

ARMY AL&T

May - June 2004



Supporting an Army at War

ASC

ACQUISITION SUPPORT CENTER

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From the Army Acquisition Executive Supporting an Army at War

Supporting an Army at war is critical both tactically and strategically. From a tactical standpoint, we are working with our sister services and industry to ensure that our Soldiers have the weapon systems and equipment they need to successfully carry out their duties. Our primary focus is on reducing risk to our Soldiers so they can accomplish their mission safely and effectively and return home.

As we wage the global war on terror, we continue to improve our acquisition and fielding processes. In 2002, we implemented the Rapid Fielding Initiative (RFI) to ensure that all units — Active and Reserve — deploy to Iraq and Afghanistan with the latest available equipment. Program Executive Office (PEO) Soldier, under the leadership of BG James R. Moran, is responsible for developing RFI to meet the needs of the individual Soldier rapidly in the categories of force protection/mobility, lethality, Soldier mission-essential equipment and individual weapons/optics. In coordination with field commanders and Soldiers, RFI now provides Soldiers with more than 40 mission-essential equipment and clothing items, including the Advanced Combat Helmet and accessories, knee and elbow pads, close-combat optics, hydration systems and much more. As of May 2004, 5,000 RFI equipment sets are air-shipped each week for in-theater issue to units in Iraq. RFI will have equipped more than 120,000 Soldiers by the end of this fiscal year. In addition, we are accelerating fielding of select future capabilities, including thermal weapon sights, enhanced night vision goggles and the Future Combat Rifle. Clearly, PEO Soldier amplifies the message that what we do impacts our Soldiers, their safety and their effectiveness every day.

The Army also instituted the Rapid Equipping Force (REF), which is led by COL Bruce Jette. REF teams work directly with operational commanders in *Operations Iraqi Freedom (OIF)* and *Enduring Freedom (OEF)* to find promising technology solutions to identified operational requirements. These solutions may be off-the-shelf or near-term developmental items that can be made available quickly. We are acting aggressively to protect the force with items as sophisticated as the Rapid Aerostat Initial Deployment, a 360-degree surveillance device suspended from an Aerostat balloon or atop a tower, to something as inexpensive as shims that enable Soldiers searching for weapons in Iraq to nondestructively open padlocks. And, there are many more items, including the Well-CAM, a remote video system that enables Soldiers to search for weapons in wells and other inaccessible areas and, of course, the PackBot, an unmanned ground vehicle used to clear caves, bunkers and compounds so Soldiers are not put in harm's way unnecessarily. And when, from time to time, a PackBot is destroyed, we know a Soldier's life has been saved. The REF also works hand-in-hand with the Improvised Explosive Device (IED) Task Force to mitigate the effects of IEDs. Together, their teams in *OIF* and *OEF* are conducting analysis and training Soldiers in counter-IED tactics, techniques and procedures.

“To all the men and women in our military — every Sailor, every Soldier, every Airman, every Coast Guardsman, every Marine — I say this: your mission is defined. Your objectives are clear. Your goal is just. You have my full confidence, and you will have every tool you need to carry out your duty. ... The battle is now joined on many fronts. We will not waiver, we will not tire, we will not falter, and we will not fail. Peace and freedom will prevail.”

President George W. Bush
Oct. 7, 2001



Afghanistan and Kuwait. This is a great example of the responsiveness of America's defense industrial base. Just 2 years ago, one manufacturer was producing 2,000 SAPI plates monthly. We now have 7 suppliers producing 25,000 sets a month.

Other significant force protection programs include the up-armored Humvees. The requirement has steadily increased from 235 in August 2003 to more than 4,400 by October 2004. Production rates are now approaching 220 per month and climbing to 300 vehicles by July, with a capability of reaching 450 vehicles a month.

Complementing this effort is the Army's program to add ballistic protection to light vehicles and selected aviation platforms. We are well on our way to adding ballistic protection to more than 11,000 vehicles and aircraft. To ensure that these kits deliver the expected protection and do not create a separate danger to Soldiers by overloading vehicles or creating shrapnel, the Army has extensively tested these kits against a variety of expected threats. More than 3,000 armor kits have already been installed, mostly on Humvees, with additional kits being delivered to meet the current requirement as quickly as possible. In addition, we are installing reactive armor tile sets to our roughly 600 Bradley Fighting Vehicles in *OIF*.

As we meet our ongoing requirements, we are also looking to the future to support an Army at war from a strategic standpoint. We are taking the lessons we're learning in *OIF* and *OEF* and planning to meet future requirements better and faster. It is clear that when we are at war, we must collapse the timeline — from months to weeks to days to hours — that it takes to get weapon systems and equipment to our Soldiers. It is very important that we plan now for future conflict because, as any military historian will tell you, it is inevitable that we will end up in another war. And, it is now that we must take the necessary steps to ensure that in the next war our industrial partners will be able to surge again very quickly from either cold production or no production at all. Achieving this will not be easy; but, achieve it we must. For I believe this will be a key factor in our maintaining the most capable, most powerful and most respected Army the world has ever known. While supporting an Army at war, we continue to look to the future.

Thank all of you for making our Army what it is and what it will be.

Claude M. Bolton Jr.
Army Acquisition Executive



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May - June 2004

ACQUISITION, LOGISTICS & TECHNOLOGY

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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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ARDEC's Fast-Track Armaments Provide Full-Spectrum Battlefield Dominance

Michael P. Devine and Anthony J. Sebasto

At the U.S. Army's Armament Research, Development and Engineering Center (ARDEC) at Picatinny, NJ, engineers and scientists are providing America's warfighters solutions to today's battlefield challenges faster than ever before. In an environment that once measured progress by decades, the laboratories here are creating new metrics that are based on speed, flexibility, value and customization.

Often called the home of Army lethality, Picatinny's ARDEC and its program executive office (PEO) and project management office (PMO) partners have provided more than 90 percent of the Army's weapons and munitions systems for well over a century. Current support to Iraq and Afghanistan represents a new chapter in this long tradition of Soldier support.

ARDEC's rich heritage and strong knowledge base acts as a springboard for innovative armaments engineering practices and technologies. U.S. forces are benefiting from the full spectrum of

Picatinny's armaments expertise in a number of ways. This article will highlight some of the armament systems and advanced technologies supporting the Joint warfighting community today.

Urgent Fieldings

ARDEC understands the immediacy of the Soldier's needs. During a 12-month period, the center and its partners responded to urgent Army and Joint service requests by fielding 17 specialized weapons and ammunition systems in record time. Among these are:

- *Gunfire Detection System (GDS)*. The GDS quickly detects and locates the origin of small-arms fire, allowing troops to rapidly return fire, enhancing their survivability. Twenty systems — 10 fixed and 10 vehicle-mounted — were fielded within 90 days of receiving a requirement.
- *M211/212 Advanced Aircraft Infrared Countermeasure Flares*. The M211/212 flares counter all known surface-to-air missile (SAM) threats by serving as decoys that confuse the SAM's infrared guidance systems. Army aviator CW3 Al Mack, 160th Special Operations Aviation Regiment

summed up the M211/212's effectiveness — "Our MH-47E fleet had 16 confirmed SAM firings during the first 6 months of the Afghanistan conflict. I had two SAMS fired during a daylight flight with then Commander, U.S. Central Command (CENTCOM) GEN Tommy Franks onboard. The flares dispensed automatically. I think I am sitting here writing because our aircraft survivability equipment (ASE) worked," Mack explained.

- *XM1060 40mm Thermobaric Grenade.* This 40mm device, developed and fielded by Picatinny within a 4-month span, is the very first small-arms thermobaric device released to the war theater. It's applauded as a critical tool for military operations in urban terrain and close-quarters cave applications.
- *Advanced M26 Taser Stun Pistol.* Adapted for Army use from a commercial design, the M26 nonlethal weapon is used for crowd control and detainee management. It provides the soldier with a less-than-lethal option appropriate to control personnel situations.

On-The-Ground Support

ARDEC engineers are found wherever U.S. troops are living and

fighting. They serve as the Army's "911" lifeline for lethality assistance and troubleshooting. This always-open line of communication helps engineers assess the effectiveness of existing and newly fielded weapon systems, as well as identify warfighter needs. Recently, CENTCOM and the 82nd Airborne Division at Fort Bragg, NC, reported unacceptable readiness and performance of various small-arms weapons. Picatinny engineers were deployed and on the ground within 72 hours performing weapon inspections, training the troops on scheduled maintenance procedures and developing workable field inspection and repair criteria. These reports prompted a Picatinny-led mission in July 2003

A B Company, 2nd Battalion, 504th Parachute Infantry Regiment (PIR) Soldier, his M4 Carbine at the ready, watches for enemy forces in the Baghran Valley during *Operation Mountain Viper*. B Company's mission was to prevent the reemergence of terrorist activities in Afghanistan. The M4 Carbine performed remarkably well in the rough, mountainous terrain. U.S. Army photo by SPC Preston E. Cheeks, Kandahar Army Airfield.



of representatives from Fort Benning, GA, ARDEC and PM Soldier

Picatinny's ARDEC and its PEO and PMO partners have provided more than 90 percent of the Army's weapons and munitions systems for well over a century. Current support to Iraq and Afghanistan represents a new chapter in this long tradition of Soldier support.

Weapons to evaluate reliability and performance of individual soldier weapon and ammunition systems under combat conditions. The team visited Tikrit, Mosul, Irbil and Baghdad as well as sites in Afghanistan. It interviewed 1,000 soldiers and obtained valuable feedback on weapon performance and field problems.

In a similar scenario, the 101st Airborne Division reported that its M139 Volcano mine-delivery systems were inoperative for an upcoming deployment. ARDEC engineers immediately deployed to Fort Campbell, KY, to

troubleshoot and repair the systems and conduct a New Equipment Training refresher course. The ARDEC team successfully returned two of three systems to full operational readiness.

While on a fact-finding mission in Iraq and Afghanistan, the Picatinny Explosive Ordnance Disposal unit collected vital information about enemy ordnance and explosive devices. The unit developed protocols and procedure guides that enabled U.S. Joint Forces personnel to download information on how to render safe foreign ground combat enemy weapons for disarming and disposing of captured and abandoned tanks, missiles and attack helicopters.

Most recently, Picatinny engineering teams provided on-site support to the new Stryker Brigade Combat Team (BCT). The teams assisted the BCT

Soldiers assigned to C Company, 2nd Battalion, 504th PIR, 82nd Airborne Division, are shown providing perimeter security for a Chinook helicopter while conducting a Quick Reaction Force mission at Bagram Airfield, Afghanistan. The Soldier in the foreground is armed with the M4 Carbine equipped with an advanced combat optical gunsight. U.S. Army photo by SFC Milton H. Robinson, 55th Signal Company (Combat Camera).



PMO and its industrial contractors by integrating and testing various Picatinny-developed weapon systems for Stryker armored vehicles headed to Iraq. A Picatinny team also trained soldiers from Fort Lewis, WA, on a newly developed logistics software program for efficient and safer configuration of munitions for loading onto shipping platforms.

Ensuring America's Armaments Inventory Remains Strong

The majority of weapons systems and ammo used by the Army are drawn from standing inventories. These items were designed by Picatinny engineers and many industry partners. Several of these systems deserve highlighting because of their superb performance during in-theater operations in both Iraq and Afghanistan. The Bunker Defeat Munition has destroyed hardened emplacements, masonry walls and light armored vehicles. "This thing is a real kick in the pants," said SSG Lonnie Schultz, Infantry Squad Leader, 31st Infantry Regiment, 10th Mountain Division, when describing this lightweight

83mm shoulder-launched weapon. Likewise, a 3rd Infantry Division after action report credited the Search and Destroy Armor (SADARM) smart-guided 155mm artillery munition because it exceeded all battlefield expectations and it became the preferred precision munition for the field artillery battalions and their supported maneuver commanders.

"The SADARM was very effective against tanks/light armored vehicles, with three rounds killing at least one tank. It never missed," explained LTC Doug Harding, a former 3d BCT Fire Support Coordinator/1st Battalion, 10th Field Artillery Brigade commander. Of 121 SADARMS fired during *Operation Iraqi Freedom*, 48 pieces of enemy equipment were completely destroyed. SADARM defeated all known armor and artillery targets on the battlefield.

Another success story, the M109A6 Paladin 155mm self-propelled artillery howitzer — the most technologically advanced cannon in the Army inventory

Another success story, the M109A6 Paladin 155mm self-propelled artillery howitzer — the most technologically advanced cannon in the Army inventory — featured a highly mobile, highly lethal shoot-and-scoot capability.

— featured a highly mobile, highly lethal shoot-and-scoot capability. Fielded after *Operation Desert Storm*, it fires a first round 30 seconds after stopping and delivers devastating firepower at ranges up to 30 kilometers. This capability, realized by its highly automated navigation and fire control system, got rave reviews from howitzer crews and commanders alike during the "dash to Baghdad."

Soldiers have high praise for small-arms superiority that stems from weapons such as the M4 Carbine, M249 Squad Automatic

Weapon (SAW) and M240 Machine gun. In fact, Soldiers have hailed the M240 Machine gun as one of the best

weapons on the battlefield. “Three different soldiers firing the same gun outperformed a group of 30 gunners using other equipment,” said MSG Michael Valdez, 82nd Airborne Division. The new, urgently fielded XM107 Barrett .50-caliber sniper rifle was recognized as a key element in urban fighting.

Developing Advanced Weapon Systems

U.S. military capability must keep pace with the changing world to ensure supremacy throughout the entire spectrum of conflict. Looking ahead, ARDEC engineers are working on a range of advanced warfighting and counterterrorism systems to support Army transformation. One such capability — the Armed Talon robot — is a small, highly maneuverable remote-controlled tracked vehicle fitted with lethal and nonlethal armaments and is currently undergoing tests at Picatinny. Talon’s battlefield introduction will provide a new dimension to warfighting capability and enhance soldier lethality and survivability.

Leading industry combat vehicle developers like General Dynamics and United Defense have entered into cooperative research and development (R&D) agreements with Picatinny’s ARDEC to support mounted combat systems, non-line-of-sight cannons (NLOS-C) and NLOS mortar variants as well as other cannon, fire control and munition technologies.



SPC Joshua Mambre, A Company, 2nd Battalion, 22nd Infantry Brigade, cleans his M249 SAW following a long day of operations with the 10th Mountain Division (Light Infantry) searching for Taliban and weapon caches in the Afghanistan province of Daychopan. U.S. Army photo by SSG Kyle Davis, 55th Signal Company (Combat Camera), Kandahar Army Airfield.

ARDEC, working in partnership with the Army Research Laboratory and U.S. Navy, is expanding R&D efforts on electromagnetic gun technology and novel, pulsed-power gun concepts that eliminate the need for today’s energetic propellants. Development activities are maturing the technology and generating notional system designs ranging from small arms to large caliber direct- and indirect-fire systems that provide either very high velocity defeat of advanced targets or long-range projectiles, depending on the application.

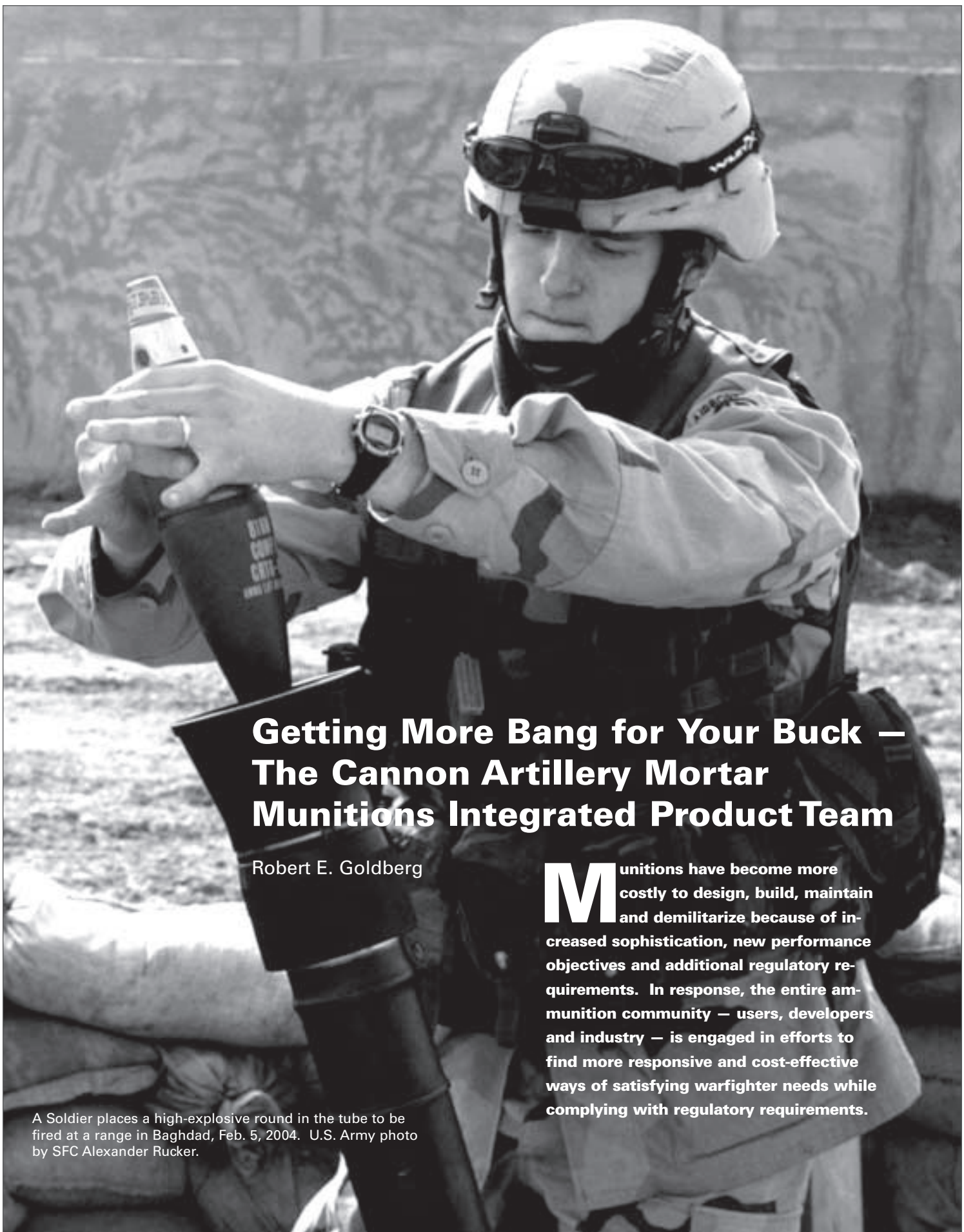
ARDEC’s development portfolio also supports exploration into “leap-ahead” and disruptive technologies such as nanotechnology and direct energy-based, scalable effects weapon systems. Ultimately, ARDEC engineers are focused on enhancing individual and crew-served weapons performance and expanding future warfighter capabilities regardless of where the battlefield takes them.

Warfighting will continue to depend on the combatant’s ability to address the full spectrum of conflict by delivering desired effects on target and reducing threat capabilities. Picatinny’s mission is to research, develop and integrate advanced armament technologies into weapon systems that meet or exceed warfighter needs. No other organization in the

world provides the overall world-class portfolio of armament systems and advanced technologies that support a broad range of Joint service warfighters today and tomorrow.

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Getting More Bang for Your Buck — The Cannon Artillery Mortar Munitions Integrated Product Team

Robert E. Goldberg

Munitions have become more costly to design, build, maintain and demilitarize because of increased sophistication, new performance objectives and additional regulatory requirements. In response, the entire ammunition community — users, developers and industry — is engaged in efforts to find more responsive and cost-effective ways of satisfying warfighter needs while complying with regulatory requirements.

A Soldier places a high-explosive round in the tube to be fired at a range in Baghdad, Feb. 5, 2004. U.S. Army photo by SFC Alexander Rucker.

