, Principal Civilian DPM MRAP Program. "We focused on anything that helped us manufacture or install our government-furnished equipment and then on to survivability and safety issues, such as the GRS [gunner restraint system]."

The CI program was created to address multiple critical Joint Urgent Operational Needs Statements (JUONS) as a single program and single requirements base so optimization could ensue. It also had an eye toward the future to enable easier incorporation of solutions to future JUONS. The JPO leveraged the internal capabilities of the U.S. Army Tank Automotive Research, Development, and Engineering Center (TARDEC), as well as external partnerships to include the Joint MRAP enterprise. Thanks to a coordinated team effort across numerous DOD agencies and organizations, hundreds of new capabilities have been added, including overhead

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wire mitigation, radio remote control, and enhanced visibility. Teams include product managers for the representative systems; TARDEC; the U.S. Army Aviation and Missile Research, Development, and Engineering Center; Space and Naval Warfare Systems Center Atlantic; and the U.S. Army Test and Evaluation Command's extensive capabilities at Aberdeen Proving Ground, MD, and Yuma Proving Ground, AZ.

While lifesaving and mission-enhancing capabilities, such as improved armor protection and better integrated vehicle electronics, receive top priority, the CI effort has resulted in other benefits to warfighters. "Some of them are just little tweaks and upgrades that help with human factors, safety, and survivability. We may modify seat belts or a better pass-through for wiring," Hansen said. He added that collaboration among defense and industry partners and continued feedback from warfighters all play a crucial role in equipping MRAP variants with greater lifesaving, mission-enhancing capabilities to warfighters.

Sustaining the Fleet

With the responsible drawdown in Iraq and surge in *Operation Enduring Freedom (OEF)*, mission requirements have changed in ways that have required the MRAP JPO to also change to support warfighter needs. With core values such as being responsive, adaptive, and perseverant, the JPO continues to meet the demand signal.

One of the JPO's biggest success stories is the MRAP Sustainment Facility (MSF) in Kuwait. Developed by the JPO 2 years ago, the MSF continues

to increase in size and capacity. When stood up in November 2007, the MSF functioned as a deprocessing center, supporting onward movement of more than 11,000 MRAPs. Since then, it has transformed to a first-class sustainment maintenance facility for re-missioned assets transitioning from the fight in Iraq to the fight in Afghanistan. In recent months, the MSF has increased personnel and improved processes using Lean Six Sigma to better prioritize and move vehicles through the line. Today, an average of 100 MRAPs per week are refurbished and upgraded at the MSF.

"This represents not only a timesaver for our warfighters, but a cost savings for the American taxpayer," said COL Stephen Ward, PM Forward, MRAP JPO. "Doing the repairs close to the theaters of operation helps get the trucks into the fight as soon as possible, at considerably less cost and time spent than if we shipped MRAPs back to CONUS for repairs and upgrades."

Besides the MSF, the JPO Forward established regional support activities where vehicles are deprocessed or repaired onsite and near combat areas in Afghanistan and Iraq. According to Peterson, the intent is to perform repair as far forward as circumstances and facilities will support to minimize transportation requirements of these heavy vehicles within the theater.

Home Station Training

A key lesson learned from the baseline MRAP program was the necessity of home station training. Sending trucks to home stations for training before deployment, "better prepares units so when deployed they are already familiar

with the equipment they will use in theater," Peterson said. Among the tools available to the MRAP user community are the MRAP Egress Trainer (MET) and the Common Driver Trainer (CDT). Training is mandatory for the driver and all vehicle crew members.

The MET teaches service members the proper skills to safely egress in the event of a rollover. This tool provides the operator and vehicle crew with a better understanding of what happens during a rollover event or how to avoid one. It also helps reinforce the need to wear seat belts and personal protective equipment, and teaches the crew to work as a team during and after an event.

The CDT trains critical driver tasks in a virtual simulator, including scenarios such as driving on poor road conditions, weak bridges, and even combat-like conditions on a fixed, motion-based platform. The devices were developed by the U.S. Marine Corps Systems Command's PM Training Systems and the U.S. Army's Program Executive Office Simulation, Training, and Instrumentation.

Whether through training, procurement, and rapid fielding; CI; or refurbishing vehicles for new missions, Peterson emphasized that they are all working toward the same goal—providing survivable, effective vehicles for warfighters in the field. "The MRAP is still in the urgent fielding right now. So, really, we're focusing on making the vehicles survivable and relevant in Afghanistan," Peterson said. "There is no greater mission than devising ways to counter the IED threat."

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