

**ARMY**

**AL&T**

January - March 2008



# Army Ammunition

On Target and More Lethal Than Ever



UNITED STATES ARMY  
**USAASC**  
ACQUISITION SUPPORT CENTER

## From the Army Acquisition Executive Joint Munitions & Lethality LCMC Provides Critical Resources to Our Warfighters



Our constant first priority within the acquisition, logistics and technology (AL&T) community is providing world-class weapon systems and equipment to the warfighter, and I am proud of my entire organization's success in fulfilling this important duty. Still, while at war, we must continue to work hard and work together to get even better capability to warfighters — especially those in the warfight right now — much faster. One way we are doing this is by bringing both the acquisition and logistics communities together. That was our aim when the Life Cycle Management Command (LCMC) concept was formalized in August 2004 with the goal to provide products to the Soldier faster, make good products even better, minimize life-cycle costs, and enhance synergy and effectiveness by enabling a closer relationship between the U.S. Army Materiel Command's major subordinate commands and the program executive offices (PEOs).

In the last few years, we have established four LCMCs in the areas of weapons, electronics, combat vehicles, aviation and ammunition. Our LCMCs provide critical resources to our warfighters at the right time, right place and right price. As I have stated before in this very publication, our LCMC effort to streamline multiple Army acquisition and logistics programs and organizations into leaner, more organized commands has been successful. In this edition, we highlight our newest LCMC — the Joint Munitions and Lethality (JM&L) LCMC, Picatinny Arsenal, NJ.

During my visits to the JM&L LCMC headquarters and other commands and organizations within its umbrella, I've seen firsthand how military personnel, civilians and contractors take great pride in their jobs because they know the importance of providing ammunition to our warfighters. Munitions are critically important. In fact, it is often said that ammunition is the lifeblood of the military. Enhanced lethality is also critically important to our men and women, especially those on the front lines prosecuting the global war on terrorism. When we stood up the JM&L LCMC in November 2006, we expected great things from the organization's men and women, and they are surpassing our expectations.

The JM&L LCMC's responsibilities to warfighters begin with making sure the partnership with its component organizations is focused on providing superior products, support and services. The alliance is comprised of three major organizations: PEO Ammunition (Ammo) and the U.S. Army Armament Research, Development and Engineering Center (ARDEC), both at Picatinny Arsenal; and the Joint Munitions Command (JMC), Rock Island, IL. Let me briefly describe the individual responsibilities.

- JM&L LCMC leads the Army's full ammunition development, procurement and technology capabilities while providing input to senior Army and DOD leaders on current and future requirements of all ammunition life cycle aspects.

• PEO Ammo develops and procures conventional and "leap-ahead" munitions to increase combat power to warfighters. In doing so, the PEO also establishes defined and prioritized areas for science and technology investment using an applied structure analysis and determining a commonality of technical solutions among its assigned program managers.

- ARDEC develops and maintains a world-class workforce to execute and manage integrated life-cycle engineering processes required for the research, development, production, field support and demilitarization of munitions (small, medium and large caliber; propellants; explosives; logistics; packaging); weapons, including non-line-of-sight fire, nonlethal and autonomous; fire control (battlefield digitization, embedded weapon systems software, aero ballistics and telemetry); and associated items.

- JMC is responsible for manufacturing, procuring, storing, issuing and demilitarizing conventional ammunition for U.S. military services, federal agencies and allied nations as directed by the U.S. Department of State. JMC also serves as the DOD operating agency for the Single Manager for Conventional Ammunition (SMCA) mission, in which JM&L LCMC Commanding General BG William N. Phillips is the SMCA. Through this mission, all U.S. Armed Services branches communicate their ammunition needs on the same page.

These organizations are on the cutting edge in identifying the latest technologies, developing them into viable, quality munitions, mass producing them and getting them to our warfighters in a timely and cost-effective manner. From creating Product Manager Improvised Explosive Device/Defeat, to modernizing our ammunition plants, to urgently fielding the award-winning Excalibur artillery projectile, this alliance is helping our warfighters accomplish their missions quickly and decisively while simultaneously streamlining the ammunition acquisition process.

The benefits to the Army and our sister services — and certainly to our warfighters — are enormous, both in terms of getting better weapon systems and equipment to the warfighter much faster as well as sustaining those items once they get where they need to be. And, for the Army and America's taxpayers, we're getting these things done more cheaply than ever before. HOOAH!

**Claude M. Bolton Jr.**  
Army Acquisition Executive



# ARMY AL&T

January - March 2008

# ACQUISITION, LOGISTICS & TECHNOLOGY

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**The Joint Munitions and Lethality Life Cycle Management Command (JM&L LCMC) Provides the Best Capability to U.S. Warfighters**

Meg Williams and Trish Bryan

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January - March 2008

# ACQUISITION, LOGISTICS & TECHNOLOGY

## Farewell From the Editorial Staff

The *Army AL&T* Magazine editorial staff would like to thank the man who has chaired our Editorial Advisory Board (EAB) for the past 6 years. Our publication's strongest supporter, Army Acquisition Executive and Assistant Secretary of the Army for Acquisition, Logistics and Technology Claude M. Bolton Jr. helped guide the direction and scope of *Army AL&T* Magazine throughout his remarkable tenure. His insight, knowledge and expert guidance enabled us to provide our readers with the latest information regarding the Army's science and technology initiatives, research and development accomplishments, Future Combat Systems capabilities, best business practices, and career and professional development policies. Secretary Bolton knows that Soldiers rely heavily on the Acquisition, Logistics and Technology (AL&T) Workforce for their weapon systems, equipment, logistics and support services, and he has worked tirelessly to ensure that our warfighters have the technological advantage to remain the finest fighting force on Earth.

We thank Secretary Bolton for his dedicated service to the AL&T Workforce, the U.S. Army and this proud Nation. It was our distinct honor and privilege to have worked so closely with him as our EAB Chair. We wish him a fond farewell and continued success in all his future personal and professional endeavors.

*Army AL&T Magazine*  
Editorial Staff

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*This medium is approved for official dissemination of material designed to keep individuals within the Army knowledgeable of current and emerging developments within their areas of expertise for the purpose of enhancing their professional development.*

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# Farewell to the Acquisition, Logistics and Technology Workforce

## From the Army Acquisition Executive

I depart my position as Assistant Secretary of the Army (Acquisition, Logistics and Technology) [ASAALT] and Army Acquisition Executive on Jan. 2, 2008 — 6 years to the day from taking office. These years have been both challenging and rewarding. *Challenging* in addressing the complexities of providing Soldiers with the right product, at the right time and at the right place to meet their needs at a time when we are a Nation at war. *Rewarding* in that it was a wonderful time for me personally to work closely with a world-class team in the Army; in the Navy, Marine Corps and Air Force; the Office of the Secretary of Defense; Congress; academia; and industry — both domestic and international. Together, we always did the right thing for our Soldiers.

As I look back on my first day on the job, I remember a brief meeting with then-Secretary of the Army Tom White. His advice was to do three things: (1) take care of programs; (2) take care of the acquisition workforce; and (3) take care of the industrial base. I had my mission and immediately turned my focus to programs, people, production and improvement. During my first year, my efforts were concentrated on programs. My second year was devoted to people and my third year was focused on the industrial base. I have continued to emphasize these areas of priority, and all along the way, we have seen improvements. I am equally as proud of the fact that we have also embedded and institutionalized those improvements for lasting change. Dedicating a share of ASAALT resources to strategic planning has been instrumental to effecting the lasting change. Let me briefly highlight some significant accomplishments.

During the early years, there were significant tactical challenges. For our brave men and women fighting the global war on terrorism in Afghanistan, Iraq and elsewhere in the world, we surged to provide body armor, armored vehicles, Soldier equipment and training. We were able to meet these tactical challenges

in a very short period of time, and our success ensured that those in harm's way had what they needed to fight and win and, to the best of our ability, return home safely.

While meeting our short-term challenges, we learned to equip and field items quickly so our Soldiers had what they needed — from a rapid equipping standpoint — within hours to 90 days. In addition to the Rapid Equipping Force, the Rapid Fielding Initiative has become the largest equipment fielding effort since World War II and provides 50 mission-essential equipment and clothing items, including the Advanced Combat Helmet and accessories, weapons accessories, knee and elbow pads, and hydration systems. To meet urgent needs on the battlefield, we learned to do rapid acquisition very efficiently and effectively.

Early in combat operations, we experienced losses of aviation platforms and, most regrettably, our Soldier aviators. We moved quickly and with great success to install state-of-the-art survivability equipment on all Army rotary- and fixed-wing aircraft in theater for enhanced flight crew and platform protection.

Moving forward, Future Combat Systems [FCS] remain at the center of our broader modernization strategy. While large and complex, it is a model program that embraces the “Big A” approach to acquisition where all stakeholders, including the requirements community, the “little a” community, testers, the sustainment community, Soldiers and others work together toward a common goal. Now in the System Design and Development phase, FCS, after 50 months, is one percent below cost, on performance with some spin-outs downrange and only a few days behind schedule. It is an amazing accomplishment that involves first-rate teamwork among the Army and our sister services, the United Kingdom and 600 companies. FCS is truly a success story. Moreover, all Army programs — more than 550 of them from every program executive office

[PEO] — are doing well. In fact, they are in much better shape than when I arrived 6 years ago.

Our world-class science and technology [S&T] community — from our University Affiliated Research Centers to our scientists and engineers — is second to none. S&T has a pivotal role in pursuing technologies to maintain and enhance the Army's already advanced capabilities. Our dynamic and responsive S&T portfolio is focused to enable specific new capabilities in the Future Force while remaining agile to satisfy operational needs of the Current Force.

The United States remains the world's leader in safely destroying stockpiled chemical weapons covered by the Chemical Weapons Convention. In meeting our international treaty obligations 7 months early, 2007 turned out to be our most successful year ever. We are more than 50 percent finished with our task of destroying the remaining stockpile of chemical weapons.

Another significant accomplishment this year was the completion of work and closure of the Iraq Project and Contracting Office [PCO]. This follows 3 years of managing and coordinating the Iraq reconstruction program where we started some 4,000 projects and completed more than 3,000. These projects included water, electricity, sewage treatment plants, roads, schools, hospitals, fire stations, oil pipelines and other key infrastructure programs that are vital to enabling the people of Iraq to press ahead with the difficult task of establishing a viable government and defending it. The PCO was instrumental and its people remarkable. They worked incredible hours under dangerous and difficult conditions. Two PCO personnel made the ultimate sacrifice: Ms. Barbara C. Heald and LCDR Keith Taylor. Their dedication and sacrifice served to encourage us all to work harder for a free and democratic Iraq.

An extremely important concept — Life Cycle Management — was formalized in 2004 and presently we have four Life Cycle Management Commands [LCMCs]. During my recent visits to the Aviation and Missile LCMC in Huntsville, AL, and the Communications Electronics LCMC at Fort Monmouth, NJ, I saw firsthand that the leadership and workforce are taking this on as their own and working together to realize

the original goal: to provide products to the Soldier faster, make good products even better, minimize life-cycle costs and build a closer working relationship between the Army Materiel Command's major subordinate commands and our PEOs. The success we have seen so far is significant. When the war ends and the budget gets squeezed, concepts like Life Cycle Management will help our Army leaders and Soldiers prepare for the next war. Without this concept in place, I would have grave concerns about our ability to surge in the future and give our Soldiers what they will need to accomplish their mission and return home safely.

Finally, as we look at the successful work being done, I am pleased that Mine Resistant Ambush Protected [MRAP] vehicles are being delivered to our Soldiers in the field. These vehicles will not only protect them, but save their lives as well.

All the foregoing would not have been possible without a tremendous workforce and our industry partners. We are fortunate to have outstanding military and civilian leadership, well-trained and well-equipped Soldiers and a world-class acquisition workforce on duty 24/7. Our accomplishments as a team provide our new leadership with a strong foundation for continued success.

Thank you for allowing me the pleasure of being your leader during this historical time for the United States Army and our Nation. The hardest part, I am finding, is leaving such a great team that I truly regard as my family.

I wish you all the very best in 2008 and in the coming years. May God bless you. May God bless the great work that you do. And, may God bless America.

Thank you for 6 wonderful and memorable years. HOOAH!

**Claude M. Bolton Jr.**  
Army Acquisition Executive

# The Joint Munitions and Lethality Life Cycle Management Command (JM&L LCMC) Provides the Best Capability to U.S. Warfighters

Meg Williams and Trish Bryan

**S**everal months ago, BG William N. Phillips, Commanding General (CG), JM&L LCMC, met with *Army AL&T Magazine* staff to discuss his organization's mission, accomplishments, goals and initiatives. In addition to his role as the JM&L LCMC CG, he serves the Army as the Program Executive Officer Ammunition (PEO Ammo) and the Picatinny Arsenal CG.

Billowy clouds of fiery smoke hang in the air after field artillerymen from Battery B, 1st Dragon Battalion, 82nd Field Artillery Regiment, fire their M109A6 Paladin Howitzer at Camp Taji, Iraq, Sept. 2, 2007, during a live-fire combat mission. (U.S. Army photo by SSG Jon Cupp, 1st Brigade Combat Team (BCT), 1st Cavalry Division (CavDiv) Public Affairs Office (PAO).)

**AL&T:** What is the most important message you would like to convey to Soldiers who might read this issue of *Army AL&T Magazine*?

**Phillips:** First, we very much appreciate and honor the sacrifices Soldiers make every day supporting freedom and democracy for our Nation and the free world. That applies to their Families too. When you have loved ones who are away for 15 months at a time, it's difficult on both sides. Our Soldiers

and their Families are making great sacrifices, and it's great that the Army is focusing significant energy and resources toward supporting Families. At the JM&L LCMC, that means we support not only Soldiers and our Army, but all service members and civilians who use ammunition, bombs and non-lethal systems. Second, our mission is to provide our Soldiers and service members with the very best capability possible. We want them to execute their missions quickly and decisively so

they can get the job done and return home safely. Every day, I ask myself, "What can I do and what can the LCMC do to help them be more successful and to give them the best capabilities to complete the mission and return home safely?" That's what we work hard to ensure every day at Team Picatinny [NJ], Rock Island [IL] and all our depots and arsenals.

**AL&T:** JM&L LCMC is responsible for bringing together the people,



infrastructure and processes required for total conventional ammunition life-cycle management to support warfighters. What is your mission and vision for this organization? In what new ways are the three major components that comprise the LCMC — PEO Ammo, Joint Munitions Command (JMC) and U.S. Army Armament Research, Development and Engineering Center (ARDEC) — working together?

**Phillips:** Establishing a mission for LCMC was important. And, you can't really put a mission in place and have it succeed if you don't have the full commitment of all the players who are critical to the LCMC, including ARDEC's science and technology [S&T] workforce, PEO Ammo's acquisition professionals, and JMC's logistics and sustainment experts. We have that commitment and we've outlined our mission and vision in a document that everyone has signed. It's not just leaders who must be committed, but the people in our organization.

For the S&T piece, Dr. Joseph A. Lannon, ARDEC Director, is looking at capability gaps that may exist today in ammo — improvised explosive device [IED] defeat, bombs and many other areas — to see what next-generation weapons and capabilities we'll be able to give our Soldiers and the Joint services over the next 2 to 15 years. PEO Ammo works with ARDEC to transition those new technologies into acquisition programs and get them to the field. And the ARDEC is truly a world-class organization at developing new technology, evidenced by being awarded the 2007 Malcolm Baldrige

National Quality Award. Of course, Army leaders, such as Chief of Staff of the Army GEN George W. Casey Jr. and Vice Chief of Staff GEN Richard A. Cody, don't only ask what you're going to do 4 years from now; they want to know what you're going to do



The new 155mm XM982 Excalibur round will help U.S. Army artillerymen provide precision fires, thereby eliminating unnecessary collateral damage. (U.S. Army file photo.)

tomorrow. From the ARDEC S&T to PEO Ammo's acquisition, we are continuously working ways to shorten the procurement and production timelines.

Once we acquire and field a system, we work with JMC to provide the readiness and logistics support that sustain the capability we put in the warfighter's hands. Operations and support, which is the sus-

tainment and logistics piece of a program in the out years, makes up about 60 percent of a program's life-cycle cost, so we have to work closely together as an LCMC to make sure whatever we give Soldiers and warfighters is producible, sustainable and affordable. We also try to leverage what we've done on one system and apply it to another. For example, we're getting into precision munitions in a big way. Now that we've got the 155mm XM982 Excalibur

When you talk about integrating the life-cycle management concept, you have to stay linked to the folks who are stakeholders in this business. The JM&L LCMC works hard to stay linked to the key stakeholders we support, namely: Office of the Secretary of Defense [OSD]; Assistant Secretary of the Army for Acquisition, Logistics and Technology [ASAALT]; AMC [U.S. Army Materiel Command] and key Army staff. We have received extraordinary support from the people I consider to be the two prime architects

of the LCMC vision — Secretary Claude M. Bolton Jr. [the Army Acquisition Executive/ASAALT] and GEN Benjamin S. Griffin [AMC CG] — as we continue to grow and stand up the LCMC. If it weren't for GEN Griffin or Mr. Bolton, we would not have been able to do what we have done as an LCMC.

Commonality is important. The more commonality among systems we have, the lower their life-cycle cost.

As the SMCA, we are chartered to buy all the large, medium and small caliber ammo, grenades and bombs for all of the services and we combine requirements to the maximum extent possible.





Certified welders Ron Burton (left) and Larry Mitchell flank BG Phillips during his visit to the Pilot Model Shop at Tooele Army Depot, UT. Burton and Mitchell have a combined work history of 75 years' experience at Tooele. (U.S. Army photo by Kathy Anderson.)

the industrial base — both organic and commercial — so we can manufacture munitions effectively.

We want to make the most of every dollar Congress gives us. To fulfill the SMCA function and to integrate the requirements, we put a lot of energy and effort into working with the other services. There are a great group of dedicated professionals within the Army, U.S. Navy, U.S. Air Force [USAF], U.S. Marine Corps [USMC], Coast Guard, OSD and the law enforcement communities who are dedicated to making the SMCA mission work. This requires

execution. It is working extremely well from our foxhole, but we constantly seek improvements.

**AL&T:** What's the scope of products under the LCMC's management and can you put an approximate dollar figure on products and services the LCMC procures, maintains and manages for the Army and the other services?

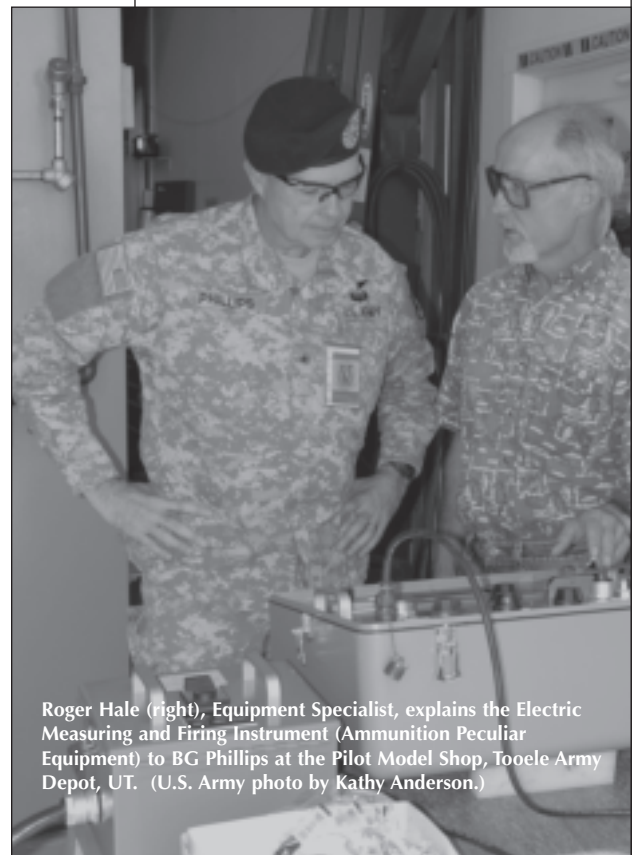
**Phillips:** We do more than ammo; we do two other key systems. The first is defeating IEDs. Last summer we established the Product Manager IED Defeat/Protect Force [PM IEDD/PF]. When you see Soldiers returning with wounds from IEDs, you see how vitally important this mission remains for our Army! In our own community, we just welcomed back SGT James Benoit. Jim's had more than 80 surgeries at Walter Reed, and counting. Homes for Our Troops, along with the local community and Team Picatinny, are building a house for him right down the street at no cost to his

**AL&T:** What are your responsibilities as the Single Manager for Conventional Ammunition (SMCA)?

**Phillips:** The most important responsibility is ensuring that our Joint warfighters have the right ammo and that there are no capability gaps! One of the things we're doing under the leadership of LTG William E. Mortensen [AMC Deputy CG] and LTG N. Ross Thompson [Military Deputy to the ASAALT] is bringing all the services together to look at their ammunition requirements. As the SMCA, we are chartered to buy all the large, medium and small caliber ammo, grenades and bombs for all of the services and we combine requirements to the maximum extent possible. Our 5.56 and 7.62mm small caliber production is a perfect example. We buy well over a billion rounds annually to meet our stakeholder's requirements. Combining these requirements helps lower cost because we're ordering higher quantities, making it possible to leverage

communication, and I speak with our stakeholders periodically — folks like USMC BG Mike Brogan, Commander, Marine Corps Systems Command; USAF MG Kathy Close, Commander, Ogden Air Logistics Center; and Tony Melita, Deputy Director, Defense Systems, Land Warfare and Munitions, Office of the Undersecretary of Defense for Acquisition, Technology and Logistics.

We also meet with the Joint Ordnance Commanders Group twice a year to review any issues we need to address. What's most important is that we stay linked and integrated with the Joint services and that we keep the warfighter foremost in our mind in terms of mission and



Roger Hale (right), Equipment Specialist, explains the Electric Measuring and Firing Instrument (Ammunition Peculiar Equipment) to BG Phillips at the Pilot Model Shop, Tooele Army Depot, UT. (U.S. Army photo by Kathy Anderson.)

Family. When I look at him and other Soldiers who are wounded by these horrible weapons, I think, "How can we defeat these IEDs?" This is a major thrust for us.

The second thing we do is demilitarization [demil]. As we take old ammunition out of inventory that is no longer viable for use by any service, we have to have a sound demil strategy. In that regard, the Demilitarization Enterprise, under the PM Demilitarization's leadership, has recast the demil strategic plan to maximize the effectiveness of available demil resources.

The JM&L LCMC has an annual budget of \$3.7 billion and employs 6,600 government and military employees, as well as 8,000 contractors and industry partners who are absolutely critical to mission execution. We work closely with our industry partners every day. We have approximately 300 systems undergoing scientific research and development [R&D]. We have transitioned about 200 systems into production, and we have another 500 that are already fielded for which we're providing logistics and support. We have extraordinary folks in our ammunition plants and depots where we receive, issue, store and demil ammunition. This enterprise encompasses some 427,000 acres that the LCMC manages, plus more than 3 million square feet of R&D capability. That's why it's so critical to get the acquisition, logistics and technology right. The depth and breath of our programs are significant.

The JM&L LCMC has an annual budget of \$3.7 billion and employs 6,600 government and military employees, as well as 8,000 contractors and industry partners who are absolutely critical to mission execution.

**AL&T:** You have another cross-service role besides SMCA. Can you tell us about that?

**Phillips:** Besides my LCMC Commander role, I am also the Picatinny Arsenal Commander. Team Picatinny is becoming purple. Base Realignment and Closure [BRAC] 2005 realigns Navy lethality functions to my installation, so I will be a cross-service landlord. It is actually a far more significant role. It is a golden opportunity for me, and for the larger Team Picatinny, to contribute even more to Soldiers, Marines, Sailors and Airmen.

BRAC is funding the largest construction project in the arsenal's history — \$75 million for 160,000 square feet of predominantly laboratory space. My challenge is to enhance the integration of missions, processes, investments, people and knowledge across the Army and Navy. The Nation's critical mass in guns and ammunition expertise will reside almost exclusively at Picatinny by the next decade. We need to make this work, and we need to make this investment pay off. I've partnered with RADM Archer M. Macy Jr., Naval Surface Warfare Center Commander, to build an effective, efficient specialty site, one that supports Joint ammo, Joint weapons and Joint lethality across

AL&T in both services. It is more work, but a perfect fit with my LCMC role. Just recently, we executed a ceremony with RADM Macy to welcome the Navy back to Picatinny Arsenal.

**AL&T:** Lean Six Sigma (LSS) has really been embraced by the JM&L LCMC, JMC, PEO Ammo and ARDEC. How do you plan to grow this initiative and what new initiatives do you see in the future?

**Phillips:** To me, Lean is a way of thinking. If you look at LSS as something you have to do to check off some blocks, that's not what we do within the LCMC. We're looking at results. There has to be a common base of understanding of how LSS can be applied. Only then can you apply Lean thinking across the whole staff and operation. We're looking for smart people to make decisions on what's value added and what's not, and then eliminate steps that aren't contributing to the end result. That will make the entire process more efficient and increase our production capacity accordingly.

We are totally self-sufficient across the LCMC in LSS. We have trained enough of our personnel to be green, black and master black belts that we don't have to rely on outside contractors. We do apply LSS to administrative areas as well. We put a lot of energy and effort into this and we track it constantly so we can report back to AMC and ASAALT.

We've worked on improving the production process for our insensitive explosive PAX 2-A and achieved a cost avoidance of almost \$19 million. We also developed a high-speed process for loading PAX 2-A into M80 grenades and validated another \$37.6 million in cost avoidance.

We've had solid success in our LSS program. We've worked on improving the production process for our insensitive explosive PAX 2-A and achieved a cost avoidance of almost \$19 million. We also developed a high-speed process for loading PAX 2-A into M80 grenades and validated another \$37.6 million in cost avoidance. Of course, not everything brings that degree of savings. We

saved almost a million dollars by streamlining our internal paperwork processing required by the Environmental Protection Agency when we're purchasing items that contain recovered materials. We saved another million dollars by simply changing the type of protectant we use on the threads of 60mm mortar bodies. We saved another million by making minor changes

in the production of the Multi-Option Fuze for mortars. Large or small, it's still dollars saved that we cycle back into Soldier product development.

Our LSS philosophy has also served to improve our communications and teaming and reinforce relationships between multiple organizations, with a focus on effective and efficient processes and communication to fulfill mission requirements. BG James E. Rogers and I spend a lot of time with our PMs, commanders and staff examining how the JM&L LCMC will get beyond where we are today and how we can get there together. I often ask myself simply, "How can I make the LCMC better so when someone else comes in, it's a step ahead of where it is today?" My intent is to make it a little better and the next commander can simply build upon this success and make it better still. Teaming helps make this happen in a big way!

**AL&T:** Force protection is a Soldier's number one priority. With the Iraq war now entering its fifth year [announced start on March 19, 2003], are we getting the right ammunition to the right place at the right time and at the right cost so Soldiers can carry on the Protect Force mission?

**Phillips:** Yes, definitely. There is no shortage of ammunition in theater. We track ammunition deliveries and manage the stockpile and flow of ammo into Afghanistan and Iraq very carefully. The 30mm ammunition for the Apache helicopter is an example. Apache and its weapon systems are critical to both theaters, and our pilots are firing a significant number of those rounds. Given that, we look at where we are with the 30mm every day. We make sure it's manufactured on schedule and that it gets into the hands of our Soldiers and pilots who need it.

By using LSS processes, JM&L LCMC has saved more than \$2 million by changing the type of protectant they use on 60mm mortar body threads and making changes in the production of the Multi-Option Fuze for all mortar systems. Here, PFC Jerry Cleveland (left) and SPC Brett Mitchell, with the International Security Assistance Force, fire a 120mm mortar during a combat operation in the Da'udzay Valley in Zabol Province, Afghanistan, Nov. 21, 2007. (U.S. Army photo by SFC Jim Downen.)





The SPARK is another extremely effective innovation that has been fielded in theater to counter IED placement along convoy routes. In-theater Soldiers suggested light placement on the SPARK to improve its night operations capability. (U.S. Army file photo.)



We have no major issues with either small or large caliber ammo. If we need something in greater quantities, we work with our industry partners to ramp up. That's what we did with Excalibur. I describe it as an artillery round that acts like a missile — it can take out a building without collateral damage to the building next door. You can shoot it from 20 'clicks' away and be accurate up to a few meters. It's an important capability for our warfighters. They want more capability and we're working to give it to them.

Intense ammunition management has assisted us in meeting the ammo requirements for *Operations Enduring and Iraqi Freedom* [OEF/OIF]. We're also meeting 100 percent of our

warfighter munitions requirements. No unit has gone to war with less ammo than their basic load required during this conflict.

On the issue of force protection, defeat of IEDs is one of our most important missions. Whatever we can do to defeat these insurgent systems is critically important to our mission here and other places in terms of S&T, R&D and acquisition. We need to shorten the cycle time to get new equipment to the field and we need to deliver it faster. We're facing a smart and extremely adaptable enemy out there who adjusts to us very rapidly. We need to ensure that we stay ahead of the technology detection curve in fielding capability to our Soldiers and protect

them so they come home safely to their Families and friends.

**AL&T:** Can you speak to any specific challenges or special warfighter needs that JM&L LCMC has responded to successfully?

**Phillips:** The single most effective thing we can do is sit with the Soldiers, see how they use the equipment we're providing, understand what challenges they are facing; then, translate that into changes or new ideas. I'll give you an example. SPARK [the Self-Protection Adaptive Roller Kit] was fielded to theater and was very successful from the beginning. [See Page 50 of this issue for the related article.] One of our PMs, LTC Karl Borjes, PM IEDD/PF, went



over to Iraq and was talking to the Soldiers. One Soldier said they often have night operations and it would be great to get additional lights for flexibility. The answer could have been, “We don’t have the money to do that.” Instead, Borjes said, “We’ll make it happen.” And, that’s what his team did. Three nights later, an IED was command detonated — on the SPARK — not the Humvee it was mounted on. The simple solution that Soldier came up with undoubtedly saved lives that night and has saved many more since then. You can’t get this kind of information sitting at Picatinny or Rock Island. You have to be on point with our Soldiers, talking with them and implementing fixes.

Intense ammunition management has assisted us in meeting the ammo requirements for OEF/OIF. We’re also meeting 100 percent of our warfighter munitions requirements. No unit has gone to war with less ammo than their basic load required during this conflict.

support the ongoing global war on terrorism, we don’t have any trouble getting funding for new technology. Demil is at the other end. Although it may not have the highest priority, if we don’t put money into demil, both the stockpile and cost to maintain the stockpile will grow exponentially. Demil is funded at about 60 percent

of what is required for an annual stockpile reduction of 6 percent. We estimate that the proceeds for reinvestment from scrap sales to be 1 to 2 percent of our current annual demil budget. Our job is to convince Army leadership, OSD and Congress that we need to continue to demil these old ammunition systems.

I’ve challenged every military member, PM and deputy under my command to get everyone on their staff certified in their area of expertise.

Transfer of knowledge is also important. We’re fortunate in that we’ve got a strong flow of potential talent coming into Picatinny through interns and new college graduates. We’re communicating the importance of Army Acquisition Corps and S&T positions. We challenge everyone to make a personal investment in learning, training and having a mentor. In fact, I require all my officers to have a mentor, someone who can guide their career and make them think about what they are doing now *and* what they’ll be doing next. If they don’t name one, we’ll do it for them. This is part of why we are the most powerful Army on Earth today. We have the equipment and technology. We do 95 percent of everything right. And, the 5 percent we’re not getting completely right? We talk about it and correct it. The key is mentorship — people who have been in the Army for years sharing their knowledge, their experiences, their failures and their successes with young Soldiers and civilians.

**AL&T:** New legislation contained in the *FY07 John Warner National Defense Authorization Act, Section 353 (P.L. 109-364)*, allows PEO Ammo to reinvest demil resource recovery and recycling proceeds to offset the cost of demil projects. Do you think this will have a significant impact and are there other ways you think demil can be facilitated?

**Phillips:** First, we need to thank Congress and others for getting this law put through because it will have a significant impact. It’s a step in the right direction to allow us to reinvest those dollars that are, in some cases, extensive. We need every dollar we can garner by harvesting parts, components and systems that are in old weapons, be it explosives, metal, gold or electronics. As you know, there are always competing priorities for funding. To

**AL&T:** What are some of your goals in relation to supporting your workforce? What are your thoughts on providing proper training and education? How are your organizations addressing the senior workforce that is getting ready to retire in the next few years?