The coordination of life-cycle management, modernization and cost-reduction efforts for artillery and mortar munitions is accomplished through the Cannon Artillery Mortar Munitions (CAMM) Integrated Product Team (IPT). The CAMM IPT is managed by Project Manager Combat Ammunition Systems (PM CAS). PM CAS falls under the Program Executive Office for Ammunition (PEO AMMO) structure. In January 2002, PEO AMMO assumed command of research, development, production, demilitarization and life-cycle management for ammunition. As the single manager for conventional ammunition, PEO AMMO also manages DOD's organic and industrial munitions production base. PEO AMMO objectives include:

- Unifying and integrating ammunition management by consolidating responsibility and resource management within the PEO.
- Developing a unified munitions acquisition strategy.
- Developing an industrial base strategy (organic and commercial).

Conventional Ammo

As the Army's one-stop shop for artillery and mortar munitions life-cycle management, PM CAS manages more than 60 munitions and armament products from development through production and into sustainment. These products include shell bodies, fuzes, precision and smart munitions, mortar weapons, fire-control systems and propellants and explosives. PM CAS manages the conventional artillery and mortar inventory as well as new items under development.

The coordination of life-cycle management, modernization and cost-reduction efforts for artillery and mortar munitions is accomplished through the CAMM IPT.

Most conventional ammunition inventory items were designed 20 years ago and have several advantages — they are in the inventory, can be manufactured by our existing industrial base and cost less to produce than new, more sophisticated types of ammunition. New munitions under development use the latest precision technology. This means they are more accurate and less likely to cause collateral damage. In addition to incorporating insensitive munitions (IM) features to better protect our military personnel, they are also designed to be more environmentally friendly and easier to demilitarize (demil).

For example, the M795 155mm High Explosive Artillery and M934 120mm High Explosive Mortar rounds are conventional artillery and mortar rounds found in the current munitions inventory. Both rounds have lower associated production costs than the new wave of ammunition,

are readily available and can be mass-produced by the existing industrial base. However, the challenge for artillerymen when these rounds are fired is that they are not as accurate for precision strikes during contingency operations. Additionally, collateral damage cannot be controlled and they present significant maintenance and demil issues for logisticians. Current operational requirements dictate that IM features be incorporated into these munitions' redesign.

Future Capability Ammo

Future capability artillery and mortar ammunition like the XM982 155mm Excalibur Extended Range Precision Guided Artillery Projectile and XM935 120mm Precision Guided Mortar Munition have been designed for increased accuracy to reduce potential collateral damage, have IM features incorporated, are environmentally friendly and can be easily demilitarized. However, these new rounds will have a higher per-unit production cost and will require more sophisticated manufacturing processes that will lead to several industrial base producibility issues.



Artillerymen fire an M109A6 Howitzer during a live-fire exercise, sending high-explosive rounds to a range 9.5 kilometers away. U.S. Air Force photo by TSGT John Houghton.

CAMM IPT

CAMM IPT will provide integrated life-cycle management and strategic and operational planning in concert with all involved stakeholders for PEO AMMO, thereby supporting the Army's transformation by providing the most effective ammunition available worldwide. CAMM IPT, a multi-service, multifunctional group, will address long- and short-term issues and requirements while engaging in an integrated approach to achieving the following cannon artillery and mortar munitions life-cycle objectives:

- Supply better products to our Soldiers.
- Improve logistics and sustainability.
- Reduce total ownership costs.
- Identify and implement programs that support current and future weapon systems.
- Provide interservice coordination.

Different organizations have expertise in different areas of the life cycle. CAMM IPT will bring these parties to the table to discuss the total life cycle and to capture best business practices. The IPT brings all the stakeholders and industry together to address issues and explore methodologies that can benefit government and industry alike. The IPT speaks with one voice for the artillery and mortar munitions community to HQDA and DOD leaders.

Before the CAMM IPT was formed, responsibility for managing life-cycle activities was segmented. As issues arose, they were addressed item-by-item in a "stovepipe" and highly sequentialized manner. Under CAMM IPT, integrated efforts will eliminate time-consuming constraints.

The CAMM IPT includes all cannon artillery and mortar munition stakeholders, who meet quarterly to identify and

work on life-cycle issues by converting ideas into actions. Emphasis is placed on reducing total ownership costs and producing both tangible and intangible benefits. The IPT's activities include:

- Networking.
- Addressing mortar and artillery ammunition challenges and opportunities brought by stakeholders and industry.
- Presenting informative briefings to government and industry representatives.
- Planning and coordinating.



PFC Jonathan Morgan, Headquarters Company, 2nd Battalion, 22nd Infantry Regiment, 10th Mountain Division (Light Infantry), uses the sights to align his mortar as part of a blocking position on a return trip from Daychopan, Afghanistan, December 2003, during *Operation Enduring Freedom*. U.S. Army photo by SGT Horace Murray, 982nd Signal Company.

The CAMM IPT artillery and mortar Tiger Teams function as its working groups. The Tiger Teams comprise core members (government) only and are responsible for working the action items and developing strategic plans. Tiger Teams have biweekly teleconferences and meet face-to-face when required.

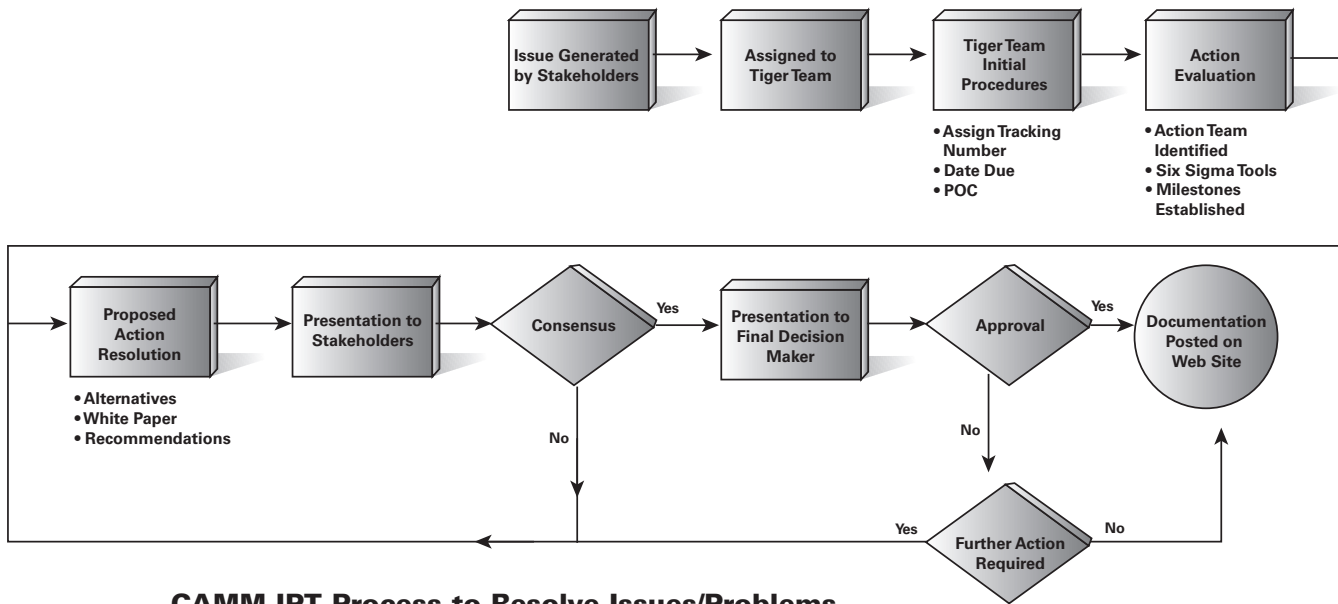
The CAMM IPT Tiger Teams are proactive and continuously oriented toward developing action plans and implementing solutions to issues. By setting priorities among the myriad potential action items, the IPT identifies yearly "thrust areas" that direct and focus the team's efforts. For each thrust area, a detailed milestone plan for accomplishment is developed. For 2003, the CAMM IPT identified the following action items:

- Obtain additional maintenance funding.
- Revitalize the aging stockpile.
- Reduce life-cycle costs.
- Find alternative IM solutions.

CAMM IPT's Web site offers a convenient means of informing all members of new developments and serves as a repository for CAMM IPT-generated documents and briefings. The Web site is located at <http://www.cannonartillery.org>. There are two sections: government only, and government and industry. Both are password-protected.

The CAMM IPT takes a streamlined, straightforward approach to resolving issues. The figure on the next page summarizes this approach.

Since its inception in 1998, the CAMM IPT has generated 322 action items for resolution by the IPT or its Tiger Teams — 292 action items have been completed and 30 are ongoing. One such completed action item was the implementation of an Obturator Retrofit Program for the 155mm M549 artillery projectile. The obturator seal prevents the escape of propellant gases around a gun's breechblock. The original obturator for the 155mm M549 projectile deteriorated over time and was not compatible with new gun systems. As a result of this program, stored M549 projectiles are being



CAMM IPT Process to Resolve Issues/Problems

retrofitted with newly designed obturators that are compatible with new gun systems and also extend tube life and improve munition precision.

Another high-priority action item was securing funding to develop an IM modification for 155mm M795/M107 high-explosive projectiles. The IM program is designed to make U.S. Army ammunition safer from external threats while continuing to meet current required performance parameters.

Further, the CAMM IPT completed an engineering study that recommended replacing the existing 105mm M67 propelling charge rayon bag with an improved acrylic bag.

The rayon bags were deteriorating in storage in as few as 3 years. The new acrylic material bags are expected to last a minimum of 35 years and will provide permanent solutions for new

M67 propelling charges, allowing the Army to sustain training with the existing stockpile.

The CAMM IPT Tiger Teams are proactive and continuously oriented toward developing action plans and implementing solutions to issues. By setting priorities among the myriad potential action items, the IPT identifies yearly “thrust areas” that direct and focus the team’s efforts.

Another CAMM IPT accomplishment during the past year was a Life Cycle Cost Reduction/Value Engineering (VE) Session held for development community representatives, program/project managers and select groups involved in manufacturing, maintenance, item management, stockpile surveillance and demil. The session featured a VE training update on cost-reduction techniques and provided a forum for discussing life-cycle issues among the functional area representatives. Time was allotted for brainstorming to develop individual cost-reduction proposals and item project cost-reduction plans. The effort has already begun to pay off. For the 155mm M795 projectile, savings of \$4.6 million have been realized with


another \$720,000 per year in cost reductions anticipated. For the 155mm XM982 Excalibur, steps taken to incorporate lean design may reduce the projectile cost by as much as 30 percent. The ideas generated in the session will be used to develop cost-reduction proposals for the 120mm precision-guided mortar munition design and 155mm M864 projectile recapitalization effort.

CAMM IPT accomplishments to date demonstrate that this type of integrated approach provides an effective way of meeting the challenges posed by a rapidly changing defense environment.

ROBERT E. GOLDBERG is an environmental engineer in the Life Cycle Management Office, PM CAS, and chairs the CAMM IPT. His responsibilities include total life cycle cost-reduction techniques and industrial base analysis life cycle environmental assessments. He earned a B.S. in chemical engineering from Cooper Union for the Advancement of Science and Art, an M.S. in chemical engineering from New York University and an M.B.A. from the Florida Institute of Technology.

The Use of Technology Readiness Levels for Software Development

Dr. John Niemela and Dr. Matthew Fisher



The rapid growth of technology is clearly evident in our daily lives, *and* its use is increasing in every aspect of acquisition and development within DOD. Technology enables the Acquisition, Logistics and Technology (AL&T) Workforce to create superior communication and weapon systems that provide warfighters with battle dominance. So strong is the appeal to reap the benefits of technology that it is being inserted before the risk associated with using it has been thoroughly tested and certified. This concern was brought out in a General Accounting Office (GAO) report titled *Better Management of Technology Development Can Improve Weapon System Outcomes*. The report explains how commercial “best practices” ensure that new technology is sufficiently mature to eliminate the possibility of inordinate risk on a product acquisition or development. This article outlines the process developed by the Army to integrate these best practices into the software development process.



Connectivity versus risk? So strong is the appeal to reap the benefits of technology that it is being inserted before the risk associated with using it has been thoroughly tested and certified.

TRLs in place at the time were difficult to apply to technology that was primarily based on software — they were quite platform-centric.

To address this difficulty, the Communications-Electronics Command's (CECOM's) Research, Development and Engineering Center (CERDEC) was requested by HQDA to conduct an intensive investigation and propose a solution that would allow TRL concept applications to systems employing software. A team was assembled, in virtual space, with representation from the Software Engineering Institute (SEI), Army Research Laboratory, Simulation and Training Command and CECOM Software Engineering Center. The result was a set of TRLs for software — compatible with those for hardware — that were completed in time to be applied to the extensive analyses preceding the Future Combat Systems Milestone B Decision in May 2003.

The GAO report cited two conditions that were absolutely critical to reducing resource and schedule risk attendant with the use of new technology. First, a science and technology organization is where the technology management should be located. It provides the environment for maturing technologies as opposed to an organization that concentrates on the cost, schedule and performance aspects of producing products. Second, technology and program managers must be supported with the discipline, processes, readily available information, readiness standards and authority to ensure technology is ready for integration into the system acquisition or development.

The GAO report recommended that DOD adopt methods to assess the maturity and readiness of technology prior to commitment to system acquisition and development. One method recommended to DOD was using Technology Readiness Levels (TRLs) as a means of managing new technologies when incorporating them into system acquisition and development. The Army responded to this imperative by informing its research and development (R&D) centers

that the TRLs would serve as yardsticks for assessing technology maturity and potential use in system development and demonstrations. The general notion of TRLs in the context of the technology transition process is shown in the figure on Page 12. As noted in this figure, the Army Research, Development and Engineering Center's (RDEC's) critical mission is to manage technologies from applied research to facilitate technology transition to the systems development and acquisition community at a minimum TRL of 6.

TRLs for Software

Coincidentally, with the emphasis on lessening the risk in technology transition, revolutionary technical and operational concepts were rapidly emerging — to include network-centric warfare — that we are heavily dependent on computer software. The

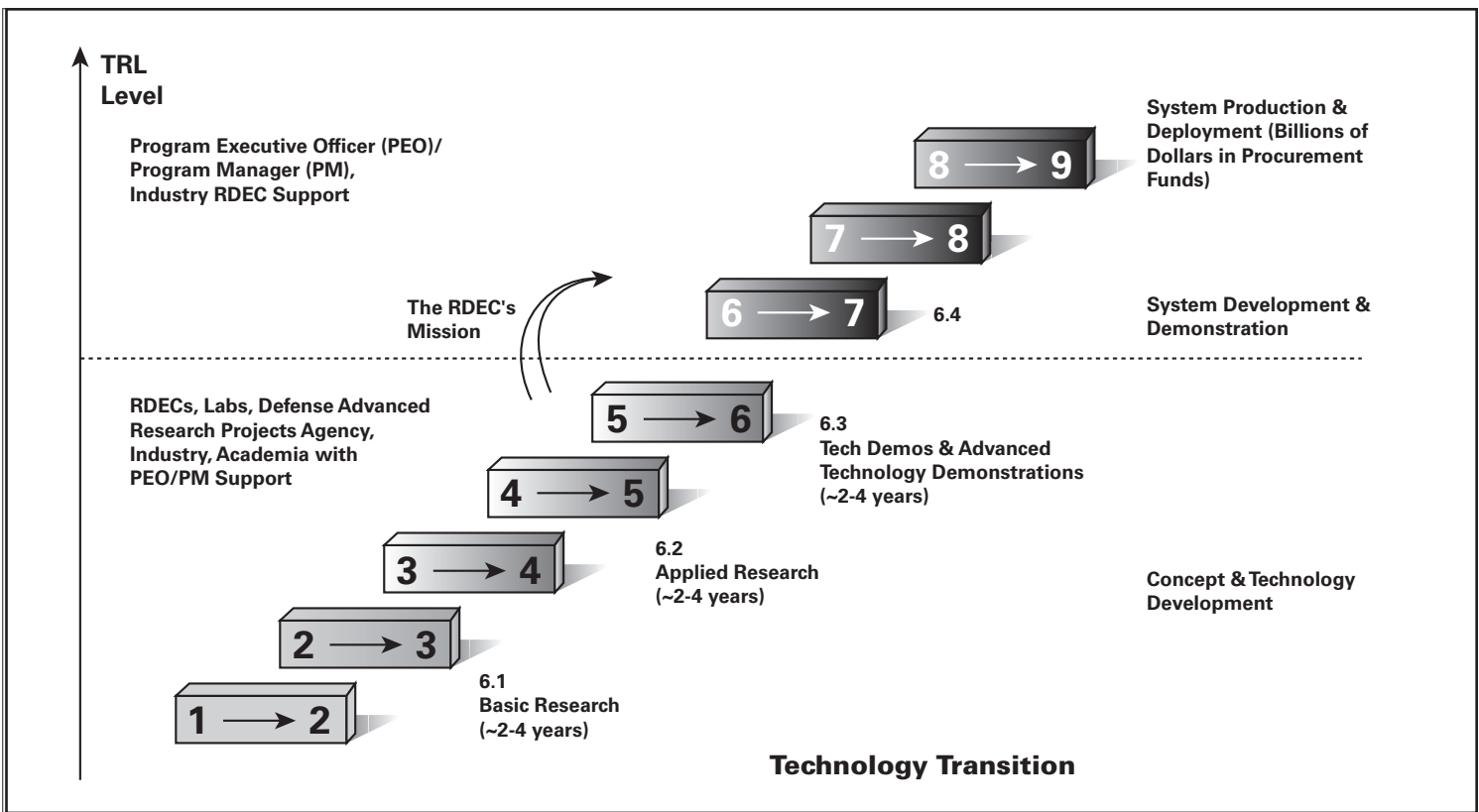
The Better Management of Technology Development Can Improve Weapon System Outcomes report explains how commercial “best practices” ensure that new technology is sufficiently mature to eliminate the possibility of inordinate risk on a product acquisition or development.

As shown in the following text, TRLs for both hardware and software systems are measured along a scale of one to nine, starting with basic concept studies proceeding to laboratory demonstrations and ending with technology that has proven itself in the military and/or operational environment.

TRLs for Hardware (HW) and Software (SW)

TRL 1. Basic principles observed and reported.

HW/System or subsystem (S): Lowest TRL. Scientific research begins to



be translated into applied R&D. Examples might include paper studies of a technology's basic properties.
SW: Lowest level of software readiness. Basic research begins to be translated into applied R&D. Examples might include a concept that can be implemented in SW or analytic studies of an algorithm's basic properties.

TRL 2. Technology concept and/or application formulated.

HW/S/SW: Invention begins. Once basic principles are observed, practical applications can be invented. Applications are speculative and there is no proof or detailed analysis to support the assumptions. Examples are limited to analytic studies.

TRL 3. Analytical and experimental critical functions and/or characteristic proof of concept.

HW/S: Active R&D is initiated. This includes analytical studies and laboratory studies to physically validate analytical predictions of separate technology elements. Examples include

components that are not yet integrated or representative.
SW: Active R&D is initiated. This includes analytical studies to produce code that validates analytical predictions of separate SW elements. Examples include SW components that are not yet integrated or representative but satisfy an operational need. Algorithms run on a surrogate processor in a lab environment.

TRL 4. Component and/or breadboard validation in lab environment.

HW/S: Basic technological components are integrated to establish that they will work together. This is relatively "low fidelity" compared to the eventual system. Examples include integration of "ad hoc" hardware in the lab.

SW: Basic SW components are integrated to establish that they will work together. They are relatively primitive with regard to efficiency and reliability compared to the eventual system. System SW architecture development initiated to include interoperability,

reliability, maintainability, extensibility, scalability and security issues. **SW** integrated with simulated current/legacy elements as appropriate.

TRL 5. Component and/or breadboard validation in relevant environment.

