

# PEO GCS — Retrofit, Reset, and Battle Damage Repair (BDR) of Stryker Vehicles

Project Management Office Stryker Brigade  
Combat Team (PMO SBCT) Logistics Division

**T**he mission of Program Executive Office Ground Combat Support's (PEO GCS's) PMO SBCT is to develop, produce, field, and sustain the full range of safe, reliable, supportable, and effective systems while developing the acquisition and program management framework to transform the Army to the Future Force. Strategic responsiveness, holistic survivability, force protection, superior situational awareness, full-spectrum capability, platform commonality and efficiencies, reduced footprint, and anticipatory logistics are just some of the capabilities that the SBCTs bring to the battlefield. Reset, retrofit, and BDR are key to maintaining these capabilities. These enablers ensure that Stryker vehicles are properly restored, equipped, and ready for combat. Together, these activities allow the SBCTs to maintain highly operational, current configuration combat vehicles with the latest technology and safety engineering efforts available.

Strykers with retrofits applied await loading to a ship in San Diego in November 2007. (Photo by Al Madrona, GDLS.)

PMO SBCT has established a process to complement the SBCT Army Force Generation (ARFORGEN) Model cycle while not interfering with units' training schedules. This process takes a considerable amount of planning, synchronization, and, most importantly, flexibility to accommodate the ever-changing timelines.

## Retrofit

Prior to a unit deploying to *Operation Iraqi Freedom (OIF)*, PMO SBCT retrofits its Stryker vehicles, ensuring that they are at current production configuration, and installs Stryker *OIF* kits. Production configuration retrofits ensure that Strykers have the latest technology and safety engineering efforts available. These consist of software upgrades, human factor improvements, and communication improvements that are relevant to send the Stryker to war. The *OIF* kit is equipment developed specifically for the *OIF* mission, and continues to transform with the changing threats in *OIF*, as well as from new requirements derived from lessons learned. Many of these new requirements come through Operational Needs Statements from the SBCTs that are approved by Army Headquarters/G-3/G-8, and some are identified through quarterly program manager (PM)/U.S. Army Training and Doctrine Command Capabilities Manager SBCT visits to *OIF*.

The retrofit operation is a partnership between PMO SBCT and General Dynamics Land Systems (GDLS). A typical retrofit operation takes place at the port of debarkation after the unit has completed a Mission Readiness Exercise. The team is only afforded 30 days on average to retrofit an entire SBCT (approximately 320 Stryker vehicles). Since the above timeframe is marginal, PMO SBCT identifies other times within the ARFORGEN cycle to

apply needed retrofits. Major challenges include coordinating unit schedules, deliveries, parts availability, and labor.

To date, there have been seven SBCT deployments to *OIF* with two more scheduled for the near future. The first SBCT deployed in December 2003 and looked much different than the Strykers in *OIF* today. Over the past 7 years, PMO SBCT has applied multiple retrofits to the Stryker, including:

- Slat Armor.
- Exhaust Deflector.
- Swing-Arm Mounts.
- Common Ballistic Shield.
- Fire Support Vehicle and Reconnaissance Vehicle Cupola Shields.
- Driver Enhancement Kit.
- Air Warrior Micro-Cooling Kit.
- Hull Protection Kit.
- Blue Force Tracker.
- Tacticomp™ wireless and Global Positioning System(GPS)-enabled hand-held computer.
- One Station Remote Video Terminal.
- Counter Remote Control  
Improvised Explosive Device (IED)  
Electronic Warfare Devices.

Furthermore, throughout the years many of the existing Stryker components have been retrofitted to provide improved capabilities. Upgrades have been provided to the software, remote weapon station installment, driver vision enhancement tools, and GPS capabilities. Also, PMO SBCT has developed the Tire Fire Suppression Kit, which was to be applied this summer, and the Mine Protection Kit, to be applied in 2009.

## Battle Damage

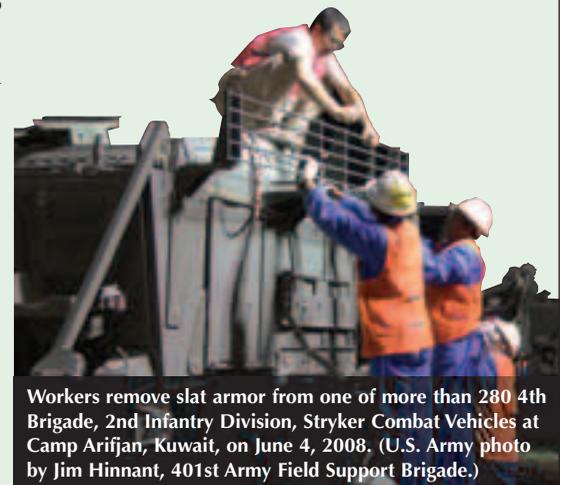
In the event a Stryker is damaged during combat operations, it enters the Stryker BDR (SBDR) Program, which consists of above-field-level repair conducted at BDR Facilities

(BDRFs) at Camp As Sayliyah, Doha, Qatar, or Anniston Army Depot (ANAD), Anniston, AL.