**Phillips:** I stood in front of a Town Hall meeting recently and asked, “Who’s the most important person in this room?” Everyone was looking around. The answer is, “you are.” People are our number one asset. It’s the people who work here every day, wanting to do great things that get the mission done. I must ensure that our people have the resources they need to do their job and that they are trained properly. If they aren’t acquisition certified in the position they hold, we will get them certified and do it quickly.

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# Managing Ammunition to Better Address Warfighter Requirements Now and in the Future

Jeffrey Brooks

**F**rom the onset of the global war on terrorism (GWOT) in 2001, it became apparent to Headquarters, Department of the Army (HQDA) that there would be problems providing sufficient quantities of some ammunition items because of dramatically increased requirements DOD-wide. Appropriated funding couldn't get through the budget process quickly enough and production couldn't be ramped up fast enough to keep up with increasing demand. The "Iron Mountain" of ammunition left over from the Cold War was depleted because of reduced replenishment funding during the 1990s. Conserving what was available by reducing some levels of training in CONUS for a period of time while continuing to fully supply warfighters engaged in or preparing for combat overseas had little positive impact on the overall supply. As a result, in April 2004, the Army Chief of Staff (CSA) tasked the Army Staff (ARSTAF) to investigate and make recommendations for improving the Army's munitions management.

Soldiers from the 82nd Field Artillery Regiment's Alpha Battery, 1st Battalion, fired their M109A6 Paladin Self-Propelled Howitzers at Camp Taji, Iraq, last March. The big guns fired the new Modular Artillery Charge System (MACS) for the first time on foreign soil. Today, the Paladins are using MACS to propel the 155mm Excalibur precision munition against insurgent targets. (U.S. Army photo by SSG Jon Cupp, 1st Brigade Combat Team (BCT), 1st Cavalry Division Public Affairs Office.)

### Centralized Control, Coordinated Requirements Process Needed

Coordinating the myriad new requirements, urgent needs, the programming of dollars and increasing production and distribution of munition assets lacked centralized control and processes across ARSTAF. During this same time, the Program Executive Office Ammunition (PEO Ammo) was established in 2002. PEO Ammo consolidated all conventional ammunition programs from three different commands — 23 programs in PEO Ground Combat Systems, 74 programs in the U.S. Tank-automotive and Armaments Command and 94 programs in the U.S. Army Materiel Command (AMC) — along with the ammunition industrial base and Single Manager for Conventional Ammunition missions. ARSTAF determined that there was no single, responsible munitions

management organization or staff element and that the munitions requirements process was disjointed.

### Munitions “Team of Teams” Focuses on Ammunition

As a result of the CSA’s tasking, a more centralized munitions requirements and prioritization process under the G-3 was developed and integrated with the current HQDA staff structure. Because the G-3/5/7 retains the overall role as the staff office that sets the Army’s priorities and requirements, they were identified as the lead integrator in coordinating and synchronizing Army munitions management.

The G-3 combined two separate munitions offices — training and future warfighting capabilities — bringing the war reserve and training requirements functions together into one central office. The Army Munitions Management Office/DAMO-TRA would become

the Army’s single point of contact (POC) for all munitions requirements, and would integrate the functions, responsibilities and execution of other ARSTAF munitions offices.

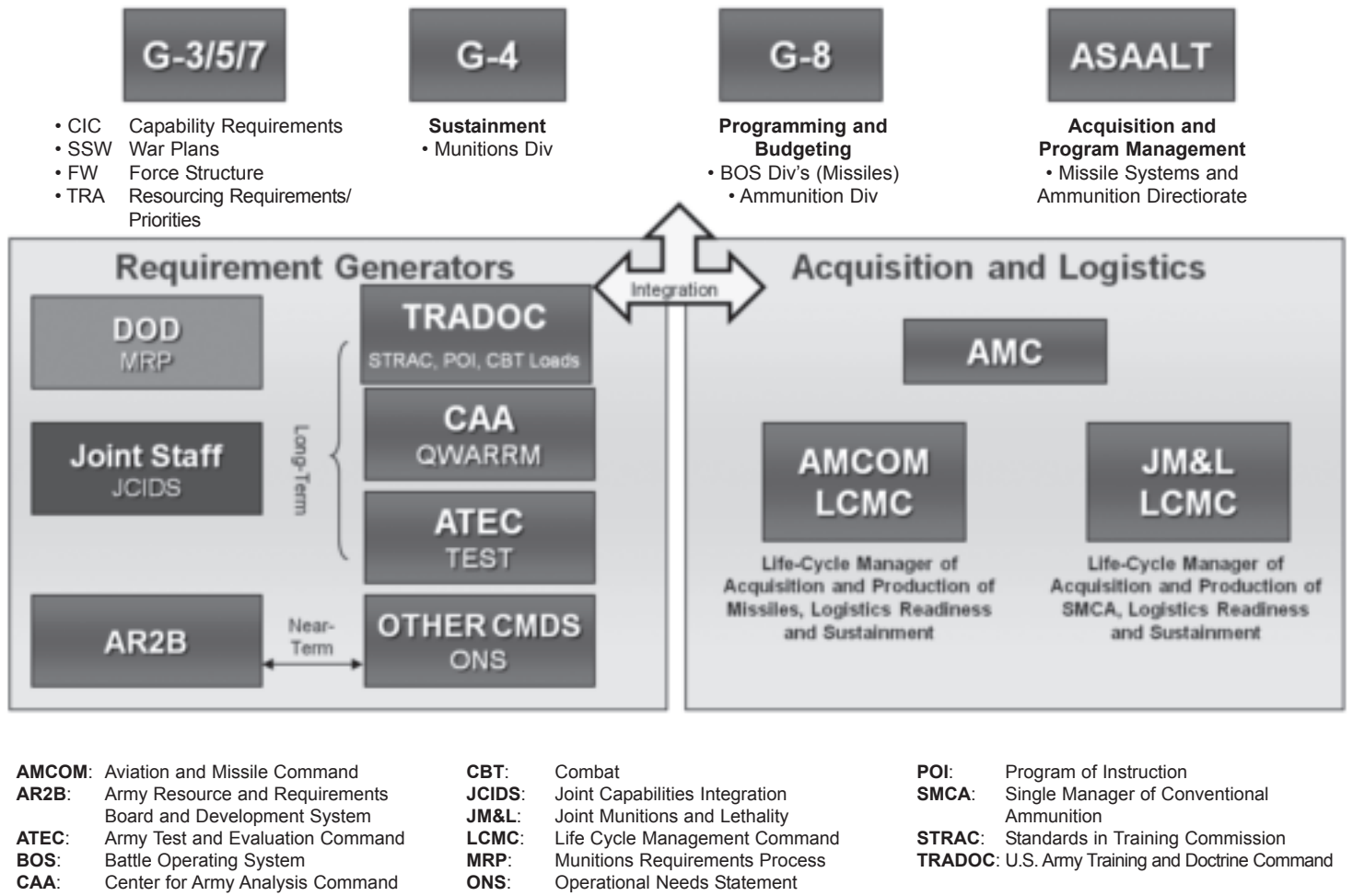
Three other established HQDA staff offices supported this new organization —

the G-4 Munitions Division/DALO-SMA (sustainment), the G-8 Munitions

The Army Munitions Management Office/DAMO-TRA would become the Army’s single POC for all munitions requirements, and would integrate the functions, responsibilities and execution of other ARSTAF munitions offices.



## Munitions Team of Teams Validation, Prioritization, Resourcing, Policy



Directorate/DAPR-FDX with assistance from other missile and rocket hardware directorates (programming and budgeting), and the Assistant Secretary of the Army for Acquisition, Logistics and Technology (ASAALT) Missile Systems/Munitions Directorate/SAAL-SMA (acquisition and program management). This created a munitions Team of Teams on the ARSTAF that could focus on ammunition, headquarters-level policy, management, requirements, resourcing and distribution, while simultaneously planning and programming for future ammunition needs.

It is this core team that deals with the day-to-day issues of ammunition and

missiles in the Pentagon. Many other offices interface with them consistently. In the Washington, DC, area, these offices and organizations include at a minimum, the Investment and Budget Liaison Teams in the Army Budget Office; the Office, Chief of Legislative Liaison; AMC; various Secretary of Defense and Joint staff offices; and other resourcing and requirements directorates within G-3, G-8 and ASAALT. Outside the area, offices and organizations include PEO Ammo at Picatinny Arsenal, NJ; PEO Missiles and Space at Redstone Arsenal, AL; the Joint Munitions Command at Rock Island, IL; and the U.S. Army Training and Doctrine Command and its proponents.

The figure clearly maps out organization duties and responsibilities for ammo management.

### Changes Lead to Profound Results

The results of this reorganization were profound and immediate. Consequences of these actions included:

- A better coordinated, accurate and easily understandable war reserve requirements determination process known as the Quantitative War Reserve Requirements for Munitions (QWARRM) and results. The Army gets better war reserve planning figures and it paved the way for senior



leaders to better understand the QWARRM process and make their munition-related decisions.

- A fully developed and coordinated consolidated, worldwide monthly munitions status for Army senior leadership. Presented monthly at the balcony briefing, the Army's leaders see a consolidated, integrated snapshot on the status of ammunition in theater and worldwide, and are updated on current ammunition issues affecting warfighters.
- Defined munition staff officers who know their functions within the requirements and budget cycles and cross coordinate when required, speaking with "one voice." It has become vitally important to fully coordinate and speak in unison when communicating the Army's ammunition message to Congress, the press and industry.
- A central, focused core team to look into the future for Army munitions at the HQDA level. The Army is looking at short-term and long-term ways to respond to immediate GWOT needs and across the Future Years Defense Plan to plan and program legacy and future munition requirements.
- One, single office for ammunition staff leadership, G-3/DAMO-TRA.

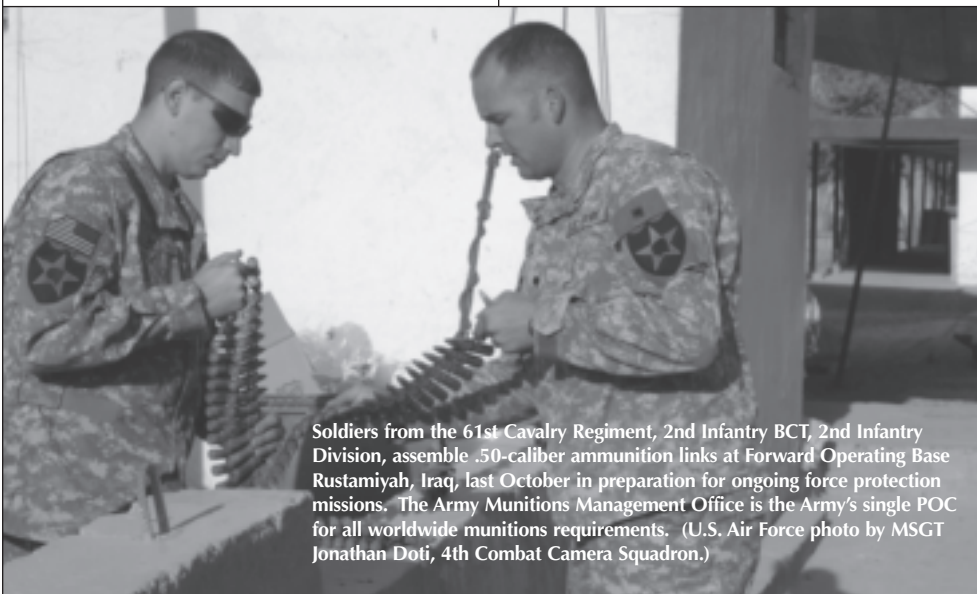
G-3 is the single entry point for all external ammunition inputs to ARSTAF and the focal point for internal ammunition staff guidance and direction.

As appropriated funds began to flow, other results gradually emerged. Ammunition deliveries increased to meet warfighter demands. For example, small caliber ammunition deliveries grew by a factor of four. The team continued to look for opportunities to reprioritize and redirect funds in response to theater demands, including small caliber ammunition and associated production modernization efforts, visible light mortar illumination cartridges and the 155mm Excalibur guided projectile, to name just a few.



PFC Mack Borden, Alpha Battery, 3rd Battalion, 7th Field Artillery Regiment, carries ammunition to an M119A1 105mm Towed Howitzer during a live-fire exercise last June near Kirkuk, Iraq. (U.S. Air Force photo by SSGT Dallas Edwards, 460th Space Communications Squadron.)

Today, as immediate theater munition needs reach the Pentagon and are validated, this Team of Teams works with various Pentagon and other external staffs to give warfighters what they need to accomplish their missions.



Soldiers from the 61st Cavalry Regiment, 2nd Infantry BCT, 2nd Infantry Division, assemble .50-caliber ammunition links at Forward Operating Base Rustamiyah, Iraq, last October in preparation for ongoing force protection missions. The Army Munitions Management Office is the Army's single POC for all worldwide munitions requirements. (U.S. Air Force photo by MSGT Jonathan Doti, 4th Combat Camera Squadron.)

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# Picatinny Arsenal — Home of American Firepower

Trish Bryan

**O**n June 26, 1880, the U.S. government purchased 1,195.8 acres of land to build what was referred to as the “Grand Arsenal on the Atlantic Seaboard.” Originally called the Dover Powder Depot, the name was changed just 4 days later to Picatinny Powder Arsenal, NJ. In 1907, it officially became Picatinny Arsenal.

Picatinny's Cannon Gate, one of the most recognizable and enduring Arsenal symbols. The gates were manufactured by the Cornell, NY, Iron Works in 1885 using cannons and cannon balls. (Photo courtesy of U.S. Army.)



During the intervening years, more land was purchased, buildings were constructed and a railway was built. One of Picatinny's most enduring symbols, the Cannon Gate, was installed and still greets arsenal visitors today. By the early 1900s, a propellant charge loading activity was initiated, storage facilities were added and the first powder factory was constructed.

The arsenal moved into research and development work and started a school to instruct officers in weaponry sciences. Testing and control laboratories were established during World War I (WWI), as well as a small, experimental plant for design and development of artillery ammunition in 1919. In 1921, the arsenal took over responsibility for experimental work on fuzes. In 1926, lightning struck Navy Hill, an area transferred to the Navy Department to store ammunition. A tree overhanging a magazine that housed 600,000 pounds of TNT was hit, starting a series of explosions. The devastation yielded unexpected, but useful information. By studying the degrees of damage at different ranges, it was possible to calculate the first reliable, safe-distance tables for munition storage.



Workers assemble rocket fuzes on a Picatinny assembly line during WWII. (Photo courtesy of U.S. Army.)



Rocket shells for the 3.5-inch Bazooka were tested at Picatinny Arsenal. Overnight, they were put into full production and were destroying Chinese and North Korean tanks 7 days later as hostilities during the Korean War intensified. (Photo courtesy of U.S. Army.)

As the reconstruction of Picatinny Arsenal following the fire continued, the balance of world power shifted and Axis countries began increasing stockpiles of arms. By the time the U.S. entered WWII, Picatinny was prepared to play a major role in arming the Nation. As one of the few facilities with the ability to manufacture munitions, it employed 18,000 people and ran three shifts turning out bombs and artillery shells. Still, Picatinny had its research triumphs, especially the development of a delay fuze for skip bombing and special bombs for dams and oil fields. It also pioneered production processes later transferred to munitions manufacturers around the country.

After WWII, and into the Cold War era, Picatinny refocused its efforts on developing new weapons and munitions. Its support to American forces in Korea included an improved bazooka and an illuminating rifle grenade. Ammunition for the world's first nuclear artillery weapon, the 280mm cannon, was developed. In periods of peace, the arsenal made important contributions in the areas of radar, pyrotechnics, missiles, time fuzes and many other munitions. When war broke out again, it gave troops in Vietnam a complete family of 40mm ammunition for grenade launchers and helicopter gunships.

Innovations in 20th century warfare made it possible for the U.S. to maintain battle supremacy in the 1990s and beyond. There were new rules of engagement along with high-tech weaponry such as laser-guided bombs, electronic countermeasures and much more. Picatinny Arsenal played an invaluable role in this new kind of war with the development of smart weapons, the next generation of mounted and dismounted objective crew-served weapons and many other munitions used in the Gulf War, *Operation Desert Storm* and *Operations Enduring* and *Iraqi Freedom*.

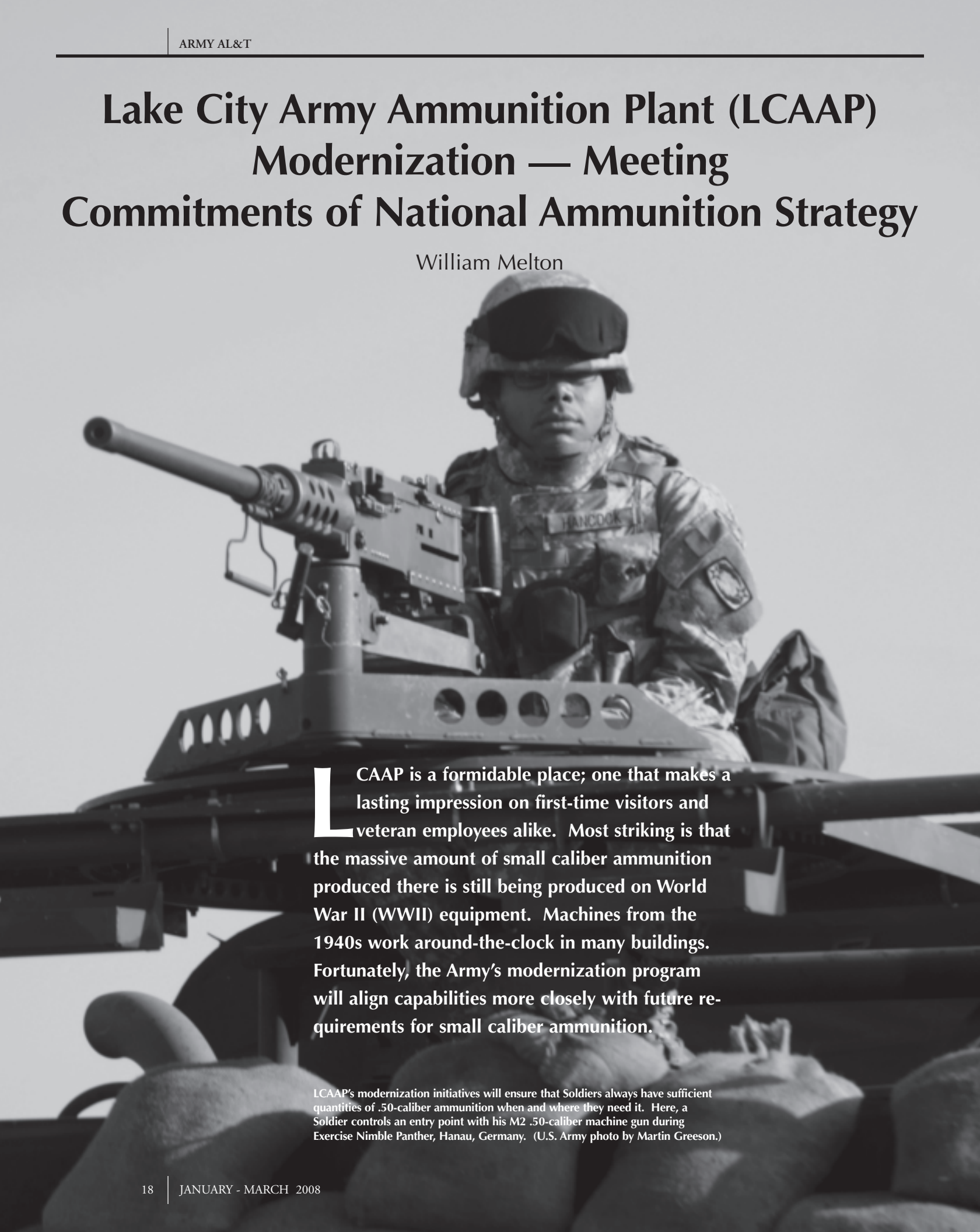
As the Army fulfills a vision to transform itself into a 21st century modular land force, it is clear that America will continue to count on Picatinny Arsenal in the future as they have in the past to respond with unwavering commitment, ingenuity and skill. The "Home of American Firepower" will help ensure the legacy of freedom for many generations to come.

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# Lake City Army Ammunition Plant (LCAAP) Modernization — Meeting Commitments of National Ammunition Strategy

William Melton



**L**CAAP is a formidable place; one that makes a lasting impression on first-time visitors and veteran employees alike. Most striking is that the massive amount of small caliber ammunition produced there is still being produced on World War II (WWII) equipment. Machines from the 1940s work around-the-clock in many buildings. Fortunately, the Army's modernization program will align capabilities more closely with future requirements for small caliber ammunition.

LCAAP's modernization initiatives will ensure that Soldiers always have sufficient quantities of .50-caliber ammunition when and where they need it. Here, a Soldier controls an entry point with his M2 .50-caliber machine gun during Exercise Nimble Panther, Hanau, Germany. (U.S. Army photo by Martin Greeson.)



LCAAP, located in Independence, MO, sits on approximately 4,000 acres of formerly rural river valley. Senator Harry Truman presided at the Dec. 26, 1940, groundbreaking for what became the first of 12 WWII-era Army small caliber ammunition factories. Then, as now, workers at the plant produced small caliber ammunition components such as cartridge cases, bullets and primers; loaded and assembled cartridges of all types such as ball, tracer, armor piercing and incendiary; and packaged them for use in a broad range of U.S. and NATO weapons. The plant is government-owned but contractor-operated — presently by Alliant Techsystems (ATK). It has been active since it was built, contributing billions of rounds used by our U.S. Forces over the last 60-plus years.

### Global War on Terrorism (GWOT) Reinforces Need for LCAAP

Production declined markedly during the 15 years preceding the events of Sept. 11, 2001. In response to the GWOT, LCAAP output surged steadily during 2002-2004, but not enough to keep pace with rapidly expanding small caliber ammunition demand. Operational challenges brought into sharp focus the plant's age and declining condition, as well as its reliance on manual quality systems and outdated technology. For the short term, Army officials sought alternate supply sources, which only served to prove that despite its shortcomings, LCAAP was not only the largest capacity producer, but also the most cost-effective. Modernization, as the way forward, was the clear

Army officials sought alternate supply sources, which only served to prove that despite its shortcomings, LCAAP was not only the largest capacity producer, but also the most cost-effective.



LCAAP workers ensure all .50-caliber ammunition belts are "stretch/flex" tested and visually inspected before being packed in M241 ammo cans for shipment or storage. (U.S. Army photo courtesy of LCAAP)

path to providing a long-term sustainable and affordable source of supply.

Two increments of Army investment totaling nearly \$50 million facilitated LCAAP's post-2001 ramp up. An FY02 appropriation established 5.56mm capacity and added Army equipment to bolster the manufacture of steel links for ammunition belts, expanding overall plant capacity from 800 million per year to 1.2 billion cartridges per year. The second investment, during FYs 04-06, further increased 5.56mm capacity and supplemented 7.62mm lines, further expanding overall plant capacity to 1.6 billion per year. These capital projects were not directed at modernization, but rather reconditioning or reinstalling existing idle equipment and restoring its production capability, at least for near-term GWOT requirements.

### Project Manager Maneuver Ammunition Systems (PM MAS) Leads the Charge for Plant Modernization

During 2005, PM MAS outlined its proposed long-term solution for a reliable supply base — a 7-year, \$242 million program for essential LCAAP modernization. It targeted critical and major operations for selective replacement and renovation, rather than alternate quick-fix or wholesale replacement strategies. Key modernization program objectives included assuring a reliable baseline capacity; improving productivity, maintainability and product quality; and above all, maintaining wartime production throughout the modernization program's course. The Assistant Secretary of the Army for Acquisition, Logistics and Technology approved the program and authorized essential modernization for LCAAP in August 2005.

PM MAS organized an integrated process team (IPT) and implemented strict acquisition disciplines to manage this critical program. IPT membership includes:



An LCAAP worker visually inspects a 5.56mm M855 cartridge for defects. A key LCAAP modernization initiative will integrate in-process inspection systems to replace manual inspections of finished cartridges on the aging SCAMP cartridge loaders. (U.S. Army photo courtesy of LCAAP.)

established for each project built around common performance milestones. Cost and schedule performance is tracked and reported on a monthly basis using Earned Value Management indices that effectively identify project execution issues or opportunities. Throughout the project life cycle, risk assessment and mitigation is an integral part of the decision-making process.

### Upgrades Bring Legacy Equipment Into the 21st Century

After modernization of 7.62mm and .50 caliber operations, the building that houses these operations will no longer seem frozen in time. The plan calls for new equipment for case priming and cartridge loading, a mix of new and refurbished equipment for cartridge case manufacturing, and refurbished equipment for bullet production and packaging. Modernization project implementation will be carefully choreographed to protect production runs on a 24/7 schedule, while working within the constraints of existing floor space. Many projects are still under design, but new 7.62mm case inspection machines, hardness testing machines and a

cartridge loader are already on order. A key element in this modernization effort is the integration of in-process inspection systems to replace 100-percent manual inspections of finished cartridges.

Combat 5.56mm cartridges are produced on automated equipment developed and installed under a predecessor 1970s Small

Caliber Ammunition Modernization Program (SCAMP). The modernization

- Joint Munitions Command (JMC), which shares responsibility for maintaining the ammunition industrial base and manages ammunition orders from all military services.
- U.S. Army Armament Research, Development and Engineering Center, which develops and maintains the cartridge technical data for the products manufactured at LCAAP and provides engineering support.
- ATK, the LCAAP ammunition supply and facilities management contractor.

### Careful Planning and Thorough Reporting Ensure Success

As a first order of business, the IPT developed a tactical plan that defined the modernization requirements, scope and funding allocation for the entire program. The team systematically assessed factory needs using a Quality Functional Deployment process to set

project priorities and allocate project budgets for each production area. The tactical plan provides a road map for the entire 7-year program. Updated annually, the plan is now at the heart of LCAAP modernization execution.

The process for managing individual projects begins with defining clear project goals and objectives at project initiation and incorporates Alpha contracting to expedite initial funding. Front-end planning during project definition and design increases the likelihood of success, as do rigorous project prove-out tests. Baseline, resource-loaded project schedules are

Key modernization program objectives included assuring a reliable baseline capacity; improving productivity, maintainability and product quality; and above all, maintaining wartime production throughout the modernization program's course.

plan for 5.56mm SCAMP operations is to rebuild these lines and continue using them in the future. The 1970s equipment has proven to be durable, much like its WWII counterparts, but has now been in service for 30 years. The vintage electronic control systems and instrumentation on these automated lines pose the greatest risk of failure. They're now technologically obsolete, built with components and software no longer manufactured or supported by vendors. The overhaul process encompasses redesign and replacement of electronic controls and inspection systems with current off-the-shelf electronic components and technology, as well as the rebuild of mechanical presses and line parts. One SCAMP primer insert machine has already been rebuilt and returned to production at higher production efficiency and reliability, and two

additional lines are in process. The first case line overhaul is scheduled to begin in the next 6 months, although certain case line components, case anneals and trim motors have already been replaced in advance. The expanded 5.56mm capacity will back up 5.56mm deliveries during the SCAMP rebuild process.

The modernization plan focuses on cartridge operations and incorporates only limited plant infrastructure improvements where necessary for production equipment installation and operation. As the program has matured, the need for more infrastructure and support area upgrades has been recognized. One project, already completed, is the upgrade to plant security. Modifications to the plant's explosive waste incinerator are under construction to meet new emission standards

and a third project is underway to replace a section of failing wastewater piping. Overall plant infrastructure needs have been assessed and prioritized, and a parallel program to address these projects is being managed by the Joint Munitions and Lethality Life Cycle Management Command.

## 60 Years Later, LCAAP Continues its Mission to Support Warfighters

The WWII investment in the LCAAP has paid dividends to U.S. taxpayers many times over. Generations of U.S. Armed Forces have trained and fought with ammunition bearing the "LC" (Lake City) headstamp. Although the facility itself is aging and requires capital investments to maintain its long-term viability, those investments are being made. Progress toward a modernized facility is evident throughout as the pace of modernization accelerates. Simultaneously, the unique capabilities of this plant make it possible to continue to deliver products. With more than 100 million small caliber rounds being manufactured and delivered to our warfighters every month, the modernization effort will position LCAAP to continue its role as one of the Nation's most prolific suppliers of ammunition well into the future.



LCAAP has been in continuous operation for more than 60 years producing the Army's small caliber ammunition components that include cartridge cases, bullets and primers, and load and assembly cartridges for the ammunition depicted here. The plant is currently undergoing a 7-year, \$242 million modernization program that will enhance LCAAP's production capability, quality and baseline capacity. LCAAP manufactures the full range of 5.56mm, 7.62mm, .50-caliber and 20mm cartridge types. (U.S. Army photo courtesy of LCAAP)

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# The Future of Gun-Fired Precision Munitions (GFPM)

COL Ole A. Knudson, Martin Moratz and Frank Altamura

**T**he Excalibur 155mm artillery projectile can precisely engage targets in urban and complex terrain with minimal risk of collateral damage. The successful use of Excalibur in theater over the last several months has demonstrated its effectiveness, signaling the arrival of a new generation of GFPM.

Soldiers from the 1st Cavalry Division fire their M109A6 Paladin Self-Propelled Howitzer from Forward Operating Base Camp Taji in Taji, Iraq, during an operational mission. Since being fielded in May 2007, the Excalibur 155mm artillery projectile has become the GFPM of choice among artillery commanders because of its enhanced accuracy in complex and urban terrain and 24 km range. (U.S. Army photo by SPC Benjamin Cossel, 196th Mobile Public Affairs Detachment.)

This ground-launched munition can be quickly employed without extensive mission planning or the extensive coordination needed to deliver precision munitions via an air delivery platform. In general, providing precision fires exponentially reduces collateral damage and drives down the logistics footprint while significantly increasing operational effectiveness. The deployment of a new generation GFPM holds the prospect of providing precision munitions that are much less costly overall than current missile-based or air-dropped solutions. The technical challenges to accomplish high G load (the magnitude of the acceleration compared to gravity) survivability GFPM are being solved by current Programs of Record (PORs) such as Excalibur, Precision Guided Kit (PGK), Precision Guided Mortar Munition (PGMM) and the Mid-Range Munition (MRM).

Based on the significant progress that has already been demonstrated for GFPM, one of the greatest challenges remaining is to develop more affordable solutions. Near-term solutions to make GFPM much more affordable should change the ongoing debate from “how much precision can we afford?” to “how do we implement more affordable precision solutions?” This change will ensure that the warfighter’s precision needs aren’t restricted by budget shortages. To achieve greater affordability, component costs must be reduced and technologies that will enable cost drivers such as inertial measurement units, semiactive laser seekers, canard actuation systems, power supplies, and fuze safe and arm devices must be further developed and simplified.

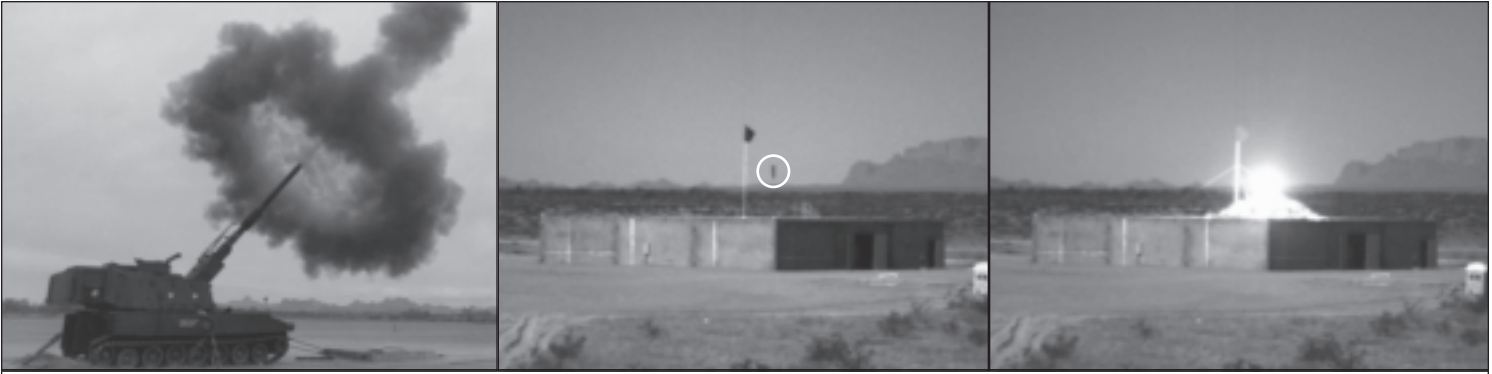
Advances in these key technology areas, coupled with aggressive acquisition strategies that maximize competition and provide participants incentives to bring

forward the most cost-effective solutions, will continue to drive down the cost of GFPM. For example, PGK’s Increment 1 average unit cost is approximately \$3,000, making it much more affordable than any previous precision capability. Tech base and contractor’s independent research and development funding focused on exploring potential solutions for artillery precision-guided munitions, and mortar guidance kits (similar to PGK for mortars) also show potential for having very affordable gun-fired precision solutions in the near future.

