Soldier Armed

M7 Spider

By Scott R. Gourley

One of the challenges service planners faced over the last few years has involved equipping an Army at war while also meeting new operational mandates stemming from arms agreements and domestic policy decisions.

In some cases, the arms agreements have led to the development of new products that will support tactical success while meeting those mandates. An example of this is the development of the M30E1 Guided Multiple Launch Rocket System Alternative Warhead rocket, which can be used against area targets while meeting the new criteria of the pending cluster munitions ban.

Another recent example of meeting this challenge is the M7 Spider, a hand-emplaced, remotely controlled, anti-personnel munition system. The M7 was developed to replace the capability of persistent (non-self-deactivating and non-self-destructing) anti-personnel land mines that were banned from use after December 2010 under U.S. land mine policy.

As described by Lt. Col. Wesley Williamson, product manager area denial, Program Executive Office Ammunition, the Spider system is comprised of four subsystems: man-in-the-loop (the human operator), remote control station (the system command and control station), repeater (a communication link to the munitions that provides extended range), and munition control units that deliver anti-personnel effects with miniature grenade launchers or the M18 Claymore.

"Each [mission control unit] can utilize remotely deployed, extended-range trip line sensors and hand-emplaced trip lines for early warning and detection of intruders," he said. "The Spider is designed to mitigate indiscriminate initiation of the lethal effects, eliminating civilian casualties or even harm [to] animals by requiring the soldier make a conscious decision to engage a target."

The Spider design also allows for measured and graduated responses, including sense-only, nonlethal and lethal modes. In addition, Spider supports net-centric operations by feeding situational awareness information, such as location and status, into the Army Battle Command System.

"The Spider system, with its many desirable features, makes it a versatile weapon system that provides protective and hasty obstacles," Williamson said, crediting the system with significant utility across the full spectrum of military operations and the ability to support current and future operations.

Spider has been developed using an incremental acquisition approach, with the XM7 Increment 1 first deployed to Afghanistan in 2009 under an urgent request in support of Operation Enduring Freedom. The Increment 1 system was developed and produced under a joint venture agreement between Textron Defense Systems and Alliant Techsystems.

The Increment 1 program received full materiel release, with designation changed from XM7 to M7, in September 2013. The M7 is currently in production, which is scheduled for completion in March 2015, with program representatives acknowledging "exploring opportunities for foreign military sales" that might extend production beyond that date.

As of September, 242 M7 Spider systems have been fielded to over 25 brigade combat teams. The total planned production is 732 systems, which will be fielded to selected active, Reserve and National Guard Army components worldwide.

The Increment 1A follow-on, now designated M7E1 Spider, is being developed by Northrop Grumman Information Systems with subcontractors, including Green Hills and American Ordnance. The M7E1 is currently in the engineering and manufacturing development phase and is scheduled

U.S. Army/Staff Sgt. Charles Burden

The M7 Spider is a remotely controlled, anti-personnel mine system that is placed by hand.

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Spc. Jacob Avila, 3rd Brigade Combat Team, 1st Cavalry Division, trains on the M7 Spider system at Fort Hood, Texas.

to enter production in the third quarter of fiscal year 2016.

Improvements in the M7E1 design include replacement of the Spider Increment 1 remote control unit with a new networked munitions control station that includes mapping capability, seamless interoperability to the Mission Command system or Joint Battle Command-Platform, and new operating system; control of current Spider anti-personnel munitions; and demonstration of the ability to operate with legacy government off-the-shelf anti-vehicular (lethal) and anti-personnel (lethal and nonlethal) effects.

"The Spider system is being developed utilizing an incremental acquisition approach," Williamson said. "The two current increments (1 and 1A) are primarily providing an anti-personnel obstacle capability. Increment 1A will provide an improved control station to the Increment 1 system. This effort will leverage existing [commercial off-the-shelf] computer hardware to a large extent and integrate new controller software with a color map display that is easier to use, provides seamless interoperability and an open architecture for future developments. Future hardware technology refresh is planned and will be needed to maintain 'producibility' and product support. There is also another potential future increment to provide an anti-vehicle capability if funding becomes available and there is support from the user, the Maneuver Support Center of Excellence at Fort Leonard Wood, Mo., and the Army."

U.S. Army

Sgt. Michael Seneus emplaces an M7 Spider during training at Fort Hood.

Meanwhile, the M7 Spider improves the tactical effectiveness of soldiers by providing a unit-level asset with hasty and protective obstacle capabilities; effectiveness against dismounted threats; demolitions obstacle effects against mounted threats; an enhanced user interface; scalable effects with nonlethal and lethal Claymores; nonlethal stingball and flash-bang grenade launcher; rapid manual emplacement; safe, recoverable and reusable employment design; all-applicable terrain capability; and an open architecture that allows for development of anti-vehicle/anti-tank capability.

"Spider leads the way as the only man-in-the-loop networked munition system that is U.S. national land mine policy-compliant, providing lethality when needed as well as safe passage when desired," Williamson said. "It has been battle-tested in Operation Enduring Freedom since 2009 and has received favorable feedback from the most important folks in this process: the soldiers in the field. Operational scenarios have proven the utility of the M7 Spider in preventing noncombatant casualties as well as protecting soldiers with its unique [man-in-the-loop] operation. As fielding density with the various increments of Spider increases, the system will provide much-needed capability improvements for the Army." ★