M1128 Stryker Mobile Gun System (MGS)

Executive Summary

- The Army Test and Evaluation Command (ATEC) began conducting Engineering Change Order validation testing in May 2009 to verify material fixes and mitigations to address deficiencies identified both in the 2008 Secretary of Defense Report to Congress and by the Vice Chief of Staff of the Army (VCSA).
- The Army is working to correct additional deficiencies identified during the operational and live fire tests.
- DOT&E assesses that nine of the 23 deficiencies identified in the 2008 Secretary of Defense Report to Congress are mitigated or fixed either by material fixes or by tactics, techniques, and procedures (TTPs). Ten deficiencies still require validation and four deficiencies were not corrected.
- The 2008 Secretary of Defense Report to Congress directed that full-rate production of the Stryker Mobile Gun System (MGS) will not be approved until the identified deficiencies are corrected. The Army delayed the FY09 MGS procurement decision until not earlier than 2Q-3QFY10.
- The C-130 Transportability Key Performance Parameter is a design constraint that limits the MGS capabilities.

System

- The Stryker Family of Vehicles consists of two variants on a common vehicle platform: Infantry Carrier Vehicle (ICV) and the MGS. There are eight configurations of the ICV variant.
- The MGS was a separate acquisition decision because the system needed additional development.
- The MGS mission equipment includes the following:
  - M68A2 105 mm cannon system with an ammunition handling system
  - Coaxial 7.62 mm machinegun and a secondary M2HB, .50-caliber machinegun
  - Full solution fire control system with two-axis stabilization
  - Low-profile turret designed to provide survivability against specified threat munitions
- The system integrates the Driver's Vision Enhancer and Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance components as government-furnished equipment.

- The MGS provides the three-man crew with levels of protection against small-arms, fragmenting artillery, mines, and rocket-propelled grenades (RPGs). RPG protection is provided by add-on slat armor (high hard steel arranged in a spaced array).

Mission

- The Stryker Brigade Combat Team uses MGS to create openings in walls, destroy bunkers and machinegun nests, and defeat sniper positions and light armor threats. The primary gunnery systems are designed to be effective against a range of threats up to T-62 tanks.
- The MGS operates as a three-vehicle platoon organic to the Stryker infantry company or as a single vehicle in support of a Stryker infantry platoon.

Prime Contractor

- General Dynamics Land Systems, Sterling Heights, Michigan

Activity

- The Army delayed the FY09 MGS procurement decision because an integrated configuration for RPG protection and reliability corrections will not be available for verification before 2Q-3QFY10. In 2008, the Secretary of Defense Report to Congress directed that full-rate production of the MGS will not be approved until the deficiencies identified in the report are corrected.
- In March 2009 the VCSA prioritized three additional deficiencies (trigger delay, reboot time, and gun tube stabilization) that had been identified by the Army Training and Doctrine Command and the Armor School (system proponent) as the users' top three MGS deficiencies that must

be mitigated. This raised the total number of deficiencies that must be corrected or mitigated to 23.
- ATEC conducted Engineering Change Order validation testing from January to October 2009 to verify material fixes and mitigations to address the three deficiencies identified as priorities by the VCSA.
- ATEC conducted a developmental test/operational test in July 2009. This event evaluated five fixes and seven TTPs that correct or mitigate 12 of the 23 identified deficiencies.
- The Army, in consultation with DOT&E, submitted reports to Congress in December 2008 and July 2009 updating the status of actions taken by the Army to mitigate all Stryker MGS deficiencies as directed in Section 115 of the Duncan Hunter National Defense Authorization Act for FY09.

Assessment
- The program has mitigated, by either material fixes or TTPs, nine of the 23 deficiencies identified in the 2008 Secretary of Defense Report to Congress or by the VCSA. Of the remaining 14 deficiencies, solutions for 10 deficiencies have been identified by the program, but the corrective actions have not yet been applied and evaluated. Four deficiencies – gun pod protection, low ammo sensor, hydraulic circuit separation for redundancy, inadequate ready load for 7.62 coaxial machine gun - have not been satisfactorily corrected.
- Integration of software version 2.3 reduced the incidence of trigger delay to a level accepted by the user. Integration of software 2.5 provided increased gun stabilization and reduced the number of gun tube strikes on the back deck of the vehicle. The MGS retained its boresight on the occasions that the gun tube did strike the back deck of the vehicle.
- The Abrams Commanders Display Unit is not susceptible to electromagnetic interference and provided better resolution to the vehicle commander than the original Amber Monochromatic Display Unit.
- Redundancy in the hydraulic circuit will potentially be accomplished through a redesign of the circuitry and will only be accomplished with the Stryker Modernization Program.
- In the 2007 Beyond Low-Rate Initial Production (BLRIP) Report, DOT&E assessed the MGS as not operationally effective in the degraded mode. The current protection of the gun pod meets the Operational Requirements Document Change One approved requirement, and is not anticipated to be upgraded by the program. DOT&E assesses that not upgrading gun pod protection increases MGS vulnerability and increases the likelihood of the MGS operating in a degraded mode.
- The C-130 Transportability Key Performance Parameter is a design constraint that limits the MGS capabilities. Because of size and weight constraints for transporting equipment on the C-130, there is a limitation on the size and weight of the MGS. This limit impacts several survivability deficiencies including the Commander's Weapon Station, protection of 105 mm ammunition, gun pod protection, and hydraulic circuit separation. These deficiencies will potentially be addressed as part of the Stryker Modernization Program with Milestone B planned for in FY11.

Recommendations
- Status of Previous Recommendations. The Army satisfactorily addressed five of the eight previous recommendations through either material fixes or the use of TTPs. The remaining recommendations merit additional emphasis.
- FY09 Recommendations. As part of our coordination with the Army as directed in Section 115 of the FY09 National Defense Authorization Act, DOT&E recommended:
  1. Continue to improve Mission Equipment Package Reliability and verify corrective actions during an operational gunnery event.
  2. Finalize configuration for Stryker Reactive Armor Tile (SRAT) and schedule live fire testing in order to validate the SRAT design and configuration.
  3. Increase gun pod protection.
  4. Develop an audio or visual cue to indicate low ammo to the gunner for the 7.62 mm coaxial machine gun.
  5. Continue to replace the Amber Monochromatic Display Unit with the Abrams Commanders Display Unit.
  6. Proceed with the Stryker Modernization Program to completely fix deficiencies identified in the 2007 BLRIP that require an integrated solution.