### **Excalibur Provides New Capabilities in Urban Warfare**

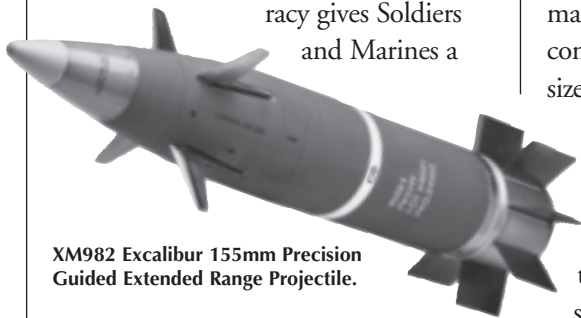
After completing development testing and a limited user test, Excalibur was fielded in May 2007 and is providing deployed forces an urgently needed 155mm artillery precision capability. The weapon’s guidance system enables a fire-and-forget, continuously guided,





An M109A6 Paladin Self-Propelled Howitzer test fires an XM982 Excalibur 155mm projectile downrange at Yuma Proving Ground, AZ. The Excalibur's on-board guidance system will deliver the projectile within a 10-m CEP accuracy with a near-vertical, terminal angle, top-attack effects capability as demonstrated in this firing sequence. The Excalibur's increased accuracy also helps minimize potential collateral damage and civilian casualties when employed against point and high-payoff targets. (U.S. Army photo courtesy of PM CAS.)

gliding projectile with less than 10-meter (m) circular error probability (CEP) accuracy with a near-vertical, terminal angle, top-attack effects capability. Excalibur has a high-explosive (HE) warhead with three fuzing modes — point detonating, proximity and delay — that makes it effective against a variety of target types, ranging from personnel to structures and both lightly armored and other vehicles. In comparison to conventional unguided artillery projectiles, Excalibur's accuracy gives Soldiers and Marines a



XM982 Excalibur 155mm Precision Guided Extended Range Projectile.

whole new capability that they can employ effectively in complex and urban terrain where collateral damage is a primary concern. The fielded version of Excalibur has a range of 24 kilometers (kms). A longer-range version that will reach 35-40 kms is undergoing testing and is expected to be in production soon. Raytheon is the prime contractor for the first two increments of Excalibur, and a competition is planned for follow-on increments to help reduce unit costs and increase reliability for the long term.

### PGK Solves Long-Standing Problem

The PGK will provide the Army's current inventory of 155mm HE projectiles with less than a 50-m CEP. Potentially, it will provide increased precision to a CEP under 30 m. Using a screw-on kit in place of a standard artillery fuze, PGK provides a solution to a very difficult problem: guiding an artillery projectile that has a spin rate of 250-300 hertz, weighs approximately 100 pounds and is being fired at a maximum of approximately 15,000 G loads with all the kit's components packaged in a very small size of the fuze well on the existing stockpile of 155mm HE projectiles.

To greatly reduce the technical difficulty, Increment 1 requirements allowed potential technical solutions to deviate from the standard NATO size factor and use all of the space within the deep well cavity on existing HE projectiles. External stakes and canards were also allowed as long as the solutions were compatible with existing ammunition and howitzers.

The average low-rate initial production cost for the PGK is about \$3,000 per unit. The simplicity of the design approach that expanded the allowable space beyond the standard fuze size was a major factor in developing a successful technical solution and in keeping the unit cost down. Alliant Technologies, the winning contractor from

the competitive technology demonstration (TD), used predeployed, fixed canards to reduce the design complexity and demonstrate dramatic improvements in first-round accuracy at longer ranges. The same TD proved that algorithms that measure antenna strength as the round spins can be used to determine roll rate and provide an accurate measurement of up, thus, eliminating the need for more complex inertial sensors. Continued competition among key component providers and other producibility improvements could potentially reduce PGK's unit cost even more. A planned follow-on competitive PGK effort will provide a similar capability for 105mm projectiles.

### XM395 PGMM — A Commander's Hip-Pocket Munition

PGMM is a multipurpose, laser-guided 120mm mortar cartridge that is capable of engaging high-payoff targets out to a maximum range of 7,200 m, providing a precision strike round capability with a first round defeat of high-value point targets such as enemy personnel protected by brick over block walls, lightly armored vehicles, earth and timber bunkers, and command and control centers. The ability to hit point targets is especially valuable in urban environments and low intensity conflicts where avoiding collateral damage and reducing the potential for civilian casualties



is critical. PGMM is fired much like any standard mortar cartridge after programming the fuze with time-of-flight, target type and laser code of the day. It can be fired from all current and future smooth-bore 120mm mortar weapons and flies ballistically to its search area where the laser sensor acquires the target. It requires an operational lasing time of approximately 10 seconds. The current PGMM engages stationary targets, and future increments will include moving targets and a longer range. The PGMM is the battalion or task force commander's hip-pocket precision munition.

### **XM1111 MRM Raises Stand-off, Lowers Collateral Damage**

The MRM is a 120mm multipurpose, GFPM that enables the Future Combat Systems Mounted Combat Systems (MCS) to engage moving or stationary high-payoff targets at beyond-line-of-sight (BLOS) ranges from 2 km out to 12,000 m and beyond. This enables the MCS to exploit terrain and range to provide the tactical standoff that enables them to act first, as well as an organic BLOS capability, without the need to queue fires. The MCS can fire MRM while stationary or on the move, providing precision defeat of single point, high-payoff targets, including stationary or moving main battle tanks, light armor, self-propelled howitzers, air defense artillery and bunkers. MRM is compatible with the M256 gun tube, which will potentially allow for future integration onto the Abrams M1A2 tank.

The MRM employs three modes of operation: autonomous, designate and designate-only. In the *autonomous* mode, the MRM searches for and engages targets using data downloaded to the projectile prior to firing to aid in target acquisition. *Designate* is when the munition searches for a semiactive laser designator return from the target and engages it. The munition switches

to the autonomous mode in the terminal phase, which allows for sensor-fuzed, aimpoint refinement to maximize lethality. If the laser spot is lost or not present, the projectile will automatically revert to autonomous. The *designate-only* mode is the same as designate, except the munition does not revert to the autonomous mode if the laser spot is lost or not present. This allows for added control where fratricide or collateral damage is a concern.

### **The Key to Greater Affordability — Technology Advancement**

In addition to the PORs described above, numerous technologies must be advanced to enable more affordable GFPM. Warhead technologies that will allow increased or selected lethality with a significant decrease in payload size are needed, as well as reduced rate sensors that lower cost without sacrificing performance. Introducing more Micro-Electro Mechanical Systems technology into the sensors and fuze safe and arm devices to reduce volume without degrading performance is a near-term solution to reduce costs. Developing small, low-cost, gun-hardened actuators and power supply alternatives are also essential to overall cost reductions for GFPM solutions.

To promote the independent advancement of key technologies, the Defense Ordnance Technology Consortium issued Request for Project Proposals for Very Affordable Precision and Enabling Technologies in FY07 and FY08. The enabling technologies include fuze safe and arm, semiactive lasers, height of burst sensors, super capacitors, inertial measurement units, novel actuation mechanisms, alternate energy sources, common telemetry and novel sensors. More than 25 qualifying proposals were received. These are being prioritized and, when possible, funded.

Providing affordable precision solutions to the warfighter is a clear necessity for ongoing combat operations and is likely to be essential for success in any future conflict. As technology and the current PORs advance, affordable precision will advance as well, providing dramatic improvements in precision-striking power immediately available to ground combat commanders.

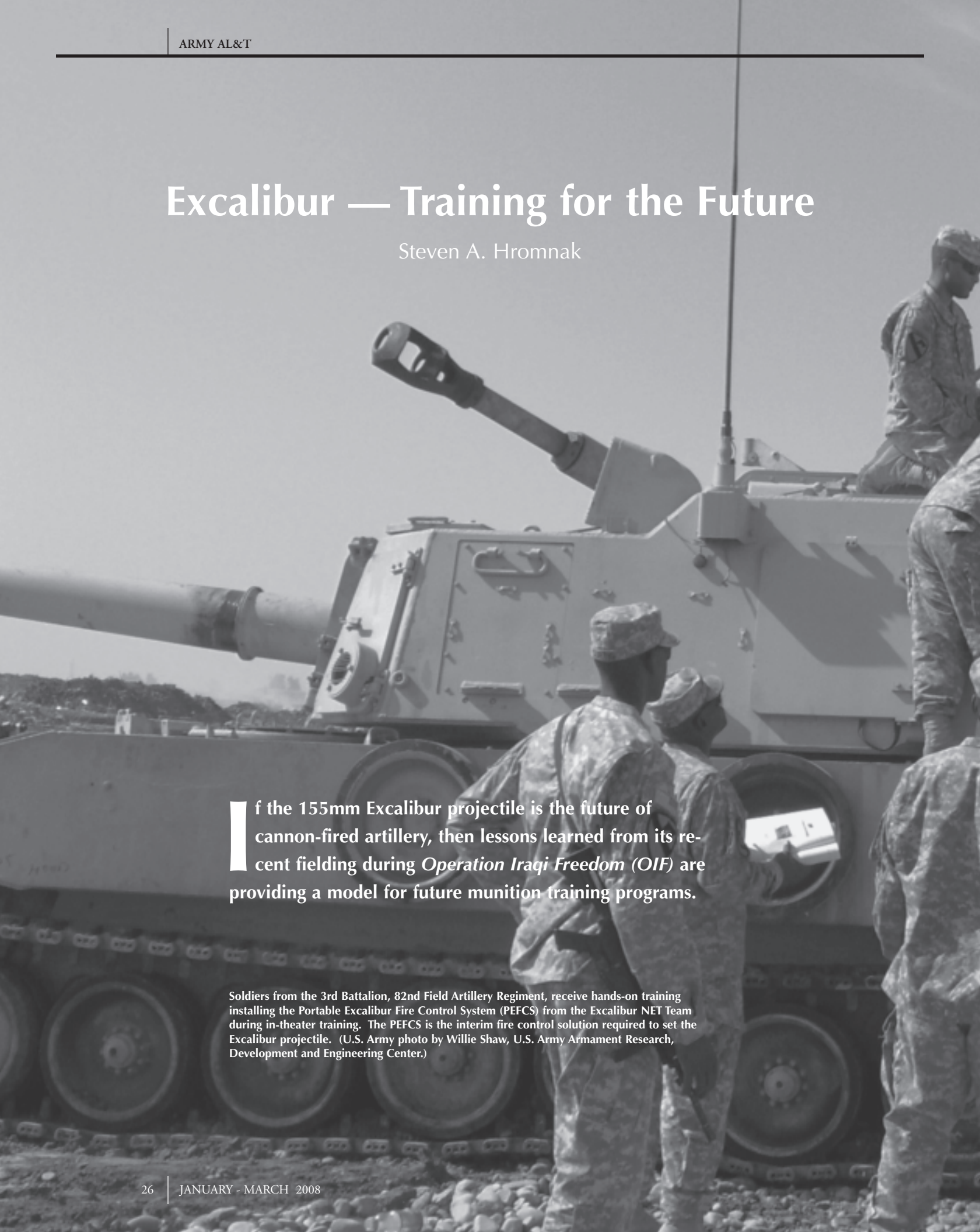
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# Excalibur — Training for the Future

Steven A. Hromnak



**I**f the 155mm Excalibur projectile is the future of cannon-fired artillery, then lessons learned from its recent fielding during *Operation Iraqi Freedom (OIF)* are providing a model for future munition training programs.

Soldiers from the 3rd Battalion, 82nd Field Artillery Regiment, receive hands-on training installing the Portable Excalibur Fire Control System (PEFCS) from the Excalibur NET Team during in-theater training. The PEFCS is the interim fire control solution required to set the Excalibur projectile. (U.S. Army photo by Willie Shaw, U.S. Army Armament Research, Development and Engineering Center.)



Why does Excalibur require a different approach to training? The answer lies in the way missions have changed. War and insurgency have moved into urban environments, and destroying a city block is no longer an option. Precision engagements have become the new mission, and training is the key to getting advanced precision munitions like Excalibur selected as the choice munition by field commanders.

Since Excalibur relies on sophisticated targeting capability and new tactics exercised by fire direction elements, an integrated comprehensive training program is essential to realizing the system's full capabilities. To ensure that Excalibur training meets Soldier needs, Soldiers were integrated into the training program in the earliest stages of product development. Later, Soldiers helped write the training documents.

A New Equipment Training (NET) team was organized to cover the full mission from forward observation (FO), through fire direction center (FDC) operators, down to gun crews. Using a mix of classroom and extensive hands-on exercises, skills were honed and training units conducted test firings for critical program events with full digital connectivity from FO through the FDC to the gun crew.

When the team hit the sand during *OIF*, there was no question they would succeed. Each Forward Operating Base capped off the training with the unit firing a tactical mission. With each hit, Soldiers' confidence in the system grew. When the NET team left and missions came in, Soldiers were ready and Excalibur performed as expected.

As we move into the future, training plans must be fully developed. We owe it to our Soldiers to equip them



Artillerymen from 1st Battalion, 82nd Field Artillery Regiment, 1st "Iron Horse" Brigade, 1st Cavalry Division, prepare an XM982 Excalibur 155mm projectile for a fire mission, May 6, 2007. (U.S. Army photo courtesy of the Multi-National Division-Baghdad Public Affairs Office.)

with superior weapon systems and then to train them to succeed. In keeping with the philosophy of "train as you fight," the more hands-on experience we provide, the more effective our Soldiers will be in employing Excalibur and other future gun-fired precision munitions systems.



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# 30mm Apache Ammunition In-Bore and Hang Fire Investigation Team (IHIT)

Kenneth Insko and John Hirlinger

**A** primary warfighting munition for the Apache attack helicopter is the 30mm M789 high-explosive dual-purpose round. Considered the armament of choice for soft and light armor targets, it is fired from the M230E1 cannon at rates in excess of 600 rounds per minute. Unfortunately, the round has experienced low-order, in-bore detonations and hang fires periodically that have damaged the M230E1 cannon in incidents dating back to the 1970s. Several failure investigations were conducted in the 1980s and 1990s to determine the cause, resulting in design changes to the fuze, ignition system and moisture seals. The most significant change occurred in 1987 in the hope of eliminating a design flaw that was proven to contribute to in-bore detonations. While the number of incidents was reduced, the problem persisted.

The AH-64 Apache's preferred warfighting munition of choice is the M789 30mm high-explosive dual-purpose round. Here, an Apache prepares to leave the flight line for a combat mission over Ninewa Province, Iraq. PM MAS and ARDEC have teamed together to implement numerous ammo design changes and make the 30mm cartridges more robust. (U.S. Navy photo by PH2 Robert M. Schalk, Fleet Combat Camera-Atlantic.)

## Warfighter Needs Increase Dramatically

The start of *Operations Enduring and Iraqi Freedom* resulted in a dramatic increase in Apache 30mm M789 cartridge use. Weapon failures continued to occur, and by 2003, enough incidents had been reported that Project Manager Apache issued a System Safety Risk Assessment. More than 1.1 million 30mm M789 cartridges produced prior to the 1987 design improvement incorporation were suspended, except for emergency combat use. To meet warfighting requirements, Program Manager Maneuver Ammunition

Systems (PM MAS) initiated new ammunition production contracts, quickly ramping up to 75,000 rounds per month. However, there continued to be occasional in-bores and hang fires during operational use.

## Team Challenged to Find Solutions

A formal cross-organizational investigation team was chartered to finally determine the causes and corrective actions needed to eliminate the ongoing problem. Co-chaired by Apache Project Management Office and Product Manager Medium Cannon Caliber

Ammunition, the IHIT consisted of personnel from the U.S. Army Armament Research, Development and Engineering Center (ARDEC); Joint Munitions Command; Army Research Laboratory; Tank-automotive and Armaments Command; U.S. Army Training and Doctrine Command Systems Manager Attack Helicopter; Boeing Co. (Apache prime contractor); and Alliant Techsystems Inc. (M230 weapon and ammunition prime contractor). Specifically, the team was chartered with identifying and evaluating root causes of in-bores and hang fires, recommending impacts on current ammunition

stockpiles and reducing or eliminating identified failures and potential risks.

Unlike previous investigations that focused mostly on the ammunition, the team looked at the problem from a total systems perspective. Using systems engineering and Lean Six Sigma (LSS) techniques, they explored all aspects of potential contributors from the aircraft, to the cannon and ammunition handling system, to the ammunition design and production processes, to fielding, handling and ammunition storage. The team's membership included a Six Sigma Black Belt. Process mapping, failure mode effects analysis (FMEA), fault tree breakdown, voice of the customer and design of experiments were some of the LSS tools the team employed.

Initially, the team's FMEA identified 215 potential failure modes. These were grouped into four major areas:

- Gun manufacturer, handling and aircraft systems (121).
- Ammunition metal parts and fuze manufacturer (55).
- High-explosive charge pressing and cartridge load, assembly and pack (36).
- Handling and storage of ammunition (3).

Through risk prioritization, potential failure modes were narrowed down to 24 and evaluated using fault tree

analysis. Cartridges were built with the specific flaws ranked highest from the fault tree analysis, and were evaluated using a design of experiments test to determine individual contributions as well as interactions that contributed to causing an event. Results from the test firings replicated the observed field signatures for all of the event types that had been previously noted.

### Hard Work = Successful Results

The IHIT effort took 2 years. The IHIT team eventually found three primary root causes for the various failures:

- Foreign material contamination in the warhead that could lead to in-bore detonation.
- Damage to the cartridge ignition train and propellant degradation as a result of long-term exposure to extreme temperatures and aircraft vibration that could lead to delayed ignition and hang fire or high-pressure events.
- Ammunition damage or degradation because of storage and loading procedures that could lead to high pressure or bullet-on-bullet events.

The team's findings led to implementing multiple production process improvements in the ammunition manufacturing facility to minimize occurrence of in-bore detonations. A more complete understanding of the aging effects of propellants was also gained, resulting in

issuing instructions to the field on proper ammunition storage to prevent hang fires. This guidance also updated procedures for upload and download, and implemented procedures to rotate ammunition on the aircraft to minimize potential damage from prolonged aircraft vibration that could lead to hang fires and high pressure. The team recommended numerous ammunition design changes to make the cartridge more robust and new screening procedures for ammunition that had been suspended because of in-bores or hang fires. The net effect is that the Army was able to recover more than 100,000 rounds that otherwise would have been demilitarized at a loss to the Army of more than \$7 million.

While the potential for another in-bore or hang fire cannot be positively eliminated, their occurrence has been dramatically reduced through these efforts. A multidisciplinary team employing a systems approach and tailored use of LSS tools resulted in considerable success in reducing a problem that has plagued the Army for more than 20 years.

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A multidisciplinary team employing a systems approach and LSS tools is striving to eliminate 30mm in-bore detonations and hang fires that lead to weapon systems failures in Iraq's and Afghanistan's harsh operational environments. Here, an AH-64D Longbow Apache helicopter from 1st Battalion, 101st Aviation Regiment, 101st Airborne Division, provides air support for U.S. and Iraqi army ground forces operating from Forward Operating Base Speicher, Iraq. (U.S. Air Force photo by TSGT Andy Dunaway, 1st Combat Camera Squadron.)



# Countermeasure Flares Team (CFT) Leverages Acquisition Process to Meet Warfighter Demands

Rene Medina

**I**n November 2005, the Army drastically increased monthly requirements for the M211, M212 and M206 countermeasure flares from 9,000 to 54,000 in just 3 months. This new requirement was the challenge faced and met by the Project Manager Close Combat Systems (PM CCS) CFT.

An AC-130 Spectre gunship fires M211 flares during an air interdiction mission. During *Operations Enduring and Iraqi Freedom*, the USAF and SOCOM expended nearly 80,000 flares per month. (USAF file photo.)



Driving the demand was the highly accelerated, fleetwide fielding of the new helicopter-mounted Common Missile Warning System (CMWS) without sufficient munitions to support it in theater. “The M211, M212 and M206 flares have been highly effective in defeating surface-to-air heat-seeking missiles, and have saved countless Soldiers’ lives,” remarked PM CCS COL Ray Nulk. “Recognizing this, the CFT worked tirelessly with contractors to meet the increased demand and get this lifesaving equipment into the hands of our warfighters.”

As demand rose and funds became available, the team worked with the flare producers to rapidly increase production capacity. At the same time, the testing team performed lot acceptance testing against intensive schedules to verify product quality while performing additional qualification testing in support of new production processes and equipment implementation. According

to Santo Lombardo, PM CCS Pyrotechnics and Shoulder Launched Munitions Division Chief, exceptionally close communication between the government and contractors — Alliant Techsystems Inc. for the M212 and Alloy Surfaces for the M211 — allowed this to be choreographed so effectively.

### **Prompt, Expedited Contracting**

In response to Soldiers’ increased needs, the integrated product team (IPT) was established to guide the effort streamlined the contracting process, resulting in several awards within 30 days of receiving funds. This was accomplished by providing innovative contracting strategies such as multiple ramp ups, product improvements and increased production quantities. It also required the development and staffing of several justification and approvals to various levels, the highest being the Assistant Secretary of the Army for Acquisition, Logistics and Technology (ASAALT).

The M206 team promptly executed supplemental funding requirements, assuring appropriate justifications, approvals, solicitation and award documentation was completed to award two split (45 percent/55 percent) contracts within 1-2 weeks of funding receipt. The team’s contracting specialists negotiated requirements and delivery schedules with each contractor to meet 30-60 day customer-required delivery dates.

The IPT was able to identify issues, develop solutions and contractually execute alternative approaches quickly and decisively to meet the need for more countermeasure flares to support the increase in fielding of the CMWS currently being used in *Operation Iraqi Freedom (OIF)*. “By developing effective solutions and accelerating the award of multiple contracting actions, the team was able to provide a higher level of protection to our Soldiers during conflict,” said Lombardo.



USAF transport planes preemptively fire countermeasure flares during take-off and landing, as those are the times when they are most vulnerable to shoulder-fired IR missiles. (DOD photo by SA Julianne Showalter.)

### Collaboration Increases Production Without Delays

The government team and flare producers worked in close collaboration so increases in production capacity did not interrupt current flare production, delivery or quality. Jointly, they were able to streamline approvals of new tooling, manufacturing processes and lot acceptance testing to ensure that deliveries arrived in time to support theater operations. PM CCS qualified new suppliers to support increased production, not only allowing increased rates, but also eliminating potential single points of failure while reducing and mitigating risks. Manufacturers were directed to expedite flare delivery by shipping directly from the production line to Dover Air Force Base (AFB), DE, or Charleston AFB, SC, for delivery to Kuwait or Iraq until inventory was sufficient in theater to support monthly requirements.

The team also helped facilitate construction of a new manufacturing plant that successfully completed the ramp up of M211 flare production to 80,000 units per month — enough to meet Army, U.S. Special Operations Command (SOCOM) and U.S. Air Force (USAF) requirements for the flare.

### Expedited Delivery and Clearance Times

Transportation specialists on the CFT managed the delivery process to expedite clearance and shipment of materials through constant communication and quick action. Aside from continuously tracking production delivery schedules, they provided liaison support between the contractor, Defense Contract Management Agency and Army Air Clearance Authority to expedite clearance into the aerial port of embarkation.

Using Lean Six Sigma techniques in addition to other initiatives, process time was reduced from 3 days to 1.

The transportation specialists also coordinated unit line number airlifts directly with the U.S. Central Command (CENTCOM) and U.S. Army Transportation Command and created a weekly dedicated Air Mobility Command channel mission to provide supply stability to the entire theater. Diplomatic clearance time was reduced from 21 to 9 days for these critical items. This group was also able to maximize scarce transportation assets, including diverting in-transit ground shipments to alternate ports to meet critical theater needs.

### Continuous Reporting to Army Leaders and Warfighters

The CFT continuously reported flare requirements, usage and projections to the very highest level of Army leadership, supporting balcony briefings, CENTCOM status briefs, weekly production updates and reports to the ASAALT. This vital information was provided to Congress in support of the Army's request for supplemental funding for these urgently needed flares.

The team also provided support and information directly to warfighters in theater through weekly teleconferences with the Coalition Forces Land Component Command's Command, Control Communications and Computers (CFLCC C4) Ammunition Officer; PM CCS; Joint Munitions Command (JMC) managers; and logistics support. The weekly meetings were an integral part of coordinating with CENTCOM, the 321st Theater Materiel Management Center and the U.S. Army Materiel Command. CFT members have also traveled to theater to provide the latest information on flare status.

In recognition of their outstanding support, CFLCC C4 presented the



A UH-60 Black Hawk helicopter fires flares during a combat troop insertion during OIF. Transport helicopters are especially vulnerable to shoulder-fired IR-guided missiles. The new LA59 flare will greatly improve crew survivability in both Army fixed- and rotary-wing aircraft. (U.S. Army photo courtesy of PM CCS.)

During OIF, U.S. and coalition forces have depended heavily on American manufacturing base initiative and production capability to counter insurgent ground-to-air missile threats. Here, an Australian airman loads U.S. produced M206, M211 and M212 flares to his aircraft in preparation for a combat mission. (Photo courtesy of PM CCS.)



team with commander coins. Positive feedback was received from theater regarding the Joint Munitions and Lethality Life Cycle Management Command support. CFLCC C4 Commanding General BG Raymond V. Mason remarked, “[CFT’s] daily dedication and coordination efforts for Class V have been nothing short of outstanding! It is individuals like you who have allowed the U.S. Army to leverage its logistics capabilities to give our Soldiers and our allies the best support available.”

### Team Wins Prestigious Packard Award

The PM CCS CFT received the David Packard Excellence in Acquisition Award in November 2006 in conjunction with the U.S. Army Armament Research, Development and Engineering Center; the Rock Island-based JMC; the U.S. Army Tank-automotive and Armaments Command contracting staffs; the Army Field Support Command; and the Communications Electronics Research, Development and Engineering Center (CERDEC) (e.g., CERDEC’s Infrared (IR) Flares

Team) for their work on the M211, M212 and M206 countermeasure flares project.

“This award means a great deal to all of us,” stated Patti Felth, Deputy PM CCS. “Through teamwork, hard work and focus on our ultimate customer, the Soldier, we are proud to have been instrumental in meeting the Army’s accelerated demand for the lifesaving M211, M212 and M206 flares.”

### Multipurpose Flare Prompts Quick Procurement Action

In early 2007, the U.S. military experienced an increase in aircraft losses from enemy attack. Testing conducted in FY06 by SOCOM had shown that the LA59 (XM216) Aircraft Countermeasure Flare provided a better level of protection with a lower visible signature and a lower cost than the M206, M211 and M212 flares currently in use. When the results were presented to Army senior leaders, including Vice Chief of Staff of the Army GEN Richard A. Cody, at an aviation summit held in February 2007, Cody directed PM CCS to procure the LA59.

The LA59 improves crew survivability by protecting Army fixed-wing and rotary-wing aircraft from shoulder-fired IR-guided missiles. It also acts as a decoy to counter an attack on aircraft from various IR-guided missile threats at both low and high altitudes. This new flare can serve as protection for Army helicopters and low-altitude aircraft, and can be used on the A-10, F-16 and C-130. The LA59 is intended for use in either the CMWS dispenser or the Improved Countermeasure Dispenser (ICMD) package, both of which hold 30 flares total. Currently, upon engagement, the CMWS dispenses a minimum of one each of the M206, M211 and M212 for up to 10 engagements. With the LA59, the CMWS or

the ICMD will be able to handle up to 30 engagements.

“Once sufficient quantities of the LA59 are on hand,” said Lombardo, “it will enhance the current cocktail of countermeasure flares that are used to counter an attack on aircraft at high altitude.”

The CFT developed an acquisition strategy to rapidly get the Army on contract to procure the LA59 by using a letter contract to award a 1-year indefinite delivery indefinite quantity contract only 3 days after receiving congressional approval for new start authority. The IPT used this Unfinalized Contract Award approach to award a delivery order concurrently with the contract award and began receiving flare deliveries in November 2007, with increased flare production per month exponentially by May 2008. PM CCS definitized the contract in October 2007, which will vastly increase deliveries in May 2008 as the initial contract will only satisfy the urgently needed requirements.

Army requirements for aircraft countermeasure flares consist of operational requirements (war reserve plus training requirements) of approximately 800,000 per year. This 1-year contract will allow the government enough time to have another contract vehicle in place to satisfy additional nonurgent requirements.

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# Insensitive Munitions — New Explosives on the Horizon

Nancy Gray

**T**he U.S. Army is testing a new explosive filling for the 155mm M795 artillery projectile developed by scientists at the U.S. Army's Holston Army Ammunition Plant (HSAAP) in Kingsport, TN. BAE Systems, Ordnance Systems Inc. (OSI), is the HSAAP operating contractor. Recently, OSI embarked on a program to identify potential next-generation energetic materials that can be used to address stakeholder concerns over the conventional ammunition filling (2, 4, 6-TNT) for 155mm projectiles used by the U.S. Army.

An M109A6 Paladin 155mm Self-Propelled Howitzer fires an M795 projectile against an insurgent target in support of *Operation Iraqi Freedom* combat operations last year near Baghdad, Iraq. (U.S. Army photo.)

The main issue with TNT as a filling for modern projectiles is that the explosive behaves violently if subjected to an accidental stimulus, such as being involved in a fire. In addition, TNT-loaded ammunition is susceptible to attack by enemy fire. For example, .50-caliber armor-piercing bullets can penetrate a TNT-loaded projectile, causing a devastating reaction. High-speed fragments and even the Rocket Propelled Grenade-7 shaped charge weapon system provoke a similar, violent response from TNT-loaded 155mm projectiles.

Over the years, there have been many initiatives to make TNT safer. For example, mixing TNT with other non-explosive additives to "desensitize" the explosive and make it less violent (and sensitive) when subjected to unplanned

stimuli. One major consequence of these approaches is that when TNT is diluted with nonexplosive additives,

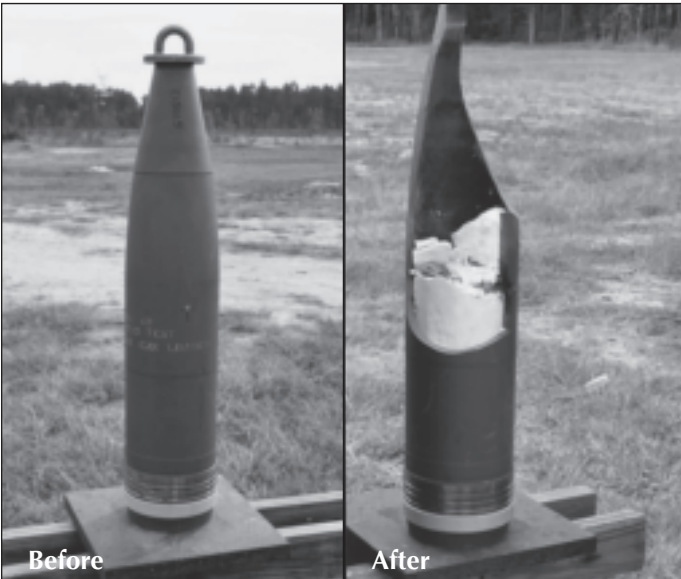


A motor pool fire at the Camp Doha, Kuwait, compound in July 1991, involving an M992 ammunition carrier loaded with 155mm artillery projectiles, resulted in the destruction or damage of 102 vehicles. Forty-nine people were injured and 3 Soldiers were killed. Losses exceeded \$15 million. That's why PM CAS, OSI and HSAAP have partnered to produce OSX-CAN, an insensitive munition that is entering qualification testing as a potential TNT replacement in M795 munitions. (U.S. Army file photo.)

such as wax or other inert organic materials, the resultant system energy is reduced, which renders the ammunition less effective. The current state-of-the-art shows that while TNT can be made safer, it can never be completely safe. Even the best attempts to make a safe TNT-based explosive filling fail to fully meet the Army's stringent testing requirements for insensitive ammunition.

## New Path Results in a Safer Explosive

When OSI scientists looked at this problem, they took a different path. Their research suggested that the materials needed to make a safe 155mm artillery explosive were not actually available in large quantities. This left two choices — adopt the conventional approach and try to make a safer TNT-based explosive or



**Before:** An inert 155mm M795 artillery projectile moments before being struck by a .50-caliber armor-piercing bullet. **After:** The same 155mm M795 artillery projectile after being struck by a .50-caliber bullet. Note the white “energetic material” exposed in the damaged shell casing. It is this kind of “accidental stimulus” that renders TNT violent and sensitive. (U.S. Army photos courtesy of HSAAP.)

explosive formulation. The first of these new ingredients was 2, 4-dinitroanisole (DNAN); the second was 3-nitro-1, 2, 4-triazol-5-one (NTO).

