



PEO Ammunition — We Make the Ammo, You Make the Difference

LTC Karl Borjes, LTC John Lewis, and LTC Joseph S. Minus Jr.

According to BG William N. Phillips, Joint Munitions and Lethality Life Cycle Management Command Commander and Program Executive Officer, Program Executive Office Ammunition (PEO Ammo), the PEO's first priority is the Soldier. "I ask myself every day what we can do to help our Soldiers be successful in their efforts; to give them the best capabilities we can provide so they can return home safely. We see that as our primary mission."

SPARK, shown installed here, is one of the Army's Top 10 Greatest Inventions of 2007. The rollers force the blast from IEDs down and away from the vehicle. (U.S. Army photo.)

The IA on this Husky mine detection vehicle allows for standoff interrogation of suspected IEDs. (U.S. Army photo.)



PEO Ammo is joined in this mission by four program offices:

- Program Manager Close Combat Systems (PM CCS) — responsible for close combat, force protection, and assured mobility capabilities across full spectrum operations.
- PM Combat Ammunition Systems (CAS) — responsible for acquisition and life-cycle management of cannon artillery munitions, mortar weapons, fire control, and munitions.
- PM Maneuver Ammunition Systems (MAS) — responsible for lethality for the current and future small-, medium-, and large-caliber direct-fire ammunition systems as well as the individual Soldier.
- PM Joint Services (JS) — responsible for oversight of the Single Manager for Conventional Ammunition (SMCA) mission, demilitarization of conventional ammunition for all services, and management of the industrial base.

PEO Ammo was established Jan. 1, 2002, to develop and procure conventional and leap-ahead munitions to increase combat power to the Joint warfighter, develop and field

precision-guided munitions, and improve and sustain the conventional stockpile.

“Equally important to our mission, we want to satisfy the customer, achieve excellence while we’re doing so, and grow world-class people and teams,” said Jim Sutton, Deputy PEO Ammo.

The PEO Ammo acquisition workforce is well positioned to achieve that mission. Eighty-one percent of the employees are certified acquisition professionals in the U.S. Army Acquisition Corps, and 76 percent have completed Lean Six Sigma training.

“The result is a high-performance, results-oriented organization where everyone is committed to meeting 100 percent of our warfighter requirements,” noted Phillips. And this commitment can be seen through the organization’s efforts. PEO Ammo is responsible for nearly 350 Army programs; more than 130 materiel release actions, many of which were urgently released in support of the global war on terrorism (GWOT); and acquisition of conventional ammunition for all military services

as Executor of SMCA. The actions resulting from these responsibilities allowed the organizations to be singled out for four of the U.S. Army Top 10 Greatest Inventions of 2007.

Countering the IED Threat

A June 25, 2008, headline in *USA Today* read, “Iraq IED [improvised explosive devices] deaths down 90 percent in a year.” The drop was attributed to a number of factors including new vehicles and improved surveillance, both areas where PM CCS, Product Manager Countermine and Explosive Ordnance Disposal (PdM CM&EOD), and PdM IED Defeat/Protect Force (IEDD/PF) have had a significant impact.

The IED Interrogation Arm (IA) is a good example of a current initiative. Developed and fielded in cooperation with the Research, Development, and Engineering Command, Night Vision Electronic Sensor Directorate (NVESD) at Fort Belvoir, VA, the IA provides standoff detection of IEDs for the RG-31 and Husky mine detection vehicles. This innovation proved so effective that urgent operational need statements were approved for 150 of

them. The IA was recognized by the Secretary of the Army as one of the Top 10 Greatest Inventions of 2007.

In collaboration with the Joint IED Defeat Organization, PM CM&EOD procured and fielded the Vehicle Optics Sensor System (VOSS) for EOD and route clearance vehicles. This system provides greater standoff detection and interrogation capabilities from within a blast-protected vehicle than was previously achievable. The VOSS is a gyro-stabilized triple sensor camera system mounted on a telescoping mast integrated onto the vehicles. According to COL Ray Nulk, PM CCS, more than 200 VOSS' have been fielded so far with 338 more planned. Total VOSS program funding approaches \$400 million. This system was also recognized as an Army Top 10 Greatest Invention of 2007.