HW/S: Fidelity of breadboard technology increases significantly. The basic technological components are integrated with reasonably realistic supporting elements so that they can be tested in a simulated environment. Examples include high-fidelity lab integration of components.

SW: Reliability of SW ensemble increases significantly. The basic SW components are integrated with reasonably realistic supporting elements so that they can be tested in a simulated environment. Examples include high-fidelity lab integration of SW components. System SW architecture established. Algorithms run on a processor(s) with characteristics expected in the operational environment. SW releases are "Alpha" versions and

configuration control initiated. VV&A initiated.

TRL 6. S model or prototype demonstration in a relevant environment.

HW/S: Representative model or prototype system, which is well beyond that of TRL 5, is tested in a relevant environment. Represents a major step up in technology's demonstrated readiness. Examples include testing a prototype in a high-fidelity lab environment or in a simulated operational environment.

SW: Representative model or prototype system, which is well beyond that of TRL 5, is tested in a relevant environment. Represents a major step up in SW demonstrated readiness. Examples include testing a prototype in a live/virtual experiment or in simulated operational environment. Algorithm run on processor or operational environment integrated with actual external entities. SW releases are "Beta" versions and configuration controlled. SW support structure in development. VV&A in process.



TRL 7. System prototype demonstration in an operational environment.

HW/S: Prototype near, or at, planned operational system. Represents a major step up from TRL 6, requiring demonstration of an actual system prototype in an operational environment, such as an aircraft, vehicle or space. Examples include testing the prototype in a test bed aircraft.

SW: Represents a major step up from TRL 6, requiring the demonstration of an actual system prototype in an operational environment, such as in a command post or air/ground vehicle. Algorithms run on processor of the operational environment integrated with actual external entities. SW support structure in place. SW releases are in distinct versions. Frequency and severity of SW deficiency reports do not significantly degrade functionality or performance. VV&A completed.

TRL 8. Actual system completed and "flight qualified*" through test and demonstration.

HW/S: Technology has been proven to work in its final form and under expected conditions. In almost all cases, TRL represents the end of true system development. Examples include developmental test and evaluation (T&E) of the system in its intended weapon system to determine if it meets design specifications.

SW: Software has been demonstrated to work in its final form and under expected conditions. In most cases, this TRL represents the end of system development. Examples include T&E of the SW in its intended system to determine if it meets design specifications. SW releases are production versions and configuration controlled, in a secure environment. SW deficiencies are rapidly resolved through support structure.

The GAO report recommended that DOD adopt methods to assess the maturity and readiness of technology prior to commitment to system acquisition and development.

However, TRLs should not be considered the panacea to eliminate technical risks associated with acquisitions or developments. Simply, TRLs provide additional information to allow managers to make more informed, programmatic decisions for their projects/programs.

* Qualification attributes include reliability, maintainability, extensibility, scalability and security.

TRL 9. Actual system "flight proven" through successful mission operations.

HW/S: Actual application of the technology in its final form and under mission conditions, such as those encountered in operational T&E. In almost all cases, this is the end of the last "bug-fixing" aspects of system development. Examples include using the system under operational mission conditions.

SW: Actual application of the SW in its final form and under mission conditions, such as those encountered in opera-

tional T&E. In almost all cases, this is the end of the last bug-fixing aspects of system development. Examples include using the system under operational



mission conditions. SW releases are production versions and configuration controlled. Frequency and severity of SW deficiencies are at a minimum.

System functionality is demonstrated in environments of increasing realism. Initially, at the basic research level, the possibility of new capabilities may only be that of conjecture. As the concept matures, its feasibility is demonstrated in “laboratory” environments approaching that of actual field environments. Software integration is successively accomplished with other system hardware and software components as follows:

- *Verification, Validation and Accreditation (VV&A).* VV&A, often very resource-intensive, is staged as it becomes evident that the software is to be fielded. Verification and validation helps improve software quality and maturity. This cannot be accomplished without documenting and “baselining” the software products.
- *Configuration Management.* Is essential for tracking and coordinating development of all software components on a common baseline, as well as preventing unauthorized access

and automatically alerting users when a component has been altered.

- *Software Deficiency Reports.* The frequency and severity of software deficiencies are documented in reports that result in corrective actions.
- *Software Release Documentation.* Knowledge gained from user experience with beta and alpha software version releases is documented and “fed back” to technology development for incorporation into subsequent releases.
- *Software Development.* Early in the process, a surrogate processor that may have functional characteristics such as throughput, but not form factor or environmental characteristics, can be used. As the software matures, the “run-time” software is executed on the intended processor to take advantage of the size, weight, power, cost and performance benefits of “Moore’s Law.”

TRLs are important tools that the R&D community can use to plan, prioritize and allocate resources to assure that their technology — hardware and software — is suitable for transition to systems level development. Similarly, TRLs are valuable to

the AL&T Workforce allowing more complete assessments of, and better decisions on, the technology that underlies their system acquisition and development projects.

However, TRLs should not be considered the panacea to eliminate technical risks associated with acquisitions or developments. Simply, TRLs provide additional information to allow managers to make more informed, programmatic decisions for their projects/ programs.

The U.S. Army has seriously embraced the management practice of making major programmatic decisions based on disciplined approaches for assessing technology maturity, and recommending only that technology which is ready for transition to proceed to system level development. With an ever-increasing dependency on software, acquisition program managers cannot overlook the risks associated with software development. TRLs for software are critical for program managers to make informed, programmatic decisions that lower acquisition and development risks.

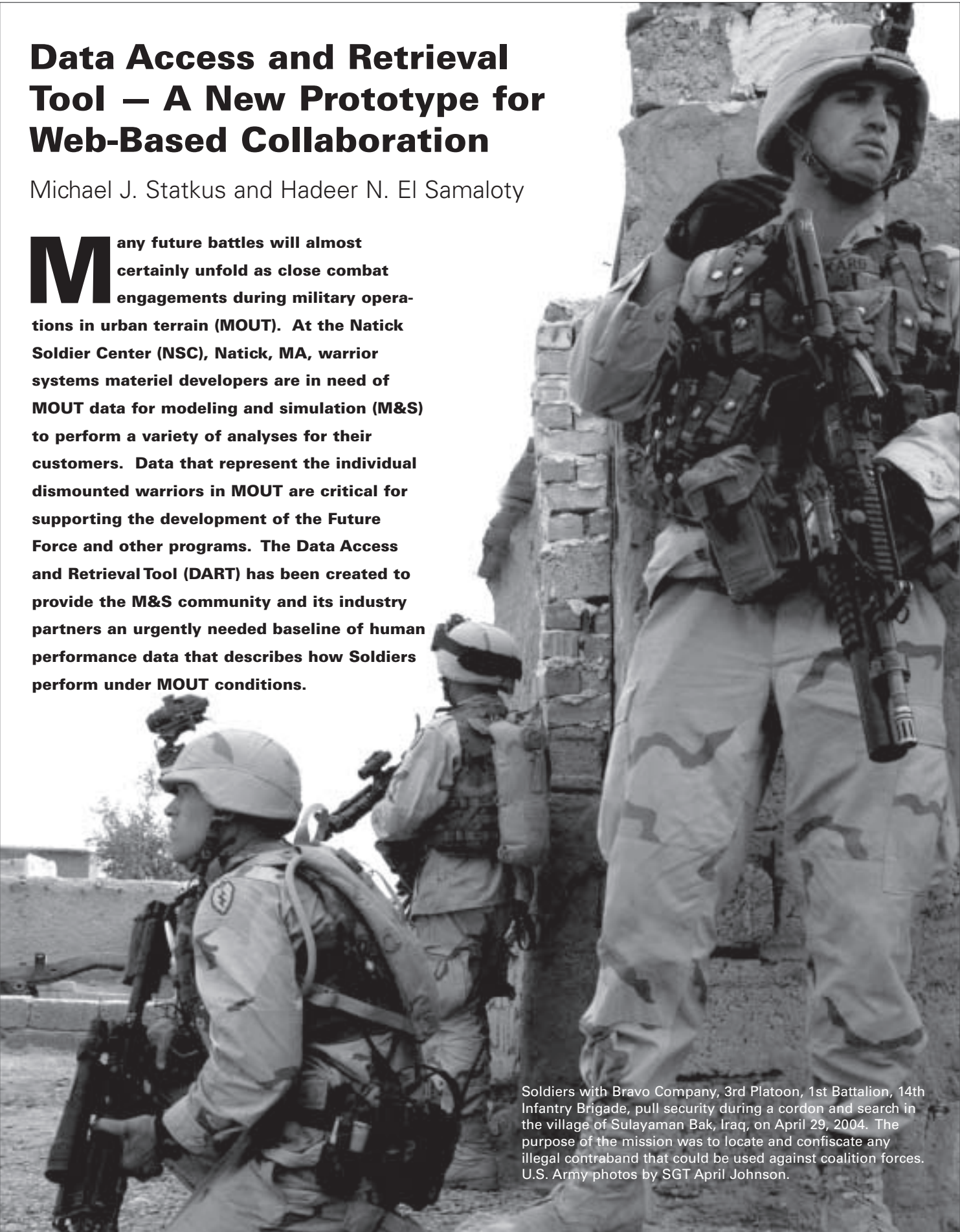
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Data Access and Retrieval Tool – A New Prototype for Web-Based Collaboration

Michael J. Statkus and Hadeer N. El Samaloty

Many future battles will almost certainly unfold as close combat engagements during military operations in urban terrain (MOUT). At the Natick Soldier Center (NSC), Natick, MA, warrior systems materiel developers are in need of MOUT data for modeling and simulation (M&S) to perform a variety of analyses for their customers. Data that represent the individual dismounted warriors in MOUT are critical for supporting the development of the Future Force and other programs. The Data Access and Retrieval Tool (DART) has been created to provide the M&S community and its industry partners an urgently needed baseline of human performance data that describes how Soldiers perform under MOUT conditions.



Soldiers with Bravo Company, 3rd Platoon, 1st Battalion, 14th Infantry Brigade, pull security during a cordon and search in the village of Sulayaman Bak, Iraq, on April 29, 2004. The purpose of the mission was to locate and confiscate any illegal contraband that could be used against coalition forces. U.S. Army photos by SGT April Johnson.

Background

The NSC Human Science/Modeling and Analysis Data (HSMAD) Project, initiated in FY01, is funded through FY04 to address several Soldier performance data gaps. During this 4-year research effort, dismounted warrior performance data have been obtained from field exercises, simulator tests, data mining and subject matter expert interviews. This MOUT data collection effort is focusing on the following primary infantry tasks:

- Move, shoot and communicate.
- Sense/perceive and decide situation



A soldier with Bravo Company, 3rd Platoon, 1st Battalion, 14th Infantry Brigade, pulls security during a cordon and search in Iraq.

awareness and human behavior representation.

- Supporting data, (physiological data and equipment performance characteristics).

DART was envisioned as a means of making the collected data accessible to the entire M&S community. Making strides toward achieving this HSMAD Project capstone goal, DART was initially developed and deployed June 27, 2003.

Historically, agencies that generate and collect data are often protective or unwilling to share their data for fear of losing control over its use. It is hoped that DART will set the pace as the prototype for fostering a renewed era of information and knowledge exchange.

DART's backbone is its data warehouse, which uses Microsoft® SQL Server 2000 Enterprise Edition. The data warehouse uses a snowflake schema to better accommodate large amounts of data and to provide the ability to expand as more data becomes available from both internal and external sources. A Web-based Graphical User Interface (GUI) application allows universal and user-friendly access to the data warehouse and all of its contents.

The DART data warehouse possesses these basic features and capabilities:

DART was envisioned as a means of making the collected data accessible to the entire M&S community.

- Accessible through the Internet.
- Intuitive and easy-to-use GUI.
- Password-protected user accounts on a secure server.
- Data categorized by primary infantry tasks.
- Expandable as more data becomes available.
- Flexible as different kinds of data become available.
- Data extract, transform and load (ETL) tools.
- Commercial-off-the-shelf software architecture.

From the first login, users will immediately find DART easy to use. For efficient retrieval of information, data

can be presented and categorized in the predefined data classes of *Move, Shoot, Communicate and Sense/Perceive and Decide*. The database stores both summary and raw data (if available) organized according to these data classes. Raw data is presented and maintained in its original form, such as Microsoft Excel spreadsheets, and is exportable to third-party applications for analysis. In addition to the five data classes, a Side Navigation Bar, multiple common links and innovative search tools aid the user in surfing the DART site for specific data and supplementary information.

Historically, agencies that generate and collect data are often protective or unwilling to share their data for fear of losing control over its use. It is hoped that DART will set the pace as the prototype for fostering a renewed era of information and knowledge exchange.

DART houses and displays documents in a variety of formats. A multimedia toolbar with icon links to the various formatted files held in DART provides users with one



1st Battalion, 14th Infantry Brigade Soldiers roll down a street in Iraq during cordon and search operations.

of several options for viewing study-related information. Viewers can access text documents in Microsoft Word and Adobe® Acrobat® PDF formats, spreadsheets in Excel format, presentations in Microsoft PowerPoint format and videos and pictures in standard formats. Files can generally be viewed by simply clicking on a link. However, should a user need to download a viewer for any application, links are provided directly from the DART Web site.

DART also possesses an online help system to assist users in navigating any application. It provides information and examples that illustrate how the multiple search and query filters can be leveraged optimally. A Feedback Page also offers users the opportunity to communicate via

e-mail with DART administrators to address comments, questions or suggested improvements to the Web site. DART also offers a variety of search tools to aid users in locating studies,

summarized data, related files and analytic resources. Users will primarily search for studies via the “Study Search” tool, which provides several parameters for locating desired studies. Parameters to search or sort by include the study’s identification number, study name, principal investigator, date, data class and keywords. Study Search results are hyperlinked to their respective study home pages, making it easy for users to quickly jump to the information. Once they arrive at a study home page, users can read the study’s abstract, see a list of related files or hyperlink to summary data.

DART’s “Query” feature has the capability to drill down into data vertically and horizontally across all studies and tests cataloged in DART. In creating queries, data can be filtered by data classes such as mission, enemy, terrain, troops, time available and civilian parameters and statistical measures of interest. For added user-friendliness, each row returned as a query result is hyperlinked to its relevant study and allows the user to access the study’s information with one click. The Query tool also gives users the capability to save their queries and return to them at a later date.

The “File Finder” — which functions much like the “Study Search” mechanism — is an extremely useful tool that allows users to quickly locate documents in DART. It provides options to search DART by file type, file identification number, file name, keyword, country of origin or data class. When users execute searches, DART returns file results split into “Study Related Files” and “Analytic Resources” files.

DART houses and displays documents in a variety of formats. A multimedia toolbar with icon links to the various formatted files held in DART provides users with one of several options for viewing study-related information.



Bravo Company, 3rd Platoon, 1st Battalion, 14th Infantry Brigade, provides security as a Humvee rolls by during a mission in Iraq to locate and confiscate illegal contraband that could be used against coalition forces.

Under the Study Search and Query functions, DART users can easily access dismounted warrior performance data. However, researchers may need other supplemental data to successfully execute analyses or populate their models. Accordingly, there is a wealth of information contained under “Analytic Resources.” Here, users can find equipment specifications, weapons performance data, physiological data, Web site links, videos, still photos and a host of information geared toward research methodologies.

The “Submit Information” function will be critical to DART’s continued growth and usefulness to the M&S community. It allows users to send their data to DART administrators for potential uploading into the system. Although DART’s primary focus is on dismounted warrior performance data in MOUT, any information that can provide a better understanding of how Soldiers fight in these complex environments will be considered for inclusion.

DART also offers a variety of search tools to aid users in locating studies, summarized data, related files and analytic resources.

New Prototype

DART’s design allows for the storage, retrieval, maintenance and manipulation of dismounted warrior performance data in a simple, widely accessible and usable form. It is hoped that DART will help to increase the validity of M&S analyses

by making available empirical data collected in the field. Also, DART will foster dialogue between DOD agencies, DOD contractors and international allies. Currently, more than half of DART users are affiliated with the U.S. Army or other government organizations while the remaining user base is comprised of contractors, academicians and international partners. Clearly, DART provides analysts with an atmosphere for collaboration and gives leaders the critical information they need to make informed decisions. In the end, our Soldiers will benefit from superior technology that gives them a decisive edge in MOUT and combat operations.

To request a user account, please log on to <https://www.natick-dart.com/>.

The submission of studies and other relevant information is welcome and encouraged.

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The CECOM Approach – Performance-Based Service Acquisitions

Bob Tiedeman

The U.S. Army Communications-Electronics Command (CECOM) Acquisition Center was designated as a Service Contracting Center of Excellence for Major Systems in December 2000. Citing its reputation as a proactive leader in innovative business solutions, the U.S. Army Materiel Command (AMC) sought an agent that could revolutionize the Army's service contracting practices by focusing on the efficiency and effectiveness of its acquisition business processes.



Fibertek® Inc. engineers complete the final assembly stage on a Compact Laser Designator Rangefinder (CLDR). The CLDR was developed under CECOM's Night Vision Low-Tech (NVLT) Program.

In concert with the administration's efforts to further reduce the size of government, and recognizing its own increased reliance on service contracting to meet its mission responsibilities, the CECOM Acquisition Center developed a plan to address the trends in service contracting. Those trends, marked by significant increases in expenditures and mission reliance, were driven home by heightened visibility in Congress. By 2001, the Congress' General Accounting Office (GAO) issued *Report GAO-01-295* citing that DOD spent more than \$87 billion dollars in

Performance-based service acquisitions are structured around a service requirement defined in terms of performance objectives.

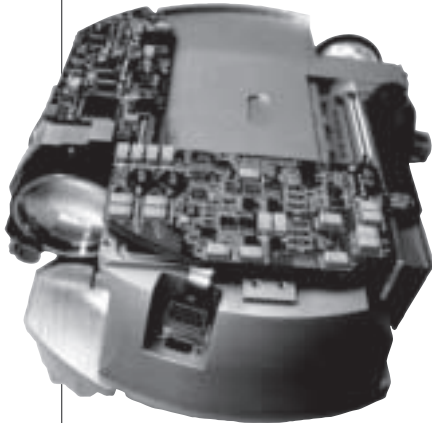
2000 for its service contracts, accounting for 43 percent of all contracting expenses. At CECOM, many of these expenses are funded through its Operations and Maintenance Army appropriation.

To meet the challenges associated with these trends, the CECOM Acquisition Center partnered with other organizations within the CECOM community to implement its plan to increase the efficiency and effectiveness of service contracting practices and processes. First and foremost, the plan

required the early involvement of senior leaders from throughout CECOM, especially its requirements community. To that end, a Technical-Requirements Executive Steering Committee (TESC) was established early in FY00.

The TESC consisted of senior leaders representing the CECOM Acquisition, Logistics Readiness and Software Engineering Centers, Office of Command Counsel, Information Systems Engineering Command and Deputy Chief of Staff for Operations and Plans. Although TESC was disbanded in 2001, it successfully furthered the "cultural" changes on which fundamental reform of CECOM's service contracting procedures depended. More importantly,

TESC served to establish open communication between the requiring and contracting communities so that new approaches to service contracting could be proliferated throughout the CECOM community.



Close-up view of CLDR circuitry.

With the cultural change generated by the TESC underway, a CECOM Command Policy Memorandum was issued in March 2001. The policy established the CECOM Opportunities Page (OP) that helped coordinate requirements and avoid duplicative efforts with respect to both contracting efforts and mission fulfillment efforts. The policy mandated that all CECOM activities submit their service requirements exceeding \$250,000 through the OP for review purposes and not directly to the Acquisition Center for action.