OSI manufactures DNAN and NTO in a facility originally designed to destroy explosive materials. From 2000-2001, the U.S. Army established a capability at HSAAP to dispose of energetic ingredients as part of an international peacekeeping effort. This facility

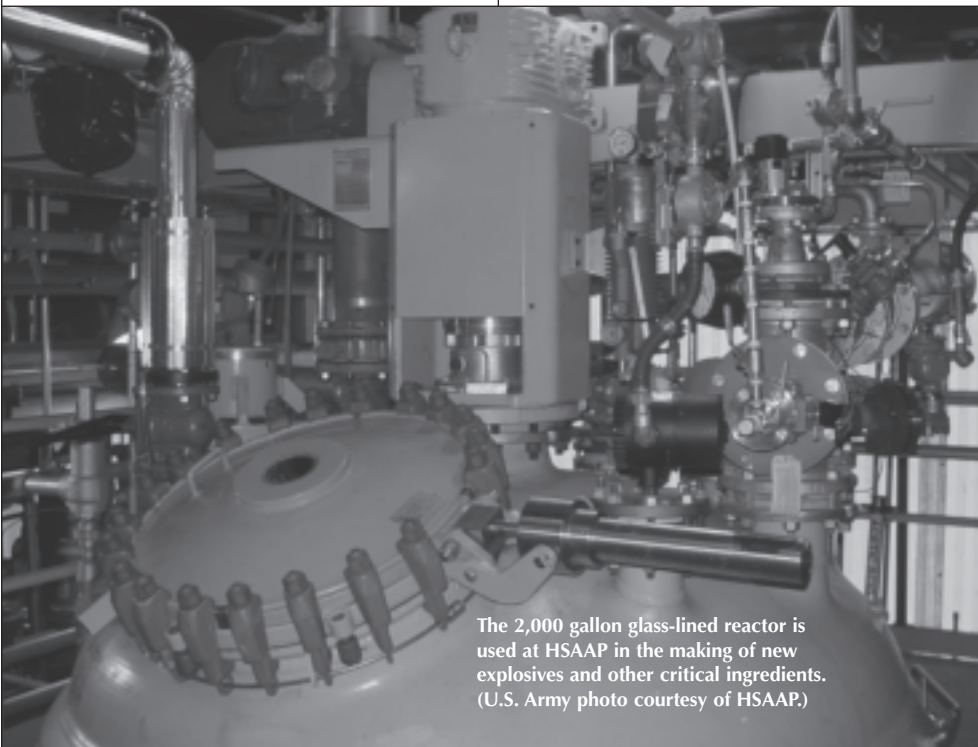
OSI used DNAN, NTO and other ingredients to develop Ordnance Systems Explosive-Common Ammunition Newfill (OSX-CAN). This new explosive was submitted to the U.S. Army’s Program Manager Combat Ammunition Systems (PM CAS) as part of an industry-wide evaluation program to identify a truly insensitive replacement for TNT in the 155mm M795 ammunition. It was evaluated alongside numerous other candidates in a series of carefully orchestrated tests managed by PM CAS.

The evaluation effort involved systematically testing the candidate explosives loaded into 155mm projectiles against various credible tactical threats such as bullet impact; fragment attack; slow- and fast-heating, sympathetic detonation; and shaped charge attack. OSX-CAN successfully passed all of the insensitive munitions (IM) tests that the explosive was subjected to and was identified as being a “superior choice in all areas” to all other candidates. OSX-CAN was selected as the leading candidate for qualification testing as a TNT replacement in the M795 ammunition.

find a way to produce the potentially more suitable, but not readily available, insensitive replacement for TNT. OSI chose the second option. Following the completion of a series of strategic programs, OSI had established a capability at HSAAP to manufacture two key ingredients that would become the major components of its 155mm insensitive

employed a 2,000 gallon glass-lined reactor that was used to demonstrate the disposal process, but was then redundant. OSI used the glass-lined reactor as a nucleus for establishing a reconfigurable production facility — one that could be used to make multiple new explosive ingredients, including DNAN and NTO.

In developing IM components such as OSX-CAN, HSAAP is ensuring a safer product for warfighters to use and handle, a safer product for transporting and a safer product for manufacturing and storing. The bottom line for OSX-CAN and other IM components being developed at HSAAP is that this ammunition will save lives on and off the battlefield while sustaining the same powerful ability to stop the enemy in its tracks during combat operations.



The 2,000 gallon glass-lined reactor is used at HSAAP in the making of new explosives and other critical ingredients. (U.S. Army photo courtesy of HSAAP.)

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# The Security Assistance Ammunition Program — Helping Allies Help Themselves

Marcy Salmonson

**E**nabling friendly foreign countries and international organizations to acquire timely, quality conventional ammunition, operations support, training and related logistics support, in furtherance of U.S. national security policies.

*Security Assistance Mission*

The U.S. supports legitimate defense requirements of allies and friendly foreign countries to help them deter or defend themselves against aggression and to promote better interoperability with U.S. military forces. Here, 1LT Gabriel Scheinraux, 172nd Stryker Brigade Combat Team, coaches an Iraqi police officer at a weapons training course in Khidr Ilyas. (DOD photo by TSGT John M. Foster, 1st Combat Camera Squadron.)

The Security Assistance Ammunition Program (SAAP) was founded on, and remains today, an invaluable instrument of U.S. foreign policy. The arms trade and related services are reaching enormous dimensions and involve most nations as sellers, providers, buyers or recipients. At the U.S. Army Joint Munitions Command (JMC), security assistance is the means by which the U.S. government seeks to achieve national security and foreign policy objectives by enabling allied and friendly nations to acquire and maintain the capability to defend themselves. JMC provides the ammunition and equipment that allows our allies to carry out this objective.

## Security Assistance Evolves as Part of U.S. Foreign Policy

The idea of security assistance began during the Cold War with concerns that war-torn countries would fall victim to the Soviet Union. The U.S. containment policy, which called for stopping the domino effect of nations

moving politically toward Soviet Union-based communism, began with a proclamation by former U.S. President Harry S. Truman on March 12, 1947, which became known as the *Truman Doctrine*. It was used effectively in Turkey and Greece and set a pattern for security assistance that developed through the next 4 decades.

The *Marshall Plan* (also referred to as the European Recovery Program) enactment on April 3, 1948, served as an emergency tool to stabilize Europe and marked a turning point for U.S. foreign policy following World War II (WWII). This enactment led to the establishment of the Economic Cooperation Administration (July 1948). When it ended in 1951, Congress was in the process of formulating a new foreign aid and containment policy designed to unite military and economic programs with technical assistance. The new policy became a factor in determining which countries would receive aid, what type and how much assistance would be

furnished, and whether it would be provided through a grant or sale.

In 1961, Congress passed the *Foreign Assistance Act (FAA)*, which reorganized the U.S. foreign assistance programs including separating military and non-military aid and putting primary emphasis on long-range economic and social development assistance efforts. A key *FAA* element was a provision for multiyear financing to allied countries that allowed for commitments beyond the year-to-year basis, while still allowing each year's appropriation to come before Congress. Congressional reviews of appropriated funds offered to international organizations and foreign countries are subject to certain conditions and requirements. This allows Congress its "checks and balances" on foreign-assistance policy. Through this and other military statutes, the Foreign Military Sales (FMS) Program was authorized with the security assistance organizations executing the program.



The U.S. reaffirmed its containment policy by joining formal security alliances, such as the United Nations and NATO. These alliances had significant influence on security assistance priorities and special accommodations, and every presidential administration has made those accommodations the foundation of their foreign policy.

The Middle East assumed a preeminent role in U.S. security assistance beginning in the 1980s. Because of countless border conflicts, international terrorism and invasions, and ultimately, the world dependence on the region's petroleum reserves, no other part of the world, with the exception of Southeast Asia, has commanded as much presidential attention since WWII.

### Program Helps Allies Throughout the World

Today, the total funding of the JMC's SAAP is in excess of \$691 million in sales to foreign customers. The top 10 countries, including Egypt, Afghanistan, Iraq, Japan, Israel and Canada, account for \$626 million in sales.

The FMS Program is used by first-world allies, such as Greece, New Zealand, the United Kingdom, Australia and the Netherlands, but also by lesser known NATO and global war on terrorism partners such as Slovenia, Estonia, Senegal, Mauritania and Georgia, which struggle with their independence from the communist-socialist influence.

Georgia, for example, requested FMS assistance to train and equip its forces in support of *Operation Iraqi Freedom*. Items obtained through U.S. inventories included mines, simulators and signals. Foreign equipment was obtained through a U.S. contractor and supplied primarily by former *Warsaw Pact* nations. Those items included rockets, mortars and various small- and medium-

caliber arms. Logistics services and equipment, also provided by a U.S. contractor, included daily base operations, water purification and medical facilities.

The role FMS assistance plays in lesser-known countries such as Colombia is crucial. U.S. drug intervention in Colombia is intended to discourage the production, distribution and consumption of targeted substances. These counternarcotics efforts have been, and continue to be, supported by the U.S., which supplies rockets, launchers, grenades and medium- and small-caliber ammunition.

### Goals Ensure Support to U.S. and Allied Forces

The benefits of U.S. and allied negotiations and sales go beyond the obvious — it includes sales by the U.S. government as well as the necessary partnering with U.S. contractors and private industry. Since the U.S. is not the only source of ammunition and related services on the world market today, JMC has a tremendous challenge to foster solid business relationships. With U.S. contractor and industry assistance, the U.S. government retains customers and obtains additional sales via improved ammunition acquisition, competitive prices and better delivery schedules.

Since 1961, the Security Assistance FMS Program ideals have not changed, yet the program has undergone significant changes in the way it does business. Export sales and transfers are complex transactions involving three primary stakeholders — the U.S. government, allied or friendly governments and U.S. defense companies. Industry marketing efforts, necessary to support cash sales, are intensifying.

A primary method by which foreign governments acquire U.S. defense articles and services is through government-

to-government FMS agreements using a Letter of Offer and Acceptance. Under FMS, the U.S. government uses its own procurement procedures and acts as its own procurement agent for foreign customers.

Because restraint is most important in arms transfer, the U.S. supports legitimate defense requirements of allies and friendly foreign countries with the following five goals:

- To ensure U.S. military forces continue to benefit most from technological advances over potential adversaries.
- To help allies deter or defend themselves against aggression, while promoting interoperability with U.S. forces when combined operations are required.
- To promote regional stability in areas critical to U.S. interests, while preventing the proliferation of weapons of mass destruction and their missile delivery systems.
- To promote peaceful conflict resolution and arms control, and protect human rights, democracy and other U.S. foreign policy objectives.
- To support the U.S. defense industrial base's ability to meet U.S. defense requirements and maintain long-term military technology superiority at lower costs.

Security assistance is dedicated to those efforts, ensuring that our Armed Forces have the best possible resources available — both at home and abroad.

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# Conventional Ammunition Demilitarization (Demil) — A Growing Challenge

LTC Brian W. Raftery

**A**s the Single Manager for Conventional Ammunition, the Army has demil responsibility for DOD conventional ammunition. This includes storage, surveillance, demil and disposal of DOD's excess, obsolete and unserviceable ammunition, including conventional munition items, tactical missiles and large rocket motors. Also, the Army is charged with planning, programming and budgeting. Obtaining the resources to reduce the demil stockpile is the single biggest challenge.

Here, 81mm mortar rounds undergo demil treatment in an Ammunition Peculiar Equipment 1401 Autoclave Meltout Facility. (Photo by Sam King, The CSI Group.)



## Size Matters

The current demil stockpile is estimated at almost 480,000 short tons of conventional ammunition and more than 300,000 missiles and missile components. At an approximate cost of \$1,800 per ton to demil this stockpile with future additions or generations, the demil liability to DOD is almost \$2 billion through the current budget and program years. At the current funding level, the stockpile, instead of getting smaller, continues to grow.

Most of the demil stockpile is stored and maintained by the U.S. Army Joint Munitions Command (JMC) at

its major depots and ammunition plants, where they also receive, store and outload ammunition in direct support of the warfighter. The presence of demil stocks in the same place as the critical mission and training stocks results in storage inefficiencies, increased costs and decreased opportunity to apply Lean Six Sigma (LSS) principles to improve efficiency.

In addition, under the Base Realignment and Closure program, the JMC lost a significant amount of covered storage space without a corresponding decrease in stored stockpile. Demil is more critical than ever to ensure that

excess, obsolete and unserviceable munitions items do not consume valuable covered storage space. In this regard, the JMC is the Demil Program's major customer. In fact, for every ton of conventional ammunition demilitarized, approximately 7 to 9 square feet of covered storage space can be opened to store ammunition required by the warfighter.

At current funding levels, the demil stockpile is expected to grow to more than 500,000 tons by 2013. As the stockpile is demilitarized, the munitions toward the end of the queue are more complex than those currently being demilitarized, further exacerbating the



problem. This increased complexity results in increased cost, so tomorrow's demil dollar will potentially buy less in terms of the number of items demilitarized. The trend over the last few decades has moved from the more traditional and less complex open burn or open detonation (OB/OD) demil techniques to more complex and more costly Closed Disposal Technology (CDT) and Resource Recovery and Recycling (R3) methods.

Environmental considerations have resulted in the current Demil Program operating at CDT or R3 levels of 85 percent or higher and OB/OD at 15 percent or less. Additionally, CDT and R3 capabilities generally require a capital investment to develop and purchase hardware, as well as the normal level of operational funding to actually execute demil. Thus, it would seem that operating at a high level of CDT and R3, although more environmentally responsible, results in diminishing marginal returns.

**Recycling Has Potential to Lower Costs, Expand Effort**

With demil funding levels either flat or trending downward, and demil costs on the rise, the Demil Enterprise was

forced to look for ways to reduce costs. One potential answer was finding markets for demil operations recyclable components and end products, much the way the commercial recycling industry does. This involved several challenges, not the least of which would require statutory relief for the Demil Program to directly reinvest the proceeds of R3 operations back into the program. While demil operations were already producing millions of pounds of marketable metals and energetics every year, there was no way to

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effectively see and direct monetary benefit back into the program. This would require changing the law.

The U.S. Army Materiel Command (AMC) G-3 and Command Counsel crafted language that would do just that. After a concerted effort by the Army, this language was codified into law through the *John Warner National Defense Authorization Act for FY07 (NDAA 07)*.

With *NDAA 07* passage, the Army has the legal authority to establish and operate a recycling program that will benefit the Demil Program by offsetting demil R3 operations cost. While considerable, this accomplishment is just a first step in establishing and operating a program to help achieve the statute's intent. Now that the Army has this legal authority, it can sell recyclable munitions materials resulting from demil and reinvest the proceeds into demil R3 operations. Proceeds from the reinvestment are estimated at \$2-3 million annually.

In close coordination with AMC G-3 and Command Counsel, the Demil Enterprise Partners (Product Manager (PM) Demil); JMC; the U.S. Army Defense Ammunition Center; the U.S. Army Armament Research, Development and Engineering Center; and the U.S. Army Aviation and Missile Command G-3, as well as the Army G-4 and the Assistant Secretary of the Army for Acquisition, Logistics and Technology, started implementing the new statute as quickly as possible. A Department of the Army (DA)-level policy would be required when the bill's final version was received, as well as an implementation plan.

Within the Demil Enterprise, a working-level plan was devised. It became



Here, demilled mortar rounds and other munitions metal scrap await recycling. Under *NDAA 07*, the Army can now operate a recycling program that will offset demil R3 operations costs. (Photo by Sam King, The CSI Group.)



With current demil stockpiles estimated at 480,000 short tons, coupled with the high operations tempo associated with the global war on terrorism, demil stockpile tonnage is expected to grow to more than 500,000 tons by 2013. Inadequate resourcing and storage, handling and shipping challenges exacerbate the situation. The demil community has responded with creative and innovative LSS processes to address the situation. With the passage of NDAA 07, additional revenues from recyclables are being put directly into R3 operations. (U.S. Army photo by SPC Clydell Kinchen, 55th Signal Co. (Combat Camera).)

clear early on that the JMC installations would be critical planning partners and, for it to be successful, the installations would have to receive incentives for marketing work to generate the revenue in the first place. A cost-sharing arrangement would have to be established that provided monetary benefit to the installation performing the work. This would take the form of a 40-percent return of the proceeds harvested by the installation for future demil R3 projects or capabilities. The remaining 60 percent would be for demil reinvestment for similar activities for the Demil

Program at large. The intent was that 100 percent of the proceeds would be used to offset demil R3 projects costs. Additionally, a financial accounting system was established to maintain revenue management control and accountability.

The DA G-4 drafted, staffed and published a DA-level message that effectively served as the interim regulation required by statute to implement the plan. This message codified the key tenets of the operational plan previously described, as well as established overall applicability. At this time, only CONUS installations

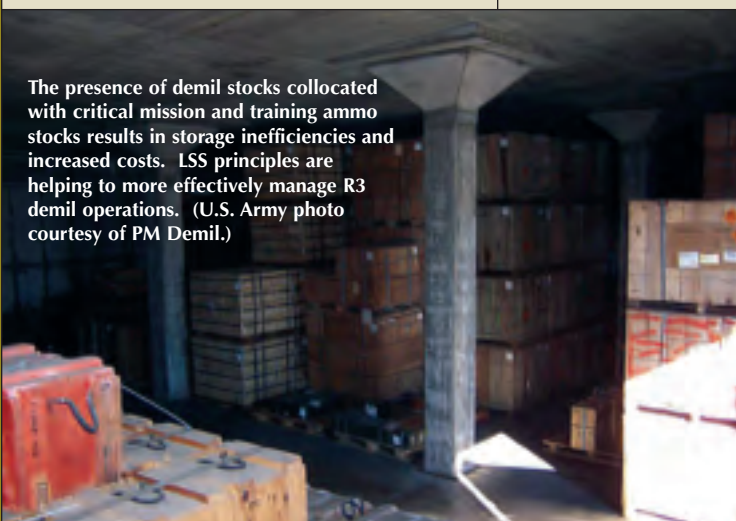
are eligible to participate. When this message was published in May 2007, the Demil R3 Program was established and the first revenue checks were deposited in the centrally managed account.

## Where Do We Go From Here?

While the new legislation does offer potential in terms of cost reduction for demil R3 programs, more is needed. Reducing the demil stockpile must be adequately funded. While selling demil recyclable derivatives can help offset costs, it doesn't pay the whole cost, nor does it apply to the entire stockpile. Additionally, many items are too small or complex to effectively recycle; other derivatives produce little or no value, like commercial glass, which is cheaper to produce new.

The new law complements two existing demil initiatives: the Demil Research and Development (DRD) Program and the Design for Demil (DFD). DRD has major thrust areas focusing on disassembly and reusing existing munitions. DFD seeks to influence future munitions design for easier disassembly. Both of these initiatives can help maximize the recycling value of demil residual products by reducing the cost of a more valuable end product. By using LSS principles, existing processes can be tuned to return higher yields on existing R3 projects. With new leverage provided by the new law, we can increase current demil program effectiveness and enhance demil R3 economic viability.

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The presence of demil stocks collocated with critical mission and training ammo stocks results in storage inefficiencies and increased costs. LSS principles are helping to more effectively manage R3 demil operations. (U.S. Army photo courtesy of PM Demil.)



# Assessing Munitions Solutions — The Army's Munitions Readiness Reporting (MRR) System is on Target

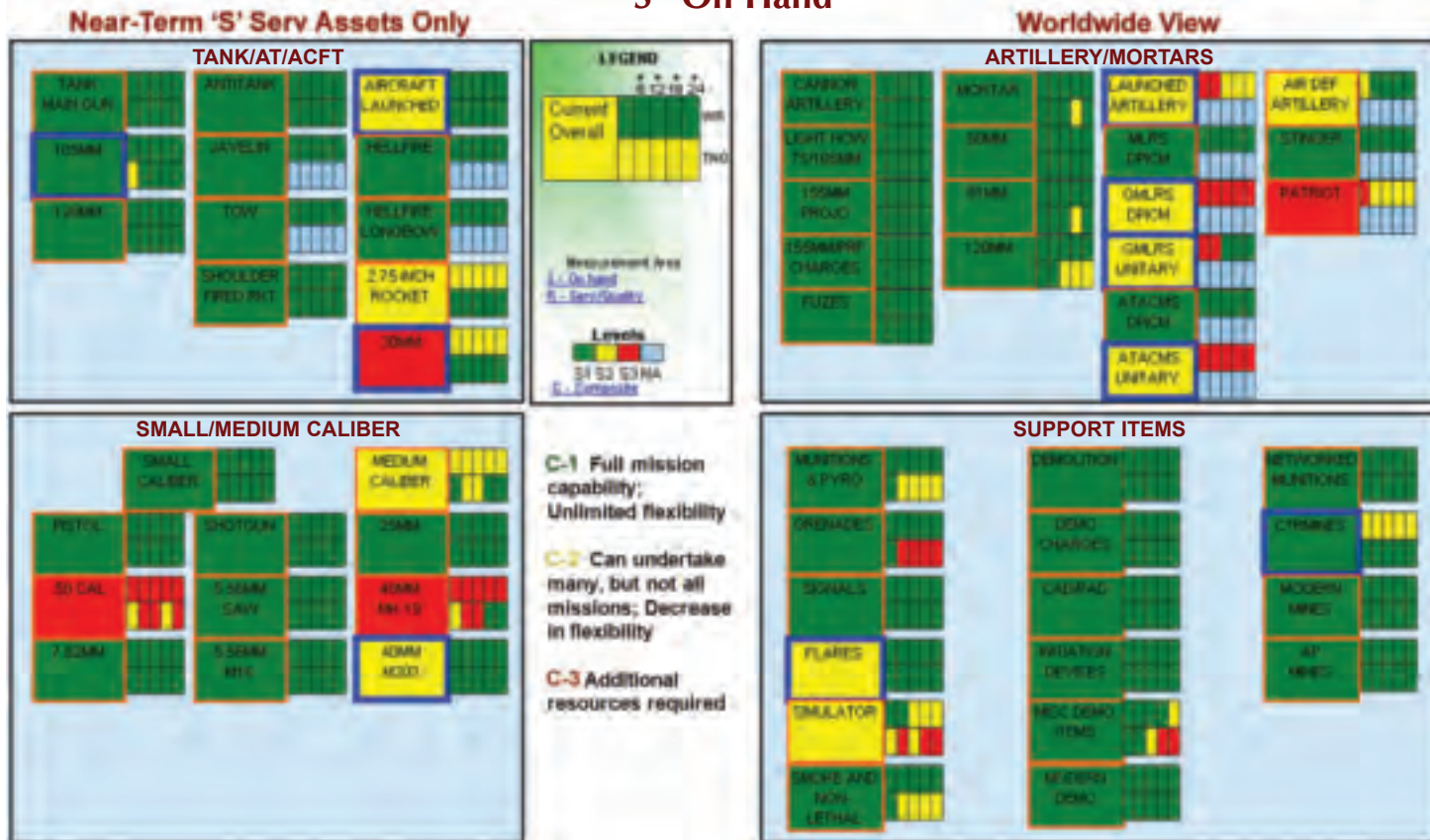
Jay D. Sloat

**D** *Develop a system for munitions that will portray the Army's ability to support contingency operations.* This was the challenge issued by then U.S. Army Chief of Staff GEN Eric K. Shinseki just 2 days after the Sept. 11, 2001, attacks. The Operations Support Command, now known as the Joint Munitions Command (JMC), headquartered at Rock Island Arsenal, IL, quickly accepted this challenge.

The MRR system reports readiness availability and reliability while capturing current stockpile status. Here, Marines from Lima Co., 3rd Battalion, 2nd Marine Regiment, fire their 60mm mortar during a live-fire training exercise in Northern Kuwait. (U.S. Marine Corps photo by LCPL Gordon A. Rouse.)



## MRR Worldwide View “S” On Hand



The MRR system determines ratings for two basic measurement areas. Readiness is reported for availability (S rating) and reliability (R rating) for each ammunition item. At the roll up levels, ratings are color coded and displayed graphically.

JMC is the Army’s field operating agency (FOA) for the DOD Single Manager for Conventional Ammunition (SMCA). In this capacity, JMC produces, stores, maintains and demilitarizes ammunition for all military services. The command operates a global network of installations, activities and forward support elements.

Shinseki recognized that the Army needed a tool to define and assess its ability to support contingency operations, and that major elements within the Army lacked a common methodology for assessing munitions readiness. To meet this challenge, JMC developed and implemented the MRR system. Consequently, the Army is now measuring munitions readiness using the standard methodology for measuring unit readiness.

Initially, JMC turned to *Army Regulation (AR) 220-1, Unit Status Reporting*, which establishes measures for readiness of Army units and defines four resource areas for unit status reporting. Adopted as a model, these resource areas were modified to fit MRR. The above table illustrates:

### Unit Status Reporting *AR 220-1*

#### Areas Rated:

- S — Equipment on Hand
- R — Equipment Serviceability
- T — Training
- P — Personnel

### MRR

#### *AR 220-1* Adapted

#### Areas Rated:

- S — Munitions on Hand
- R — Munitions Serviceability

### Q — Munitions Quality B — Production Base

The MRR system rates readiness focused on specific munitions categories rather than particular Army units.

With unit status reporting, S and R ratings are assigned to items and rolled up at the battalion level. T and P ratings are then added, and (composite) C ratings are subsequently developed and reported at brigade and division levels. This is a well-established and proven process within the Army.

Similarly, in reporting munitions readiness, with the MRR’s earliest version, S, R, Q and B ratings were all assigned at the individual item level (model level). Rollup occurred at the subcategory level (i.e., 81mm mortars),



SPC Karl Snow and SSG Leon Junk, Alpha Co., 1st Battalion, 38th Infantry Regiment, 4th BCT, 2nd Infantry Division, prepare to fire their 60mm mortar during a combat mission in Baqubah, Iraq, Oct. 28, 2007. The MRR measures and aggregates munitions readiness to ensure our frontline Soldiers always have the ammo they need. (U.S. Air Force photo by SSGT Jason Robertson, 1st Combat Camera Squadron.)

and C ratings were developed at the munitions category level (i.e., mortar). The methodology had a very familiar feel and was quickly understood.

Although the MRR has evolved significantly from its initial design, it still has a familiar approach to measuring and aggregating readiness.

Refined from the original four resource areas, the system currently determines ratings for just two basic measurement areas. Readiness is reported for availability (the S rating) and reliability (the R rating) for each ammunition item. At the rollup levels, ratings are color coded and displayed graphically. The system screen in the figure illustrates the MRR organization of munitions. Today in the MRR, ratings for approximately 543 active class V items are rolled into 45 subcategories. These 45 groups, in turn, determine composite ratings at 12 category levels.

Modeling *AR 220-1*, the MRR initially adopted four rating levels. This has been simplified to three rating levels. Each rating level defines a range of readiness in each of the two resource areas and for

the category evaluations. The readiness ratings are represented by separate colors — red, amber and green — using a traditional ‘traffic light’ schema.

The MRR is a Web-based system. MRR screens were initially updated quarterly. However, the system continues to improve, and today, screens regenerate monthly.

Various algorithms are built into the system to compute and aggregate ratings. These are much too involved to be articulated in this article’s scope. For an in-depth look at how the MRR computes ratings, log into the system and click on the methodology button. The JMC Munitions Readiness Directorate is also available to answer questions and demonstrate the system.

For a quick, simple MRR user guide, look at the Worldwide S view illustration on the previous page. Notice that each subcategory is displayed as a colored block connected by a vertical line to a category block. All blocks are labeled and annotated.

On the right of each block, 10 small ‘tabs’ are displayed in 2 rows of 5 each.

The upper row of five tabs shows our ability to meet war reserve requirements, while the lower row captures our ability to meet training requirements.

The MRR captures current stockpile status and is also a *predictive* system. Moving from left to right, those small tabs indicate a readiness rating beginning with current status, then at 6, 12, 18 and 24 months into the future. Predictions are based on planned consumption, production due-ins and maintenance schedules.

With all the talk of colors, lines, tabs, blocks and circles, you may be getting the idea that the MRR is very graphic. Indeed it is. Yet the system provides detailed numbers down to the most prime levels. This system can slice and dice. Click on any block and users find they can “drill down” for more definition.

Drilling down, the user is provided the actual assets and requirements by model. Assets are segregated into Serviceable, Unserviceable/limited restoration, Emergency Combat Use Only and Unserviceable. Requirements are identified as War Reserve and Operational projects, Pipeline, Training, Test and Current Operations.

Click on any individual rating and the specific details pertaining to that rating will pop up. At the most detailed level, information such as shortfall quantities, percentage filled, and scheduled funded and unfunded production quantities are available.

As mentioned, the figure provides a mock worldwide view snapshot. The customer can also select views for U.S. Army Pacific, U.S. Army Europe and any Army Pre-Positioned Stocks. A “line of balance” report is available and can be downloaded as a spreadsheet. The MRR user can run a line of balance for all of

the individual items in the system, or by a specific group or family. Industrial base maps are also available that portray a part-by-part geographic analysis of where our munitions are produced.

The MRR database includes both missiles and conventional ammunition. Very much a product of the Army Ammunition Enterprise and the Joint Munitions and Lethality Life Cycle Management Command (JM&L LCMC), reported data is the result of a collaboration involving input from many agencies including the U.S. Army Program Executive Office Ammunition, the U.S. Army Missile Command and Department of the Army (DA).

The MRR is used as a tool to assist in determining our munitions capability to support the warfighter. It helps determine what munitions we should buy and maintain. It is also used to feed the class V readiness data into the Army's Strategic Readiness System. Initially patterned after *AR 220-1*, and continually improved, the MRR successfully provides a much-needed standard methodology to measure our munitions readiness.

The MRR can be used to predict readiness ratings based on planned consumption, production due-ins and maintenance schedules. Here, Soldiers from 4th Squadron, 14th Cavalry Regiment, fire their 120mm mortar from the back of a Stryker Mortar Carrier. (USMC photo by LCPL Andrew D. Young, 1st Marine Division Combat Camera.)



Shinseki provided the vision and the challenge, JMC supplied the expertise. Not long after the Sept. 11, 2001, attacks and resulting from an intense developmental effort, the MRR went online in early 2002. But the effort has never rested.

Throughout 2006, JMC collaborated with DA G-3/5/7. In fact, this team's work resulted in some of our recent configuration improvements. The DA G-3/5/7 provides a monthly ammunition readiness update to Army senior leadership during the Army Operations Center balcony briefing every month. Key participants include the Secretary of the Army, Undersecretary of the Army, Chief of Staff of the Army and Vice Chief of Staff of the Army. The update provides Army worldwide ammunition status based directly on the analysis conducted by the MRR.

JMC and JM&L LCMC project manager staffs also provide additional acquisition information via a dedicated chart in the MRR that is designed exclusively to support this briefing. The DA G-3/5/7 Munitions Management Office uses the information to build a condensed version referred to as the One Voice chart. The One Voice chart is essentially used as a quick reference guide (focused on munitions with red ratings) to answer questions during the balcony briefing. The DA G-3/5/7 also provides the One Voice chart to other DA staff as a reference, including the DA G-4, Assistant Secretary of the Army for Acquisition, Logistics and Technology and others.

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JMC also recently collaborated with the U.S. Marine Corps (USMC) Program Manager for Ammunition and the USMC Systems Command to develop and operate a USMC MRR system. The new USMC MRR employs some common reporting conventions with the Army MRR and has the same general look and feel. However, the embedded business rules are USMC-unique. The USMC has defined its own algorithms for munitions readiness, which

are designed to support the USMC strategic and logistics perspectives. Because of its SMCA mission, JMC can provide some of the data required to support the USMC MRR, but the primary data feeds are received from USMC systems and databases.

These recent projects demonstrate that the MRR solution is an evolving tool. Work will continue to develop improvements such as increased modeling capability to allow "what if" scenarios to be run. Beyond the MRR near-term view, Program Objective Memorandum budget data will likely be incorporated into an additional, new view. Joint service munitions reporting capabilities may also be possible in the not-too-distant future.

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# Nonlethal Munitions (NLM) Expand Warfighter Capabilities

Fareed Choudhury

**I**n the jumbled terrain of modern urban combat, the preferred theater of operations for today's terrorists, the need to distinguish combatant from noncombatant is paramount. In a war with no fixed fronts, with no clearly identifiable foe, where the very definition of the word enemy is maddeningly fluid, our Soldiers require better, smarter and more innovative ways to defend themselves without jeopardizing their overall mission.