PM CM&EOD has also worked with NVESD's Countermine Division to develop Ground Penetrating Radar (GPR) for use on the Husky mine detection vehicle. The GPR is a downward looking sensor that detects low metal content antitank mines and IEDs. Future procurement of vehicle-mounted GPRs will be determined after a field assessment.

MRAP Started Here

The procurement of blast-protected vehicles formed the cornerstone of the number one program in DOD, the Mine Resistant Ambush Protected (MRAP) Vehicle program. "What some people don't realize is that the MRAP program actually started as a countermine initiative," LTC Peter Lozis, PdM CM&EOD said. "The first Interim Vehicle Mounted Mine Detection System (IVMMD) was fielded in 2003 to detect roadside

bombs in Afghanistan and Iraq. That same year, we also fielded the Buffalo Mine Protected Clearance Vehicle and the RG-31 Medium Mine Protected Vehicle. Even though these vehicles have been transitioned to the U.S. Army Tank-automotive and Armaments Command and Project Manager Assured Mobility Systems, the survivability they offer has changed the doctrine, tactics, techniques, and procedures, as well as the way we train in an asymmetrical war."

The PEO Ammo workforce consistently leaves a footprint across DOD and in the fight against the GWOT.

Listening to Soldiers — Our Most Important Tool

One of the real success stories from PM CCS' newly chartered IEDD/PF office is the Self-Protection Adaptive Roller Kit (SPARK). Since the

Left: Gyro-stabilized cameras and a 25' telescoping mast allow detection of IEDs on the move in day and night conditions. Right: A cyclone blower is mounted on an RG-31. (U.S. Army photo.)



SPARK rollers force the blast from IEDs down and away from the vehicle, providing better protection to Soldiers inside. SPARK has been a real success story for the PdM IEDD/PF office. (U.S. Army photo courtesy of the Tank Automotive Research, Development, and Engineering Center.)



beginning of the Iraq war, U.S. troops have been looking for ways to protect themselves against IEDs. That was the intent when a group of Soldiers from the U.S. Army 3rd Infantry Division created a roller system for their High-Mobility Multipurpose Wheeled Vehicle. This system eventually became the SPARK. The rollers, installed on the front of vehicles, can initiate an IED by rolling over it. The roller causes the device to detonate in front of the vehicle instead of underneath it, greatly reducing the risk of injury to the crew and battle damage to a vehicle.

SPARK, which is also on the Army's Top 10 Greatest Inventions of 2007 list, has already successfully resolved 72 events in theater and is a real standout.

"I'm proud of the product and of how we got there," Phillips said. "This started as a Soldier initiative and has continued in that vein. Not long ago, LTC Karl Borjes, PdM IEDD/PF, was in Iraq talking to Soldiers who used the SPARK. The Soldiers said they could really use lights for night ops. Borjes replied, 'We'll make it happen.' And that's exactly what they did. It's that can-do attitude that permeates this PEO and makes it possible for us to get the warfighters what they need quickly."

According to Robin Gullifer, Deputy PM IEDD/PF, the Rhino is also a Soldier-developed item. "The Rhino features a pre-detonation capability that acts as an early detonation device," she said. "Mounted to a vehicle via a universal bracket, it has

become standard equipment in theater." The Rhino can be integrated with SPARK or Cyclone, a super powerful blower that removes debris and other objects while en route.

Another new system of note is the Ground Torch — a flame thrower that burns vegetation along the side of the road. It is currently being used by the U.S. Marine Corps (USMC) and is being adopted by the Army. The plan is to deliver and field systems to theater later this year through a partnership with the Rapid Equipping Force and USMC.

Simple Solution Enhances Grenade Safety

Grenades have played a part in warfare for hundreds of years. And, for many of those years, Soldiers have been

“taping” their grenades for perceived safety or to reduce noise. However, this is a safety hazard since removing the tape can inadvertently pull the pin, resulting in serious injury. In addition, it can also obscure vital markings, such as lot numbers, so otherwise functional grenades have to be demilitarized.