In April 2002, this dollar threshold was reduced to \$2,500, thereby broadening the initiative's scope. The OP gave senior leaders a means to exploit CECOM's organic capabilities and served as an advertising tool. This increased awareness of planned and ongoing efforts and/or pre-existing contractual instruments by which activities might satisfy their various support services requirements. This awareness obviated the possibility that contracts for mission-related efforts would be duplicated. More importantly, it promoted a fundamental change in the way the CECOM community satisfied

its requirements for services and how the CECOM Acquisition Center processed those requirements.

CECOM's plan to revolutionize its service contracting processes would require reeducating and retraining its workforce. Performance-based service acquisitions involve strategies, methods and techniques that describe and communicate measurable outcomes rather than direct performance processes. Performance-based service acquisitions are structured around a service requirement defined in terms of performance objectives. It also provides contractors the latitude to determine how best to meet those objectives, thereby fostering innovation and a more consensual approach to problem solving. This approach represents a marked departure in the way requirements are set forth and how those requirements are translated into actual contracts.

Almost immediately after its designation as a Service Contracting Center of Excellence, the CECOM Acquisition Center began the process of reeducating and retraining its workforce on performance-based service acquisition techniques. Acquisition Reform Week, sponsored by AMC in May 2002, provided a venue to "get the word out." Shortly thereafter, Acquisition Center personnel completed the online Performance-Based Service Acquisition course developed by the National Contract Management Association. Acquisition Center personnel also completed a number of in-house training events during the ensuing

months. In June 2002, the Acquisition Center hosted AMC's Innovative Business Advocate Conference that focused on implementing and proliferating performance-based service acquisition techniques. Representatives from AMC headquarters and its major subordinate commands attended the conference.

The CECOM community remains committed to educating and training its workforce to advance performance-based service acquisition tools and techniques. This, along with cultural change, will yield greater efficiencies and effectiveness and result in better value to the govern-

ment. It is essential that all stakeholders be involved in the cultural changes necessary for this revolutionary change in service acquisitions. While support activities and acquisition personnel have been involved in this cultural change, so have industry personnel.

CECOM recognized the importance of involving its industry partners early in its planning. Senior leaders and managers sought industry best practices and small business involvement when it developed its strategies to implement performance-based service acquisition tools and techniques. They also saw this initiative as part of a broader, ongoing effort to improve overall acquisition practices. To this end, the CECOM community engaged its industry part-

ners in "Industry Days" so that planned acquisition opportunities could be discussed and market conditions could be assessed.

Excessive government control and nonvalue-added process approval mechanisms related to contractors' performance were eliminated in both contracts. This fostered contractor innovation and eliminated costs and delays associated with government approval of contractors' processes.



The lead electrical and optical engineers field-test the CLDR at Fort A.P. Hill, VA.

One-on-one conferences were conducted so that CECOM and its partners could tailor strategies based on experience, market research and program risk. During these events, performance incentives were developed so that the government could expect high quality and economic efficiency, and industry could expect maximum profit. The use of draft solicitations and performance work statements was institutionalized so that performance objectives, standards and incentives were incorporated into requirements documents and resultant contracts.

While there are many examples of success throughout the CECOM community, two high-dollar, high-visibility programs stand out as a testimonial to its successful implementation of performance-based service acquisitions. CECOM's NVLT and Omnibus Support (OS) programs have produced significant rewards and benefits for the government and industry alike. The NVLT program resulted in two contracts awarded in July 2001 to two small business concerns — Fibertek Inc. and EIO-R. Excessive government control and nonvalue-added process approval mechanisms related to contractors' performance were eliminated in both contracts. This fostered contractor innovation and eliminated costs and delays associated with government approval of contractors' processes. Both contracts incorporate contractor-proposed evaluation metrics that can be easily evaluated

and duly rewarded throughout the contract performance period.

The OS program, which will provide support to the CECOM Software Engineering Center's (SEC's) various mission responsibilities, resulted in two contracts awarded in October 2001 to iTel Solutions Inc. and Litton, now part of Northrop Grumman Corp. These contracts, like those for the NVLT program, eliminate unnecessary government control and process-prescriptive mandates that stifle innovation and efficiency. Also like NVLT program contracts, these contracts include measurable metrics by which the government can assess contractors' performance. In this specific case, the metrics are standardized. To ensure that appropriate metrics are included in any resultant task order, SEC engineers use a matrix of these standard metrics to assess their suitability for a particular effort. If an engineer intends to use metrics not included in the matrix, the SEC director's approval is required. Standard metrics matrix use provides discipline and rigor to the process of developing the Acquisition Requirements Package, which is then subject to review by SEC managers and leaders.

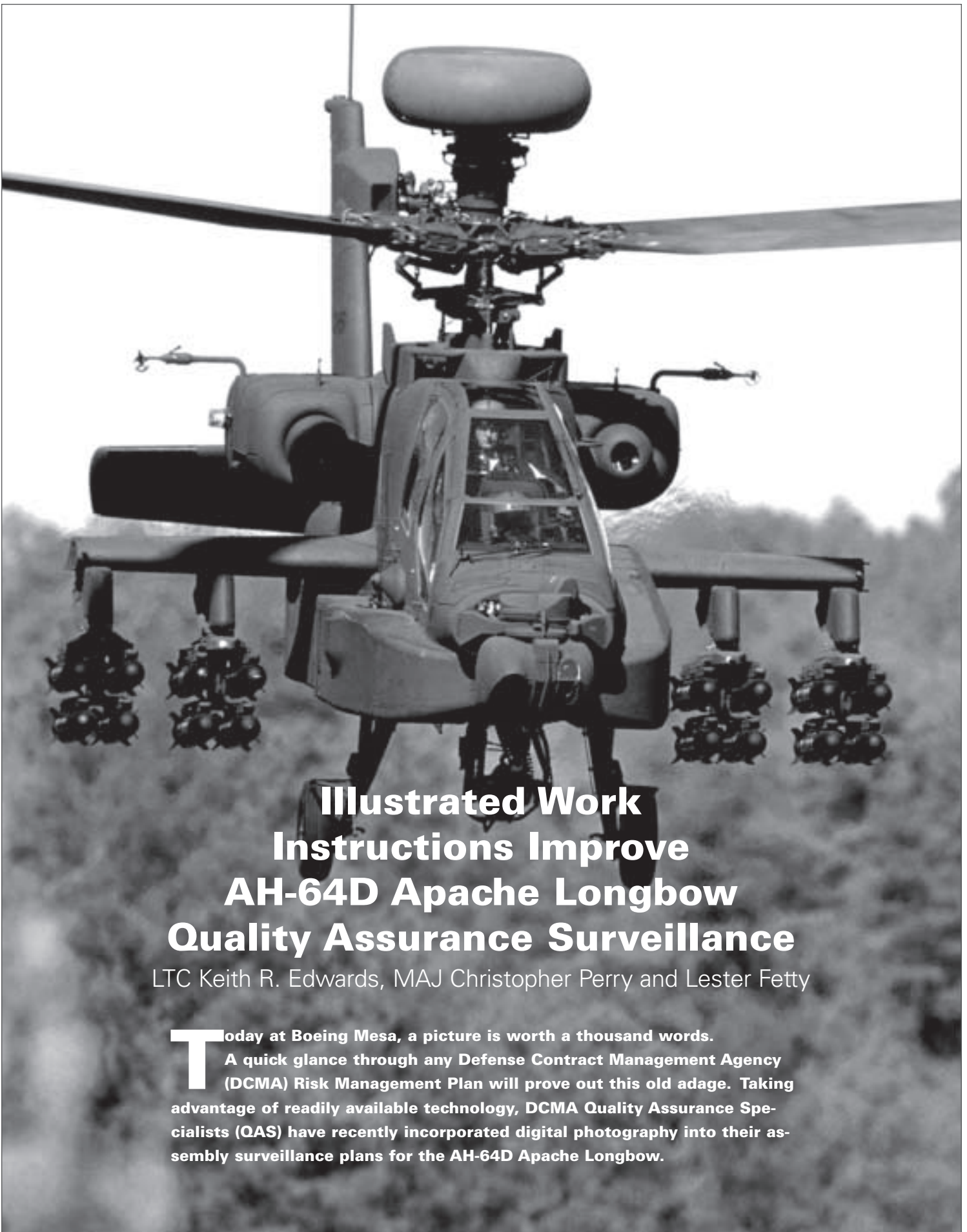
The most innovative concept in these OS contracts is the "award term" incentive. This incentive rewards excellent performance by extending the period of performance and is granted based on the standard metrics discussed

above. Simply stated, this translates into greater profits for the contractors. It also enhances a contractor's past-performance record, a record that can affect a contractor's future government opportunities. Most importantly, this sort of incentive fosters managerial effectiveness and improves communication between the parties throughout performance and performance evaluation.

This new strategy has already produced favorable results, ensuring that CECOM meets or exceeds Office of Federal Procurement Policy goals that mandate 50 percent of all service dollar obligations are performance-based by FY05.

The use of performance-based service acquisition tools and techniques has resulted in more cost-effective contracting, better value to the government and greater competition in the industrial sector. It has shifted performance risk from the government to its contractors and, ultimately, rewards those contractors who manage risk best. It has enabled the government to adopt commercial best practices and obviated the government-unique, stovepiped process controls formerly used to manage contractor performance. Additionally, it has institutionalized a means to evaluate and assess process improvements on a continuous basis. Most importantly, it has served to further the goals of acquisition streamlining and the *President's Management Agenda*.

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Illustrated Work Instructions Improve AH-64D Apache Longbow Quality Assurance Surveillance

LTC Keith R. Edwards, MAJ Christopher Perry and Lester Fetty

Today at Boeing Mesa, a picture is worth a thousand words. A quick glance through any Defense Contract Management Agency (DCMA) Risk Management Plan will prove out this old adage. Taking advantage of readily available technology, DCMA Quality Assurance Specialists (QAS) have recently incorporated digital photography into their assembly surveillance plans for the AH-64D Apache Longbow.

These improved factory-floor tools bring significant advantage to the quality surveillance work environment including high definition and detail, ease of use and effective/efficient personnel cross-training capability. The result: significantly improved levels of on-aircraft quality oversight. At Boeing Mesa, all aircraft Safety of Flight (SOF) installations and procedures are candidates for this enhanced surveillance approach. For DCMA QAS personnel, complete assembly coverage is the ultimate goal, a goal that will be realized in the very near-term.

Boeing has used this type of work aid since 1999. The AH-64A Apache had previously been assembled, and quality-inspected, without the benefit of these types of tools. However, affordable availability of high-quality digital photography has rapidly transformed assembly-line operations and the quality inspection functions associated with them. Initially used for critical and complex assemblies and procedures, illustrated work instructions (IWIs) are now available to Boeing assembly personnel for most tasks performed on aircraft production lines. Acknowledging the benefits that these tools provide to assembly line operations, DCMA QAS personnel are adapting these same references for the government's quality inspection function.

Until recently, DCMA Boeing Mesa's QAS personnel relied on AH-64 manufacturing engineering plans, blueprints and drawings, written work instructions and factory-floor experience to perform aircraft assembly surveillance. Combined with extensive

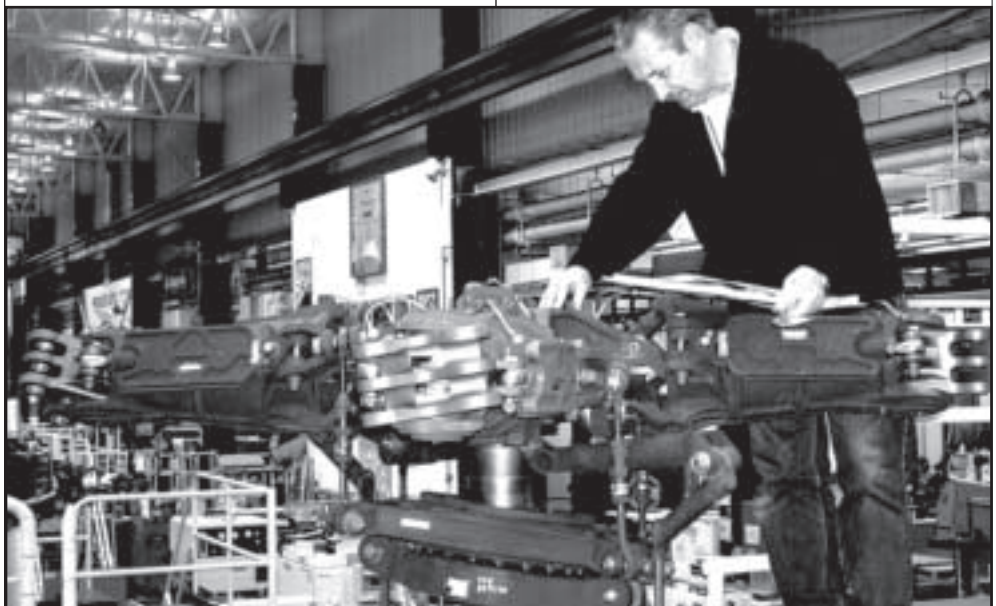
aircraft-specific knowledge, this approach ensured effective surveillance of most aircraft assembly tasks. However, no approach is completely foolproof and this one proved no exception. DCMA Boeing Mesa's wake-up call came in spring 2002.

... affordable availability of high-quality digital photography has rapidly transformed assembly-line operations and the quality inspection functions associated with them.

On April 20, 2002, 1st Battalion, 2nd Aviation Regiment, Camp Page, Korea, experienced a potentially catastrophic in-flight event while conducting AH-64D aerial gunnery operations. As the aircraft maneuvered into firing position, it began an uncommanded right yaw. Confirming that the turn was not copilot/gunner-induced and that neither station could move the pedals, the crew determined that they were experiencing a fixed-pitch tail rotor emergency. Pulling just enough power for stabilized, level flight, the crew flew the stricken aircraft to a Republic of Korea airfield and landed without further incident.

Upon inspection, the aircraft's directional control system revealed full pedal travel and no evidence of binding or foreign object damage that could have restricted pedal travel. However, when unit inspectors removed the automatic roller detent decoupler (ARDD) access panel on the pilot's station floor, it was confirmed that the bonding jumper cable was in close proximity to the ARDD assembly. Further inspection revealed that, though not presently fouled, the cable had a peculiar bend formed in it. Subsequently, the gun turret was removed and the directional ARDD assembly was closely inspected. The investigation concluded that the jumper cable had migrated and temporarily lodged within the assembly, fouling the ARDD and restricting full pedal travel.

Boeing's on-site field support representative issued a "flash mishap report," which described the incident and its suspected root cause. At the Boeing Mesa facility in Arizona, all production line aircraft were immediately inspected. The inspection results were noteworthy for several reasons. First, it was determined that the jumper cable routing was clearly problematic



All SOF inspections are covered by this enhanced approach to quality assurance surveillance.

Digital photography greatly aids task performance in all quality areas.



(i.e., allowed cable travel). Furthermore, this condition was found to be “not to print.” Most significantly, the condition was present on 20 of the 22 aircraft inspected. Inspectors found that the jumper cables had been improperly routed beneath or behind the ARDD assembly. Blueprints depicted that cables should be routed in front of and above the assembly.

The follow-on review revealed the source of the assembly procedure error. Although assembler and quality inspector misinterpretation were clearly factors in this shortcoming, the blueprint/drawing also played a role. Simply put, the drawing did not adequately depict the true/correct jumper cable routing for the ARDD assembly. Though in fact installed incorrectly, the cable routing “looked right” to the trained eye and appeared to have more than adequate clearance past the ARDD assembly. Under static factory assembly conditions, and follow-on functional checks, the potential for cable travel and subsequent fouling within the ARDD assembly occurred to

no one. Government and contractor personnel agreed an immediate solution was required to correct this fault.

Fortunately, IWIs were already in use for other complex assembly tasks on the Boeing assembly line. Recognizing the utility of IWIs from both a production quality and lean manufacturing standpoint, the company had extensively integrated high-fidelity digital photos into its assembly operations. Supplemented by imbedded text instructions, notes and cautions, these illustrated instructions were superior in many ways to any written descriptions or the actual technical drawings.

Though IWIs had not yet been migrated to all areas of the assembly process, rapidly creating reference tools for the ARDD assembly procedure was neither difficult nor time-consuming. Within hours of the factorywide aircraft inspection, an IWI was in place on the Apache Longbow assembly line that depicted the correct routing procedures for the ARDD jumper cables. Using this enhanced visual tool as a reference, the risk of further installation errors was significantly mitigated.

Within this pretext, DCMA QAS personnel quickly seized on the idea of using modified IWIs to support their areas of assembly surveillance responsibility. Emphasizing capturing the critical characteristics associated with SOF-related installations, DCMA QAS personnel modified, and in some instances, created from scratch, a series of digital photo inspection tools. With inspection-related notes, cautions and attention-grabbing icons, these aids are imbedded in nearly all SOF-related procedures performed at the Mesa facility. DCMA QAS personnel have fully integrated these highly detailed references into their Risk Management Plans, with each

SOF procedure being accompanied by at least one photographic depiction.

Extensive use of highly detailed inspection aids, in conjunction with traditional assembly inspection references, is now the standard at DCMA Boeing Mesa. By recognizing, then leveraging Boeing’s successful practices, DCMA modified and integrated the necessary tools and procedures to fit within the assembly inspection and surveillance approach. DCMA Boeing Mesa has taken AH-64D quality assurance surveillance to the next level. Seeking continuous improvement, the overriding goal is to provide the very best products to Army aviators. Initiatives such as this will ensure that this goal is met.

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LESTER FETTY is a DCMA Boeing Mesa Quality Assurance Representative with more than 28 years of government service. He provides quality assurance surveillance within the AH-64D Apache Longbow assembly facility at Boeing Mesa. He is certified in mechanical and aerospace quality assurance, nondestructive testing, composites and packaging.

First Things First — Getting to Know Your Customer

LTC Larry D. Hollingsworth



PM Battle Command Sustainment Support System (BCS3), Fort Belvoir, VA, recognizes the need for constant and consistent communication and conducts regular meetings with its Army Test and Evaluation Command (ATEC) representative to discuss the BCS3 maneuver sustainment command and control system it's developing. From left, MAJ Sandy Vann-Olejasz, LTC Joseph Grebe, LTC Robert T. Hickson, TSM Jerry Guston and Mary McCall. U.S. Army photo by Debbie Fischer-Belous.

Congratulations on your selection to be a product manager (PM)! You are about to embark on the most challenging and rewarding job of your career. As you prepare to assume your responsibilities, I want to offer two pieces of good old footlocker advice that will have application throughout your tenure as a PM. The first pearl is somewhat philosophical but all too often forgotten — every decision you make potentially impacts Soldiers' ability to survive and execute their battlefield missions. Given that premise, you should demand the very best from your team and expect them to make a difference every day!

My second pearl focuses on customers. The relationship you develop with customers will tremendously affect your organization's contributions to the Army over the next 3 years. The following tactics, techniques and procedures (TTPs) are the most important lessons I observed, learned and eventually executed as a PM. They all define the customer — the user — as your center of gravity. As a point of clarification, I use the terms customer and

user almost interchangeably. In most cases, you will have either a Directorate for Combat Developments or U.S. Army Training and Doctrine Command (TRADOC) Systems Manager (TSM) as your schoolhouse counterpart. My team considered the schoolhouse our primary customer. We also put great premium on our relationships with users in the field. Both relationships are critically important.

Customer Focus Starts at the Top

Make customers your organization's top priority. Customer relationship quality is your responsibility — a responsibility that cannot be delegated. The organization will quickly take on your personality when dealing with customers. If your employees see that you put a premium on customer focus and contact, so will they. If they see you discount the customer's voice and involvement during

requirements definition, acquisition planning and product development, they too will discount the customer's contribution. Encourage your senior leaders to play an active and visible role in fostering solid relationships with customers. They should make regular contact at the executive level with each customer's senior leaders to ensure good relationships.