A Soldier loads an XM1091 40mm nonlethal point cartridge into his M203 grenade launcher. This new NLM is designed to deliver a measured effect against a specific target to cause blunt force trauma to an individual at distances from 10 to 50 meters. The munition can be fired from the M4 carbine or M16 series rifle mounted with an M203 grenade launcher. (U.S. Army file photo.)

Instead of “shoot first and ask questions later,” NLM allow our Soldiers to “ask questions by shooting.” The judicious application of nonlethal effects allows the Soldier to interrogate the intent of the target by giving it ample warning and incentive to cease any questionable or objectionable behavior prior to resorting to more extreme measures. NLM are, therefore, analogous to precision guided weapons, in that they are designed to deliver a measured effect against a specific target while minimizing the likelihood of collateral damage.

Many of the current NLM were type classified from specifications drawn up in a bygone era. The Cold War had ended, the military was downsizing, the so called “Peace Dividend” was on every politician’s lips and the Berlin Wall was being broken up into souvenirs for tourists. The Army’s NLM were based on civilian law enforcement models — short-range, low-velocity rounds intended for use only as a last resort. After all, the greatest foreseeable threat to law enforcement at that time was from “peaceniks” and antiglobalization protestors.

But times changed quickly and our deployment with NATO to Kosovo identified a real and urgent need for NLM in a military role. In April 2000, the Office of the Project Manager Close Combat Systems (PM CCS), part of Program Executive Office Ammunition (PEO Ammo), deployed the Army’s first ever Nonlethal Capabilities

Set. A large part of that set was the munitions. “Bottom line is that our new equipment works well and the NLM kept us from having to kill someone,” noted COL James B. Brown, then serving as Task Force Falcon Provost Marshall. The Army seemed well on the way to acquiring a nonlethal capability that would protect our troops while avoiding unnecessary civilian casualties.

Instead of “shoot first and ask questions later,” NLM allow our Soldiers to “ask questions by shooting.” The judicious application of nonlethal effects allows the Soldier to interrogate the intent of the target by giving it ample warning and incentive to cease any questionable or objectionable behavior prior to resorting to more extreme measures.

### A New Era Harkens New Needs

Sept. 11, 2001, changed all that. Those attacks plunged our Nation into a new kind of war, one that many predict will be as long, if not longer, than the Cold War. It holds the potential to be bloodier and far more complex and the stakes will be just as high. In adapting to this new kind of warfare, nonlethal capabilities were thrust to the forefront and our current assumptions and ways of thinking about



The 40mm Sponge Grenade is an NLM used to provide a standoff capability in conjunction with riot/crowd control during low-intensity conflict and peace-keeping missions where use of deadly force is unwanted or unwarranted. The nonlethal 40mm crowd dispersal round provides U.S. forces the capability to enhance force protection by stopping, confusing, disorienting or deterring a potential threat without using deadly force. (Photo courtesy of the Military Analysis Network.)

NLM would have to adapt as well to meet warfighters’ evolving needs.

As stated in *FM 3-22.40, Tactical Employment of Nonlethal Weapons (Air Land Sea Application Center)*, “NLWs [Nonlethal Weapons] provide commanders the flexibility to influence the situation favorably with increased safety to U.S. Forces while reducing risk of both noncombatant fatalities and collateral damage.”

### Next-Generation NLM Extend Range

PM CCS is working closely with PM Soldier to acquire the next-generation, extended-range NLM for the warfighter. Two, in particular, the XM1091 40mm extended range marking round and the XM1116 12-gauge extended-range marking round, will fill critical gaps in



Soldiers from the 114th Transportation Battalion, Illinois National Guard, conduct nonlethal weapons training at Camp Atterbury, IN, last May. NLM will help warfighters enhance force protection measures by countering civil disturbances and responding to various levels of threat by employing nonlethal means. (U.S. Army photo by SSG Russell L. Klika.)



U.S. Marines and Soldiers demonstrate the use of NLWs and tactics during an exercise sponsored by the U.S. European Command and hosted by U.S. Marine Corps Forces, Europe, in Boeblingen, Germany, June 21, 2006. (DOD photo by GSGT Donald E. Preston, U.S. Marine Corps.)



current nonlethal capabilities and assist warfighters immeasurably in applying escalation of force (EOF) procedures.

The XM1091 is similar in appearance and function to the Army's current M1006, 40mm non-lethal point cartridge. It produces a blunt trauma impact on the target and will be capable of being fired from the M203 and XM320 as well as the Marine Corps' MK 1 and Penn Arms XM328, 6-shot multigrenade launcher. What's new is the range. The XM1091 will have nearly twice the

Building on experience gained through civilian law enforcement, PM Soldier Weapons and ARDEC engineers are working to enhance performance to better meet user community needs.

M1006's effective range. And range matters. Similarly, the XM1116 will provide an extended range capability (far in excess of the current M1012) to standard 12-gauge manually operated platforms.

Both rounds incorporate a fluorescent green marking powder that disperses on impact to identify troublemakers for later detention or to

single out individuals for extraction teams that must be able to identify their target from within a crush of hostile bodies.

### Cooperative Acquisition Approach Facilitates Development

The XM1091 and XM1116 are being developed jointly by PEO Soldier and PEO Ammo. Through its innovative Soldier Enhancement Program, PEO Soldier is providing the funding for developmental testing and safety certification of these rounds, which will type-classify standard for fielding and use by the Army. Through PM Soldier Weapons, they are providing strong experience and expertise in small-arms ammunition. The U.S. Army Armament Research, Development and Engineering Center (ARDEC) at Picatinny Arsenal, NJ, is providing the engineering expertise and support. As part of PEO Ammo, PM CCS will provide life-cycle

management. As with all other NLM, PM CCS will have ownership and management responsibilities of these extended rounds as part of its growing nonlethal inventory.

As with past NLM, the Army is leveraging the best available technologies from the civilian world. Defense Technologies of Casper, WY, longtime partner with the Army's NLM development and production efforts, is the current manufacturer for the rounds upon which the military versions will be based. Building on experience gained through civilian law enforcement, PM Soldier Weapons and ARDEC engineers are working to enhance performance to better meet user community needs. They will also "militarize" the rounds, toughening them up to handle the stringent requirements for shipping, storage and handling, as well as the shelf life required by the services.

All this takes time. To meet the current operational needs, PM CCS is rapidly fielding the required XM1091 and XM1116 munitions quantities per the urgent materiel release (UMR) process. This UMR process provides the most expedient means for acquiring these capabilities and getting safe and reliable products into the warfighter's hands in a timely manner.

Of course the story doesn't end here. The XM1091 and XM1116 represent the best available capabilities right now. Research continues to achieve even greater ranges and better performance and to expand the list of platforms that



Various types of NLM including foam, rubber and bean bags, rest on a target impacted by Taser probes after an NLW demonstration last February at Fort Leonard Wood, MO. (Photo by Charlie Riedel courtesy of the Associated Press.)

can fire NLM so that they will be available to suit every situation or operational need. PM CCS will continue to work with the user community and, wherever possible, anticipate future requirements to ensure that the best available technologies are fielded as quickly as possible.

### Greater Range Equals More Time

The range advantage of the XM1091 and XM1116 over the M1006 and M1012, respectively, will provide warfighters with that extra split second

to evaluate the situation and avoid a tragic mistake. EOF is all about a measured, sequential response to a perceived threat. The time to evaluate that threat is greatly increased when warfighters can

EOF is all about a measured, sequential response to a perceived threat. The time to evaluate that threat is greatly increased when warfighters can employ the nonlethal option at longer and more practical engagement ranges.

employ the nonlethal option at longer and more practical engagement ranges. As GEN David H. Petraeus, Commanding General Multi-National Force-Iraq has noted, "... you must shape situations to minimize the tough calls, and train our leaders on how to react ... this will reduce the number of Iraqi civilian injuries and deaths."

With the XM1091 and XM1116, PM CCS is saving the lives of Soldiers and innocent civilians alike, and increasing the NLM capabilities for warfighters and the law enforcement community moving forward.

**FAREED CHOUDHURY** is the PM CCS Project Officer for NLM. He has a B.S. in mechanical engineering from the City University of New York, is certified Level III in systems planning, research, development and engineering, and Level I in program management. He is an Army Acquisition Corps member.



# The Self-Protection Adaptive Roller Kit (SPARK) — Negating the Improvised Explosive Device (IED) Threat for Soldiers and Vehicles

LTC Karl Borjes

**T**he number one threat to Soldiers in Iraq and Afghanistan is the IED, which has been responsible for almost 40 percent of U.S. casualties in *Operation Iraqi Freedom*. There are numerous ways to activate IEDs, ranging from crude timers to command wires to remote activation via cell phone. However, one of the most common activation methods is a pressure-sensitive trigger that relies on targets to activate the IED by rolling over it themselves as they would, for example, in a vehicle. Commonly called the “Victim-Operated IED,” it is typically buried beneath the many long roads that U.S. and Coalition Forces patrol on a daily basis.

Currently, the Army has equipped three vehicle platforms with the SPARK in Iraq. Since the HMMWV is the most used vehicle in theater, it is also the most vulnerable to IED threat. Here, a SPARK-mounted HMMWV is tested at YPG before being deployed to Iraq in March 2007. (U.S. Army photo.)



One of the newest weapons in our arsenal against this threat is the SPARK, a modular mine roller system designed to be mounted on tactical wheeled platforms. It is currently being used in Iraq on three platforms: the M114/1151 armored High-Mobility Multipurpose Wheeled Vehicle (HMMWV), the RG-31 and the M900 5-ton truck series. SPARK is managed by Product Manager IED Defeat/Protect Force (PM IEDD/PF), which is a part of the Project Manager Close Combat Systems (PM CCS), Program Executive Office Ammunition (PEO Ammo), based at Picatinny Arsenal, NJ.

Two SPARK configurations are currently available in theater. The track-width front roller configuration attaches to the frame of the RG-31 and the HMMWV, the two vehicles most commonly used for deliberate route-clearance operations. The full-width configuration attaches both a front and rear roller to the M900 5-ton truck series. This version is intended for use on vehicles that are part of fast-moving logistical convoys.

In both configurations, the front roller consists of two roller banks on the vehicle's left and right side, its sole purpose being the defeat of any IED. These roller banks provide contact with the ground, causing the IED to detonate on the roller, forcing as much of the blast down and out as possible, as opposed to underneath the vehicle. The purpose of having the two rollers in front and back in the full-width configuration is that the rear roller also has a hydraulic system that controls rollers, allowing the vehicle to move faster down the road and be more stable.

### **Need Necessitates Invention, While Research Refines Effectiveness**

Before SPARK, there was no mine roller kit available to Soldiers for a

tactical wheeled vehicle platform. So, like many innovations, its creation was born out of immediate need and improvisation. In early 2006, enterprising U.S. Army 3rd Infantry Division members took it upon themselves to create a roller for their HMMWV out of tow bars and wheels for the M1113 vehicle.

“Soldiers do what Soldiers do best,” says COL Ray Nulk, PM CCS. “If there is a threat out there, they will take whatever they can find to protect themselves and their vehicles.”

Responding to Soldiers' needs, the Rapid Equipping Force quickly fielded two mine roller variants based on these improvisational solutions in late 2006/early 2007 — the Sharp Edge and the Sharp Knife rollers. While these new designs addressed the immediate warfighter needs, the rollers were only stopgap measures until a more effective solution could be found.

In September 2006, a Joint Urgent Operational Need Statement (JUONS) for 313 mine rollers was approved, and the newly formed PM IEDD/PF teamed with the U.S. Tank Automotive

Research, Development and Engineering Center (TARDEC) to present a commercial-off-the-shelf solution to the Joint IED Defeat Office (JIEDDO). The two organizations pooled their resources to gather data from outside sources on available alternatives.

“Prior to our JUONS, the U.S. Marine Corps had already fielded mine rollers from several different vendors,” said Robin Gullifer, Deputy PM IEDD/PF. “TARDEC had assisted them in effectiveness analysis, so we were able to leverage that data for our own purposes.”

After a thorough assessment, it was determined that of the various mine rollers in use, Pearson Engineering offered the best solution for the Army against the IED threat. Aside from having the only option that provided both blast dampening and a modular, easily repairable design, Pearson Engineering already had a history with the Army.

“Since the late 1990s, Pearson has provided a roller variant for the Stryker engineer vehicle,” noted Gullifer. “Having a similar system already in

A HMMWV equipped with SPARK and a Rhino IED detection system is put through its paces at YPG. SPARK has undergone grueling endurance testing at both YPG and ATC to ensure it was field ready for deployment to the theater of operations. (U.S. Army photo.)





production provides commonality of key components that make long-term sustainment feasible.”

### Tight Collaboration Enables Rapid Acquisition

Once the Pearson roller was selected, JIEDDO approved funding on Dec. 22, 2006, and a contract through the U.S. Army Tank-automotive and Armaments Command Acquisition Center was awarded Jan. 9, 2007. Three urgent materiel releases (UMRs) for rollers to equip the HMMWV, the RG-31 and the M900 5-ton truck series were issued soon after in an extremely short time span, which needed to be fulfilled in a rapid sequence to meet fielding requirements. PM IEDD/PF received funding in December, and in a record 90 days, Soldiers in Iraq received the first delivery of SPARKs.

What made this quick turnaround possible was PM IEDD/PF working in concert with multiple key external organizations. “We collaborated with the Army Test and Evaluation Command (ATEC) and with TARDEC for engineer support, designing three unique brackets that would attach the SPARK to each vehicle.

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We were in constant communication with those in theater to coordinate distribution plans. We involved Pearson Engineering from the very beginning to work through any production issues. PM Stryker was invaluable in managing the contracting process, and the PMs for each of the vehicles were quick to offer their endorsement and support,” related Gullifer. “Working as a team with these outside organizations enabled us to put together test, UMR, production and distribution schedules that allowed us to get this equipment to the Soldier as fast as possible.”

### Thorough Testing Ensures a Solid Solution

Even though the SPARK was fielded quickly, no shortcuts were taken with testing. PM IEDD/PF, working with TARDEC and ATEC, conducted in-depth, safety-centric automotive performance testing

for the SPARK on each of the three vehicles at Aberdeen Test Center (ATC), MD. The team also performed a

We collaborated with the ATEC and with TARDEC for engineer support, designing three unique brackets that would attach the SPARK to each vehicle. Working as a team with these outside organizations enabled us to put together test, UMR, production and distribution schedules that allowed us to get this equipment to the Soldier as fast as possible.

SPARK mobility test at Yuma Proving Ground (YPG), AZ, where they captured data on braking, speed, turning and slope navigation. While at YPG, the SPARK underwent endurance testing, ensuring that the 3,200-pound roller system wouldn't cause any additional stress on the HMMWV — the most used, and therefore, most vulnerable vehicle of the three. Lastly, the SPARK

went through a successful blast test attached to the HMMWV.



A mechanic adjusts the tension arm of a SPARK on an M900 5-ton truck series at an FOB in Iraq. The 3,200 pound modular system has already been credited with saving dozens of Soldiers' lives in Iraq. (U.S. Army photo.)



Here, technicians finish outfitting an M900 5-ton truck series with SPARK at an FOB in Iraq. The rollers are designed to defeat pressure-sensitive triggered IEDs by forcing the blast down and away from the vehicle. (U.S. Army photo.)

## Life-Cycle Management Plays Vital Part in System Success

PM IEDD/PF's involvement with the SPARK system doesn't end with system delivery. Once in theater, field support representative (FSR) teams based in four forward operating bases (FOBs) are on hand to handle installation, training and sustainment. According to Gullifer, "It's not easy sustaining anything in Iraq. In most cases, the Soldier won't contact you unless the system is falling apart or blown up. That's why our FSRs pay SPARK-issued units daily visits, interfacing with the warfighter, checking system maintenance, getting feedback on system performance, even lubing the fittings."

Vehicles equipped with the SPARK are on patrol every day, but not always with the same crew. That's why FSRs conduct regularly scheduled training on the system at FOBs, training new units, revisiting units for maintenance and training, making certain that everyone in the organization is familiar with every SPARK aspect.

Training consists of hands-on work on the roller, ensuring that units can install

and uninstall the roller, conduct basic maintenance, be cognizant of safety concerns and perform a test drive. Every crew member is given the opportunity to drive their SPARK-equipped vehicle until they feel sufficiently familiar and comfortable with it. In total, training takes from 30 minutes up to 1 hour to complete.

"Training doesn't stop with one class or one crew," remarked Gullifer. "It's a continual thing. That's why it's so important that we have FSRs on the ground integrated with the Soldier."

## SPARK Saves Lives

Since the SPARK was first fielded in March 2007, it has been involved in 22 reported IED incidents and has been cited in saving many Soldiers' lives. In one instance, five Soldiers in a HMMWV hit an IED that propelled the 3,200-pound roller 20 feet from the vehicle, leaving a crater as big as the vehicle. All five crew members walked away from the blast, including the Soldier stationed in the turret. Countless times, the SPARK's modularity design has proven its effectiveness. In most

cases, systems damaged in an IED attack have returned to the battlefield within hours. One system has borne the brunt of four IED attacks and is still in the field performing its mission.

## SPARK in the Future

At present, a revision to the initial JUONS is with the U.S. Army Central Command for approval to increase the number of SPARKs in theater significantly, while increasing the variety of vehicles the SPARK will support. Of the proposed new amount, the majority would be allocated to equipping armored HMMWVs, as the SPARK has proven itself to be especially effective when mounted on this vehicle.

Beyond requirements, PM IEDD/PF personnel are constantly finding ways to improve the SPARK on their own. Recent innovations include a version of the front-mounted track-width roller with lights mounted on it to assist night patrols, and integrating multiple IED defeat capabilities to combat various IED threats.

"We want to create a system-of-systems built upon the SPARK, providing the warfighter with a complete IED defeat toolkit. We are always investigating new ways to evolve the capability of the system, through analyzing event matrix data and talking directly to the Soldier in theater," Gullifer concluded.

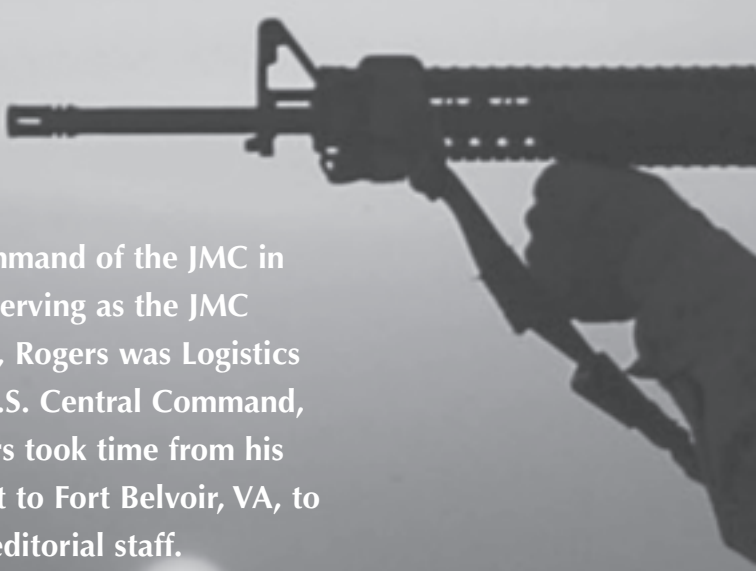
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# Making the Best Quality Ammunition for the Warfighter — An Interview With the U.S. Army Joint Munitions Command's (JMC's) BG James E. Rogers

Meg Williams



**B**G James E. Rogers took command of the JMC in September 2005. Prior to serving as the JMC Commanding General (CG), Rogers was Logistics Operations Division Chief (J-4), U.S. Central Command, MacDill Air Force Base, FL. Rogers took time from his busy schedule during a recent visit to Fort Belvoir, VA, to meet with *Army AL&T* Magazine editorial staff.

While the SMCA supports the common ammunition requirements for all services, the JMC provides critical acquisition, logistics and sustainment support for the ammunition from production or receipt through the demil and disposal process, ensuring that Soldiers, Sailors, Airmen and Marines will always have the right type of conventional ammunition when and where they need it. (U.S. Army file photo.)



**AL&T:** The JMC and Program Executive Office Ammunition (PEO Ammo) represent two sides of the Single Manager for Conventional Ammunition (SMCA) triangle. How does the SMCA work and what benefits does it present the Army and DOD for ammunition procurement, production and management?

**Rogers:** The SMCA provides a means to support common ammunition requirements for all services. I represent the Joint Munitions side of the SMCA mission. As the SMCA principal Field Operating Activity, JMC has the lead on logistics and sustainment concerns to include receipt and issue; storage and distribution; inventory and accountability; safety and security; quality assurance; maintenance; demilitarization (demil) and disposal; transportation; and Operations and Maintenance, Army funding decisions, whereas BG William Phillips, PEO

Ammo, has overall responsibility for ammunition life-cycle management with focus on acquisition. Together, we make a very powerful team because we are executing the entire ammunition life cycle. The U.S. Army Armament Research, Development and Engineering Center [ARDEC], which has the research and technology piece, is the third side of the SMCA triangle. With ARDEC, you are really bringing acquisition, logistics and technology [AL&T] together and it pays huge dividends for our Soldiers.

When you talk about the SMCA, you are talking about the centralized management of conventional ammunition, where we obtain the most bang for the buck. Whoever thought of this concept was right on the mark. By maintaining a DOD perspective, there's more benefit and you can reduce the cost in most cases for bulk buys. Wal-Mart® does it very well. We must

work on being at least as good as Wal-Mart from a bulk manufacturing and distribution standpoint. We can really reduce our buys if all the services come together.

Everyone needs a 5.56mm bullet for their weapons. Army, Navy, Air Force, Coast Guard and Marine warfighters need it. So we now buy in bulk rather than each service purchasing items on their own and competing against each other for the same resources. That is really the benefit of the SMCA — we bring together the needs of all services and the people who are trained to execute the mission's acquisition portion. My folks are trained on how to receive, store, issue and ensure that the ammunition is maintained properly and is delivered to the warfighter whenever and wherever they need it. We also provide logistics support through our Defense Ammunition Center in the form of explosive safety,





Not even a winter storm that left a 1-inch slick of ice could keep employees at home when ammunition needed to be loaded onto a train at McAlester Army Ammunition Plant (MCAAP) in January 2007. (U.S. Army photo courtesy of JMC.)

demil technology, hazard classification, ammunition transportability, ammunition peculiar equipment development, technical assistance and training of DOD's ammunition workforce — providing a total quality life cycle program approach. That's the huge benefit of having one service do this mission.

**AL&T:** How are responsibilities allocated between the JMC and PEO Ammo?

**Rogers:** That is hard to say because we are so integrated. You must look at the history before PEO

Ammo. In the past, all ammunition was consolidated under the U.S. Army Materiel Command [AMC]. After several years reviewing numerous studies, the decision was made to establish a PEO for Ammunition to get the

The JMC provides critical acquisition and logistics support to the PMs through the resident expertise on our commodity teams.

ammunition experts involved in ensuring that we obtain the most bang for the buck when acquiring munitions. We had acquisition experts at AMC, but breaking it out gave it even more fidelity. The JMC provides critical acquisition and logistics support to the project and product managers [PMs]

through the resident expertise on our commodity teams, so the PMs are integrated with portions of the JMC to ensure we support them. There are two acquisition centers supporting the ammunition mission.

One is part of the U.S. Army Sustainment Command collocated with and providing support to the JMC at Rock Island, IL, and the other is at Picatinny, NJ, assigned to the U.S. Army Tank-automotive and Armaments Command.

So when you ask, where the line is between the JMC and PEO Ammo, I do not think there is a line, and that's a good thing because of what the Joint Munitions and Lethality Life Cycle Management Command [JM&L LCMC] was designed to accomplish. The AL&T communities not only have to work together, but they work so much better if they are tied at the hip. Once you pull in the technology from the research and development [R&D] community, you have a very powerful team because the whole life cycle is integrated, and that is what our PMs are ultimately responsible for. By collocating the key players together, everyone can do their jobs better.

Finally, from a warfighter perspective, there should be no line. The warfighter wants a readiness solution, and it's up to the JM&L LCMC to provide a seamless, integrated AL&T ammunition readiness solution. As is

true in most organizations, information exchange can be a challenge as we communicate globally 24/7. The JM&L LCMC recognizes these challenges, and we continue to look for better ways to improve our processes and communicate more effectively to support warfighter ammunition readiness and battlefield requirements.

**AL&T:** What processes does JMC use to integrate the other services' ammunition acquisition and logistics requirements?

**Rogers:** The Joint Ordnance Commanders Group [JOCG] is responsible for guiding and influencing conventional ammunition life cycle for all services. JOCG participants are involved in the development and updating of joint SMCA policy and procedures, and they address urgent and important issues relative to insensitive munitions and the services' safety concerns. One JOCG goal is to develop and continuously improve Joint processes and procedures in the best interest of the services' warfighters. I am the Army JOCG member, and BG Phillips chairs it. Also, as part of the requirements piece, JMC, as part of the LCMC, has the distribution and outload requirement for all services.

We have been working numerous continuous improvement and Lean Six Sigma [LSS] actions to aid us in our efforts. We work with the Department of the Army [DA] G-3 equivalents for requirements with all the services to try to ensure that we understand their

The JOCG is responsible for guiding and influencing conventional ammunition life cycle for all services. JOCG participants are involved in the development and updating of joint SMCA policy and procedures, and they address urgent and important issues relative to insensitive munitions and the services' safety concerns.

needs and where they want the ammo positioned in our depots, so we can best support them on outload or training requirements. We also have this Integrated Logistics Strategy program, which is really a complexity study, and above black belt work when you consider it in an LSS-type process.

We are also analyzing whether our network was set up to accomplish the mission of supporting all the services. We have looked at outload and at the network for all the depots, and we are now positioning stocks in coordination with the services' requests. We want to ensure that they have optimal stocks at the best place so they can have it at the best price, as well as the most effective way to ship it out the door should we have an outload requirement. It's a huge project that involves the JMC,

the PMs and the other services' requirements people. We ask them, "This is what we think you need based on our analysis and what you've told us. We want to confirm that's true. And this is where we're putting it to best support you. Are you in line with that?" We are at about a 90-percent solution, and we are always improving upon that number.

**AL&T:** There are two tools that were reported in the August 2004 issue of *Army AL&T Magazine* that support ammunition readiness: Munitions Readiness Reporting (MRR) and Centralized Ammunition Management (CAM). Can you briefly explain both and tell us what impact they have had on being able to provide the highest quality, ready-to-use ammunition to our Soldiers?

**Rogers:** The MRR was developed shortly after 9/11 to best determine what ammunition we had out in the world, what condition it was in and whether it supported the warfighter. At that time, the Army did not have an overarching assessment to show leadership how well we were doing our

Kathryn Condon, Executive Deputy to the CG, AMC, visited the MCAAP Conventional Ammunition Demil Facility, Robotic Disassembly, Cryofracture and Incineration operations. The robots are used for demilling Area Denial Artillery Munition (ADAM) mines, a safe, efficient disassembly technology for downloading and inspecting Improved Conventional Munition (ICM) rounds. The robots were designed specifically for the ADAM mines, but are adaptable to other ICM rounds. (U.S. Army photo courtesy of JMC.)





job. Ultimately, our mission is to support the warfighter down to every individual Soldier, Sailor, Airman or Marine. It sounds simple, but it's very difficult. So the MRR was designed.

First, we started with the Army and ensured that the G-3 agreed with it because we knew that once he agreed with it, HQDA would follow. In fact, DA G-3 helped us develop the metrics. Now we have a system all the way down to the individual bullet, the DODIC [DOD Identification Code] level, to show where

all our ammo is around the world, what condition it is in and whether or not we are ready to support training and operational requirements.

We have refined the MRR over the years to the point that we literally have one common operational picture [COP] that everyone understands, because everyone is using the same one in the Army. This COP is briefed all the way

up to the Army Chief of Staff to show ammo readiness. Everyone can understand it. In addition, we have found a need exists to ensure that we have the stocks positioned correctly to meet

Combatant Commanders' [CCDRs'] requirements. We continue to refine the details now, which will allow us to articulate to all CCDRs whether or not we have that ammo in the right place for them, too. MRR is a very powerful tool.

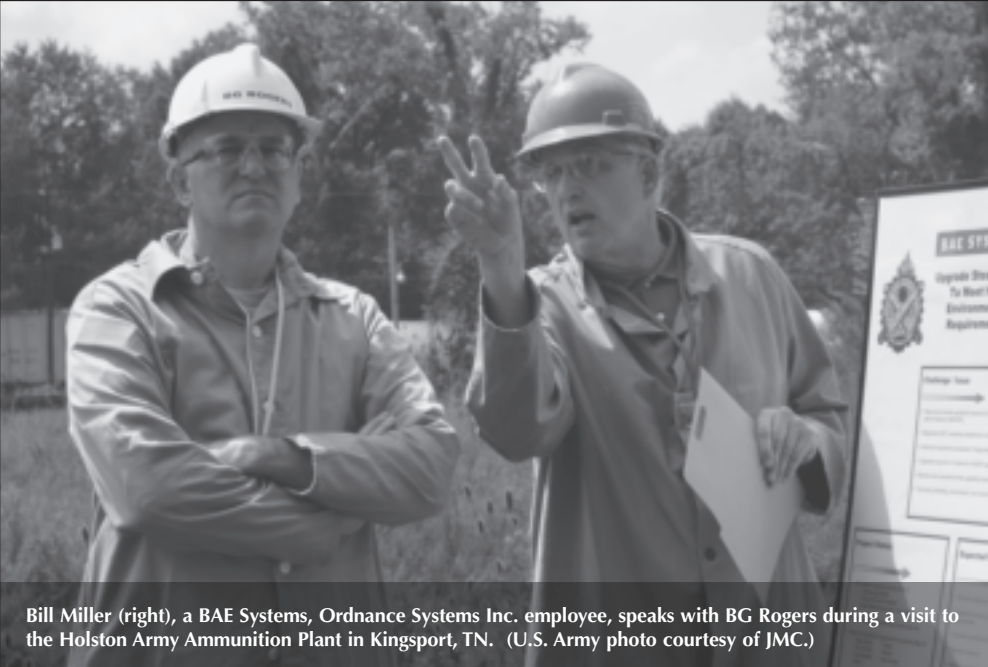
Traditionally, the ammo at our supply depots and the ammo

at our Ammunition Supply Points [ASPs] were managed in stovepipes. No single entity was responsible for the entire process or for tracking the ammo stockpile from beginning to end. CAM came about in May 2002 as a Chief of Staff Army Logistics Transformation Task Force initiative from the U.S. Forces Command [FORSCOM] Commander to the JMC Commander. We were critically

short of some go-to-war items when the ASPs were holding large quantities in excess of their training requirements. JMC undertook the challenge to manage wholesale and retail ammo as a unified whole, and today we are the Materiel Management Center supporting training and mobilization at 78 CONUS sites. CAM started before LSS came into vogue. The CAM team developed process stream and value stream maps in the early 2000s. They laid out the CAM process of how to ensure that we have visibility of ammo and that everybody has what they need to train and deploy. We hold the rest of the stocks and make sure we deliver them to the people who need it. It was one of those fair-sharing logic schemas.

As a result, we were able to manage it better than individual organizations because we now had ASP visibility. Now, we literally manage for FORSCOM, the U.S. Army Training and Doctrine Command [TRADOC] and the National Guard. We have brought all of their management boxes into the JMC where we execute ammunition management for them. That does not negate the fact they still have to tell us what they need to support training, and it goes through those entities to ensure that they are doing the right thing with it for the mission. When they ask us for rounds now, we can actually look into their ASP and tell them whether or not they have enough rounds to do their mission. We can tell them they have a huge stockage of rounds that they have not used and we are going to coordinate with TRADOC, FORSCOM or the National Guard — which is the key to having that coordination — to take some of what they have and move it someplace that really needs it more. So we have been able to optimize where we deliver ammunition, where it is stocked and have visibility of that throughout

Now we have a system all the way down to the individual bullet, the DODIC level, to show where all our ammo is around the world, what condition it is in and whether or not we are ready to support training and operational requirements.



Bill Miller (right), a BAE Systems, Ordnance Systems Inc. employee, speaks with BG Rogers during a visit to the Holston Army Ammunition Plant in Kingsport, TN. (U.S. Army photo courtesy of JMC.)

the United States. Next, we'll tackle the overseas ammo management challenge. We have visibility of OCONUS stocks, but we are working to convince the entities that we can help them better manage their overseas stocks. Overall, these tools have been very successful for us.

