Program Executive Office Ground Combat Systems (PEO GCS) Leads Combat Vehicle Modernization

Anthony Desmond

Over the last 40 years, the U.S. Army's ground combat fleet has provided the heavy muscle of the world's premier ground combat force. The Army's "Big Five" modernization strategy, started in the 1970s, provided the Army with the M1 Abrams and M2 Bradley Family of Vehicles (FOV). These vehicles spearheaded the coalition victory over Iraq in *Operation Desert Storm*, and, in conjunction with the M109A6 Paladin self-propelled howitzer, provided the ground combat power to overthrow the Iraqi government in 2003.

A Bradley Fighting Vehicle with the 2nd Battalion, 69th Armor Regiment, 3rd Heavy Brigade Combat Team, 3rd Infantry Division, rolls back into Forward Operating Base Reno during a training exercise at Fort Irwin, CA. The Ground Combat Vehicle will replace the IFV variant of the Bradley. (U.S. Army photo by 1LT Duncan MacQueen IV.)

The M1 Abrams and M2 Bradley FOV have provided essential ground combat power to U.S. forces. Here, an M1A1 Abrams tank fires at Besmaya range, Iraq, April 14, 2010, during a partnered firing exercise with the Iraqi army. (U.S. Army photo by PFC Jared Eastman.)

However, lessons learned from the last 8 years of warfare identified common capability gaps in all of our platforms, including the Stryker FOV. The greatest gap was in survivability, especially against lower intensity conflict weapons, such as rocket-propelled grenades, improvised explosive devices (IEDs), and under-armor blast from explosives or artillery shells. Our solutions ranged from the slat armor that was so effective for the Stryker, to the Tank Urban Survival Kits and Bradley Urban Survival Kits for protection of the Abrams and Bradley, to the Counter-Radio Controlled IED Electronic Warfare System that can jam detonation signals. These have all been effective, but at the cost of extra weight and power requirements that have reduced or eliminated the reserve space, weight, and power capability of the vehicles. In addition, the aging of the fleet, along with the inevitable obsolescence issues inherent in 40-year-old platforms, have significantly driven up the Army's operations and support costs.

The cornerstone of the future ground combat force will be the new Ground Combat Vehicle. Using the best of today's mature technologies, the Ground Combat Vehicle will be able to combine unparalleled effectiveness and suitability into an Infantry Fighting Vehicle (IFV) that will be dominant on any future battlefield, urban or rural.

Using the best of today's mature technologies, the Ground Combat Vehicle will be able to combine unparalleled effectiveness and suitability into an IFV that will be dominant on any future battlefield, urban or rural.

However, it will take considerable time to replace the 30,000-plus tracked vehicles in the Army's combat fleet. The initial increment of the Ground Combat Vehicle, as a replacement for the IFV variant of the Bradley, is slated to replace approximately 51 percent of the Bradley FOV and only 18 percent of the total current tracked vehicle fleet. When we field new brigade combat teams within the Army Force Generation model, the brigade must act as a single formation, able to maneuver in the same environment, fight against the same threat, interoperate on the same network, and be sustained under the same logistics footprint as a unified fighting force.

Modernization

Using technologies from the Ground Combat Vehicle program as well as other Army modernization programs, PEO GCS will execute a series of affordable, incremental recapitalization and reset programs for the Abrams, Bradley, and Stryker platforms, as well as execute a Paladin obsolescence program to ensure that the single fleet can address common capability gaps and continue to operate on the modern battlefield.

In planning these programs, we are following a series of key modernization tenets:

- Addressing the trends driving the need for combat vehicle modernization, including the need to use integrated lethal and nonlethal effects in net-enabled operations to proactively adjust to and defeat an adaptive enemy.
- Using a systems engineering approach within a fleet context. Where possible, we will use a common systems engineering approach across the entire fleet, harmonizing requirements, developing common functional and physical architectures, and using common design solutions to speed development time, leverage scarce development and test dollars, and minimize the need to mature multiple technologies.
- Coordinating/synchronizing within the Assistant Secretary of the Army for Acquisition, Logistics, and Technology. In conjunction with PEO Integration and our sister PEOs, we will work on development of common open systems architectures and interfaces and standards to ensure "plug-and-play" interoperability between ground platforms and the radios, sensors, and other components developed by other PEOs.
- Buying back space, weight, power, and cooling capability. The first increment of each modernization plan will incorporate mature technologies to allow us to recover size, weight, and power margins through chassis and power generation upgrades that will enable the integration of future mission equipment packages, theater-provided equipment, and transport layer and battle command hardware and software to ensure brigade interoperability. Our future increments will incorporate other mature technologies, including vehicle electronics and drive upgrades, health monitoring to enable condition-based maintenance, and other components, as funding permits.

The Army's ground combat fleet is currently the world's best. Selected, judicious modernization will ensure that it will continue to support the Nation's needs.

ANTHONY DESMOND is the Director of Systems Engineering and Integration (G7) and Chief Systems Engineer for PEO GCS. He holds a B.S. in both chemical engineering and biomedical engineering from Carnegie Mellon University and an M.S. in systems management from the Florida Institute of Technology. Desmond is Level III certified in systems planning, research, development, and engineering (SPRDE)-systems engineering; SPRDE-program systems engineer; and program management. Desmond is a U.S. Army Acquisition Corps member.

PEO GCS will execute a series of affordable, incremental recapitalization and reset programs for Stryker vehicles. Here, a completed Stryker awaits transportation to its unit, recently returned from Iraq. (U.S. Army photo by Barbara Toner, U.S. Army Sustainment Command.)