Visit the Customer at the Schoolhouse

There is always a good reason to visit the customer on his turf. Right or wrong, the customer will partly evaluate your commitment to his programs by the frequency of your visits. I visited my customer's location once a month, but established formal program reviews that allowed my division chiefs and project directors to interact in quarterly program updates with each of my customers. Formal schoolhouse visits are in addition to TRADOC-sponsored lab and industry days.

To ensure customer involvement and awareness, make each customer a member of your integrated product teams (IPTs). I also recommend that you visit your customer's senior leaders regularly. Commandants, assistant commandants and chiefs of staff want to know how their branch-specific programs are progressing. Take responsibility for getting your senior leaders

down to the schoolhouse. An established relationship with schoolhouse senior leaders will provide a huge advantage during annual 1-to-N list priority development. Their familiarity with your name and face means familiarity with your products and programs.

Visit the User's Environment

Take the time to see your products in the field, or take advantage of numerous other opportunities where you and your staff interact with field users, even if your product is still in development. Go to the prospective end users and interview Soldiers about existing products. Gain insights on what they like about your product and what they would change. Soldier creativity will amaze you. Pay close attention to the way Soldiers use your products. Modifying equipment for its intended use may imply a material change to make the product more robust or easier to operate. You don't gain those insights from sitting behind your PM desk or attending symposiums.

Take an active role in your products' logistics demonstrations, user tests, developmental tests, operational tests and fielding events. Your presence at these acquisition events is synonymous with the field commander overlooking a bridge crossing — be where you can best influence critical activity. Include field

users on your IPTs. Sponsor User-Lab Days where Soldiers interact with your project directors and engineers. Host symposiums that are user-centric, allowing users to gain confidence in you, the materiel developer community and your civilian engineering staffs.

Take Your Customer With You

I can count on one hand the number of times I went to the Pentagon without my customers. Ironically, I can count the same number of visits on the other hand that I wish I had taken them with me. In most cases, your visits to the Pentagon to brief or update senior leaders will address as a minimum two common themes — discussion about cost and schedule, and discussion about the user's operational requirements. My visits included dozens of sessions regarding the ability to deliver affordable products "on time" that met achievable-incremental operational requirements. There will always be exceptions to this tag-team approach, but as a general rule, unified PM/customer teams will prevail during program scrutiny. However, don't rely on your customers to defend your cost, schedule and performance. Likewise, your customers shouldn't expect you to defend their operational requirements either. Unfortunately, this valuable lesson is usually only learned after the pain from the first unaccompanied visit subsides.

Always Tell the Truth — Good or Bad

Keep your customers informed of program status and changes in the acquisition environment. Solid customer relationships include continuous communication with your customers. Keep them aware of acquisition decisions that affect their products as well as policy and regulatory changes. In many cases, the PM office is your customer's

... interview Soldiers about existing products. Gain insights on what they like about your product and what they would change. Soldier creativity will amaze you. Pay close attention to the way Soldiers use your products. Modifying equipment for its intended use may imply a material change to make the product more robust or easier to operate. You don't gain those insights from sitting behind your PM desk or attending symposiums.

best source for acquisition policy. The more you communicate with your customers, the easier it will be when you have to share less positive program information. Believe me, you will have to share bad news with your customers sooner or later. Don't let that exchange be your first contact. Additionally, *always* deliver bad news personally. Notify your customers about schedule slips, funding cuts and test failures along with frequent project and product management updates. Your customers deserve to know the truth, and it's your responsibility to ensure they get it.

Establish Priorities

Your customers have responsibility for many more products than just those you manage. In most cases, your products compete against dozens, if not hundreds of other mission-essential items. Poorly established and managed priorities hurt all acquisition programs.

Your customers have responsibilities to materiel developers and the science and technology communities to establish those priorities of effort in the PM offices and the technology base labs. Limited human and fiscal resources demand identification of each school marquis programs.

Communicate, Communicate, Communicate!

Include your customers and Pentagon teammates in your weekly staff meetings. This frequency of dialogue sets the foundation for solid relationships

that are absolutely critical for effectively discussing tough materiel and combat developer issues. Leverage video-teleconferencing or weekly teleconferences to collectively meet with your entire acquisition team. Include your schoolhouse customers, Department of the Army Systems Coordinators (DASCs) from the Assistant Secretary of the Army for Acquisition, Logistics and Technology staff and system synchronization officers (SSOs) from G-8 Force Development. Your team will benefit tremendously from these routine exchanges.

Open dialogue should include, as a minimum, Pentagon fiscal reviews and budget drills, requirements discussions, delivery schedules, new equipment training, IPT schedules, contractor visits and user priorities — just to name a few. Emphasize the importance of constant and consistent

communication with your Pentagon counterparts and customers. Bottom line: your schoolhouse customer, DASC and SSO should all be on your speed dial.

Of equal importance, invest the time to understand how your products operate in the customers' environment. Understand the requirements determination process. Likewise, invest in educating your customers on the acquisition process. Be familiar with your customers' field manuals and doctrine. Understand TTPs and how weapons and systems are employed.

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Likewise, understand the methodologies your customers use to define and document requirements. In most cases, authoring requirements is a collaborative effort between materiel and combat developer. Knowledge *is* power! Knowledge also leads to productivity. Dealing with knowledgeable, informed counterparts on acquisition matters can make a tremendous difference when developing strategies and incrementing capabilities. Your customers must understand the acquisition process to better appreciate what you can deliver. In most cases, you are your customers' best source of education on acquisition matters, Program Objective Memorandum issues and Pentagon policy. Take the time to teach and coach your customers about your business. The return on investment will benefit all concerned in the long run.

You have your work cut out for you. I can't overstate the importance of your responsibility to develop and foster strong relationships of trust and confidence with your customers and end users. I hope these lessons learned will serve as a starting point for you and serve as a reminder for even the most experienced PM teams as to just how important our customers are to the acquisition process. Good luck!

LTC LARRY D. HOLLINGSWORTH is an Army War College (AWC) Fellow at the Institute for Advanced Technology, University of Texas in Austin. He holds an M.B.A. from the University of Dallas. Prior to his AWC assignment, he served as PM for Mortar Systems.



Joint Warrior Interoperability Demonstration (JWID) 2003

LTC Todd L. Smith, USA, and LTC Jill K. Farris, USANG

LCDR Porfirio Beltran explains the concept of operations to Commander Hoon Lee, South Korea Navy. Beltran is assigned to the Navy and Marine Corps Reserve Center in Washington, DC.

JWID is a Chairman of the Joint Chiefs of Staff annual event that enables U.S. Combatant Commands and the international community to investigate command, control, communications and computer solutions that focus on annually determined objectives for enhancing coalition interoperability. The U.S. Pacific Command (PACOM) hosted the June 2003 event with the U.S. Army and U.S. Marine Corps (USMC) collocated at the Naval Surface Warfare Center Dahlgren Division (NSWCDD), Dahlgren, VA. There were 42 Coalition Interoperability Trials with 19 in use at Dahlgren supporting 6 objectives. Soldiers from the 34th Infantry Division (ID) provided operational assessments of emerging technologies while sharing situational awareness data with the other services and 10 coalition partners.

For the first time, we were able to pass fire missions to and from Spain using the Advanced Field Artillery Tactical Data System (AFATDS). Other key technologies included language translation, network monitoring and shared geospatial awareness. The 34th ID operated a brigade tactical operations center

(TOC) under the Combined Forces Land Component Commander. The TOC used the Maneuver Control System Light, All Source Analysis System Light and AFATDS to share the common relevant operational picture products with the Global Command and Control System and the USMC

Command and Control Personal Computer System. This article describes the key victories from the exercise.

Interoperability Among Artillery Groups

For the first time, the Army exchanged field artillery fire missions with Spain using the Artillery Systems Cooperation Activity standard over a network. Sponsored by the Spanish Joint Chiefs of Staff, this trial allowed fire support planners from the 34th ID to conduct fire missions, send and receive geometries and then send and receive unit locations with Spanish units. This highly successful trial bodes well for vastly improved interoperability with an important ally.

Geospatial Awareness

The U.S. Army Engineer Research and Development Center and the Topographic Engineering Center provided a geospatial environment for

network-centric tactical awareness. This trial provided joint and coalition operations and intelligence officers actionable decision products and decision tools in a distributed environment.

After action reports from Iraq and Afghanistan suggest that paper maps and mapboards have yielded to digitized and vector products. One notebook computer can now store maps and images that would have previously filled the commander's vehicle. Additionally, digitized images and vectors can provide three-dimensional views, sophisticated terrain analysis and "fly-through" capabilities that allow commanders to truly visualize their battlespace. This trial made these products and others available through a Web interface.

Language Translation

Several trials focused on language translation problems. Imagine trying to coordinate the efforts of coalition forces from Korea, Japan, Singapore and Thailand.

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Commanders still experience difficulty communicating with English-speaking countries such as Great Britain, Canada, Australia and New Zealand. Though language translation in the commercial sector is maturing, the problem of translating domain-specific terminology and acronyms remains extremely challenging.

During the exercise, vendors successfully demonstrated several tools. AT&T demonstrated a prototype military application of its telephony-designed automated speech recognition translation technology. Combined with AT&T's Mandolin™ and Natural Voices™ components, and the ANUVADD machine translation technology, AT&T provided a multi-lingual text and speech interface tool used to facilitate the translation of critical information between the United States and Spain. The prototype application provided users with an instant messaging type (chat) translation process for both text and voice. Their

automated text and speech recognition/translation tool provided English and Spanish text translation via instant messaging technology. The tool also provided prototype speech recognition and voice translation capabilities for both English and Spanish languages.

JWID 2004

Though some battles were won, the campaign continues. Northern Command will be the host combatant commander for JWID 2004 and 2005. Northern Command will continue to work the tough problems associated with service and coalition interoperability and will dedicate the upcoming exercises to improving interagency interoperability. With the ongoing global war on terrorism, creation of the Department of Homeland Security and increased need to exchange intelligence among multiple agencies, the importance of interoperability and JWID will increase significantly. Thanks to all who made 2003 a success; see you in Colorado Springs, CO, in 2004! For more information on JWID, visit www.jwid.js.mil.

LTC TODD L. SMITH manages JWID for the Chief Information Officer/G-6. He is an acquisition aviator with an M.S. in computer science from Vanderbilt University and an M.S. in procurement and acquisition management from Webster University.

LTC JILL K. FARRIS is the Deputy State Surgeon for the Minnesota Army National Guard. She is a Medical Service Corps officer with an M.A. in speech communication from South Dakota State University and an M.B.A. from Touro University.



Commander Hoon Lee, South Korea Navy (center), briefs JWID operations to coalition partners at PACOM Headquarters, Camp H.M. Smith, HI.



Installation Restoration Program — Getting the Job Done Safely With Performance-Based Contracting

Gloria Jean Skillman

The Army's Installation Restoration Program (IRP) for Active and Excess Installations has a goal to complete the cleanup of 1,080 installations by the end of FY14. Installation restoration is the Army's environmental program that addresses the cleanup of contaminated Army property from past practices. The installation restoration mission is to perform appropriate, cost-effective cleanup so that the property is safe for use and to protect human health as well as the environment. Currently, the Army has achieved 90 percent of the goal at a cost of \$4.9 billion.

Geologist Aaron Rosenboom checks the pressure of a solution to be injected into a monitoring well as environmental scientist Scott Rose operates the pump. Both work for Arcadis. U.S. Army photos by Gloria Jean Skillman.

The last 10 percent of that goal has been challenging. With cost-to-complete estimates increasing, schedules slipping and installations only achieving between 60-70 percent of their planned milestones, the Army realized that it needed to change its cleanup strategy to get the job done quickly and safely.

Cleanup Strategy Background

In 2002, Secretary of Defense Donald Rumsfeld approved Performance-Based Contracting (PBC) to provide financial incentives for contractors to develop and implement expedited and efficient solutions for meeting DOD goals and requirements. As a result, the Army identified PBC as a tool that could be incorporated into long-range plans for its environmental cleanup program and one that could assist in facilitating cost-effective and timely cleanup activities.

In April 2003, the Army introduced a new cleanup strategy and accompanying plan that combined restoration and compliance-related cleanup to create consistency and accountability across the entire IRP. One of nine strategy objectives is to support the development and use of cost-effective cleanup approaches and technologies to improve program efficiency.

The installation restoration mission is to perform appropriate, cost-effective cleanup so that the property is safe for use and to protect human health as well as the environment.

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The Army used PBC as the preferred method for cleaning contaminated sites to curtail schedule and cost overruns, decrease the number of contract overruns and get more money on the ground to do the actual cleanup. According to Janet Kim, the Army's PBC action officer, the fact that it is currently showing a 16-percent savings has been an added bonus. The Army's commitment to using PBC is also part of *The President's Management Agenda* and part of a larger governmentwide initiative including the *Federal Acquisition Streamlining Act of 1994* and the *Government Performance and Results Act of 1993*.

DOD has a goal of awarding 50 percent of its program dollars using performance-based work statements by

FY05. In FY03, the Army committed 9.6 percent of its IRP funds to PBCs and plans on meeting the 50-percent DOD goal by FY05. It has targeted awarding 80 percent of its program funding using PBC by FY07.

What is PBC?

In relation to environmental cleanup, PBC provides financial incentives for cleanup contractors to develop and implement an expedited and efficient approach to achieving environmental remediation goals at Army installations. Simply put, instead of detailing how a contractor will reach each cleanup project milestone in a request for proposal or statement of work, the government states the objectives and leaves it to the contractor to find effective and efficient ways to achieve them, while also maintaining an emphasis on worker safety and environmental protection. PBC characteristics include:

- Clearly defined performance expectations and measures.
- Clearly defined due dates and milestones.



Vials used for groundwater samples are collected at Fort Leavenworth, KS, for laboratory analysis. Volatile organic compounds are analyzed on a regular basis and the results help determine the effectiveness of the remediation.



Scott Rose, an environmental scientist with Arcadis, takes a low flow ground water sampling of a monitoring well at Fort Leavenworth before the remediation solution is added.

- Use of incentives for performance.
- Flexibility in exchange for accountability of results.
- Cost-effective approaches for both the contractor and the government.
- Contract guarantees, when required, that limit the risk the Army faces when unexpected conditions are encountered during remediation.

A Proven Approach

PBC is not a new approach in the private sector. PBC has been used by the Army at Base Realignment and Closure sites as well as in the commercial sector. Guaranteed Fixed Price Remediation (GFPR) is another PBC mechanism that allows the Army to buy environmental cleanups for a fixed price and at

a set schedule. In 2001, the environmental cleanup program at Fort Leavenworth was identified as a pilot GFPR program. According to Richard Wilms, Fort Leavenworth's restoration program manager, they made tremendous progress using GFPR. Of the nine environmental sites identified in the first contracting phase at Fort Leavenworth, four are near completion, three have a remedy in place and two are in an interim remedial action period.

GFPR was also piloted at Fort Gordon, GA. As a result, Fort Gordon expects site closure to occur no later than FY08 and, possibly, achieve closure ahead of that schedule. "Performance-based contracting makes the contractor part of the solution, rather than just an employee," said Fort Gordon Environmental and Natural Resources Management Office Chief Steve Willard.

In 2002, an informal Army study reported that 40 private sector sites using GFPR closed 45 percent earlier than they would have under more conventional methods. The reason — basing the contract on performance gives the company an incentive both to remain focused on a schedule and to use innovative technologies.

How the Process Works

It's important to note that the Army solicits feedback from key stakeholders, including federal and state regulatory agencies and the community, as part of the evaluation and procurement processes. By seeking stakeholder input early in the process, the Army can better define performance measures in the contracts. To ensure that the objectives a contractor must meet align with regulatory expectations, the Army, Environmental Protection Agency and state agencies dialogue to define what constitutes satisfactory project completion and closeout. The

framework for implementing the program is outlined in the figure below.

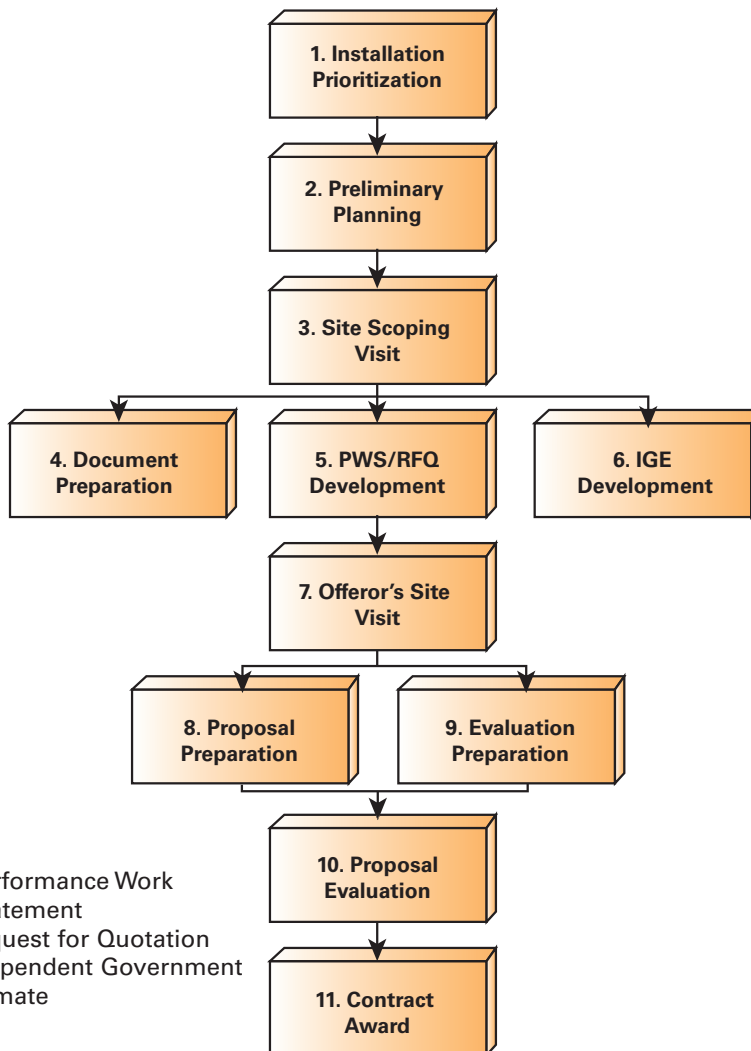
Based on an FY04 activity review, it appears to take at least 6 months from the initial installation site scoping visit and baseline evaluation until a PBC award can be made. However, depending on the installation's complexity and the contract's scope, that timeframe may increase. The bulk of FY04 procurements are being processed through the Army Contracting Agency at Fort Eustis, VA. Additionally, most FY04 contracts are being solicited using the *General Services Administration Schedule (GSA) 899 (Environmental Remediation Services)*.

What's Next?

Installation prioritization for FYs 04-05 was initiated in FY03. Baseline evaluations were recently completed for all FY04 candidates, and planning activities are underway for FY05 candidates. It is important to note that not all candidates evaluated are currently suited for PBC placement. In some cases, installations are continuing their cleanup efforts using existing contract mechanisms. In other cases, additional evaluations will be conducted to determine if future work can or should be done under a PBC framework.

During FY05, the Army's IRP will use multiple contract vehicles including contract suites available through

the U.S. Army Corps of Engineers, continued use of the *GSA 899 Schedule* and Indefinite Delivery/Indefinite Quantity contracts that are being procured through the Northern Region Contracting Center at Fort Eustis. The Army intends to build on past PBC successes and make improvements to the implementation process based on observations gathered along the way. To date, the Army's IRP has reported \$32.9 million in cost savings thanks to PBC. Also, the Army estimates an additional \$280 million in cost avoidance through FY09. Cost savings can be reinvested in the cleanup program to help get more dollars on the ground for actual land restoration. According to Kim, the cost savings to American taxpayers is important as long as the Army continues to be a sound environmental steward that provides healthy land for our Soldiers, their families and neighbors. For more information on PBC in the Army's IRP, including the FY 04-05 candidate installation locations, go to <http://aec.army.mil/usaec/cleanup/pbc00.html>, scroll down to **FY04 PBC Program** and click on **FY04/05 Installation List**.