JMC manages all the depots, arsenals and ammo plants for the Army. Our people take a lot of pride in what they do. There is only one military person in these depots — the commander; everyone else is civilian. They know their mission in life is to support the Soldier and they go out of their way to do just that. As a good example, McAlester Army Ammunition Plant [MCAAP] in Oklahoma had a huge ice storm in January [2007], yet they had an ammo outload mission required to go overseas for the war effort. Those guys came in when they did not even have power in their own houses! I do not know how they made it to work, quite honestly, because MCAAP was considered a disaster area. But they went in anyway to make sure they filled the railcars for that outload. People are what makes the JMC so powerful.

**AL&T:** What are the biggest changes you've seen in the ammunition industrial base during your tenure at JMC? How will this be addressed in the future?

**Rogers:** Because the ammunition industrial base is more than the government, or organic industrial base, we have a huge effort going on to scope the ammunition industrial base. If you look at the whole spectrum of the ammunition industrial base, it is made up of government-owned, government-operated [GOGO]; government-owned, contractor-operated [GOCO]; and contractor-owned, contractor-operated organizations. You have to

look at the whole perspective. From a life-cycle management perspective, we are looking at the ammunition industrial base holistically. From the GOGO to our commercial vendors, we are ensuring that we are prepared for the future and are supporting the war effort. Everyone knows, sooner or later, we are going to slow down and we must be prepared for that, too. We must slow down in the right way so that we do not hurt our commercial and government base capabilities. So, when you weigh all those challenges, it's a very complicated task to execute. We at PEO Ammo, JMC and ARDEC have taken that mission on to ensure that we modernize the right areas in the organic industrial base and continue to support the commercial industrial base as well. It's our responsibility to ensure that everyone understands our whole purpose in life is to make the best quality ammunition for the warfighter — bar none!

What I have seen change is that we are trying to refine and better articulate this overarching ammunition industrial base with requirements and capability and scoping that down to determine if we have the right mix of government and civilian structure. Are we going in the right direction to ensure that we can support the warfighter in the future? Not only is the infrastructure critical, but we must also start to think what the next munitions are going to be. You have to prepare yourself — in the government and commercial world — for that next step and that's where the ARDEC folks come in.

**AL&T:** Soldiers can't fight without ammunition. Are we doing a better

job today than we were 4 years ago in supplying the right ammunition to the right place at the right time? What initiatives have JMC or the SMCA put in place to resolve that?

**Rogers:** I think we have done a better job across the board of ensuring that the stockage is there to support not only this contingency, but other potential contingencies. We have created better analytical tools to project what will be needed in a specific theater before it's even requested. The necessary infrastructure is in place to ensure that the ammo arrives when and where it is needed and that the quality is there. As far as support operations for *Operations Enduring* and *Iraqi Freedom* are concerned, I don't think any Soldier has ever gone without a type of ammo that he or she has ever needed.

That, to me, is what this mission is all about — quality ammunition that is there when Soldiers need it.

**AL&T:** Under the Base Realignment and Closure (BRAC) program, the JMC lost a significant amount of covered storage space without a corresponding decrease in stored stockpile. How will JMC manage this?

**Rogers:** We are losing some covered storage space, but that was factored in when BRAC was developed. Originally, one of our biggest storage facilities out at Hawthorne, NV, was on the BRAC list, but it was pulled off and that alleviated some of the problem. The Integrated Logistics Strategy has also helped us redefine how we store stocks safely in all our igloos. It has garnered us space throughout our depots to be able to store munitions

It's our responsibility to ensure that everyone understands our whole purpose in life is to make the best quality ammunition for the warfighter — bar none!



more efficiently and be more ready to outload should the requirement arise. We are continuing to improve and refine the process. We have an initiative with ARDEC right now to work some 3-D models into our storage capacity, so when individuals say, "I need to store something, it is coming in next week," they can look inside the igloo and see what is there and see whether it will fit by testing it. It has constraints — you could not store incompatible ammo because the algorithm in the system would not let you. That will be a pretty powerful capability, and we are working that for the future.

Right now, our biggest concern for storage is our demil program. We have a large percentage of ammo that must be destroyed because it has

become obsolete or is excess to the warfighter's requirements. It's still safe to store, but it needs to be demilitarized. That bill is increasing and the Army is the executive agent for demil of conventional ammunition. We have all the other services' demil as well, which is also growing. We have an ongoing effort now to try to stabilize the money so that we can reduce the demil requirement in the out years. We have a very robust demil program, but it has never been funded to our full capacity. It is so critical that we continue to free up igloo space for the next generation of rounds, so demil is something we're aggressively pursuing. We are optimizing the space and repositioning the stocks to best support our warfighters. We are also working hard to obtain the funding we

need for demil so we can destroy excess and obsolete stock.

The JM&L LCMC recommended the law change relative to reinvestment of revenue from recovery and recycling demil operations, and AMC supported the initiative. As we continue to execute environmental stewardship in all our demil processes, it becomes more expensive to operate. The issue becomes how to garner money to do that. As you melt out a bomb, for example, we have found there are other uses for fill, such as selling the fill to mining companies for commercial slurries as long as the stability factor is still there so it is safe for them to use. Then, you have a big chunk of metal. The idea was, if we could resell the metal as scrap after making it safe, you could take that



SPC Thomas Quinn, a Division Rapid Response Force Soldier, Battery C, 1st Battalion, 37th Field Artillery Regiment, 2nd Infantry Division, stands guard as an AH-64D Apache helicopter takes off following a training mission at Camp Taji, Iraq. JMC's mission is to ensure that Soldiers like Quinn always have the ammo they need when and where they need it. (U.S. Army photo by SPC Nathan Hoskins, 1st Air Cavalry Brigade, 1st Cavalry Division Public Affairs.)

money and place it back into demil funding. Instead of demilitarizing say 20,000 rounds this year, we could afford to demil 25,000 rounds. This not only incentivizes the installations to participate, but it reduces the demil burden and helps offset rising costs. It's a great initiative.

**AL&T:** If you could "fix" one thing with the way we procure or produce ammunition, what would it be?

**Rogers:** Our biggest challenge is establishing stable requirements. This affects the entire government and commercial industrial base. If you look at a graph of ammo requirements and how they have varied over the years, you would see a sinusoidal curve that peaks during a conflict and drops off dramatically immediately following the conflict. We are aggressively trying to fix that. The challenge is competing demands for federal dollars.

We are trying to better articulate requirements for all the services so we can predict what we call the "soft landing" for the industrial base. Predicting this presents a huge challenge. Requirement estimates can change substantially from year-to-year based on numerous factors and the changing world situation. I do not know if we will ever reach the point where we can avoid a periodic drop in requirements, but we are working this hard as a total munitions community through the LCMC, the services, commercial and government suppliers, and the depots. HQDA G-3, G-4 and G-8 are critical players in this issue as well.

**AL&T:** Safety is a big issue, both in storage and handling the ammunition.

We will never concede on our quality standards and we will always do everything humanly possible to give Soldiers the bullet that they need before they need it.

What safety initiatives have been put in place to ensure better safety for both Soldiers and civilians working in our arsenals?

**Rogers:** For us, safety is the most important thing. As you can imagine, handling, making and storing ammunition is extremely hazardous, so you must understand the hazards and eliminate or mitigate the risk in everything you do. We have, through AMC, initiated in all the depots,

OSHA's [Occupational Safety and Health Administration's] Voluntary Protection Program. Our depots and arsenals are shooting for 'Star Status,' which means that OSHA recognizes you as having all the controls and processes in an aggressive safety program. This is considered the top of industry and is very difficult to achieve. It brings every person into the safety program. The biggest safety challenge is having every worker on the line thinking safety every second of every day. Because if they don't and they take shortcuts, things can go 'boom' that you don't want to. The next step is that the supervisor must think that way as well. Although we say the commanders are ultimately responsible — I am the safety officer for the JMC just as GEN Benjamin S. Griffin is the safety officer for AMC — when it hits the road, you have to go down all the way to individual workers, and they must be their own safety officers because they want to go home safe each night. That is what we have built into our safety processes. That is the GOGO side where we have government civilians working.

In the GOCO sites, we have dedicated a safety officer to each one of our

plants that contractors operate. We require them to have a very aggressive safety program. The safety officer's sole mission in life is to ensure that the plant complies with the established safety standards. That has been very powerful, over the years, to ensure that safety is the number one concern and is emphasized every day.

**AL&T:** What is the most important message you would like to convey to Soldiers who might read this issue of *Army AL&T Magazine*?

**Rogers:** They should never worry about the quality of ammo they receive. What's powerful about the LCMC is that I have Logistics Assistance Representatives [LARs], ammunition LARS and QASAS [Quality Assurance Specialist Ammunition Surveillance] personnel all the way down into the units. They are emergency essential and deploy with their units. The LARs and QASAS ensure that ammo is stored safely, that it's ready and safe when Soldiers pick it up, and that it's safe when it has been stored for an extended period of time, especially in the harsh conditions Soldiers live in. We will never concede on our quality standards and we will always do everything humanly possible to give Soldiers the bullet that they need before they need it. That is what is key to us. I never want a Soldier worrying, "Am I going to get the next bullet that I need?"

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# Single Manager for Conventional Ammunition (SMCA) and Joint Ordnance Commanders Group Meet Warfighter Needs

COL André C. Kirnes and Claudia Applegate

**S**ince the 2004 stand-up of Program Executive Office Ammunition (PEO Ammo), the Army's Ammunition Enterprise management approach has been used to integrate the people, organizations, infrastructure and processes that are responsible for effective ammunition life-cycle management. In October 2006, the Army Ammunition Enterprise was formalized as the Joint Munitions and Lethality Life Cycle Management Command (JM&L LCMC), combining PEO Ammo and the U.S. Army Joint Munitions Command (JMC) into a single organization under one chain of command, with strategic and operational linkage to the U.S. Army Research, Development and Engineering Command's (RDECOM's) Armament Research, Development and Engineering Center (ARDEC). Lean Six Sigma methodologies institutionalized in the JM&L LCMC ensure continuous pursuit of improved management practices.

The SMCA is DOD's executive authority for managing conventional ammunition for all five services. Here, Soldiers from 2nd Battalion, 377th Parachute Field Artillery Regiment, 25th Infantry Division, fire their M119A1 105mm Towed Howitzer during a fire mission near Forward Operating Base Kalsu, Iraq, last November. (U.S. Army photo by SSG Sean A. Foley.)





Within the Army, PEO Ammo has overall responsibility for ammunition life-cycle management. Primarily, it focuses on acquisition/procurement and is the functional lead on ammunition manufacturing science and system development, make or buy decisions, ammunition-peculiar equipment for maintenance support and Procurement of Ammunition, Army funding decisions. JMC is the lead on logistics and sustainment concerns to include receipt and issue, storage and distribution, inventory and accountability; safety and security; quality assurance;

maintenance; transportation; and Operations and Maintenance, Army funding decisions. The industrial base is led by Project Manager Joint Services. With ARDEC's technical support, the JM&L LCMC provides the full spectrum of functional activities associated with developing, acquiring, moving, maintaining and disposing of conventional ammunition for Soldiers.

### **A Practical Approach to Ammo Management**

During the Korean conflict's later years, four problems were identified by

DOD and Congress with regard to the U.S. military services:

- Procurement of common munitions by multiple organizations.
- Competition among the Armed Services for limited production capacities.
- Fragmented industrial base management.
- Inefficient stockpile management.

Centralized management of conventional ammunition was recommended as a solution to these problems and in 1975, the Office of the Deputy Under





Through the JM&L LCMC, JMC and PEO Ammo — the SMCA Executor — with technical support from RDECOM's ARDEC, the Army provides DOD's functional expertise for the management, production, procurement and sustainment of the services' conventional ammunition. Here, U.S. Marines maneuver their M1A1 Abrams tank into position during Exercise Talisman Sabre 2007 near Yakima, WA. (USN photo by MC1 Mark A. Rankin, Fleet Combat Camera Group-Pacific.)

*Single Manager for Conventional Ammunition: Responsibilities of the SMCA and the Military Services*, are accomplished for SMCA-assigned conventional ammunition. The JM&L LCMC functional expertise that supports conventional ammunition for the U.S. Army (USA) is extended to U.S. Marine Corps (USMC), U.S. Navy (USN), U.S. Air Force (USAF) and U.S. Coast Guard to accomplish the SMCA objectives of efficient and effective acquisition of top-quality ammunition and performance of wholesale conventional ammunition logistics functions.

PEO Ammo is delegated the authority as SMCA Executor to ensure execution of the *DoDI 5160.68* SMCA mission functions. The SMCA Executor uses the PEO Ammo organization and JMC to accomplish these functions. Collaboration and communication are fundamental to effective and efficient execution of functional responsibilities in fulfilling the ammunition requirements for our Nation's Armed Forces.

Secretary of Defense issued a decision to implement the SMCA concept. The Army was designated as DOD's SMCA because it owned most of the government-owned production base, most of the storage sites and had the largest acquisition conventional ammunition program. Centralized management of conventional ammunition is intended to provide:

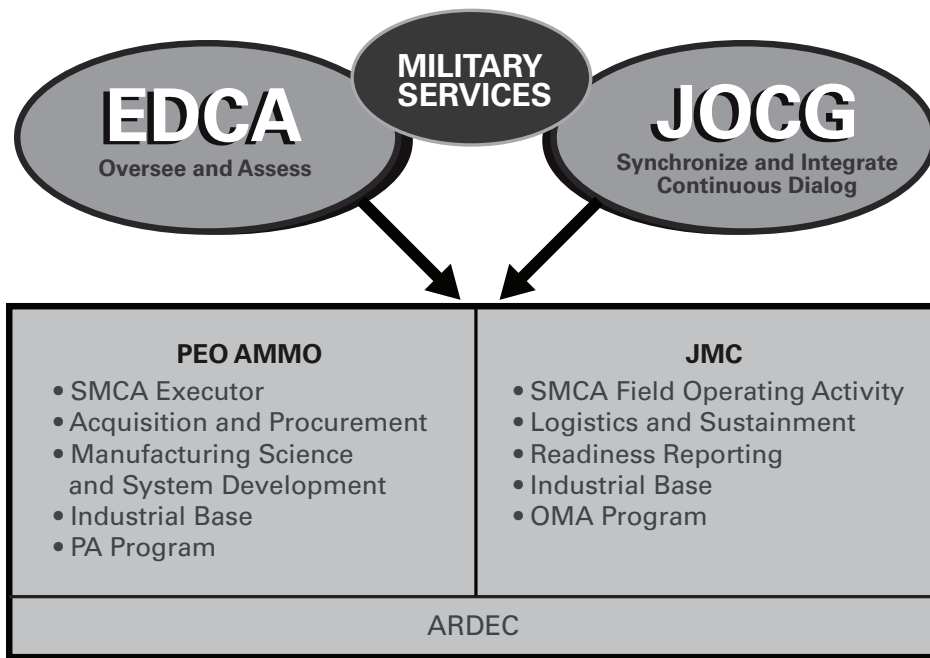
- Improvement in storage and distribution management to reduce transportation and handling costs.

As the DOD SMCA, the Secretary of the Army is responsible for ensuring that the mission functions outlined in *DOD Instruction (DoDI) 5160.68*,

- More accurate budget requests for military services' projected requirements.
- Better use of limited commercial industrial capacity.
- A single government focal point for resolution of technical, quality and other production issues.
- An entire DOD perspective in scheduling production, modernization and mobilization.
- Better communications among the services.



The JOCG provides a forum for senior service members to identify and resolve conventional ammunition concerns, and then synchronize and integrate the necessary processes and procedures across the services. Here, JOCG Principal Members met at Picatinny Arsenal on May 3, 2007, to discuss life-cycle management approaches within the entire spectrum of conventional ammo. Depicted left to right are: BG James E. Rogers, USA; CAPT David H. Lepard, USN; BG Michael M. Brogan, USMC; MG Kevin J. Sullivan, USAF; MG Paul S. Izzo, USA; LTG William E. Mortensen, EDCA Executive Director, USA; and RADM James P. McManamon, USN. (Photo provided courtesy of the JOCG.)



The JM&L LCMC Collaborative Ammunition Enterprise

As depicted in the figure, the JM&L LCMC organizations work together to execute the SMCA mission; the Executive Director for Conventional Ammunition (EDCA) oversees and assesses the SMCA mission execution; and the Joint Ordnance Commanders Group (JOCG) provides a forum for senior service members to identify and resolve issues of common concern within the entire spectrum of conventional ammunition life-cycle management, including matters pertaining to SMCA operations.

JOCG responsibilities center on synchronization and integration of processes and policies across the services, maintaining continuous dialogue to gain understanding of similar problems and to effect common approaches for resolution.

JOCG responsibilities center on synchronization and integration of processes and policies across the services, maintaining continuous dialogue to gain understanding of similar problems and to effect common approaches for resolution.

Chaired by the JM&L LCMC Commanding General, the JOCG membership consists of flag and general officers representing the Army PEO

Ammo and JMC; the Navy Supply, Ordnance and Logistics Operations Division, Deputy Chief of Naval Operations (Logistics), and Warfare Systems Engineering, Naval Sea Systems Command; the Air Force Ogden Air Logistics Center; and the Marine Corps Systems Command. These men and women establish a trusting environ-

ment in which candid comments are accepted and issues addressed. They strategically examine and plan for SMCA's future, actively involving senior staff as their JOCG Executive Committee and functional staffs in subgroups individually established to

satisfy continuing requirements for advice and assistance in specific areas of ordnance technology, management and operations. JOCG participants are involved in the development and update of SMCA policy and procedures; they address urgent and important issues relative to insensitive munitions, safety concerns and alternatives to the use of chemical constituents of concern in ammunition production; and they seek solutions to the growing demilitarization munitions stockpile.

Ammunition support to the Armed Forces has evolved into a unified, single command structure under the JM&L LCMC. The acquisition expertise of PEO Ammo and the logistics and sustainment expertise of JMC are integrated with a common focus and unity of purpose, supported by ARDEC's technical expertise. Through the SMCA mission, this common focus extends to providing quality ammunition to our sister services, overseen and assessed by the EDCA, and continuously monitored through the active communication and collaboration of JOCG members.

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**CLAUDIA APPLGATE** is a retired Department of the Army civilian. At the time of her retirement, she held the position of Chief of the JMC, Joint Services and JOCG Integration Office and served as the JOCG Executive Secretary. She is an Ordnance Order of Samuel Sharpe member and holds an M.B.A. from St. Ambrose University.



# Joint Munitions Command (JMC) Facilities Provide Unique Capabilities Within its Ammunition Industrial Base

Dennis Dunlap

**T**he Army relies on the private sector for 70 percent of DOD's conventional ammunition requirements; the remaining 30 percent are provided by government-owned ammunition plants and depots. Some plants, such as Radford Army Ammunition Plant (AAP), VA, and Holston AAP, Kingsport, TN, are well-known. This article focuses on some of the lesser known unique capabilities within the government-owned industrial base and how those capabilities provide flexibility to support our Soldiers, often in ways that were never imagined when the capabilities were developed.

CAAA produces the USN's MJU-32/B decoy flares to protect aircraft from attack. CAAA has been producing illumination pyrotechnics for DOD since the 1940s. (U.S. Army photo courtesy of JMC.)





### Unique Needs Spur Ongoing Operations

Some capabilities within the government-owned industrial base are truly unique. Private industry could not afford to sustain them given the ups and downs of defense munitions requirements. Riverbank AAP in Riverbank, CA, for example, produces steel-drawn cartridge cases used in the 105mm Stryker mobile gun system and the U.S. Navy's (USN's) 5-inch gun ammunition. Although the plant is scheduled for closure, the capability is

so critical that JMC has laid out a comprehensive plan to stockpile sufficient cartridge cases to meet Soldiers' and Sailors' requirements while the production line is being moved to Rock Island Arsenal, Rock Island, IL, where JMC is headquartered.

Other capabilities are not unique, but serve a unique purpose. Crane Army Ammunition Activity (CAAA) in Crane, IN, has been producing pyrotechnics for illumination since the 1940s. In October 2001, when the

USN needed MJU-32/B decoy flares to protect aircraft from attack, it was logical to turn to CAAA. In a little over 10 months, they were able to produce an acceptable first article product. While there are several commercial producers available, the fact that CAAA has this capability allows the government to conduct low-rate initial production prior to technical data package (TDP) release and to ensure that TDPs are fully acceptable for competitive procurement. This also reduces the cost of follow-on buys.





An 8" artillery projectile is placed in its carousel by an MCAAP explosive worker prior to being lowered into an autoclave. The autoclave melts the TNT that will be sent through a process that returns the explosive into its original form for reuse in other bombs. More than 20 million pounds of TNT have been reclaimed since 2004. (U.S. Army photo by Jerri Mabray.)

**Diverse Missions Lead the Way to New Technology**

Pine Bluff Arsenal (PBA) in Pine Bluff, AR, has diverse missions ranging from depot storage to chemical and biological defense (CBD) equipment production. PBA's production engineering lab, smoke test facilities, and chemical and physical laboratories are integral to new munition item development. PBA is a key producer of white and red phosphorus rounds, pyrotechnics and training items; and manufacturer of the M45 protective mask, large filters and decontamination kits used by Soldiers around the world. PBA's support of DOD's CBD has led to broader involvement with homeland security first-responder training, pre-positioned equipment surveillance and national weapons of mass destruction training center maintenance for the American Red Cross.

The need to reduce environmental impacts has spurred new technology at

Anniston Defense Munitions Center (ADMC) in Anniston, AL, where a missile recycling center (MRC) is being implemented in three phases. *Phase I* established a disassembly process for Tube-launched, Optically tracked, Wire-guided (TOW) missiles. ADMC estimates that 98 percent of missile hardware, warhead explosives and propellant ingredients can be reclaimed. Currently, TOW missile cases are being recycled and sold to the original equipment manufacturer for reuse in new production. Other components are undergoing testing to determine reuse potential. *Phase II*, a slurry explosives module, will incorporate low-value energetic materials

and produce a mining explosive for commercial use. *Phase III*, an energetics processing module (EPM), is planned for startup in 2008. The EPM will reclaim high-value HMX (cyclotetramethylene-tetranitramine), RDX (hexahydro-trinitro-triazine) and AP oxidizer ingredients in crude form with greater than 99 percent purity. The MRC technologies should be directly applicable to the vast majority of missiles in the DOD and NATO inventories.

MCAAP partners have developed cost-effective methods for recovery of explosives like tritonal and TNT that has resulted in recovering 11 million pounds of tritonal per year and more than 20 million pounds of TNT for reuse in new bomb production.

**Demilitarization (Demil), Recovery and Renovation**

Demil capability exists across the ammunition industrial base. At McAlester

AAP (MCAAP) in McAlester, OK, capabilities include disassembly, autoclave meltout and recovery with technologies like robotic and cryofracture disassembly under development. MCAAP partners with several commercial firms doing a wide variety of demil work. Together, they have developed cost-effective methods for recovery of explosives like tritonal and TNT that has resulted in recovering 11 million pounds of tritonal per year and more than 20 million pounds of TNT for reuse in new bomb production. The Defense Ammunition Center (DAC), collocated at MCAAP, is currently developing three capabilities for implementation into the U.S. Republic of Korea Demil Facility — a unit to treat contaminated solid waste for projectile meltout operations; a unit to treat contaminated liquid waste; and a unit that converts military propellants into usable liquid fertilizer.

Hawthorne Army Depot in Hawthorne, NV, is home to the Western Area Demil Facility (WADF), a \$120 million complex with a full range of demil capabilities including meltout, steamout, high-pressure washout,

JMC established the MARID team to provide direct ammunition logistics support to Soldiers in the field. Calling on ammo expertise from throughout the JMC depot system, MCAAP deploys teams to perform all aspects of ammo life-cycle management, including maintenance, shipping, receiving, inspection, renovation and demil.

decontamination furnaces and disassembly capabilities for improved conventional munitions. WADF has a capacity to demil 49,000 tons of ammunition per year.

Similarly, ammunition renovation is a capability that exists throughout the ammo industrial base. Renovation allows the Army to recover and extend the life of ammunition that otherwise would have become candidates for demil. For example, MCAAP and Blue Grass Army

Depot (BGAD) in Richmond, KY, have pioneered bomb maintenance

and renovation with complete thermal coating and thermal arc spray capabilities that meet stringent U.S. Air Force (USAF) thermal arc coating standards. The “new” bombs have 41 percent lower life-cycle maintenance costs and a 20-year useful life extension. BGAD has also developed a high-output renovation process for 105mm howitzer ammunition, a much needed capability since the 105mm howitzer is the primary artillery piece currently being used by our light forces.

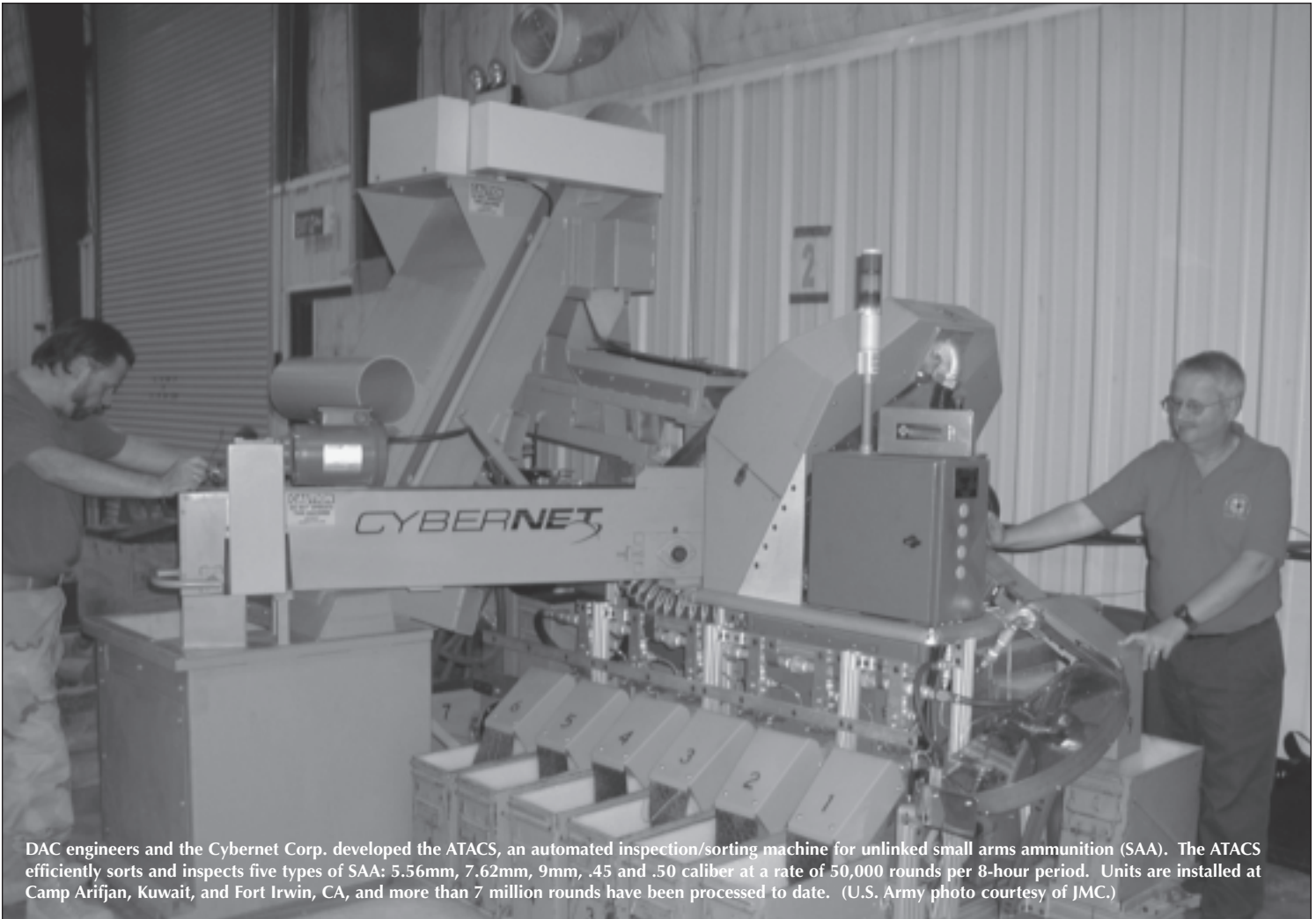
### Specialized Capabilities Support Design, Manufacturing, Logistics

Some capabilities emerge from the need to maintain the depot itself. For example, MCAAP, the largest ammunition storage depot in DOD, also has the largest rail system in the Army. Over the years, MCAAP has developed



CAAA Project Engineer David Peel works on the new Armor Survivability Kits for HMMWVs. (U.S. Army photo courtesy of JMC.)





DAC engineers and the Cybernet Corp. developed the ATACS, an automated inspection/sorting machine for unlinked small arms ammunition (SAA). The ATACS efficiently sorts and inspects five types of SAA: 5.56mm, 7.62mm, 9mm, .45 and .50 caliber at a rate of 50,000 rounds per 8-hour period. Units are installed at Camp Arifjan, Kuwait, and Fort Irwin, CA, and more than 7 million rounds have been processed to date. (U.S. Army photo courtesy of JMC.)

institutional expertise and capabilities for efficient and effective rail maintenance that it now provides as a service to other facilities to generate revenue.

Another specialized capability at MCAAP is the design and manufacture of both wood and steel pallets. The metal pallet facility can prototype, machine, weld, fabricate and galvanize as many as 2,000 pallets a month. The wood pallet shop is equally versatile. MCAAP houses two of only four heating chambers within DOD capable of destroying insects and pests in wood products meeting U.S. Department of Agriculture, European Community and

DAC also serves as the Army's Hazard Classifier, coordinating actions with the USN, USAF, SDDC, DOD Explosives Safety Board and DOT.

United Nations requirements, making MCAAP the supplier of choice for numerous DOD customers and vendors throughout the world.

JMC established the Mobile Ammunition Renovation Inspection Demil (MARID) team to provide direct ammunition logistics support to Soldiers in the field. Calling on ammo expertise from throughout the JMC depot system, MCAAP deploys teams to perform all aspects of ammo life-cycle management, including maintenance, shipping, receiving, inspection, renovation and demil. DAC also provides mobile training teams to provide critical hazardous

materials (HAZMAT) training to DOD-deployed forces in Southwest Asia (SWA). A 2-instructor team spends 3 months in theater, teaching students the rules and regulations governing HAZMAT transport by land, sea or air.

DAC also serves as the Army's Hazard Classifier, coordinating actions with the USN, USAF, Surface Deployment and Distribution Command (SDDC), DOD Explosives Safety Board and Department of Transportation (DOT). DAC also operates and maintains the Joint Hazard Classification System on DOD's behalf and serves as the Army approver for Explosives and Chemical Agent Safety Site plans for operations and storage.

Some of the equipment used by the MARID team comes from another JMC

facility, Tooele Army Depot (TEAD) in Tooele, UT, as well as from DAC. These activities maintain a skilled staff of engineers and machinists who develop, design, manufacture and field ammunition peculiar equipment (APE) worldwide. There are more than 370 types of APE including deactivation furnaces, meltout systems and operational equipment that provide a safer environment for handling HAZMAT, many of which have been deployed in support of *Operations Enduring* and *Iraqi Freedom* (OEF/OIF). Using their highly specialized skills, the workforce at APE and TEAD have developed robotic vehicles for antipersonnel mine clearance, lifting towers for security surveillance and communications systems used by both Soldiers and homeland defense personnel.

In direct support to the warfighter, DAC developed an Automated Tactical Ammunition Classification System (ATACS) that is capable of sorting and classifying 50,000 rounds of mixed small arms ammunition from 5.56mm through .50 caliber per 8-hour shift, and has processed 5 million rounds since spiral integration in 2004 at Camp Arifjan, Kuwait. A second ATACS at the National Training Center, Fort Irwin, CA, has processed 2 million rounds since 2006. A third ATACS is being integrated into the Desert Optimized Equipment Workshop, and will provide a transportable, self-contained workshop for fielding to SWA.

Along with providing critical equipment to the warfighter, DAC provides Joint service ammunition-related training to

more than 35,000 military and civilian students annually. DAC also manages the Army's oldest career program, the Quality Assurance Specialist Ammunition Surveillance, and the Ammunition Managers career program. Combined, these career programs provide more than 1,000 qualified civilians in the field supporting warfighters. DAC produces the *Yellow Book*, formally known as the *Hazard Classification of United States Military Explosives and Munitions*, to help Soldiers in the field who don't have ready access to official information sources.