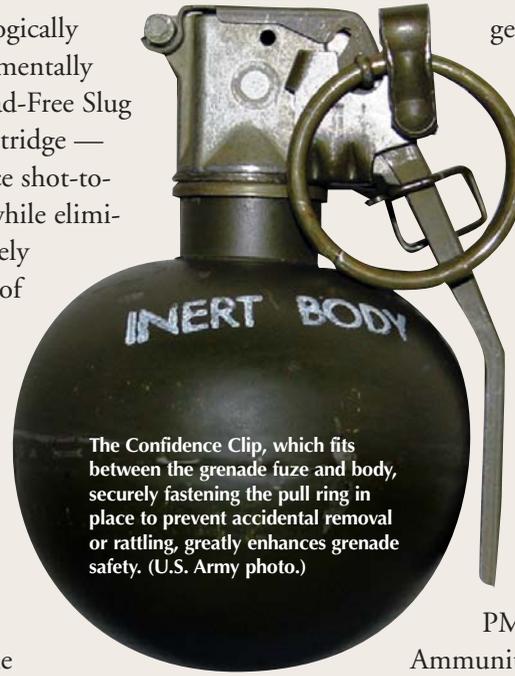
According to Kevin T. Wong, Force Application Division Chief, the Confidence Clip solves this problem. The clip is a simple device that fits between the grenade fuze and body, securely fastening the pull ring in place to prevent accidental removal or rattling. It will be incorporated into newly produced grenades as well as the existing inventory of lethal hand grenades to mitigate the unsafe, wasteful practice.

Technology Advancements Focus on Green Ammo, New Munitions, and Plant Modernization

The Green Ammo program is a joint effort between PM MAS; the U.S. Army Research Laboratory; U.S. Army Armament Research, Development, and Engineering Center; Joint Munitions Command; and the Lake City Army Ammunition Plant (LCAAP), Independence, MO, system contractor, Alliant Techsystems. The goal — to

produce a technologically advanced, environmentally friendly M855 Lead-Free Slug (LFS) 5.56mm cartridge — will greatly enhance shot-to-shot consistency, while eliminating approximately 2,000 metric tons of lead currently left in theater and on training ranges each year. Other improvements include an improved propellant and aerodynamics, reduced flash, and higher velocity. The M855 LFS, which will be in theater in 2009, is compatible with the M4, M16, and M249 weapons systems. PM MAS is also investigating incorporation of this technology into larger small-arms calibers.

Another advancement is the development of the M100 Grenade Rifle Entry Munition. This lightweight, muzzle-launched, standoff-breaching munition is fired from the M16/M4 series weapon using current 5.56mm service ammunition (either M855 ball or M856 tracer). The munition’s main charge detonates upon reaching its tar-



The Confidence Clip, which fits between the grenade fuze and body, securely fastening the pull ring in place to prevent accidental removal or rattling, greatly enhances grenade safety. (U.S. Army photo.)

get, breaching an opening through secured doors and windows. The munition also provides friendly forces the necessary capability to gain access into sealed buildings in urban threat areas. “Most importantly,” said Rob Zienowicz,

PM Soldier Weapons
Ammunition Team Lead,

“it provides enhanced protection for Soldiers by allowing them to breach doors at a safe range.”

The LCAAP modernization effort is a 7-year, \$242 million endeavor targeted at improving production facilities to better support the war-fighter. LCAAP is the only remaining DOD-owned small caliber ammunition plant in the U.S. and produces more than 80 percent of the ammunition used by U.S. military services. Built in the early 1940s, many of the production lines have had little or no upgrades in more than 60 years — yet the demand for ammunition in support of GWOT has increased from approximately 400 million rounds per year in FY02 to more than 1.5 billion rounds in FY08.

This increased demand exposed vulnerabilities in the aged facilities. The modernization plan, which includes modern control systems and the addition of Occupational Safety and Health Administration safety



The LCAAP modernization effort will include new and refurbished equipment to improve production of ammunition to better support the warfighter. (U.S. Army photo.)

features, will ensure an annualized production capability of 1.6 billion cartridges for 5.56mm, 7.62mm, and .50-caliber weapons and greatly improve production reliability, availability, maintainability, improved safety, and environmental emissions.