Phases in Implementing PBC for Active Army Installations

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Army IT Training Now on e-Learning

Leslie York

COL Allen L. Green III, Commander, CECOM's Software Engineering Center (SEC)-Belvoir, is one of more than 145,000 Army soldiers and civilians who registered on AKO for more than 2 million e-Learning training courses.

E-Learning is now the Army's primary means of satisfying information technology (IT) training across the entire workforce. On Jan. 8, 2004, the Army directed all of its organizations and major commands to use the Army's e(electronic)-Learning Program as the primary method for satisfying their workforce IT requirements. Policy and waiver process information can be found on Army Knowledge Online (AKO) at <http://www.us.army.mil>; My Education; Army e-Learning Portal Page.

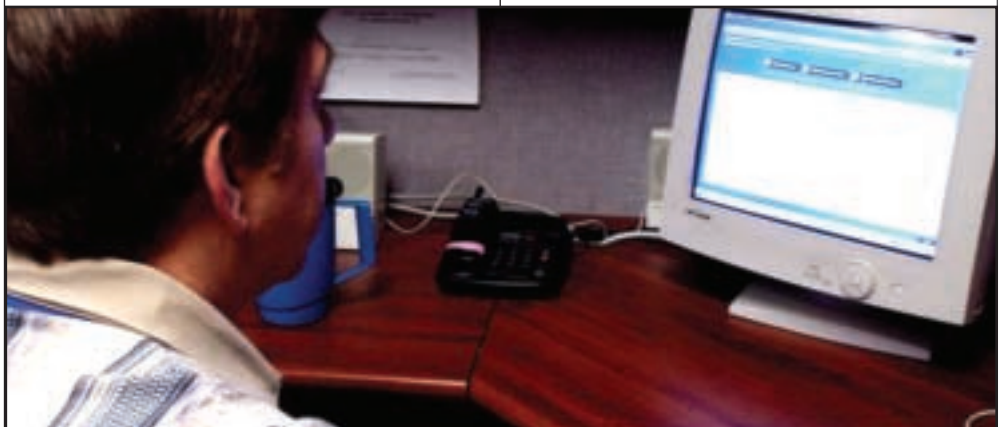
The Army has moved from computer-based training to an ever-expanding e-Learning technology environment. Today, every Active Duty Soldier, National Guardsman, Army Reservist and Army civilian employee can access a catalog of more than 1,500 IT, business, leadership and personal development courses online. E-Learning provides students with an entire range of learning tools including:

- State-of-the-art courses.
- Online subject-matter experts and mentors.
- Online meeting rooms and white boards.
- Chat rooms and threaded discussions with other students.
- A vast technical library of articles, white papers and recorded seminars conducted by the industry's leading experts.

In 1999, the Army Chief Information Officer and G-6 acknowledged that the Army's workforce training in IT was not keeping pace with rapid technology that changes in a matter of months, not years. The challenge — how to effectively and economically keep the entire workforce current with the changes that

impact an individual's workspace. In addition to rapidly changing technology, the diverse IT skills the Army needs cover the entire gamut of the IT spectrum.

The answer — use the latest state-of-the-art Web-based, online training technology that students can access anywhere, anytime. The Computer Based Training Initiative was started in 1999 and quickly proved to be a success. It's the best distance learning technology available and it's free for all Army members. You can receive anything from just-in-time training to in-depth, comprehensive education on any subject in the e-Learning catalog. Courses are self-paced and can be accessed through the AKO portal from the office, home



Army civilian Acquisition, Logistics and Technology Workforce members can receive CLPs for completing selected e-Learning courses. Here, Robert Smith, a computer scientist at CECOM SEC-Belvoir, works on an e-Learning course. U.S. Army photos by Susan Padgett, CECOM SEC-Belvoir.



MAJ Susan Pooler, CECOM SEC-Belvoir, takes advantage of e-Learning's online training environment to enhance her professional Army Acquisition Corps skills.

or just about anywhere the Internet is available. More than 145,000 Army soldiers and civilians have registered and more than 2 million courses have been accessed.

The Army has a contract with SkillSoft (formerly SmartForce) to provide the Army with this online e-Learning environment. SkillSoft has formed a partnership with many leading companies in the IT software industry, including Microsoft®, Cisco Systems Inc., Oracle® and IBM®. Together they develop courses and training courseware to prepare students for IT certification exams, using their product plans, software and source materials to ensure that the e-Learning courses meet or exceed the same technical content as the courses offered by the commercial company. More than 40 certification programs have evolved from this partnership, including Certified Information Systems Security Professional (CISSP), Avaya,

The Computer Based Training Initiative was started in 1999 and quickly proved to be a success. You can receive anything from just-in-time training to in-depth, comprehensive education on any subject in the e-Learning catalog. Courses are self-paced and can be accessed through the AKO portal from the office, home or just about anywhere the Internet is available.

A+, Network+, iNet+, Server+, IT Project+, Microsoft Certified Systems Engineer/Administrator/Application Developer/ Database Administrator (MCSE/MCSA/MCAD/MCDBA), Microsoft Office Specialist (MOUS), Certified Novell Engineer (CNE), Cisco and Oracle, just to name a few.

Besides the knowledge and skills you receive from taking online e-Learning courses, you also benefit from these advantages:

- The U.S. Army Human Resources Command Enlisted Promotions Branch says that promotion points can be awarded for military education completed on vendor-based e-Learning courses. Course completion with credit hours must be reflected in the Army Training Requirements and Resources Systems (ATRRS) prior to awarding promotion points. Promotion points are awarded

under the same guidelines as correspondence courses— 5 training hours = 1 promotion point. Information was published in the December 2003 *Cutoff Score Memorandum*.

- Army civilian acquisition workforce employees can receive Continuous Learning Points (CLPs) for these courses as well.
- The American Council on Education reviewed and made credit recommendation for 6 course modules. Procedures and forms can be found on AKO at the **My Education; e-Learning Portal Page**.
- Students can download an ATRRS transcript listing completed e-Learning courses from AKO at <http://www.us.army.mil>; **My Education; go to ATRRS Online**.

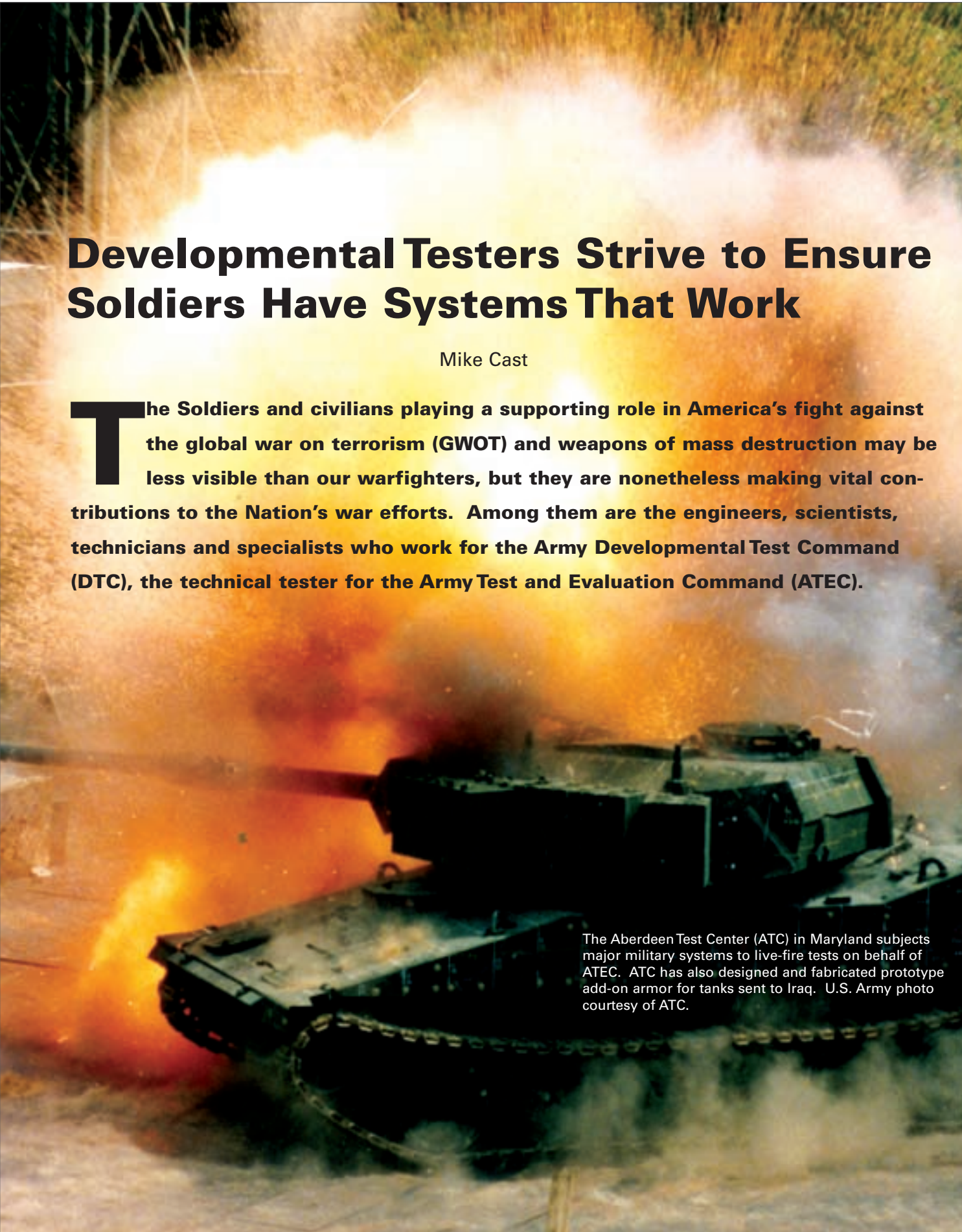
The Army encourages military retirees to continue their education so they can ensure a smooth transition to the civilian workforce. SkillSoft offers a reduced rate to Army retirees and contractors who work for the Army. More information can be obtained by e-mail from Army@SmartForce.com. Take advantage of this great opportunity and enroll in the Army e-Learning program today. Register by going to <http://usarmy.smartforce.com> and click on **Register**. If you need any additional information or assistance, contact the Army e-Learning Program Office at cbt.help@secbmail.belvoir.army.mil.

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Developmental Testers Strive to Ensure Soldiers Have Systems That Work

Mike Cast

The Soldiers and civilians playing a supporting role in America's fight against the global war on terrorism (GWOT) and weapons of mass destruction may be less visible than our warfighters, but they are nonetheless making vital contributions to the Nation's war efforts. Among them are the engineers, scientists, technicians and specialists who work for the Army Developmental Test Command (DTC), the technical tester for the Army Test and Evaluation Command (ATEC).



The Aberdeen Test Center (ATC) in Maryland subjects major military systems to live-fire tests on behalf of ATEC. ATC has also designed and fabricated prototype add-on armor for tanks sent to Iraq. U.S. Army photo courtesy of ATC.

To integrate developmental testing with the testing done in the field by Soldiers in operational environments, the Army stood up ATEC in Alexandria, VA, in October 1999. ATEC manages and synchronizes DTC's test programs and its other key test organization, the Operational Test Command. ATEC's third key subordinate organization is the Army Evaluation Center. The engineers and scientists from this center assist in test planning and analyze the data from testing to provide detailed reports to key Army decision makers.

Headquartered at Aberdeen Proving Ground (APG), MD, DTC oversees diverse test centers throughout the United States, enabling the command to subject military systems to rigorous testing in a full range of natural and man-made environments. DTC tests everything from new boots to the latest precision-guided weapons, and its testers work under all weather conditions to collect and record the accurate, impartial test data that Army evaluators need to analyze system performance.


Test support is not limited to the Army. DTC conducts tests for the DOD weapons and equipment designed for Joint-service use. DTC

test centers also provide technical support to other government agencies, including those responsible for homeland defense and law enforcement.

One of DTC's key missions is to verify the operational safety of military systems and document any concerns about the potential safety of items to be used by troops. Between October 2001 and April 2003, DTC issued safety confirmations to support the "urgent materiel release" of 43 systems in direct support of America's efforts. DTC test centers often had only a short time to complete their work to support and develop safety documentation.

A large percentage of DTC's budget is invested in developing and acquiring new test technologies, particularly technologies designed to simulate operational environments. Through investments in this

"Virtual Proving Ground" and other initiatives, DTC is helping Soldiers meet their current technology requirements while also preparing for testing needed to make Future Combat Systems a reality.



A Tomahawk cruise missile launches from USS Winston S. Churchill, operating in the eastern Mediterranean Sea in support of Operation Iraqi Freedom (OIF). U.S. Navy photo by Chief Firecontrolman James Krogman.

DTC Commander BG Marvin K. McNamara cited a recent effort, the testing of Stryker slat armor, for the first Stryker Brigade Combat Team deploying to Iraq.

“The command basically conducted an integrated Stryker developmental approach. During the last 18 months, our test centers have operated in a battle rhythm, working two 10-hour shifts a day, 6 days a week,” he explained. “When requested, testers have worked above and beyond that to support the Army’s effort to rapidly deploy the initial Stryker brigade in support of *OIF*.”

Aberdeen Test Center

Since World War I, the Army has tested weapon systems at APG. At APG, where the forerunner of today’s modern computer was once used to calculate firing tables, DTC’s ATC employs expert scientists, engineers and technicians to test major combat vehicle systems, munitions, small arms, uniform components, tents and vessels used by the Navy and Marine Corps. The M1A1 Abrams tank and Bradley Fighting Vehicle both underwent extensive developmental testing at ATC.

As the Army geared up for *OIF*, ATC provided a wide range of technical support that contributed substantially to the war effort, and ATC technical experts continue to support ongoing operations today.

When an Abrams tank armor vulnerability was discovered, ATC quickly designed, fabricated and tested prototype add-on armor. ATC’s team developed and fabricated an armor enhancement concept in only 7 days. The 3rd Infantry Division (3ID) found it needed to enhance the situational awareness (SA) and communications between tank commanders using the Force XXI Battle Command Brigade and Below (FBCB2) communications system. The Blue Force Tracker — a satellite-based FBCB2 system — was added to 3ID tanks to meet this need. ATC extensively tested the system to ensure it would not be adversely impacted by electromagnetic interference while also certifying the equipment’s safe operation. ATC conducted electromagnetic interference testing of additional radios placed in a 1st Armored Division (1AD)

brigade commander’s M1A1 command track. ATC technicians traveled to Germany to help modify the commander’s tank. Other 1AD brigade commanders would use vehicles outfitted with similar equipment.

The Army’s System Enhancement Package for the Abrams M1A2 tank included new software for the tank’s nuclear, biological and chemical protection system. Software improvements to FBCB2 databases and maps of Iraq were included in the package, tailored to the 4th Infantry Division’s (4ID’s) and 1st Cavalry Division’s mission-specific needs. ATC also tested and certified this software for field use.

ATC received a contract to fabricate 16 containers used to transport spare vehicle power packs around the world. Its welding and machine shop copied the designs of existing containers, ordered the needed materials and quickly began fabricating the containers when the materials arrived.



A Wolverine launcher performs a launch and retrieval exercise after maintenance services at Camp Boom, Baquba, Iraq. Photo by Ronny Anthony, Field Service Representative for General Dynamics Land Systems.

ATC’s Support Equipment Team tested the Improved Ribbon Bridge, which was de-

ployed with military units in February 2003 to support *OIF* operational maneuver. The team also tested the Dry Support and Wolverine bridges for deploying across gullies and low spots in the Iraqi desert.

White Sands Testing

The Tularosa Basin in New Mexico, a vast tract of land surrounding White Sands National Monument, is home to DTC’s White Sands Missile Range (WSMR). The range has a long history of conducting missile and rocket tests for the Army, DOD, U.S. allied forces and even NASA. In preparation for recent military operations, White Sands tested an array of critical systems including the Multiple Launch Rocket System (MLRS), the PATRIOT Advanced Capability-3 (PAC-3) missile, Joint Direct Attack Munitions and Army Tactical Missile System.

“White Sands has made a tremendous contribution toward fighting the war on terrorism, war in general and homeland security,” said BG William Engel, a former WSMR commander. “The credit for that has to go to the 3,500 civilian



DTC's WSMR tested munitions and missiles used in *OIF*, including the PAC-3 missile. Photo courtesy of WSMR.

and contractor employees who work every day out here on the range. The workforce has performed magnificently, and people should know that.”

The PATRIOT missile's improved effectiveness since the Gulf War in 1991 is due in large part to testing that took place at WSMR. Some tests involved the simultaneous launch of multiple missiles and targets, a technically complex feat that WSMR technicians accomplished in coordination with numerous participating organizations and local authorities.

The Navy's Tomahawk cruise missile, first launched from Navy vessels offshore during the 1991 Gulf War, has been aggressively tested at WSMR. Many Navy weapon systems have been launched from the “USS Desert Ship,” a totally land-based missile-launch facility at WSMR that resembles a real ship.

White Sands has even used Scud missiles in tests, enabling U.S. military planners to clearly understand the Scud threat. Testers continually worked on improving missile detection and delivery systems, giving U.S. forces an overwhelming missile-defense edge over Iraq.

In the GWOT, White Sands' Aerial Cable Range, the largest unsupported cable span in the world, was used to test an air-defense system that would enable large aircraft to detect and avoid attacks from shoulder-launched missiles. Suspended between two mountain peaks, the cable provides a path for target vehicles that can weigh up to 20,000 pounds. It is used to test bombs, sensors, missiles, prototype aircraft, electronic equipment and munitions smaller than missiles.

The U.S. Army Training and Doctrine Command has used White Sands test facilities to conduct computer modeling and simulation for disaster control. Likewise, the Defense Threat Reduction Agency has used facilities there to test bunkers against car and truck bombs.

Testing at Redstone

Redstone Arsenal, AL, is home to DTC's Redstone Technical Test Center (RTTC), which has the expertise and technical capabilities to test a wide variety of missiles — including the Javelin and Hellfire — both used during *OIF*. RTTC tested two Hellfire versions for use on the Predator unmanned aerial vehicle. The launchers for this missile were also tested at RTTC and modified to fix a launch mechanism problem.

During range training, a Hellfire missile went off-course, prompting the Army to require larger danger zones for Hellfire missile firing. RTTC modeling, simulation and testing determined the errant missile's root cause. Follow-on testing resulted in approval to use the missile at other training ranges, with some restrictions.

RTTC also conducted product-assurance testing of repair parts for missiles. About 10 percent of the parts tested in 2003 were in the “war-expedite” category. Although RTTC testers generally test some items designated as critical, the war in Iraq caused a surge in expedited testing.

RTTC also conducted electromagnetic effects testing on Blue Force Tracking for UH-60, CH-47 and AH-64 helicopters, enabling these types of aircraft to be declared airworthy and deploy to the Iraq theater of operations. U.S. aviators benefited from real-time SA by tracking the location of friendly forces despite blowing sands and blackout conditions.

RTTC also deployed surveillance vans to Kuwait to check performance parameters on Stinger, Javelin, Hellfire and MLRS missiles. This was required to assess stockpile

readiness, while returning some missiles to the Army's inventory and removing others.

RTTC testers also conducted essential testing to deploy the Army Airborne Command and Control System for *OIF*. In May 2003, they completed safety-of-flight and electromagnetic compatibility testing on system components. The test schedule was compressed by a year to meet Army operational requirements. During testing, several problems were pinpointed and redesign efforts initiated. As a result, two prototype systems were available for use in Iraq. RTTC has conducted additional airworthiness testing on the system, and full system qualification testing will continue throughout FY04.

Electronic Testing

DTC's Electronic Proving Ground (EPG) at Fort Huachuca, AZ, is the Army's test center for command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR). EPG plays a crucial role in military operations by rigorously testing systems that will enable U.S. forces to dominate the electromagnetic spectrum.