CAAA has developed a niche in repair of 20-foot shipping containers that are essential to the Army's logistics support. Applying Lean Six Sigma to develop production processes allows CAAA to deliver high-quality products at competitive prices. CAAA is also renovating items such as dummy nose plugs, metal pallets and other types of shipping containers. CAAA's machining center supports all of these operations with a full complement of modern computer numerically controlled machinery as well as paint, plating and powder coating capabilities.

**Unique Expertise Supports the Warfighter**

The existence of these unique capabilities makes it possible for the Army to

respond quickly to urgent Soldier requests. For example, the rapid manufacture of armor survivability kits for High-Mobility Multi-purpose Wheeled Vehicles (HMMWVs) early on in *OEF/OIF* was done at CAAA. As the improvised explosive device threat grew, CAAA and TEAD were both called upon to produce armored cabs for M939 series trucks. In FY02, DAC developed AMMOHELP,

an informational database that answers questions on any aspect of ammunition and explosives management, operations and use. Questions can be submitted by e-mail, phone or through the DAC Web page at [www3.dac.army.mil](http://www3.dac.army.mil). All responses are provided by subject matter experts, and more than 3,800 questions have been received and answered since the program began.

These are just a few examples of the diverse and unique capabilities that exist within the ammunition industrial base to support and protect our warfighters. The ammo industrial base touches Soldiers around the world every day with capabilities that extend far beyond the basics of ammunition production, storage and maintenance.

**DENNIS DUNLAP** is Director, Industrial Support, within JMC's Munitions Logistics Readiness Center. He has worked in positions related to the Army industrial base for most of his 28 years of federal government service. Previously, Dunlap was the Director, Enterprise Transformation, at the U.S. Army Tank-automotive and Armaments Command Industrial Base Operations Directorate.

DAC provides Joint service ammunition-related training to more than 35,000 military and civilian students annually. These career programs provide more than 1,000 qualified civilians in the field supporting warfighters.

DAC developed an ATACS that is capable of sorting and classifying 50,000 rounds of mixed small arms ammunition from 5.56mm through .50 caliber per 8-hour shift, and has processed 5 million rounds since spiral integration in 2004 at Camp Arifjan, Kuwait.



# ARDEC — The Army's Lethality and Armaments Systems Provider for Today's and Tomorrow's Warfighters

COL Russell J. Hrdy

**T**he U.S. Army's Armament Research, Development and Engineering Center (ARDEC) headquartered at Picatinny, NJ, is the Army's principal researcher, developer and sustainer of current and future armament and munitions systems. As a critical member of the newly formed Joint Munitions and Lethality Life Cycle Management Command (JM&L LCMC) and key TACOM LCMC supporter, ARDEC plays a major role in Army transformation with its involvement in Soldier and Future Combat Systems development.

A U.S. Marine from 1/12 Task Force Military Police maneuvers his vehicle through the Mine Resistant Ambush Protected (MRAP) course in Al Asad, Iraq, July 24, 2007. This MRAP is equipped with the ARDEC-designed and produced Objective Gunner's Protective Kit (O-GPK), which provides better gunner protection from small arms fire and improvised explosive devices (IEDs). (U.S. Marine Corps photo by LCPL Ashley S. Hoffman.)

## Center of Lethality's Facilities and Personnel Support Warfighters

As the Army's Center of Lethality, ARDEC leads the way in developing current and future armament and munitions systems for the U.S. Army, U.S. Navy, U.S. Air Force, U.S. Marine Corps (USMC) and Special Forces. According to ARDEC Director Dr. Joseph Lannon, "The success of ARDEC comes from its diverse workforce, state-of-the-art facilities and laboratories dedicated to supplying 'Innovative Armaments Solutions for Today and Tomorrow.'"

ARDEC's workforce of more than 3,000 employees is highly educated — over 34 percent hold graduate-level degrees while more than 2 percent hold doctorates. Highly trained project managers and system engineers go through "Armament University," to learn about cost, schedule and performance management using an array of system engineering software tools and models available to the enterprise before being assigned to a project team.

ARDEC is a leader in Lean Six Sigma (LSS). Since FY00, more than 1,500 employees have received Green Belt training with 771 certifications. Another 115-plus employees received Black Belt training with 80 certifications. To implant Six Sigma earlier in the life cycle, ARDEC will be expanding into Design for LSS.

The Center's state-of-the-art facilities support the work being done here and, in many instances, make it possible.

- **Armament Software Engineering Center (ASEC)** — The ASEC is Level 5 Capability Maturity Model Integration certified, one of the only government centers to have this distinction. It leverages ARDEC's fire control mission and situational

awareness technology to allow for re-configurable fire control technologies, development and implementation.

- **Armament Technology Facility** — This indoor 52,000-square-foot facility provides a secure, environmentally safe, integrated, full-service design, development and evaluation facility for small and cannon caliber weapon systems.
- **Precision Armaments Laboratory and Tower** — This 200-foot tower, harboring a lab at its top, allows ARDEC scientists and engineers to measure and evaluate the performance of sensor systems designed to detect targets during adverse weather, from ground level and at various altitudes.
- **Radio-Frequency Plasma-Based Nano-Particle Reactor** — The largest reactor of its kind in North America, it supports a wide spectrum of nanotechnology needs, ranging from integration into weapon and equipment systems, to healthcare and cosmetics, to electronics and telecommunications.
- **Rapid Prototyping Center** — Equipped with a wide array of numerically controlled milling, cutting and shaping machines, the Center can turn models into hardware to meet urgent warfighter needs.

- ARDEC's in-house capabilities also include the ability to design, fabricate and test advanced warheads, explosively formed penetrators, advanced cannon structures, complex armor materiel, directed energy systems, advanced sensor-based robotics control systems and state-of-the-art fuzes. They can also design and produce — in limited quantity — composite and energetic materials, thermoplastics, adhesives, sealants and lubricants.

ARDEC plays a pivotal role in transitioning a broad variety of technologies to support Army transformation to program managers (PMs) that will provide advanced warfighting and counterterrorism systems for the battlefield. Examples of such transitions are the 81mm Dismounted Mortar System (DMS) to PM Combat Ammunition Systems and the Medium-Range Munition (MRM) to PM Maneuver Ammunition Systems. The improved ergonomic design of the 81mm DMS is 30 percent lighter and enhances mobility in all terrains. The MRM will provide a 120mm precision munition capable of defeating high-value targets up to 12 kilometers away with first-round effects on the target.

ARDEC designed and produced the first generation O-GPK to better protect vehicle gunners. The O-GPK system includes transparent armor windows and rearview mirrors that provide 100 percent visibility for the gunner. (U.S. Army photo courtesy of ARDEC.)





The M113A2 APC REV is designed to increase Soldier survivability during peacekeeping, low-intensity conflict and crowd control situations. REV features include six modular crowd control munitions, modified firing ports and improved SA. (U.S. Army photo courtesy of ARDEC.)



### Responsive Support for the Global War on Terrorism (GWOT)

Since early 2005, ARDEC has been a key provider of fast-turnaround solutions for our deployed combat units. Using a talented pool of engineers, proven processes, facilities and in-house production capabilities, ARDEC has fielded more than 34 specialized armament systems in response to urgent field requirements. What follows is a small snapshot of the GWOT support provided by ARDEC.

To meet immediate survivability challenges of the High-Mobility Multipurpose Wheeled Vehicle (HMMWV), ARDEC designed and produced the first generation O-GPK for turreted protection of HMMWV gunners. Showcasing the benefits of collaboration, O-GPK was jointly developed by ARDEC engineers and Soldiers recently returned from active duty in Iraq. With more than 8,000 systems already being used in theater on the HMMWV, the O-GPK is currently in mass production at Army depots. Field-ready kits are arriving in Iraq and Afghanistan on a weekly basis, with more than 20,000 kits already produced through January 2008.

Notably, the O-GPK was recently selected as the standard gunner protection

platform for the family of MRAP vehicles. The O-GPK system includes transparent armor windows and rearview mirrors that allow Soldiers to maintain a protected posture while performing mission objectives with full visibility. In just 6 months, the system was transformed from conceptual design models to full-scale production, an effort that would historically take more than a year to complete for a program of this magnitude. Other recent developments include a new customized Special Forces GPK for the HMMWV and the Picatinny Blast Shield, which is now being used by the USMC on their Light Armored Vehicles.

ARDEC, in cooperation with PM Heavy Brigade Combat Team and the user community, developed a suite of add-on armor protection kits for the M1 Abrams tank. Within the span of 9 months, ARDEC was able to develop three separate kits for the M1A1 tank commander, M1A2 tank commander

and loader positions. The kits, commonly known as COMAGS (Commander Armor and Gun Shields), are intended to protect the Soldier in each position from small-arms fire and IEDs, while maximizing their situational awareness (SA) and mobility. Warfighters from the Armor School at Fort Knox, KY, were able to evaluate 3-D renderings of each design iteration, then physically review hardware prototypes on a monthly basis. This concurrent process allowed the design team to capture all design objectives as well as the often missed “soft” user requirements.

In the area of weapons development, ARDEC developed the Grenade Rifle Entry Munition (GREM), a lightweight, muzzle-launched breaching munition fired from an M16 or M4

carbine. It uses the warhead’s overpressure to breach locked doors or windows from distances up to 40 meters (m) away, with minimal hazard to operator. The GREM was released to the field under an urgent materiel release (UMR) in March 2006.

ARDEC’s involvement with nonlethal munitions led to developing the 40mm Extended Range

Marking round (XM1091), which provides the warfighter with the capability to engage hostiles at 40 m to 75 m with blunt trauma force. It contains a powder dye, which, upon impact, marks the individual for future identification. The extended range and marking capability is beyond the currently fielded M1006 sponge grenade.

As a key member of the JM&L LCMC team, we are actively partnering with PMs to effectively transition crucial technologies, develop and field rapid solutions to our Soldiers, identify and solve deficiencies with fielded systems and continue to be the world’s best provider of lethality systems to the warfighter.

In response to operational requirements from military police in Iraq for a rapid, protected means to employ nonlethal force to restore order during riots at theater internment facilities, the M113A2 Armored Personnel Carrier (APC) Rapid Entry Vehicle (REV) was designed. The current vehicle, fielded within 8 months of the project start, increases Soldier survivability by providing improved SA and the ability to move and fire from within an armored vehicle. Innovative REV features include six modular crowd control munitions that can spray nonlethal rubber pellets into a crowd to disperse it, and windows and Bradley firing ports modified for shotguns that fire nonlethal bullets. As of 2007, two REVs have been delivered and were recognized by users as a 2006 Army's Greatest Invention.

In 2007, ARDEC fielded the Special Weapons Observation Remote reconnaissance Direct Action System (SWORDS). SWORDS is an armed,

remote-controlled tracked vehicle with surveillance and reconnaissance capabilities. It provides Soldiers with a means to conduct higher risk operations while keeping them out of harm's way. The system is the culmination of a development strategy that focused on the integration of off-the-shelf components as a way to provide our Soldiers with futuristic warfighting capabilities today.

SWORDS development included extensive evaluations by 3rd Infantry Division, 3rd Brigade Combat Team (3ID/3BCT) Soldiers in November 2006, resulting in positive feedback. In June 2007, SWORDS was approved for UMR use by the 3ID/3BCT. ARDEC has since successfully transitioned the SWORDS program to the Robotic Systems Joint Project Office located at Redstone Arsenal, AL, for future planning. Since the June UMR, the three SWORDS robots assigned to the 3ID/3BCT have been used to further train their units, giving

Soldiers an opportunity to experiment with the robots and determine future mission fits. ARDEC continues to conference weekly with onsite contractors responsible for SWORDS' 3ID/3BCT maintenance and usage. Today, ARDEC SWORDS technicians note that the system is being considered for checkpoint use.

### World-Class Lethality for Today and Tomorrow

ARDEC leaders are committed to meeting the lethality challenges of today and tomorrow. This requires a commitment to workforce growth and education, continuous process improvement, modernization of facilities and an eye to the ever-changing complexities of technology. However, central to all is the underlying need to support the warfighter with effective, responsive solutions. "As a key member of the JM&L LCMC team," concludes Lannon, "we are actively partnering with PMs to effectively transition crucial technologies, develop and field rapid solutions to our Soldiers, identify and solve deficiencies with fielded systems and continue to be the world's best provider of lethality systems to the warfighter."

**COL RUSSELL J. HRDY** is the ARDEC Deputy Director. He holds a B.S. from the U.S. Military Academy and an M.S. in manufacturing systems engineering from Lehigh University. His military education includes the Armor Officer Basic and Advanced courses, U.S. Army Command and General Staff College, the Advanced Program Management course and the Industrial College of the Armed Forces. He is an Army Acquisition Corps member and is certified Level III in program management; Level II in test and evaluation; and Level I in systems planning, research, development and engineering.

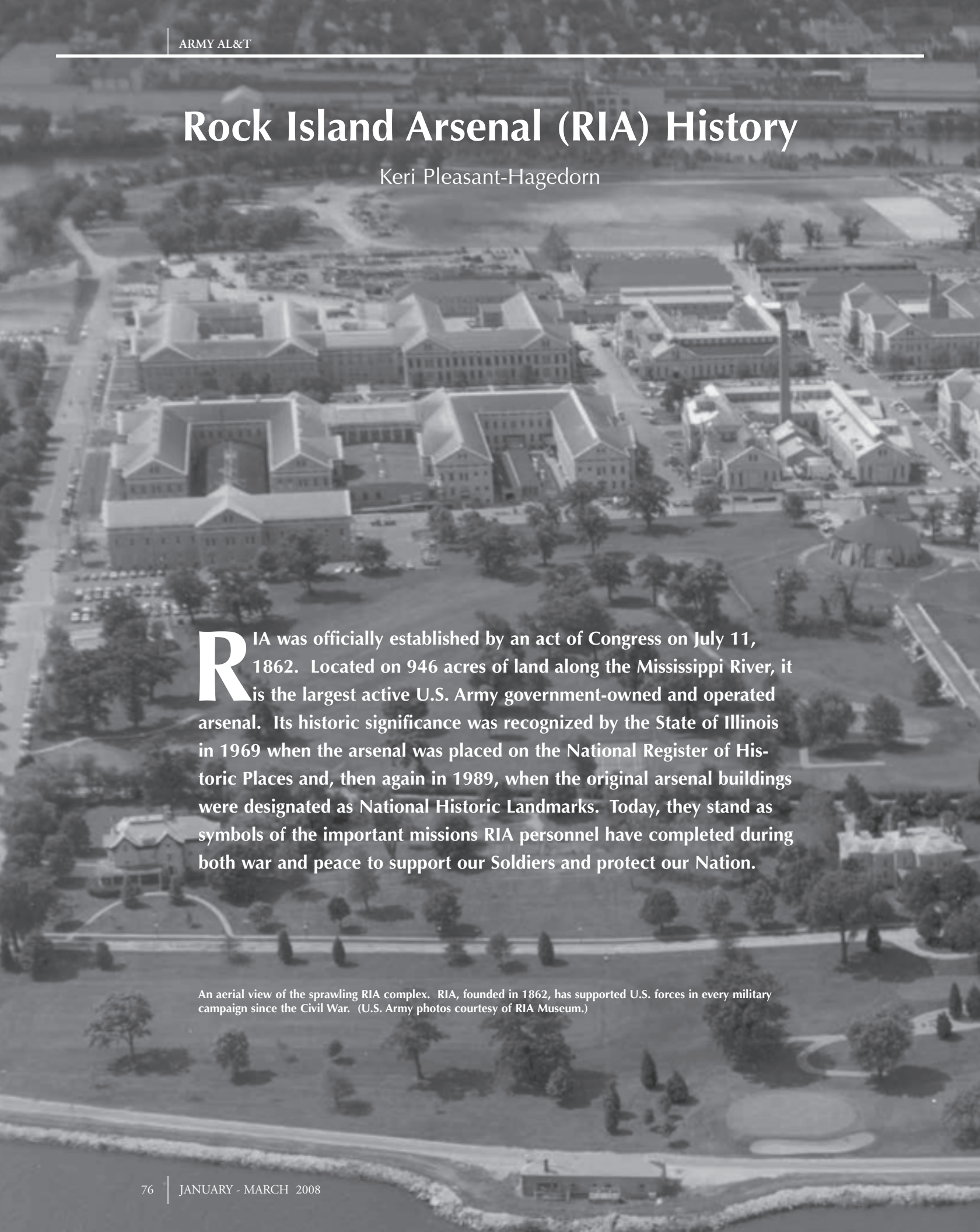


The ARDEC-fielded SWORDS is an armed, remote-controlled tracked vehicle with battle-tested surveillance and reconnaissance capabilities that is helping keep Soldiers out of harm's way. (U.S. Army photo courtesy of ARDEC.)



# Rock Island Arsenal (RIA) History

Keri Pleasant-Hagedorn



**R**IA was officially established by an act of Congress on July 11, 1862. Located on 946 acres of land along the Mississippi River, it is the largest active U.S. Army government-owned and operated arsenal. Its historic significance was recognized by the State of Illinois in 1969 when the arsenal was placed on the National Register of Historic Places and, then again in 1989, when the original arsenal buildings were designated as National Historic Landmarks. Today, they stand as symbols of the important missions RIA personnel have completed during both war and peace to support our Soldiers and protect our Nation.

An aerial view of the sprawling RIA complex. RIA, founded in 1862, has supported U.S. forces in every military campaign since the Civil War. (U.S. Army photos courtesy of RIA Museum.)

After the War of 1812, the U.S. Army built Fort Armstrong on the lower end to keep the Native Americans peaceful, the river open to traffic and to protect settlers arriving from the east. The fort was abandoned in 1836, although the Army maintained a small depot there from 1840 to 1845 until, that too, was abandoned.

With the outbreak of the Civil War, Congress needed to replace Harper's Ferry Armory, WV. RIA was ideally situated to provide ordnance stores to troops stationed in the area and to Soldiers guarding the frontier. In 1863, the Ordnance Department began constructing the first arsenal building, a storehouse, currently known as the Clock Tower building. At the same time, the Army Quartermaster Department was busy building a prisoner-of-war camp — the Rock Island Prison Barracks — to hold approximately 10,000 prisoners. Together, these and other projects made RIA's construction one of the largest military construction projects of the late 19th century. All that remains of the prison today is the Confederate Cemetery and the graves of the Union guards in the National Cemetery.

Brevet BG Thomas J. Rodman assumed command of RIA's construction in 1865. His genius is evident in the beautiful symmetry of the old stone buildings that still stand nearly intact. Rodman is considered the "Father of the Rock Island Arsenal" because of the critical role he played in designing and expanding the arsenal. LTC Daniel W. Flagler went on to complete much of Rodman's master plan.

In 1898, the Spanish-American War was RIA's first test to meet emergency wartime production requirements for haversacks, canteens, meat cans, tin cups, gun carriages, limbers and caissons. RIA also produced various

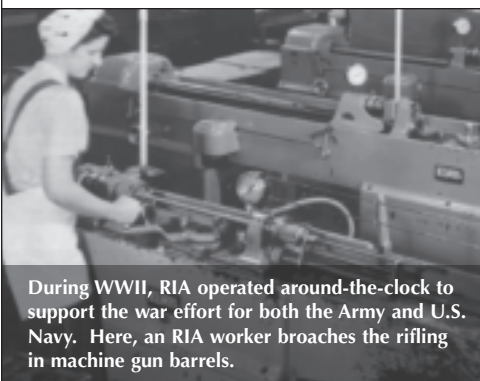
This image of an RIA shop interior, machinery and equipment was taken in August 1918. During WWI, RIA manufactured French-designed 75mm recuperators.



leather accouterments for the cavalry including saddles, saddlebags, rifle scabbards, bridles, halters, stirrups and straps. During World War I (WWI), RIA manufactured French-designed 75mm recuperators. Following the war, RIA became the Army's center for production of recoil mechanisms. From 1920 to 1930, RIA conducted developmental work on artillery, tanks, tractors and armored vehicles. The modern Army tank evolved from RIA shops.

WWII marked a period of production unsurpassed in RIA's history. RIA produced immense quantities of recoil mechanisms, gun carriages, gun mounts, machine guns, small-arms equipment and loading machines for the U.S. Navy, and enormous quantities of spare parts for various weapons and equipment. At its peak employment, RIA operated around-the-clock, with three shifts of employees totaling 18,675 in 1943.

During the Korean Conflict, RIA's principal activities focused on developing



During WWII, RIA operated around-the-clock to support the war effort for both the Army and U.S. Navy. Here, an RIA worker broaches the rifling in machine gun barrels.

and manufacturing rocket launchers and mortars, as well as overhauling tanks, artillery and small arms. In 1955, the Army established a command headquarters at Arsenal Island, and it has since hosted a series of headquarters. During the Vietnam War in the 1960s, RIA resumed production of manufactured aircraft machine gun systems, artillery recoil mechanisms and gun mounts, and completed overhaul of small arms, artillery and combat vehicles.

RIA completed an extensive modernization program, begun in the early 1980s, called Project Renovation of Armament Manufacturing (REARM). Under REARM, manufacturing operations were consolidated into a single building. During *Operation Desert Storm*, RIA manufactured carriages and recoil mechanisms, performed final assembly of M198 155mm Towed Howitzers, and produced gun mounts for M109 and M110 Self-Propelled Howitzers and for M1A1 tanks.

Today, RIA is the only U.S. Army facility that assembles tool sets, kits and outfits that support equipment in the field for the global war on terrorism. The arsenal manufactures gun mounts, recoil mechanisms, artillery carriages and other combat equipment. RIA is DOD's only complete, in-house metal parts forge, foundry and plating shop. The arsenal has contributed significantly to local, regional and national history while continuing to play a vital manufacturing role for our Nation's defense.

**KERI PLEASANT-HAGEDORN** is the Historian for the U.S. Army Joint Munitions Command, headquartered at RIA. She has a B.A. in psychology from the University of Northern Iowa and is completing an M.A. in U.S. history at Western Illinois University.





## From the Acquisition Support Center Director

I want to wish the Acquisition, Logistics and Technology (AL&T) Workforce the very best for the New Year. In 2008, the U.S. Army Acquisition Support Center (USAASC) will renew our commitment to keeping a well-trained, efficient and educated workforce to support any new challenges or contingencies our Soldiers may meet in an uncertain world. We will also continue keeping our Soldiers *Army Strong* by providing the best weapons, technology and logistics, as quickly as possible, to support persistent conflict and the continuing global war on terrorism.



### Achieving Certification Requirements

Now is a good time for supervisors to complete a review of their organization's positions for proper coding and submit any changes through the local Civilian Personnel Advisory Center. Supervisors should also review their employees' Individual Development Plans (IDPs) to ensure every employee has a strategy to meet their certification and continuous learning requirements. With the release of *Director Army Acquisition Corps Guidance Memo #3*, supervisors are required to have 100 percent of their employees' IDPs updated within the last 6 months. It is essential that employees and supervisors include all the courses required for employee certification in IDPs so we can obtain the much needed quotas for required Defense Acquisition University (DAU) training courses. This needs to be projected 8-18 months into the future. The certification process, like any well-built structure, requires a strong foundation. Along those lines, things like continuous learning and developing leadership competencies are important to career and professional development and must be accomplished concurrently. But, if there is a "requirement" to complete training sequentially, certification courses must come first.

### CAPPMIS Position Scrubs

Beginning in March 2006, USAASC conducted a manual scrub of all AL&T Workforce positions in the Civilian Acquisition Personnel and Position Management Information System (CAPPMIS) based on input from acquisition organizations identified by the Refined Packard Definition. The scrub results were loaded into CAPPMIS in April 2007, and then

top-loaded into the Defense Civilian Personnel Data System (DCPDS). After this was accomplished, organizations were advised to review the CAPPMIS data and make corrections, additions or deletions through DCPDS. This process should be repeated annually as directed by the *DOD Desk Guide for Acquisition, Technology and Logistics Workforce Career Management*, Chapter 5, Pages 5-13, Position Maintenance/Review.

Likewise, the *DOD Desk Guide* states that "supervisors are responsible for reviewing AL&T position information during the employee's annual appraisal and initiating appropriate actions within their component should changes be required." This review should also be done before recruitment, during reorganizations or when an incumbent's duties change. For more information, contact Shirley Hornaday at (256) 955-2764/DSN 645-2764 or at [shirley.hornaday@us.army.mil](mailto:shirley.hornaday@us.army.mil).

### Program Managers (PMs) Empowerment and Accountability Report

*Section 853, John Warner National Defense Authorization Act for FY07, Public Law 109-264*, requires the Secretary of Defense to develop a comprehensive strategy for enhancing the roles of DOD PMs in developing and implementing defense acquisition programs. One initiative requires that DOD revise major defense acquisition program guidance to address qualifications, resources, responsibilities, tenure and PM accountability. Each Service Acquisition Executive has been provided the following guidance:

- Formulate a performance agreement between the PM and the program's milestone decision authority (MDA) on expected parameters for cost, schedule and performance, as well as appropriate PM and MDA commitments to ensure the parameters are met.
- Expand PM authorities including, to the appropriate extent, the right to object to additional program requirements that would be inconsistent with parameters established at Milestone B and reflected in the performance agreement.
- Adhere to PM-specified tenure lengths based on their acquisition category level.

The Army Acquisition Corps (AAC) will prepare a program management and tenure agreement for centrally selected project and product managers. The process is under discussion in the program executive office (PEO) community. When the PEO requests a charter for a PM, a program management and tenure agreement will be prepared and signed by the Army Acquisition Executive, PEO and PM. For more information, please contact Joan Sable at (703) 805-1240/DSN 655-1240 or [joan.l.sable@us.army.mil](mailto:joan.l.sable@us.army.mil).

### Acquisition Key Billet Competition

After an open competition pilot in FY08 to all DOD employees to vie for two Acquisition Key Billet positions in the Defense Contract Management Agency, the Army has now expanded availability to all “best qualified” positions for the FY09 Acquisition Key Billet Board. To reach the entire acquisition community across the services, an announcement was posted on the USAJOBS® Web site (<http://www.usajobs.gov/>) outlining basic eligibility with specifics identified via the U.S. Army Human Resources Command (HRC), Acquisition Management Branch (AMB) Web page. Applicants from the other services must meet the same requirements as Army employees and include the Senior Rater Potential Evaluation (SRPE) and the Acquisition Career Record Brief in their applications. Acquisition Career Managers (ACMs) will help non-Army applicants, supervisors and senior raters prepare SRPEs.

Army employees are encouraged to have an ACM review their application before submitting it. There have been significant reductions in application errors for this announcement with no incomplete application rejections. Another change this year was that senior raters were given extra time after the closing date to complete the SRPE in the Career Acquisition Management Portal/CAPPMIS. There were 58 eligible applications for the Key Billet Announcement, 41 LTC/GS-14 and 17 COL/GS-15. For more information, contact Catheryn L. Johnston, HRC/AMB, at (703) 325-2764/DSN 221-2764 or at [cathy.johnston@us.army.mil](mailto:cathy.johnston@us.army.mil).

### SPRDE Career Field News

Effective Oct. 1, 2007, a new Acquisition Career Field (ACF) was established called Systems Planning, Research, Development and Engineering-Program Systems Engineer (SPRDE-PSE). Army AL&T Workforce members who, on Sept. 30, 2007, were certified Level I or Level II in the SPRDE-Systems Engineering (SE) will receive a corresponding level certification for the new SPRDE-PSE ACF. The letter designation for this new ACF is “W” and will be displayed in Section X of the ACRB and will also be captured in the official CAPPMIS database.

AL&T Workforce members who, on Sept. 30, 2007, possessed a Level III certification in SPRDE-SE (code S) will receive a Level II certification in SPRDE-PSE (code W). To be certified at the next highest level in the SPRDE-PSE ACF, individuals must comply with the SPRDE-PSE certification standards as posted in the DAU catalog at <http://www.dau.mil/>.

In closing, my congratulations to the 2007 AAC Annual Award winners and nominees. Thank you for a job well-done. For a list of award winners, along with ceremony highlights, please see the article published in our sister publication *Army AL&T Online Monthly* November 2007 issue at <http://asc.army.mil>.



**Craig A. Spisak**

Director, U.S. Army  
Acquisition Support Center

### Competitive Development Group/Army Acquisition Fellowship Program (CDG/AAF) — Developing Future Civilian Senior Leaders

*Richard A. King*

In August 2000, the first year group of 21 Army acquisition civilians graduated from a new program called the CDG. This program was an Army Acquisition Executive/Assistant Secretary of the Army for Acquisition, Logistics and Technology (ASAALT) and Army Acquisition Corps (AAC) initiative to transform staff-level Acquisition, Logistics and Technology (AL&T) Workforce members into successful senior leaders. Since that time, more than 100 additional acquisition leaders have graduated from the program, and there are 34 currently enrolled. Among the graduates are Project/Product Managers (PMs), Deputy PMs, Division Chiefs, a U.S. Army Acquisition Support Center (USAASC) Regional Director and the USAASC Director/Deputy Director for Acquisition Career Management.

### What is the CDG/AAF Program?

Established in 1997, the CDG (renamed in 2006 to CDG/AAF) is a 3-year Acquisition Program Management Senior Leader Position development program. The program's primary purpose is to develop civilian leaders for the future Army. With the “graying” of the AL&T Workforce, the Army is facing the reality of losing a large percentage of its most experienced leaders to retirement. The CDG/AAF program offers a cross-functional work experience opportunity, as well as a priority status on many leadership education and training courses, to develop the leaders that will fill the gaps in the AL&T Workforce.





The CDG/AAF program offers AFs cross-functional work experience opportunities, executive leadership training and intermediate coursework as part of the 3-year training curriculum. (Army AL&T Magazine file photo.)

Program members, known as Acquisition Fellows (AFs), rotate through at least three different developmental assignments chosen specifically to broaden their scope of the Army's acquisition processes. Numerous positions are available — from Assistant PMs (APMs) to logisticians, business officers, contract specialists, program integrators and others. By selecting positions in career fields outside of their current knowledge bases, AFs will develop into stronger, more-rounded leaders.

In addition to the experiential opportunities, members are required to complete developmental curriculums designed specifically to increase their acquisition knowledge and leadership skills. These curriculums include the Program Management Office course (PMT 352 A and B), two executive leadership courses, the Intermediate Qualification Course, Congressional Operations, National Training Center and the Civilian Education System courses. By combining these courses with varied work experiences, the CDG/AAF program is committed to producing acquisition civilians fully capable of leading product teams and eventually becoming PMs.

### Time for a Change

ASAALT Military Deputy LTG N. Ross Thompson III stated in his vision statement that the AAC should “develop flexible ... civilian leaders who possess diverse and well-rounded backgrounds.” Army officers entering active duty are provided timelines that lay out their career expectations. From developing leadership skills as platoon and company commanders, to broadening their acquisition knowledge as project officers and APMs, and finally culminating their progression as PMs, Army officers have a clear path in their acquisition careers.

In contrast, most of the civilian workforce has spent a large portion of their careers caught up in stovepipes that limit their progression, and fail to develop the broad skills required to be effective senior acquisition leaders. While this scenario would quite assuredly produce employees who are highly competent in their specific fields, it falls short in creating diverse and well-rounded leaders.

When the selection boards convene to determine who will fill Critical Acquisition Positions such as program managers, the decisive advantage will usually be in favor of the Army officer. Rarely will a civilian's work history and developmental progression be capable of rising above that of numerous Army officers.

### The CDG/AAF Program is for the Employee

The program was created to attract the most elite acquisition professionals who wish to advance their careers in program management and Army senior staff fields. AFs are board-selected from this group of highly qualified professionals to maintain the program's integrity and protect its reputation for producing successful leaders.

However, selecting these highly qualified individuals is only the beginning of the process. Transforming the potential these members already possess into well-defined skills that will advance them into senior leadership positions is the program's endgame. The CDG/AAF program has excelled at determining what these steps are and incorporating them into the program while continually evolving to meet the Army's needs.

Upon entering the program, AFs are assigned to a centrally funded training position for 3 years. This, in combination with rotating developmental assignments, is very beneficial to members. While most organizations might balk at allowing one of their best and brightest employees to attend training of 6 weeks to 3 months, the CDG/AAF program can easily schedule the longer-term training between rotational assignments. Not only is it possible, but it is required for members to attend the 6-week Defense Acquisition University PMT-352-B course, 5 weeks of Civilian Education System courses, 1 week of Congressional Operations, two week-long Executive Leadership courses at the Darden School of Business at the University of Virginia and the 4-week Intermediate Qualification Course at the University of Texas-Austin. This training is scheduled by the CDG/AAF program's manager — in conjunction with the Regional Directors and Acquisition Career Managers — either in between or within individual assignments.