The Qatar BDRF repair capability is six Strykers per month, while the ANAD BDRF is capable of repairing up to 12 Strykers per month. GDLS completes all repair work and manages the parts at the Qatar BDRF through contract with PM Stryker in Warren, MI. The ANAD BDRF is also managed by contract with PM Stryker and is a cooperative effort between GDLS and ANAD. Through this cooperative partnership agreement, ANAD provides touch labor while GDLS manages the parts.

## Repair Process

The repair process starts with a Limited Technical Inspection at the Forward Repair Area (FRA) in Balad, Iraq. Damaged and missing parts, as well as mandatory replacement parts, are ordered and outstanding retrofits are identified. At the FRA, a preliminary structural assessment on vehicle damage is completed and the results are transmitted to the GDLS structural engineers who, in turn, develop repair procedures based on the type and level of damage. The repair location selection is based on a number of factors including the status of the Ready-to-Fight (RTF) fleet, unit needs, and BDRF capacities.



Workers remove slat armor from one of more than 280 4th Brigade, 2nd Infantry Division, Stryker Combat Vehicles at Camp Arifjan, Kuwait, on June 4, 2008. (U.S. Army photo by Jim Hinnant, 401st Army Field Support Brigade.)



Before BDR: Stryker damaged by an IED. (Photos by Tim Armstrong, GDLS Qatar.)



After: Repaired Stryker is now able to return to securing troops moving into battle.

At home station, the prime contractor for the vehicle reset, GDLS, temporarily signs for the vehicles from the unit and conducts a 1-month Low-Rate Initial Production (LRIP) period to train the newly hired workforce required for each Stryker reset. The LRIP period's purpose is to verify the layout of site equipment and to optimize the quality of work from the new workforce members prior to the start of the 4-month Full-Rate Production period.

Once the repair location is determined, the vehicle is transported by truck to Kuwait to be placed on a boat for ANAD or Qatar. Some vehicles are sent directly from Balad Air Base to ANAD by U.S. Air Force TP-4 (space-available aircraft) depending on mission needs.

The actual repair of a Stryker is a 7-step process that consists of induction, disassembly, fabrication and welding, re-assembly, quality inspections, road test, and Defense Contract Management Agency acceptance. Strykers repaired at Qatar are sent to the RTF in Balad, whereas Strykers repaired at ANAD are sent to support fielding commitments.

The SBDR Program has been crucial in supporting the global war on terrorism (GWOT), and, to date, more than 225 Strykers have been repaired and returned to warfighters on the battlefield.

**Reset**

The ARFORGEN Model outlines the process and timelines for the deployment and redeployment of units. While it is most closely associated with unit redeployment, equipment reset is actually the first step in the ARFORGEN Model for the unit's next deployment.

The Stryker Reset Program is unique within the overarching U.S. Army

Materiel Command Reset Program. The reason for this is that unlike most vehicle programs, Stryker lacks a non-combat replacement fleet from which to issue fresh vehicles to a redeploying unit. This dictates that Stryker reset be conducted at the unit's home station to provide vehicles in time for the unit's next deployment training window.

To meet the ARFORGEN timeline, Stryker reset activities begin when the unit redeploys from Iraq into Kuwait. All reset actions in Kuwait are designed to mitigate risk to the 4-month reset at home station.

Upon arrival in Kuwait, various add-on armor components are removed from the vehicles. Removal allows a full validation inspection of the vehicle for parts requiring replacement during reset. This inspection is a preemptive action to ensure that a parts shortage does not delay the reset at home station. A structural assessment is also done on selected vehicles in Kuwait to determine if higher level structural repair is required at ANAD. Additionally, the 120mm Recoil Mortar Systems from the SBCT's 36 Mortar Carrier Vehicles are shipped to home station from Kuwait to ensure their reset is complete at the same time as their chassis' reset.

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Stryker vehicle reset includes repair and servicing to the Full-Up Power Pack, installation of mandatory replacement parts, and an inspection/replacement of the lower suspension components. PMO SBCT works closely with other program offices to ensure that all electronic components that have been reset are installed and validated in the vehicles prior to handoff to the unit.

At the conclusion of reset, the unit's Stryker vehicles have been updated to the latest configuration and are ready for their next deployment. With the future availability of noncombat replacement vehicles from a Stryker Equipping Force Pool, PMO SBCT is exploring the cost-savings and feasibility of conducting all Stryker resets at a centralized facility.

PMO SBCT continues to plan for a fluid and adaptable environment to serve the warfighter in the GWOT. As the threat matures and the insurgent's weapons become more advanced, so too do the Stryker's. PMO SBCT, along with its GDLS partner, will remain ready to repair Strykers and continue to reset the SBCTs in the future to ensure that units are well prepared for their next engagement.

*Article provided by PMO SBCT Logistics Division.*