During the first quarter of FY03, EPG was tasked to provide support to soldiers deployed to Camp Doha, Kuwait. To support the mission, EPG engineers developed compatible C4I networks using systems already in Kuwait as well as newly deployed C4I systems. These modifications required extensive work in an EPG laboratory during a compressed testing period.

EPG was asked to support the 4ID at Fort Hood, TX, before the unit deployed. EPG's Fabrication Facility at Fort Hood overhauled several tactical operation centers for 4ID, meeting the division commander's specifications before the unit deployed. Two technicians from this facility were sent to Iraq to provide technical assistance on location once the division deployed.

A large percentage of DTC's budget is invested in developing and acquiring new test technologies, particularly technologies designed to simulate operational environments.

EPG testers completed electromagnetic compatibility safety checks on the Bradley Command-on-the-Move vehicle at Yuma Proving Ground (YPG), AZ, in January 2003 and at Fort Hood in March 2003. Testers also completed intra-system electromagnetic compatibility and safety tests on Bradley Fighting Vehicles at Yuma and Fort Hood. These short-suspense evaluations were needed for safety releases on vehicles that had already deployed.

EPG played a role in the final customer test for the semi-active laser Brilliant Antitank Munitions in February 2003.

Earlier tests revealed deficiencies with a laser system component.

YPG also supported missile system safety checks in March 2003 and software development for an 11th Signal Brigade communication network.

Testing at Dugway

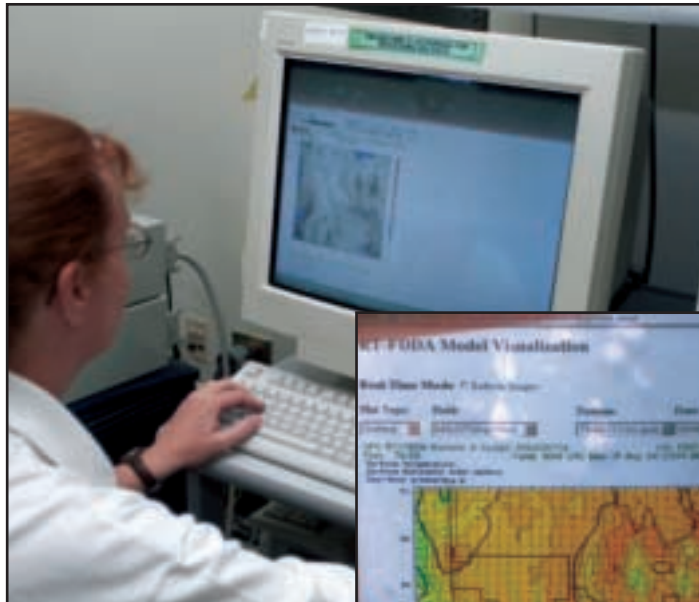
The West Desert Test Center at Dugway Proving Ground (DPG), UT, tests chemical and biological protective systems for the Army and its sister services. The rigorous testing at DPG ensured that U.S. Forces in Iraq and elsewhere would have the best chemical and biological protection available.

Concerned about troop safety, the U.S. Central Command issued an "urgent need statement" for a new decontaminant to replace one that was already fielded. DOD began testing at DPG to determine if a foam product developed by Sandia National Laboratory could serve as an effective replacement. In November and December 2002, DPG testers used chemical warfare agents and a biological warfare agent simulant to challenge the replacement decontaminant's effectiveness. DPG also tested protective clothing to determine if new decontaminants would affect its performance.



Soldiers from B Company, 1st Squadron, 4th Cavalry Regiment, Schweinfurt, GE, provide security in their M1A1 Abrams Main Battle Tank at a remote location during a training exercise, March 23, 2004. U.S. Army photo by PV2 Brandi Marshall.

The Marine Corps Systems Command (MARCORSYS-COM) was concerned that a new decontamination system might hinder the detection capabilities of fielded chemical agent detectors. The MARCORSYS-COM Program Manager (PM) for Nuclear, Biological and Chemical Defense expressed an “urgent operational requirement” for an interim chemical and biological agent decontaminant. DPG conducted a series of tests to evaluate this decontaminant’s use in conjunction with several chemical and biological detectors and chemical warfare agents.



Above, DPG Chief Forecaster Susan Krippner analyzes a Four-Dimensional Weather System computer model. At right, a Real-Time Four-Dimensional Simulation Model Visualization. U.S. Army photos by Al Vogel.

As *OIF* offensive operations began, a test program — the Joint Service Additional

Source Qualification — was underway at DPG to determine alternate production sources for materiel used in chemical protective suits. Manufacturers provided new suits, and DPG conducted stringent tests to determine their effectiveness.

More recently, DPG technicians were asked to verify the performance of drink tubing in protective systems used by troops. Testers exposed the tubing to nitric acid and then chemical warfare agents to determine if it still offered full protection after exposure to corrosive materials.

DPG specialists have also provided a variety of technical support to government and law enforcement agencies to bolster America’s homeland defense. The Army National Guard’s Weapons of Mass Destruction Civil Support Teams are trained to assist local authorities in the event of an attack. DPG has provided these teams a training base for the last several years.

DPG’s Meteorology Division has been testing a new component of its Four-Dimensional Weather System — a capability called Global Meteorology on Demand (GMOD). GMOD employs a weather model developed jointly by

Pennsylvania State University and the National Center for Atmospheric Research to provide forecasts anywhere in the world on short notice. For troops in Iraq, the GMOD system yielded high-resolution analyses of current conditions and 24-hour forecasts updated every 3 hours. The output included information used by the Defense Threat Reduction Agency to predict and assess potential hazards.

Arizona Desert Testing

YPG, home to the Yuma Test Center, tests systems in harsh desert climates. Technicians at YPG are heavily involved in a variety of tests to support U.S. military operations in Iraq.

Before newly manufactured ammunition is shipped to troops, samples are tested at YPG’s

firing ranges. YPG tested the XM983 and the XM930 120mm infrared illuminating cartridges and expedited a recommendation for a safety confirmation to support the “full materiel release” of the XM983. Days before the start of the actual ground war in Iraq, YPG testers conducted a rapid-turnaround lot-acceptance test of these projectiles, working around the clock to get the testing done. They also expedited the safety confirmation recommendation for the XM930 cartridge.

YPG also tested the Hellfire missile for Apache attack helicopters. The tests were completed in less than 7 hours on the same day YPG was contacted for support. Within another 4 hours, the tests prompted enhancements to Apache helicopters already deployed to the theater of operations.

YPG testers also assisted the U.S. Marine Corps (USMC). YPG technicians tested the M198 towed howitzer to identify problems occurring during high-zone elevation firing. YPG test results helped the PM fix the problem on the same day as the testing.

YPG is also an excellent training facility. Dozens of Special Forces (SF) units use its rugged desert terrain to train for military operations in similar topographies and climates. The U.S. Special Operations Command's Military Freefall School at YPG trains students from all services in advanced free-fall parachuting techniques. Many of the Army's SF troops have received this specialized training and put their skills to the test in numerous challenging environments overseas. Likewise, USMC engineers used a Colorado River training site at YPG to prepare for combat bridge building across rivers in Iraq.

Army Aviation Testing

While U.S. ground forces slugged it out with their Iraqi foes, Army aviation gave our Soldiers a decisive battlefield edge. The Aviation Technical Test Center (ATTC) at Fort Rucker, AL, is DTC's technical tester for aircraft and aviation systems. ATTC manages a "lead-the-fleet" program to confirm the safety of aircraft already in the Army's inventory and the safety of any equipment upgrades.

"That others may live," pararescue men from the 38th Rescue Squadron, Moody Air Force Base (AFB), GA, and the 58th Rescue Squadron, Nellis AFB, NV, jump from a C-130 for a high altitude low opening free-fall drop from 12,999 feet on Feb. 28, 2003, in support of *Operation Enduring Freedom*. Pararescue's mission is the recovery of downed aircrew members and/or isolated personnel. U.S. Air Force photo by SRA Tammy L. Grider.

The PATRIOT missile's improved effectiveness since the Gulf War in 1991 is due in large part to testing that took place at WSMR.

To ensure friendly force battlefield safety, the Army tested integrating the Grenadier Beyond-Line-of-Sight Reporting and Targeting System with the Blue Force Tracking System in UH-60A/L helicopters. ATTC testers supported material release by gathering data needed to confirm this system's safety. ATTC also conducted safety testing on the UH-60A/L with the Airborne Agent Detection System installed and issued a recommendation for safety confirmation.

Further, ATTC tested a targeting and navigation system for an AH-64A Apache attack helicopter that was equipped with the Embedded Global Positioning System, Inertial Navigation System. The test team conducted tests with differing configurations of navigation enhancements to demonstrate the attack helicopter's performance.

ATTC pilots tested AH-64D's handling qualities under instrument meteorological conditions — weather that requires the use of instruments because of reduced visibility. They also tested the AH-64D's handling when flying by instrument flight rules under weather-reduced visibility.

Other AH-64D tests included the new internal auxiliary fuel system's form, fit and function and the compatibility of an external 230-gallon auxiliary fuel tank with the new fuel system. ATTC testers assessed the safety of the system so it

could be fielded. In addition, the test team conducted preliminary airworthiness evaluations on the CD-12 aircraft designed for foreign counterintelligence. The test collected data on the aircraft's handling qualities and was used to complete a limited performance validation to substantiate the aircraft's airworthiness — steps needed to recommend a safety confirmation before the CD-12 can be fielded.

Employees Deploy

To support U.S. military operations overseas and homeland defense stateside, 19 DTC employees have been activated for service in U.S. Army Reserve or Army National Guard units. Additionally, four DTC civilian employees have deployed to assist with military operations overseas.

McNamara summed it up by giving credit to soldiers and civilians alike. "Heroes of the war come in many forms. There are those risking their lives on point for our Nation and those saving the lives of Soldiers by executing quick-turnaround testing activities," he remarked. "DTC had numerous heroes who significantly contributed to preserving the lives of our Soldiers, Sailors, Airmen and Marines. DTC heroes adapted a 24/7 selfless mindset to ensure our Soldiers had the best possible capabilities," McNamara concluded.

For more information about DTC test programs and capabilities, go to www.dtc.army.mil.

The rigorous testing at DPG ensured that U.S. forces in Iraq and elsewhere would have the best chemical and biological protection available.

MIKE CAST is a Public Affairs Specialist with the Army DTC at APG. He has a B.A. in journalism from Arizona State University. For more than 20 years, Cast has held various Army positions in writing, editing and photography.



Experiencing Life as a Soldier

Rock D. Woodstock

The Natick Soldier Center (NSC) Greening Program initially involved only Soldier Systems Center employees but has since expanded its reach to U.S. Army Tank-automotive and Armaments Command (TACOM), the Edgewood Chemical Biological Center and other elements within the U.S. Army Research, Development and Engineering Command (RDECOM). This article profiles the author's program experience at Fort Riley, KS, earlier this year.





Greening team at Fort Riley (from left): Karen Hackett, Merlin Osborn, Jeff Robertson, SFC Sam Newland, Rock Woodstock and Van Lopez.

We then went to dinner, where he answered our questions and got to know our group a little better. He said that while our job was to learn the host unit's mission, our presence gave the unit the opportunity to experience operations with embedded civilian noncombatants.

Sunday morning brought wind, snow and colder temperatures. Our group went to the 1st Battalion, 41st Infantry Brigade (1st Bn., 41st Inf. Bde.) headquarters. Newland led us into the auditorium at battalion headquarters and issued each person a large canvas bag, backpack with frame

As a contracting officer with TACOM-Rock Island (RI), IL, I receive many e-mail messages during the course of a normal business day. Most messages deal with routine contracting issues, but one message really caught my attention. It sought applicants for something called the "TACOM Greening Program."

Sponsored by the TACOM Learning Center and executed by NSC's Operational Forces Interface Group (OFIG) (see sidebar on Page 48), the TACOM Greening Program offers selected individuals the opportunity to travel to Fort Riley to observe an Army unit training in the field. Personnel applying for the program must provide a short personal biography and a brief, written statement about why they want to participate and what they hope to learn from their experience. Applicants must also be able to march 3 miles carrying a 60-pound pack.

A few weeks after I submitted my application, four other TACOM employees and I were selected to participate as embedded observers in a mechanized infantry battalion conducting live-fire exercises Jan. 26-30, 2004. OFIG would provide all the personal field equipment we would need — the same battle-tested gear

used by today's Army worldwide. The NSC also provided two noncommissioned officers (NCOs) to prepare us for the field and guide us through our "greening" experience. Our initial contact was Greening Program Noncommissioned Officer-in-Charge SFC Sam Newland.

My fellow participants were Karen Hackett, Chemical Defensive Equipment Specialist; Van Lopez, Bradley Vehicle Fleet Technical Writer; Merlin Osborn, TACOM-RI Range Target Specialist; and Jeff Robertson, Anniston Army Depot Engineer.

Gearing Up

Newland greeted us after we landed at the Manhattan, KS, airport. The jump wings on his chest and Ranger tab on his shoulder indicated that he was well-versed in combat operations and gave us the impression we were in very capable hands. After arriving at Fort Riley, Newland explained the next few days' events.

We were to engage and destroy the enemy. On contact, we expected the enemy would disengage from the fight because of our technical superiority. Intelligence estimates indicated we could expect the enemy to use chemical weapons if the battle turned against them.

and a pair of the heaviest boots I had ever seen. We opened our bags and spread ponchos on the floor. We then placed the bag's contents on the poncho and conducted an equipment inventory to accept responsibility for the Army property we would use for the next week. The bag contained uniforms, extreme weather clothing and accessories, a helmet, sleeping bag and body armor. Newland answered our questions and guided us through the process of converting the "one-size-fits-most" equipment into gear correctly sized for each participant. Then we put our body armor on, loaded the remaining equipment into our backpacks and "rucked up" for the first time. Between

the bulletproof vest and the pack, the total load weighed about 60 pounds. I felt like a slow-moving target as I lumbered out of the building carrying my heavy personal equipment load.

The vehicle crew removed the tarp covering the turret. All uncovered surfaces of the Bradley Fighting Vehicles (BFVs) were glazed by the ice storm that struck central Kansas the day before. U.S. Army photos by Rock D. Woodstock.



Show and Tell

Our group reassembled at 5:30 a.m. the next day, but our departure was delayed because of an ice storm that passed through the area the previous night. The delay gave us a chance to play cards and enjoy a Meal, Ready-to-Eat (MRE) for lunch. Some MREs are tasty — some are not. Most Soldiers have preferences and often barter meal components to customize diets to their personal tastes.

Eventually, two companies from our host battalion assembled and we departed for the training facility. After arriving, our group settled into large open-bay barracks and met with our assigned infantry squads. The Soldiers introduced themselves, identified their assignments and demonstrated their weapons functions. Assault rifles and

Even with our ear protection on inside the BFV, the 25mm Bushmaster sounded like a sledgehammer was pounding against the side of the vehicle hull. The pounding indicated that our gunner was engaging enemy targets.

machine guns are the tools of their trade, and they appeared very knowledgeable and extremely confident in themselves and their missions. Each Soldier took great pride in demonstrating the gear's special features and allowed our group to try on and get familiar with the equipment. The combination of night vision goggles and infrared lasers was very impressive.

Gunnery

After dinner, the senior NCOs conducted a briefing covering our training exercise objectives. My squad was assigned the task of heading the assault to protect the flank during the main attack. We were to engage and destroy the enemy. On contact, we expected the enemy would disengage from the fight because of our technical superiority. If necessary, we were to pursue and deny the enemy

the use of a nearby village to regroup and reorganize. Intelligence estimates indicated we could expect the enemy to use chemical weapons if the battle turned against them.

The following day dawned with clear skies and a brisk wind that put our extreme weather gear to the test. The Extreme Cold Weather System garments were very effective and proved invaluable during our training at the Fort Riley range. The actual live-fire exercise was conducted during both daylight and nighttime hours. As a safety precaution, our group only took part in the daytime operations and watched the night-fire exercises from the range control tower. Every Soldier we talked to was impressed with the 25mm Bushmaster cannon and how effective it was in urban warfare.

Throughout our visit, we explained our role as support and provisioning civilians. We discussed TACOM's mission and the equipment development and fielding process. We also listened to and noted individual Soldier

concerns and issues regarding equipment design, configuration and condition. We examined the vehicles and personal weapons being used by the 1st Bn, 41st Inf. Bde. and noted a wide disparity in the condition and configuration of equipment in fielded units. The close interaction with the host unit gave our team the chance to identify new or unmet equipment requirements.

Information Exchange

Newland and OFIG Enlisted Liaison SSG Raul Lopez documented individual equipment issues for discussion back at NSC. The host unit welcomed the chance to discuss these issues. Our team also used Soldier discussions to promote Web-based TACOM support available to Army customers. This line of communication is limited because not all Soldiers have laptop computers and many only have limited access to command-sponsored computer centers. We established new lines of communication through the Army Knowledge Online Internet-based threaded discussion forum to follow up on issues identified during our discussions.

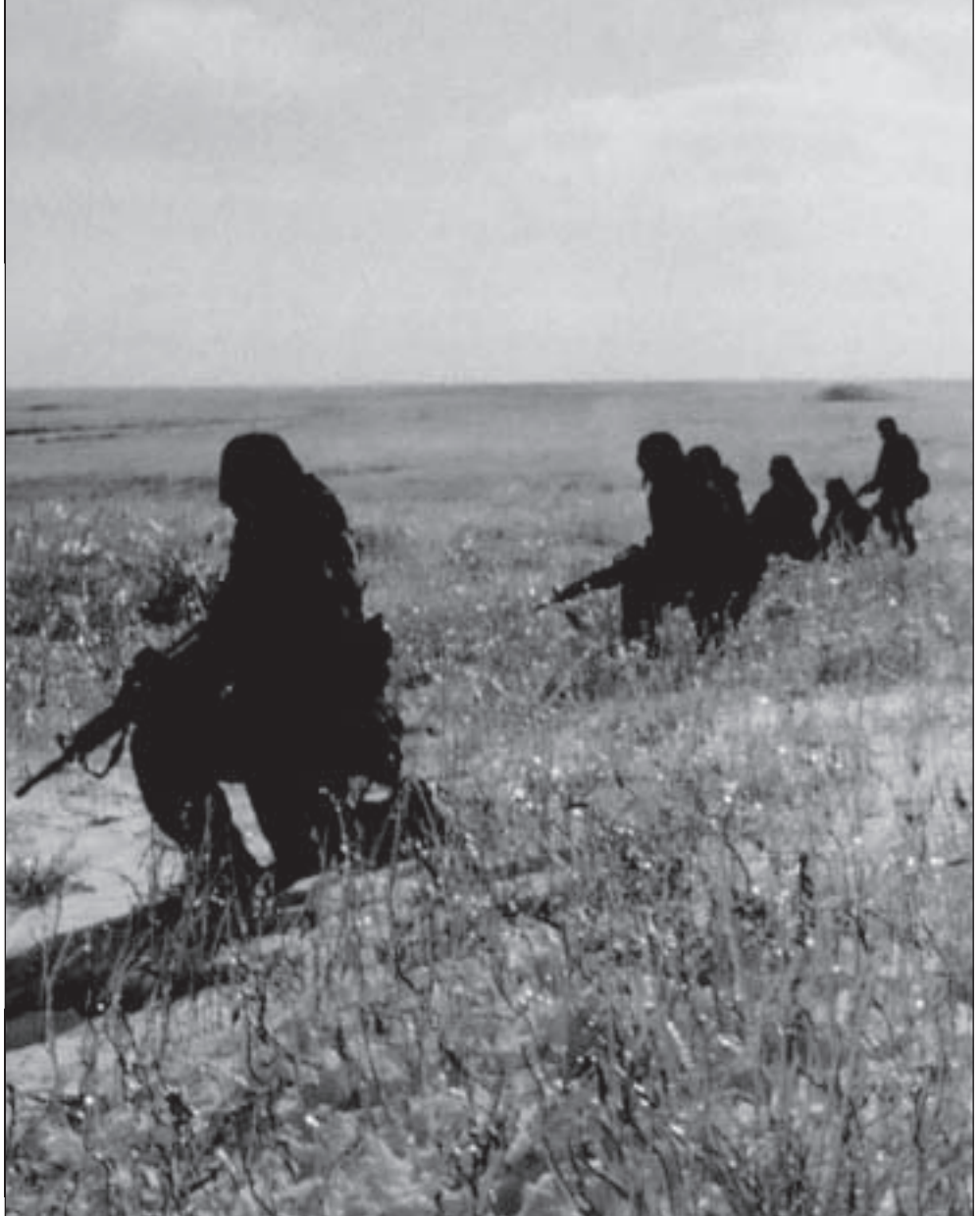
After a good night's rest, and a remarkably satisfying breakfast at the field dining facility, my squad gathered its equipment, loaded into a BFV and drove to the range for the daytime live-fire exercise. Even with our ear protection on inside the BFV, the 25mm Bushmaster sounded like a sledgehammer was pounding against the side of the vehicle hull. The pounding indicated that our gunner was engaging enemy targets. Our assault was coordinated with the other squads as we alternately advanced and provided cover for other units.