“A key focus of the modernization is to implement Lean Manufacturing initiatives,” said Chris Grassano, PM MAS. “The effort baselines Lean metrics using value stream maps and simulations, and then develops projects to reduce waste, better utilize floor space, increase flexibility, and incorporate process improvements.”

Precision Munitions Give Soldiers New Capabilities

One of PM CAS’ main focus areas is fielding precision munitions like Excalibur and the Precision Guidance Kit (PGK). With the successful introduction and use of Excalibur in



The technologically advanced, environmentally friendly M855 LFS 5.56mm cartridge will enhance shot consistency and eliminate approximately 2,000 metric tons of lead currently left in theater or on training ranges each year. (U.S. Army photo.)

theater and successful PGK demonstration, the future of cannon-fired precision munitions has arrived. Excalibur provides precision fires capability and PGK has demonstrated a near-precision capability to fill the gap between conventional artillery and precision fires. For

more than a year now, U.S. forces in *Operations Enduring* and *Iraqi Freedom* have been using Excalibur — a 155mm precision-guided, long-range artillery system — to provide deployed forces with cannon-fired precision effects.

Also selected as a Top 10 Army Greatest Invention of 2007, Excalibur’s Global Positioning System (GPS)/ Inertial Navigation System delivers a near-vertical terminal angle attack and less than a 10-meter Circular Error Probable (CEP) accuracy. Its high-explosive (HE) warhead has three fuzing modes (point detonating, proximity, and delay) that make Excalibur effective against a wide variety of target types including personnel, structures, and light armored vehicles. The weapon system’s precision accuracy and small warhead ensures lower collateral damage enabling brigade combat teams to provide indirect fire support in complex and urban terrain.

“All of these Top 10 inventions have an impact every day on the lives of the men and women in harm’s way,” said GEN Benjamin S. Griffin, U.S. Army Materiel Command Commanding General. “When you talk to units in the field, they know about them — they use them.”

PGK Increases Cannon Artillery Accuracy

The PGK — a GPS guidance kit that includes fuzing functions that will improve the accuracy of 155mm and 105mm conventional artillery munitions — tracks the projectile position location and determines trajectory navigation solutions. The result is improved accuracy, quicker target kills, less collateral damage, and reduced logistics burden. Increment 1 focuses on integrating PGK with the M107, M795, and M549/A-1 HE 155mm artillery projectiles. Follow-on increments will add the 105mm HE artillery projectiles, 105mm and 155mm Cargo and Bulk Filled Projectiles, improved accuracy, and Future Combat Systems Non-Line-of-Sight Cannon compatibility. The Increment 1 accuracy requirement



The PGK increases cannon artillery accuracy by tracking the projectile position location and determining trajectory navigation solutions. This results in improved accuracy, quicker target kills, less collateral damage, and reduced logistics burden. (U.S. Army photo.)



3rd Battalion, 321st Field Artillery Regiment Soldiers inspect the Army's new GPS-guided Excalibur round before firing it for the first time at Camp Blessing, Afghanistan. (U.S. Army photo by SGT Henry Selzer, 173rd Brigade Combat Team Public Affairs.)

is less than 50-meter CEP threshold and less than 30-meter CEP objective. Increment 1 Systems Development and Demonstration was competitively awarded to Alliant Techsystems in May 2007 following a competitive phase that included a shoot-off.

The program is on track to achieve Initial Operational Capability in

2010. These efforts are just a few examples of how PEO Ammo and its subordinate commands are achieving their goals of supporting the Soldier, winning the GWOT, preserving an agile workforce, and enhancing both organic and commercial strategic capabilities.

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LTC JOSEPH S. MINUS JR., PdM Excalibur, holds a B.A. in political science from Davidson College and an M.A. in information management from Webster University. He is a U.S. Army Command and General Staff College graduate and is Level III certified in program management, test and evaluation, and information technology. He is an AAC member.

Authors' Note: Also contributing to this article were Gregory DeRosa, Brian M. Green, Robert Muth, LTC Jeffrey Woods, and Robert Zienowicz.