The CDG/AAF program's goal is to produce high-performing, agile and ethical acquisition leaders with a wide range of experience, knowledge and skills. (Army AL&T Magazine file photo.)

In addition to the training provided to the AFs, the developmental assignments have a great deal to offer. Most civilian employees, even AAC members, will spend an entire career attempting to progress within a single acquisition career field. Whether they are working in business/financial, engineering, contracting or logistics, very few employees are "cross-trained." The CDG/AAF program opens the doors, allowing AFs to cross the boundaries between career fields, thereby becoming better-qualified program managers. Successful senior leaders should understand the functions and purpose of each division within their respective organizations, and there is no better method of gaining that understanding than through actual work experience.

### The CDG/AAF Program is for the Organization

The benefit to the receiving organization is highly qualified temporary support at no cost. With developmental assignments of only 6 months to 1 year, some organizations are hesitant to rely on AFs and refrain from placing too great an amount of responsibility on them. The fact is, however, if members were not capable of accepting that amount of responsibility, they would not have been board-selected into the CDG/AAF program. For example, the PM for Apache Sensors has been using an AF as an APM for the Fire Control Radar and Radio Frequency Interferometer for more than 4 years. In this position, the APM was given responsibility to manage the budget, inventory, production schedule and upgrades, and to lead the Integrated Product Team for the Apache radars. He will be the government interface

with the prime contractors and take the lead during negotiations for new production contracts. In attempting to forecast the future requirements for the radar based on battle losses and scheduled fieldings, a previous AF effected change in the program by convincing Army Headquarters to increase the Army Acquisition Objective allowing for increased Apache radar production. The Apache PM Office is reaping the benefits of effectively using an AF as an APM when it does not have a position on its table of distribution and allowances to fulfill this requirement.

In addition to receiving the efforts of an effective and assertive acquisition employee, the organization is also complying with the ASAALT Balanced Scorecard by helping shape a high-performing AL&T Workforce.

### The CDG/AAF Program is for the Army

The Army realizes that a shortfall is approaching. Whether it is called "critical mass," "the perfect storm" or any other cliché of the day, building an AL&T Workforce capable of withstanding the personnel losses associated with the massive "baby-boomer" retirements is certainly an issue causing great concern for Army strategic planners. This is not something that was overlooked though, as plans have been formulated that include the CDG/AAF program.

By investing 3 years in developing CDG/AAF program members, the Army will see returns in the form of efficient and effective senior leaders. The ASAALT strategy map's single overarching objective is to "shape a high-performing, agile and ethical acquisition workforce." By enhancing the careers of its civilian AAC members to create more qualified PMs, CDG/AAF is a key program toward achieving that objective.

*Richard A. King is the Executive Officer to the Deputy Program Executive Officer (PEO) Aviation and Staff Assistant to the Assistant PEO for Operations, Redstone Arsenal, AL.*





## Contracting Community Highlights



CONTRACTING COMMUNITY HIGHLIGHTS



**P**eople are the heart of an organization, and its most valuable resource. To me, these expressions are more than colloquialisms. From the Soldiers in the field defending our freedom, to the small businesses entering the defense industry, to the interns we train to succeed us — people are at the core of everything we do.

When meeting with my staff, I remind them that their work is important, recognized and appreciated, and that they should be excited to come to work because their job is important to every Soldier serving on the Frontiers of Freedom and for every American taxpayer.

This column is my opportunity to share with you my appreciation for your efforts and dedication. Each of us serving in the Army contracting community is a valued team member. Starting in this edition, we will highlight members of the contracting community whose lifetime of service exemplifies Army Values — loyalty, duty, respect, selfless service, honor, integrity and personal courage. As you read the inaugural article “Dedicated Partners in Acquisition,” reflect upon your career — past, present and future — then consider your impact on the lives of the Soldiers we serve. Please take a few minutes to imagine how different our country, our Army and our lives would be without you — the heart of our contracting community and our most valuable resource.

### **Ms. Tina Ballard**

Deputy Assistant Secretary of the Army  
(Policy and Procurement)

### **Dedicated Partners in Acquisition**

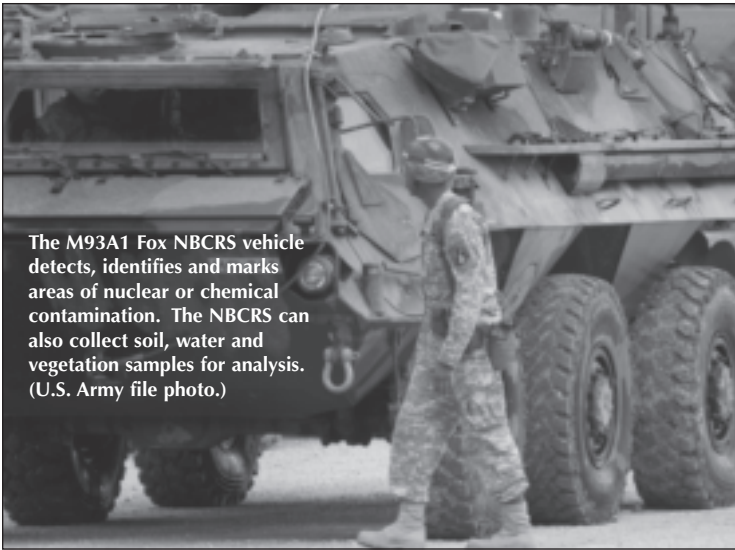
Patricia Moore and Charles Comaty are team leaders and contracting officers (KOs) at the U.S. Army Research, Development and Engineering Command (RDECOM) Acquisition

Center, Aberdeen Proving Ground, MD. The couple, married since 1983, has accumulated 64 years of combined federal service, which includes a wealth of contracting experience in key Army nuclear, chemical and biological (NBC) programs.

During *Operations Desert Shield* and *Desert Storm (ODS)*, Moore and Comaty’s professional abilities were put to the test. Because of Iraqi military capabilities, chemical and biological defense requirements were urgent and critical. Moore wrote contracts to acquire simplified collective protection equipment, which allowed warfighters to operate safely in an enclosed environment with protection from chemical and biological agents. Comaty executed contracts enabling the Fox NBC Reconnaissance System (NBCRS) deployment to Southwest Asia. The NBCRS detects, identifies and marks NBC hazards on the integrated battlefield and provides information and warning to other forces. One Fox program contract was to resolve the issue of which weapon was suitable to be mounted on the Fox vehicle because there were difficulties with the standard M60 machine gun. Further research led to the discovery of the M240 machine gun used by the U.S. Marine Corps and built by FN Manufacturing Limited Liability Corp., Columbia, SC. At the conclusion of *ODS*, Moore and Comaty resumed their more routine contracting duties.

Comaty served as the KO for the Assembled Chemical Weapons Assessment (ACWA) program from May 1997 until December 2002. A unique program, the ACWA Dialogue was formed in 1997 to ensure that the concerns of all parties involved were integrated into the destruction of chemical weapons. As this program progressed, a high level of trust developed between the Dialogue and DOD, which had not been experienced in previous chemical demilitarization efforts. ACWA’s unique contracting approach was the decision to allow citizen participation in the procurement process.

Moore is the KO for the Joint Chemical Agent Detector Program. As former U.S. Army Materiel Command contracting interns, Moore and Comaty have a serious interest in training and developing future KOs and acquisition workforce leaders. Both work closely with current interns and have served as trainers and mentors. Moore insists that interns become proficient in researching acquisition regulations. She strongly believes that such research is key to their future career field success. Moore and Comaty remember the challenges and rewards of their intern experiences and want to share their knowledge and expertise with the Army’s future KOs. They feel the energizing effects of working with the recent college graduates and emphasize the importance of sharing information and experience within the



The M93A1 Fox NBCRS vehicle detects, identifies and marks areas of nuclear or chemical contamination. The NBCRS can also collect soil, water and vegetation samples for analysis. (U.S. Army file photo.)

workforce, especially with interns. They willingly answer co-workers' questions and agree the only possible dumb questions interns can have are the questions they don't ask.

During their careers in Army contracting, Moore and Comaty have received numerous awards and citations. While they appreciate the recognition they have received, their overriding motivation is to make important contributions to the Nation's chemical and biological defense programs. Moore and Comaty have seen remarkable changes in the workplace and contracting career field as they both enter their 33rd year of civilian service. What has remained constant is their dedication to service and commitment to excellence in supporting our Nation, our Army and our Soldiers.

*Editor's Note: This article was submitted by the RDECOM Public Affairs Office.*



## Building a Better Future Through the Afghan First Program

*COL Michael T. Luft*

On March 25, 2006, Combined Forces Command-Afghanistan Commanding General LTG Karl Eikenberry established the Afghan First Program to "leverage the

command's activities and resources to provide opportunities for economic expansion, increased entrepreneurship and skills training for the people of Afghanistan." In FY06, DOD awarded 11,829 contracts and invested more than \$1 billion in Afghan businesses. The Joint Contracting Command-Iraq/Afghanistan (JCC-I/A) and its five Regional Contracting Offices (RCCs) in Afghanistan are essential contributors to Afghan First success. As of August 2007, the RCCs have awarded more than 9,000 contracts valued at \$600 million to rebuild Afghanistan. Because of this program, 70 percent of contracts and 73 percent of the value remained in Afghanistan. As the head of Afghanistan contracting operations, headquartered at Bagram Air Field, and as the Principal Assistant Responsible for Contracting-Afghanistan (PARC-A), I actively solicit Afghan business participation in this valuable economic development program.

### Afghan First Program

Afghan First is a fundamental shift to build Afghan business capacity by developing values-based leadership, responsibility, authority and accountability. In the early stages of reconstruction, most of the emphasis was on giving unskilled Afghans jobs, but it lacked capacity for training or building a future once coalition forces leave Afghanistan. Under Afghan First, emphasis is on businesses to employ and train local employees for higher skilled jobs. Providing a helping hand in Afghanistan's skilled labor development infuses economic growth, while building new trust and confidence in the Afghan people with their new government. The PARC-A contracting operation is building momentum and confidence and promoting Afghan business ownership by using the old adage: "Teaching a man to fish builds a skill for a lifetime." Creating opportunities for skills training, long-term employment, increased entrepreneurship and economic expansion, the program fosters increased human capacity while sustaining economic growth.

### Actively Applying "Best Value"

Operations orders direct commanders to simultaneously increase employment opportunities, skills training, business growth, entrepreneurship and economic expansion in Afghanistan. Contracting officers (KOs) use a best-value approach to evaluate and use Afghan First objectives when awarding contracts. They evaluate proposals on the planning, training and transfer of knowledge, skills and abilities to the Afghan workforce. Using this approach, Afghan First is highly incentivized and designed to allow diverse companies worldwide to participate. The five qualifying factors to receive credit for Afghan First participation are:

- Being an Afghan business owner
- Being an Afghan senior or mid-level manager



- Employing an Afghan labor force
- Providing training for Afghan employees
- Using Afghan subcontracting

By satisfying one or more of these factors, companies will qualify under Afghan First and receive higher consideration for award. The more factors the bidders meet, the greater chance they have of winning contracts. The ultimate goals are to build a robust business base, improve performance and encourage competition for solicitations in an open market economy.

### Building for the Future

Following host nation business development command policy, KOs seek out capable Afghan businesses and build education programs and business solutions enhancing economic growth. Each KO is tasked to use tools and methods most practical to make every reasonable attempt to support the Afghan First strategy. Where opportunities present themselves and it makes sense under the circumstances, KOs craft a best-value approach to evaluate and use Afghan First criteria in awarding contracts. Afghan First is to be weighted equally with cost and not lower than any other no-cost factors.

Afghan First isn't finished evolving yet, but the next steps for Afghanistan's economic future are well underway. According to LTC Tracey Kop, Afghan First Business Office Chief, "The PARC-A and Combined Joint Task Force [CJTF]-82 have joined forces to develop Afghan Business Centers as the next step in the evolution of the Afghan First Program." The business centers offer business training, skills and development, and information via procurement experts and the Internet. The goal is to provide the basic business tool set to understand the procurement process and to find and then compete for available contract work. Depending on the area's needs, centers could offer business assistance training, as well as construction, technology and agriculture training. The centers'

intentions are to grow and strengthen the private Afghan business community and provide fair and open business transactions with all buyers, including the United States.

LTC David DeVore, the CJTF-82 Deputy for CJ5 Future Plans, and key proponent for the business centers, acknowledges that business center development "is a community affair with a variety of participants and models contributing to the successful planning and development of these centers." Kop immediately agreed: "It takes an entire village to build an Afghan business center." Current operations and future planning are continuing the Afghan First Program's goals — the hopes of connecting the Afghan people to a more prosperous and secure future.

*COL Michael T. Luft, U.S. Air Force, is the PARC-A and Deputy Commander, Afghanistan Contracting Operations, JCC-I/A.*

### U.S. Army Medical Research Acquisition Activity (USAMRAA) Supports Medical Brigade CT Scanners

*David Denton*

In the desert heat of Iraq, Army Combat Support Hospitals (CSHs) are using Toshiba™ computed tomography (CT) scanners to diagnose and treat wounded Soldiers. In early 2006, three Toshiba CT scanners were shipped to Iraq under a USAMRAA contract, which included terms that maintenance be performed by Iraqi Toshiba contractor technicians. The CT scanners are at three CSHs under command and control of the 62nd Medical Brigade, which assumed command from the 3rd U.S. Army Medical Command (MEDCOM) in August 2007.

In August 2005, the Office of the Surgeon General (OTSG) requested that USAMRAA assist the 44th MEDCOM in leasing Toshiba CT scanners that were urgently needed in Iraq. OTSG and 44th MEDCOM agreed that the older CSH CT scanners needed replacing with new cutting-edge technology offered by the newer multislice CT scanners. The Toshiba Aquillen 16-slice CT scanner was selected by the OTSG radiology consultant because it would provide physicians optimal capability for diagnosis and treatment. Along with the medical requirements, logistical concerns dictated the need for a modular and mobile scanner that could be easily moved. Additionally, the Toshiba Corp. in



Afghanistan has plenty of unskilled laborers as well as highly educated workforce members such as doctors and lawyers. The Afghan First Program helps the group that falls in between. (U.S. Army photo by SSG Isaac A. Graham.)



CSHs in Baghdad, Mosul and Tikrit received the CT scanners and were met by Iraqi Toshiba technicians who assisted Army technicians in final assembly and testing before scanning their first patients. Here, SGT Matt Dowling listens as a technician explains the CT scanner's components at Camp Speicher, Tikrit CSH. (USAMRAA photo by CW3 Cynthia J. Dunbar.)

Iraq would provide contractor support maintenance by Iraqi local nationals (LNs). At time of the award, coalition geopolitical considerations required that Iraqi LNs be trained to operate and service the CT scanners since their ownership would eventually transfer to the Iraqi government when the Army redeployes from Iraq.

CT scanners are normally procured by the Defense Supply Center-Philadelphia. However, geopolitical considerations and urgent priorities set by OTSG and 44th MEDCOM mandated that normal procurement procedures could not be followed. To expedite the procurement and minimize transportation and support issues, the CTs were procured through Toshiba's Middle East representatives in France and Jordan. Because of the language barrier, the USAMRAA contracting officer (KO) negotiated contract terms and pricing directly with an English-speaking Toshiba representative in France, who happened to be a retired U.S. Navy radiologist. Without this individual's cooperation and patriotism, the contract would not have been completed. Negotiations were completed within a few weeks and a contract awarded

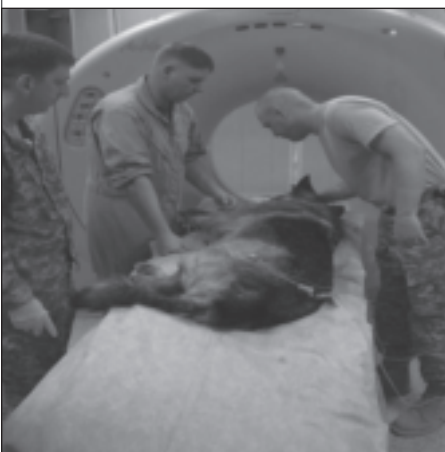
in September 2005. The terms required daily monitoring and coordination among USAMRAA, OTSG, 44th MEDCOM, the KO's representative (COR) and the contractor. The equipment was shipped from Japan to Amman, Jordan, where it was assembled by Toshiba technicians and waited for Army-escorted transportation to Iraq. Unfortunately, the deteriorating security situation caused delays, and the CT scanners were not delivered to the CSHs in Iraq until April 2006.

Once the initial procurement was complete and all CT scanners were operational, the lease period began in May 2006. The 44th MEDCOM COR monitored performance and routinely communicated with the KO to resolve problems. In January 2007, the Army requested that the CT scanner in Mosul, Iraq, be moved to Al Asad, Iraq. Once again, the COR contacted the KO, who expedited negotiations with the contractor to make this possible. The Iraqi Toshiba technicians prepared the mobile CT scanner for movement and reinstalled the equipment after its arrival at Al Asad. Recently, a CT scanner was damaged by indirect fire and became disabled, requiring emergency repair. Once again, quick coordination between the COR and KO brought timely contractor equipment inspection with parts ordered and repairs accomplished as quickly as possible.

The insurgency situation created further security concerns for the Toshiba Iraqi technicians who were routinely at risk when entering and leaving the CSHs. Increasing concerns for the Iraqi's safety resulted in the KO negotiating revised contract terms that allowed the Army to fly technicians to the CSHs during heightened security and allowing them access to Army facilities. These changes allowed the Toshiba technicians to safely and securely remain on the installation during maintenance visits to the CSHs.

Since contract awarding, three units have commanded the Iraqi MEDCOM and with each change in command, a new COR was designated. USAMRAA continues a strong working relationship with the COR and contractor, closely monitoring performance, placing the CT scanners where they're most needed, maintaining them to manufacturers' specification and calibration standard, and making the CT scanners capable of doing what they were designed to do — diagnose and treat our wounded Soldiers, Sailors, Marines and Airmen.

*David Denton is the Administrative KO for the USAMRAA Operation Center/Contract Closeout Branch.*



Here, a CT scanner is used to examine a military working dog wounded in action. Two Army X-ray technicians at the Al Asad CSH examine the dog that was wounded during an improvised explosive device attack on the vehicle driven by a U.S. Marine Patrol. The handler (center) was a passenger in the same vehicle. (USAMRAA photo by CW3 Cynthia J. Dunbar.)



## Army Contracting Integrity Panel

*Kyoung W. Lee*

Signed into law by President George W. Bush in October 2006, *Section 813, John Warner National Defense Authorization Act FY07 (Public Law 109-364)*, directs the Secretary of Defense to establish a contracting integrity panel to review contracting fraud, waste and abuse (FWA) vulnerabilities; recommend changes to regulations and policy, and submit annual reports to the Congressional Defense Committees. The Deputy Under Secretary of Defense for Acquisition, Technology and Logistics created the contracting integrity panel on Feb. 16, 2007, and convened the first meeting on June 13, 2007. To support this effort, Assistant Secretary of the Army for Acquisition, Logistics and Technology/Army Acquisition Executive Claude M. Bolton Jr. formed the Army Contracting Integrity Panel (CIP) on July 31, 2007.

Chaired by Bolton, the CIP provides an Armywide perspective on procurement operations; provides support to the DOD CIP; and examines contracting FWA vulnerabilities identified by the Government Accountability Office report, *GAO-06-838R*, dated July 7, 2006. CIP members include senior leaders of Army contracting activities. The Army's focus will mirror the following DOD panel areas:

- Sustained senior leadership
- Capable acquisition workforce
- Adequate pricing analysis
- Appropriate contracting approaches and techniques
- Sufficient contract surveillance

The CIP focuses on long-term solutions and cultural change by identifying and examining root causes of FWA. To achieve this goal, CIP looks beyond the traditional contracting community. For example, CIP supports the institutional Army's awareness that everyone is responsible to remain vigilant in deterring FWA. Also, CIP is a 5-year commitment by Army senior leadership to eliminate contracting FWA vulnerabilities. Apart from the public and media pressures, CIP is dedicated to instilling permanent checks and balances into the Army contracting integrity system.

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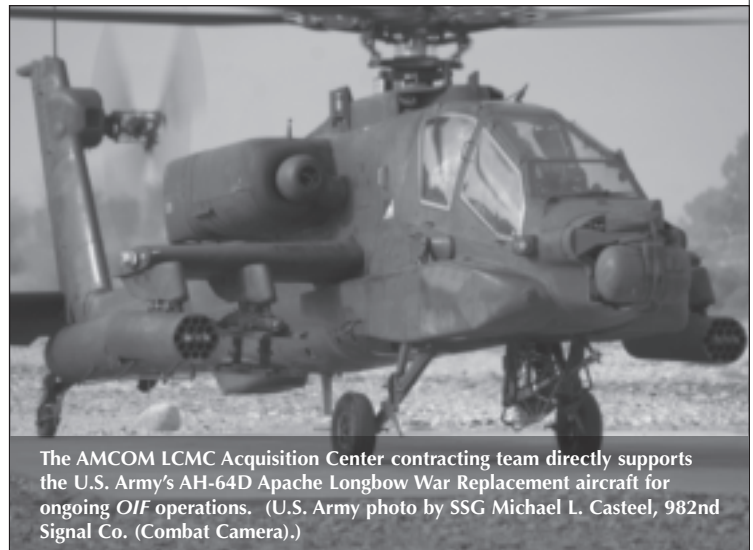
## U.S. Army Aviation and Missile Command (AMCOM) Apache Contracting Team Wins Award

*Lisa Stangle*

The AMCOM Life Cycle Management Command (LCMC) Acquisition Center contracting team was selected as the second quarter Contract Professional of the Quarter Award winner. The team was cited for exemplary accomplishments in supporting the Apache mission during the first 6 months of FY07 and for successfully executing numerous contracts valued at \$605 million for the production and upgrade of 45 AH-64D Apache Longbow War Replacement Aircraft in direct support of *Operation Iraqi Freedom (OIF)*. The team's expertise and dedication ensured that the Congressional Supplemental urgent requirements were accomplished in accordance with Department of the Army (DA) expectations. Further, individual undefinitized contract actions (UCAs) were issued for additional aircraft enhancements and definitized in less than 150 days, well below the UCA average definitization lead times on Boeing activities.

This team also completed the follow-on remanufacture program for a joint U.S. government (USG)/foreign military sales (FMS)-United Arab Emirates (UAE) multiple-year firm-fixed-price contract valued at more than \$1.1 billion. The critical contract included 96 aircraft for the USG and 30 aircraft for the UAE, a first such joint endeavor for the Apache Program Manager (PM). The team worked as a joint integrated process team ensuring timely execution to fill the production gap until the Apache Block III program development is complete.

This team's stamina attests to their exceptional commitment to the Apache mission. Both programs were top priority to



The AMCOM LCMC Acquisition Center contracting team directly supports the U.S. Army's AH-64D Apache Longbow War Replacement aircraft for ongoing OIF operations. (U.S. Army photo by SSG Michael L. Casteel, 982nd Signal Co. (Combat Camera).)

the Apache PM, DA and FMS communities, placing a great amount of pressure on the team. However, they rose to meet the challenges and demands, quickly executing these programs in an outstanding manner.

*Lisa Stangle is the Director, AMCOM LCMC Acquisition Center at Redstone Arsenal, AL. She can be contacted at (256) 313-4008/DSN 897-4008 or at [lisa.stangle@us.army.mil](mailto:lisa.stangle@us.army.mil).*

## Centralized Procurement Automated Data and Document System (PADDS) Clause Management Launched

*Susan L. LeGros*

In December 2005, the U.S. Army Materiel Command (AMC) formed a team to centralize PADDS clause management. PADDS is a contract writing system used by AMC at six Major Subordinate Command/Life Cycle Management Commands (MSC/LCMCs). A part of contract writing is selecting standard provisions and clauses that apply to the contract type and dollar value. Before centralization, each AMC MSC/LCMC managed its PADDS contractual clauses and provisions database and stand-alone clause usage guide. This duplicated work and created numerous ways of conducting solicitations and contract structuring within AMC.

Launched on June 2, 2007, the U.S. Army Tank-automotive and Armaments Command (TACOM) LCMC-Rock Island (RI) started managing and maintaining contract clauses and the clause usage guide for all AMC MSC/LCMC PADDS. It was an intricate and complex task to migrate six separate maintenance functions into one central database. The team worked extensively on several issues to make this initiative a

reality. Their hard work, innovation and accomplishments have brought a more comprehensive improved PADDS and clause guide.

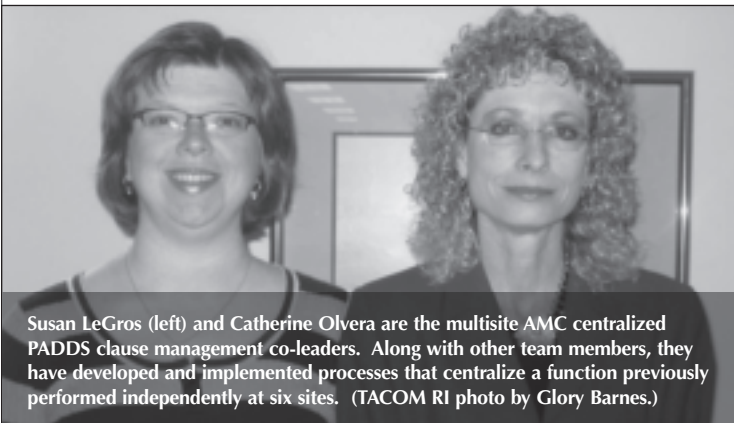
The centralization initiative has other benefits in addition to streamlining maintenance functions. It improves business processes by providing timely and consistent information, and supports a unified AMC business practice with all sites using the same database/strategy in preparing their contractual documents.

### Putting PADDS Into Practice

The team developed the required centralization automation by designing a seamless transition to the new system with no impact on current PADDS contractual documents. Additionally, they applied a multiple solutions approach where possible and practical. The team's objective was to come up with solutions that did not eliminate a site's previous practice. Using multiple solutions affords maximum flexibility and choice to contracting officers (KOs).

A major initiative innovation is clause version control. Previously, PADDS stored a clause only once — when it was changed, deleted, overwritten or removed. As such, documents were not saved for future reference. PADDS retrieved the stored clause document (if not deleted) every time a document "called" for it. This created a review burden. After receiving offers and making award determinations, contract specialists and KOs discovered that text and date clauses in the resulting contract could be different from the actual solicitation. To solve this problem, each clause version is now stored and tracked to the applicable contractual documents. The team took this capability one step further by including an alert function that signals contract specialists when a solicitation clause is updated or deleted.

Another PADDS improvement is the central clause guide. This revolutionary feature lets contract specialists use the guide to select clauses, and with the click of a mouse, their selections are added to the contract with no manual data entry required. Also, it can be used as an independent tool to research or review clauses. Process improvement and workload efficiencies are always good indicators of project success and benefits. With centralized PADDS, AMC has gained process improvements and workload efficiencies, as well as achieved a more intangible result — establishment of an AMC-wide network of contacts. Through this network, the AMC contracting community is sharing ideas and solutions instead of operating independently and duplicating efforts. The centralization project has served as a catalyst for AMC knowledge sharing and



Susan LeGros (left) and Catherine Olvera are the multisite AMC centralized PADDS clause management co-leaders. Along with other team members, they have developed and implemented processes that centralize a function previously performed independently at six sites. (TACOM RI photo by Glory Barnes.)



partnering and has opened the door to further collaboration and standardization opportunities.

For more information on PADDs, contact Mary-Louise McCarroll at (586) 574-7628/DSN 786-7628 or at [marylouise.mccarroll@us.army.mil](mailto:marylouise.mccarroll@us.army.mil).

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## DAR Council Corner

*Tom Watchko*

Below are recent *Defense Federal Acquisition Regulation Supplement (DFARS)* cases that were published in the Federal Register as interim or final rules.

***Security Guard Functions — DFARS Case 2006-D050***  
Interim rule with request for comments. Effective Sept. 6, 2007. This *DFARS* case implements *Section 333, National Defense Authorization Act (NDAA) for FY07 (Public Law 109-364)*. This section extends, through Sept. 30, 2009, the period during which contractor performance of security guard functions at military installations or facilities is authorized to fulfill additional requirements resulting from the terrorist attacks on the United States on Sept. 11, 2001. There are specified limits to the number of personnel the contractor can employ, by fiscal year, for contracts awarded under this authority.

***Limitation on Contracts for the Acquisition of Certain Services — DFARS Case 2006-D054***

Final rule effective Sept. 6, 2007. This *DFARS* case implements *Section 832, NDAA FY07 (Public Law 109-364)*. This section prohibits DOD from entering into a service contract to acquire a military flight simulator, unless the

Secretary of Defense determines that a waiver is necessary for national security and provides an economic analysis to the congressional defense committees at least 30 days before the waiver takes effect.

***Technical Data Rights — DFARS Case 2006-D055***

Interim Rule with request for comments. Effective Sept. 6, 2007. This *DFARS* case implements *Section 802(a), NDAA FY07 (Public Law 109-364)*. This section requires that DOD program managers for major weapon systems, and subsystems of major weapon systems, assess the long-term technical data and establish acquisition strategies that provide technical data rights to sustain the major systems and subsystems over their life cycle. This interim *DFARS* rule applies to both technical data and computer software.

***Carriage Vessel Overhaul, Repair and Maintenance — DFARS Case 2007-D001***

Interim rule with request for comments. Effective Aug. 28, 2007. This *DFARS* case implements *Section 1017, NDAA FY07 (Public Law 109-364)*. This section requires DOD to establish an evaluation criterion for obtaining cargo carriage by vessel that considers the offeror's overhaul, repair and maintenance on covered vessels performed in shipyards in the United States or Guam.

*Tom Watchko works for the Office of the Deputy Assistant Secretary of the Army for Policy and Procurement (DASA(P&P)) and is a DAR Council member. He can be contacted at (703) 604-7033/DSN 664-7033 or at [thomas.watchko@us.army.mil](mailto:thomas.watchko@us.army.mil).*

***Editor's Note: This column's former author, Barbara Binney, has left the Office of the DASA(P&P) for another government position. For the past several years, Binney has contributed to Army AL&T Magazine and served the DAR Council as the Army's procurement policy representative. We wish her the very best in her new job.***



# Ask an Acquisition Career Manager (ACM)

Several U.S. Army Acquisition Support Center (USAASC) Customer Service Offices have automated phone response systems with 24/7 response capability to careerists seeking guidance on Acquisition Career Record Brief (ACRB) edits, certification and Army Acquisition Corps application processes, as well as procedures for Defense Acquisition University (DAU) training applications. USAASC is in the process of expanding this capability throughout the Acquisition, Logistics and Technology Workforce. Additionally, we have taken the automated response system one step further by developing a Web-enabled response system entitled *Ask An ACM*, which will also provide 24/7 response capability via the USAASC Web site. To locate an ACM in your area, go to <http://asc.army.mil/organization/regional/default.cfm> and click on your home state. Before calling an ACM directly, please review the below Frequently Asked Questions (FAQs), which are available online at <http://asc.army.mil/faqs/ask/default.cfm>.

The screenshot displays the 'Ask An ACM' web page. At the top, it says 'FAQs' and 'Ask An ACM'. Below this is a disclaimer: 'Please review FAQs prior to contacting an ACM telephonically.' There are three main navigation buttons: 'TOP TEN (10) FAQs', 'SEE ALL FAQs', and 'FAQs BY SUBJECT'. The 'TOP TEN (10) FAQs' section lists ten common questions, such as 'If any information on my ACRB is incomplete or incorrect, how do I correct it?' and 'How do I get started with my automated acquisition IDP (Individual Development Plan)?'. The 'SEE ALL FAQs' button leads to 'All ACM FAQs' and 'Main FAQs Page'. The 'FAQs BY SUBJECT' button leads to a categorized list of topics including 'General', 'ACRB - Acquisition Career Record Brief', 'Automated Career Development Tools', 'Certification Process', 'Continuous Learning Posts', 'DAU - Defense Acquisition University', 'IDP - Individual Development Plan', 'Military Information', 'SRPE - Service Rate Potential Evaluation', and 'Supervision Information'. At the bottom, there are two links: 'View All ACM FAQs' and 'View All ACM FAQs'.



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- **The Joint Munitions and Lethality Life Cycle Management Command (JM&L LCMC) Provides the Best Capability to U.S. Warfighters**
- **Making the Best Quality Ammunition for the Warfighter — An Interview With the U.S. Army Joint Munitions Command's (JMC's) BG James E. Rogers**
- **Single Manager for Conventional Ammunition (SMCA) and Joint Ordnance Commanders Group Meet Warfighter Needs**
- **ARDEC — The Army's Lethality and Armaments Systems Provider for Today's and Tomorrow's Warfighters**