We arrived at the village — a target complex identified by hay bales and mock ruins — and engaged the enemy.

The following morning, we thanked our hosts for the experience of a lifetime and returned to our rooms on post. After washing and sorting our personal equipment, we returned the loaned gear to Lopez and reverted back to our civilian alter egos. Fantasy camp was over, but what an experience it was!

ROCK D. WOODSTOCK is a Contract Specialist/Contracting Officer assigned to the Heavy/Light Combat Contracting Group at TACOM-RI. He earned a B.A. in economics from the University of Connecticut. He is a 20-year federal service veteran with more than 16 years in the contracting career field. In addition, he is Level III certified in contracting.

Another squad of the 1st Bn., 41st Inf. Bde. awaits orders to attack on the right flank. Greening team member Jeff Robertson is seen at far right, shadowing his assigned squad leader.



Operational Forces Interface Group (OFIG)

To obtain customer feedback, NSC uses the OFIG team to provide myriad advantages and services to the center. First and foremost, the OFIG team has an understanding of our Armed Force's needs and the ability to "talk its language," enabling them to gain the respect and understanding of the military personnel NSC supports. This understanding is gained through OFIG's having actual military experience and extensive interaction with military personnel and units. OFIG's two Active Component NCOs round out and complement this organizational team's structure.

OFIG responsibilities include the following:

- NSC point of contact (POC) for the coordination of installation visits.
- Field evaluations.
- Technical exhibits.
- Command overview briefings.
- Liaison activities.
- Providing NSC Quick Reaction Teams (QRTs) worldwide.

QRTs can be specifically structured to fit mission needs, but normally consist of engineering psychologists (responsible for developing questionnaires, conducting interviews, collecting and analyzing data and preparing OFIG reports) and project officers/engineers. An OFIG representative acts as the single POC and leads these teams. To learn more about OFIG's capabilities and programs, e-mail them at ofig@natick.army.mil.

For more information about the TACOM Greening Program and other NSC programs, go to <http://www.natick.army.mil/soldier/ofig/content.htm>. The Greening Program is one of several RDECOM programs that provide project officers, scientists and engineers field experience and an opportunity to interface directly with Soldiers. These civilians take the experiences from "A Day in the Life of a Soldier" back to their laboratories and centers, incorporating that experience into the research and development of the materiel and weapons our Soldiers use. Ultimately, this experiential process and interaction provides improved equipment for our troops.



After debarking from their BFVs, both squads approach a rally point in file formation at a full run.

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How are we doing?

A *Army AL&T* Magazine's goal is to publish articles of interest and value to its readers. To determine how we're doing, we would like your responses to the following questions. This survey's purpose is to acquire as much information as possible so that we can continue providing our readers with an informative and useful magazine. Knowing what our readers want will enable us to better tailor the magazine's content, look and feel to the professional needs of the Acquisition, Logistics & Technology Workforce.

We value your feedback, so please take a few minutes to complete and then return this survey. Your responses will be kept completely confidential. We will share our findings in the September-October 2004 edition. Please return your completed survey by **July 11, 2004**.

Thanks in advance for your timely participation!

Army AL&T Magazine Staff



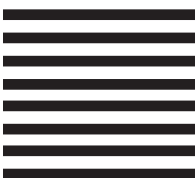
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May-June 2004 Readership Survey

Indicate your answer by circling the applicable response.

1. **Army AL&T** Magazine is published six times annually. During the past year, about how many issues of the magazine have you read?

All
Most
A Few
None
If none, why? _____

2. How useful is **Army AL&T** Magazine in keeping you informed about matters related to the acquisition, logistics, contracting and technology career fields?

Very Useful
Sometimes Useful
Seldom Useful
Not At All Useful

3. When you read **Army AL&T** Magazine, which features/sections do you prefer? (Circle all that apply.)

Cover Story
Feature Articles
From the Army Acquisition Executive
From the Acquisition Support Center Director
AHRC Notes (Army Human Resources Command)
News Briefs
Worth Reading (book reviews)
Conference Information
Contracting Community Highlights
DAR Council Corner
Did You Know?

4. Overall, how would you rate the subject matter in **Army AL&T** Magazine articles?

Excellent
Good
Fair
Poor
I do not read this magazine on a regular basis.

5. Do you prefer the longer feature articles or the shorter news-type articles?

Long Articles
Short Articles
Both Styles

6. **Army AL&T** Magazine was recently reformatted beginning with its September-October 2003 issue. How do you rate the following items?

	Like New Design		Do Not Like New Design	
a) General appearance	5	4	3	2 1
b) Page layout	5	4	3	2 1
c) Charts and graphs	5	4	3	2 1
d) Photos/captions	5	4	3	2 1
e) Addition of color pages	5	4	3	2 1
f) Addition of new sections	5	4	3	2 1

7. Do you go online to read articles featured in **Army AL&T** Magazine (<http://asc.army.mil/pubs/alt/>)?

Yes. If so, how frequently? _____
No.
I did not know articles could be found online.

8. Which other Defense/Army publications do you regularly read? (Circle all that apply.)

Army (The Magazine of the Association of the United States Army)
Defense AT&L (formerly *Program Manager*)
RDECOM Magazine (online only)
Corps of Engineer Publications
Signal Magazine
Quartermaster Professional Bulletin
Army Logistician
Soldiers Magazine
Other Branch Journals: (Please list.)

9. What articles or information would you like to see in future issues of **Army AL&T** Magazine?

10. Other comments/suggestions about the publication:

Thank you for your participation!
Army AL&T Magazine Staff

The Rebirth of a Magazine

Just like product development, magazines go through life cycles and *Army AL&T* is no exception. Ideas are discussed, plans are outlined and processes are implemented leading to new product execution and, hopefully, better results. Such is the story for this magazine, the flagship publication for the Army's research, development and acquisition community for the past 37 years. Although we've gone through several metamorphoses over this period — *RD&A Bulletin* to *RD&A Magazine* to *Army AL&T Magazine* — we've never lost our editorial focus of providing top-notch articles, news and information designed to inform, educate, challenge and reward readers who take the time to peruse our pages.

Although our mission hasn't changed much, the operating environment we all live in has. We know you're busier than ever before trying to juggle administrative, operational and management responsibilities in a "do more with less" environment often fraught with considerable risk and significant resource constraints. We also realize that we're competing with all forms of other media clamoring for your attention. That's why the Editorial Staff at *Army AL&T Magazine* is trying to cut through the communication clutter to give you the information you need most in an easily digestible format. To that end, we've had to take a hard look at what we do and how we're doing it. That's where you — the Reader — come in, and we need your help!

This issue contains a pullout **Readership Survey** that will take just a few moments of your time to complete. We'd love for you to tell us what we're doing right, but also what we could be doing better. As you can see from the last four issues delivered to your doorstep or desktop, we've completely reformatted the magazine, adding new sections and columns as we went to ensure we're reaching out and touching the entire Acquisition, Logistics and Technology Workforce. Our redesign goals were simple — transform *Army AL&T Magazine* into an eagerly awaited, well-read publication that takes advantage of new media design technologies,



adds value for our readers and is positioned for future growth as a leading DOD acquisition publication.

If there are articles or informational categories we're not covering to your satisfaction, here's your opportunity to tell us so. If you like what you see and want more of it, then tell us that too. The bottom line:

we're here to serve you by providing cutting-edge stories, information and commentary. The **Readership Survey** can be completed any one of three ways by following the simple instructions below:

- Detach survey, complete in ink, fold, tape closed and mail using the handy self-mailer.
- Detach survey, complete in ink and then fax back to us at (703) 704-0135.
- Complete survey electronically by typing this Web address into your browser: <http://asc.army.mil/go/altsurvey>.

Thank you for your time and continued support!

Michael I. Roddin
Editor-in-Chief

From the Acquisition Support Center Director



What have I done for the Soldier today?

The newspaper, *Investor's Business Daily*®, recently featured an article titled "10 Secrets to Success." These tips are something we espouse at the U.S. Army Acquisition Support Center (ASC) on a daily basis, and I'd like to share them with our readers so everyone can put them into practice in their own personal and professional lives. These tips are attributable to "all walks of life" and are common traits that all leaders have in common. I know most of you exemplify these traits in your daily lives now, but sometimes it pays to reflect on what we do and how we do it so we can refocus, as necessary, our time and energies for the good of the Soldiers we support.

1. **How you think is everything.** Always be positive. Think success, not failure. Stinking thinking leads to negative energy, which detracts from your ability to do your duty in moving programs or processes forward. You are responsible for your own attitudes, actions and behaviors. Put your best foot forward and let your conscience be your guide. Likewise, fulfill your moral obligations to the best of your ability each and every day. Ultimately, duty requires a willingness to accept full responsibility for your actions and your performance. Positive energy will make that happen each and every time!
2. **Decide on your true dreams and goals.** Write down your specific goals and develop an action plan to reach them. Whether it's short-term — today, this week or next month — or longer in scope — next quarter, the coming year or 5 years from now — if you don't record your goals in a simple check list or compile them into an individual development plan, you won't truly commit yourself to achieving those tasks because other priorities will constantly demand your attention. Goals such as obtaining the necessary level of certification, continuous learning points or volunteering to take on an additional duty to gain more hands-on experience are all important objectives that will help you grow as an individual but, ultimately, will help you better support your customers — our Soldiers.

3. **Take action. Goals are nothing without action.** Don't be afraid to get started. As writer and political/social activist Ayn Rand once said, "Throughout the centuries there were men who took the first steps down new roads armed with nothing but their own vision." Doing nothing maintains the status quo. Doing something leads to new discoveries, critical breakthroughs and better procedures. Take a chance! In more contemporary parlance made famous by Nike® advertising — "Just do it." You'll discover that honest mistakes lead to discovery and discovery leads to newer, more innovative ways of doing things.
4. **Never stop learning.** Go back to school or read books. Get training and acquire new and different skills to better guarantee your personal and professional success. Don't let a lack of knowledge or experience be a "success stopper." There is a wealth of knowledge to be gained online through e-Learning (see related article on Page 34 for more information), being mentored or mentoring or simply volunteering outside your "comfort zone" for experiential assignments. As former President Ronald Reagan said, "The real key to success is within yourself. No one can give it to you or take it away from you. You hold your destiny in your hands."
5. **Be persistent and work hard.** Success is a marathon, not a sprint. Never give up — prepare yourself for the long run. The Nation is at war and our Army is transforming. Likewise, the Army Acquisition Corps is transforming to better meet the Army's, combatant commanders' and Soldiers' needs. Obviously, these issues won't be resolved overnight. In fact, we don't know what the end state will be or when it will come. So dedicate yourself now to long-term goals that will ensure our Army's and Soldiers' success. Your persistence and dedication over time make all the difference in the world. Make the commitment to selflessly serve now!
6. **Learn to analyze details.** Get all the facts and input you can get your hands on. Learn from your mistakes. Share lessons learned. Remember, information should be shared, not brokered! One person can make a difference — make that one person you. Take advantage of the analytical tools and informational databases the Army has developed such as Army Knowledge Online (AKO), Acquisition Information Management (AIM), Advanced Collaborative Environment (ACE), Acquisition Lessons Learned Management System (ALLMS), Data Access Retrieval Tool (see related article on Page 15). On the ASC Web portal at <http://asc.army.mil>, you can find the most current information on AKO, AIM, ACE and ALLMS in the March-April 2004 edition of *Army AL&T* Magazine.

7. **Focus your time and money.** Don't let other people or things distract you from the mission at hand. Our Soldiers need you and the contributions you make — small and large — every day! What you do is important and don't let anyone tell you differently. Stay focused and go the course. Believe in yourself, and those around you, and you will succeed! Remember, you are making a difference every day in the lives of the Soldiers you serve.
8. **Don't be afraid to innovate — be different.** Following the herd is a sure way to mediocrity. Mediocrity, or “checking the box,” benefits no one. To move projects or programs forward, you must innovate by anticipating outcomes and applying knowledge and rational thinking in the absence of hard facts. In his *Day of Affirmation* address, Senator Robert F. Kennedy said “. . . to adhere to standards, to idealism, to vision in the face of immediate dangers takes great courage and takes self-confidence. But we also know that only those who dare to fail greatly, can ever achieve greatly.” The old adage “Nothing ventured, nothing gained!” certainly applies here.
9. **Deal and communicate with people effectively.** No person is an island. Effective leaders learn how to understand and motivate others. Communication is a key ingredient for success, but it is also a process that we must work hard at every day. Therefore, communication is the process by which one person gives to or receives information from another person about that person's needs, desires, perceptions, knowledge or affective states through the use of signs or symbols, verbally and nonverbally, consciously or unconsciously, thereby conveying meaning to another to effect change. Ultimately, communication is about exchanging thoughts, ideas and information. The better you communicate, the better you can address Soldiers' needs and requirements.
10. **Be honest and dependable — take responsibility.** Do what's right, legally and morally, in both word and deed. Otherwise, numbers 1-9 won't matter.

When it's all said and done, if you truly exemplify the traits discussed above, then you will have no problem answering the question I've posed, “What have I done for the Soldier today?” Your contributions — individual and team — speak volumes for themselves. Thank you for “Supporting the Fight, Improving the Force, Building the Future!”



COL Mary Fuller
Director
Acquisition Support Center

Natick Employees Graduate From NPS Program

Thirty members of Natick's Acquisition, Logistics and Technology (AL&T) Workforce graduated from the Naval Postgraduate School's (NPS's) Advanced Acquisition Program (AAP) Dec. 19, 2003. The 1-year program is designed for acquisition workforce and other professionals working the DOD acquisition and program management process. The AAP provides a flexible, on-site alternative for education and for meeting *Defense Acquisition Workforce Improvement Act (DAWIA)* Level III certification training requirements in Program Management (PM). The three-phased program is designed to accommodate professionals unable to travel away from their home office for weeks of education. Natick hosted the program via a combination of video-teleconferencing sessions and on-site classroom instructions. The program ran from Jan. 8, 2003, to Dec. 19, 2003. Attendees received certificates for completion of the equivalent of Defense Acquisition University's (DAU's) ACQ 101 (Fundamentals of Systems Acquisition Management), ACQ 201 (Intermediate Systems Acquisition), PMT 250 (Program Management Tools) and PMT 352 (Program Management Office Course) courses. Those who participated in this program are in the PM career field, or in other career fields that directly support a PM office, allowing them to also meet experience requirements for Level III certification in the PM acquisition career field. Natick's on-site PM Level III certifications will increase from 3 to 33.



NPS Instructor Brad Naegle conducts one of the five on-site courses at Natick that are part of NPS's AAP.

For additional information on NPS AAP, go to <http://www.sm.nps.navy.mil/aap/>. For a list of Natick graduates of NPS AAP, go to <http://asc.army.mil/public/news/articles/nps.cfm>.

Natick's point of contact is Diane Nyren, Acquisition Support Center, DSN 256-4899.

Army Acquisition Basic Course Graduates Two Classes

Joe East

It's been a busy spring for the Army Logistics Management College's (ALMC's) Army Acquisition Basic Course (AABC). ALMC recently graduated two classes from its dynamic, fast-paced 8-week course in Huntsville, AL. Beginning with Class 04-002, 34 students graduated March 5, 2004. LTG Joseph L. Yakovac Jr., the Director of Acquisition Career Management (DACM) and Military Deputy to the Assistant Secretary of the Army for Acquisition, Logistics and Technology, was the graduation speaker. Class 04-002's distinguished graduate was CPT Glenn A. Dean.

Class 04-003 graduated 35 students May 7, 2004. COL Tom Economy, Deputy Director of the Aviation and Missile Research, Development and Engineering Center, was the graduation speaker. The distinguished graduate was CPT Robert J. Mikesh.

AABC is a graduate-level course designed to provide a broad spectrum of knowledge pertaining to the materiel acquisition



LTG Joseph L. Yakovac Jr., DACM, speaks to AABC Class 04-002 at ALMC's Huntsville campus.

process. It covers legal and regulatory policies and objectives that shape the acquisition process and the implementation of these policies and objectives by the U.S. Army. Functional areas presented include project management, contracting, test and evaluation, acquisition logistics and information technology. Course graduates are eligible for a wide range of acquisition workforce positions. The course proponent is the Army's DACM.

Additionally, AABC is being evaluated for graduate credit. Recently, AABC was awarded equivalency with the following 10 existing Defense Acquisition University courses:

- **ACQ 101:** Fundamentals of Systems Acquisition Management
- **ACQ 201:** Intermediate Systems Acquisition (Parts A & B)
- **CON 100:** Shaping Smart Business Arrangements
- **CON 101:** Basics of Contracting
- **CON 104:** Principles of Contract Pricing (Parts A & B)
- **IRM 101:** Basic Information Systems Acquisition
- **LOG 101:** Acquisition Logistics Fundamentals
- **PMT 250:** Program Management Tools
- **SAM 101:** Basic Software Acquisition Management
- **TST 101:** Introduction to Acquisition Workforce Test and Evaluation

AABC Class 04-002 Graduates		Matthews, Carol H.
Ashford, Christina L.		McPherson, Gregory W.
Bae, Jae Young	LT	Middleton, Robert E. MAJ
Bates, Archie P.	CPT	Miller, Sherry B.
Brown, Sherri K.		Orwig, Brian K. CPT
Brown, Yolanda S.	SSG	Snyder, Kent M. CPT
Bruton, Kenneth C.		Steadman, Trent A.
Collins, Michael J.	CPT	Trimble, William Jr. CPT
Crosby, Troy W.	MAJ	Weigner, Heather E. CPT
Dean, Glenn A.	CPT*	Willis, Robert A. MAJ
Draper, Derek J.	CPT	Zahuranic, Michael R. CPT
Edmonds, James F.	CPT	* Distinguished Graduate
Epps, Mary L.		

AABC Class 04-003 Graduates	
Aiken, Terry J.	MAJ
Bailey, James C.	
Baker, Patrick J.	CPT
Callard, Kimberly A.	
Childers, Michael C.	
Choi, Tae-geon	MAJ
Cooper, Crystal N.	
Doty, David S.	CPT(P)
Dring, Lawrence W.	CPT

Hurwitz, Jonathan M.	CPT	Schramm, Matthew F.	CPT
Jackson, Darryl K.	SFC	Schuman, Edward F.	
Jones, Lester J.	SFC	Scretching, Gwendolyn M.	
Juchu, Sui	LTC	Snyder, Lisa M.	
Kenney, James P.		Tallman, Chanda C.	
Klenske, Timothy W.	CPT	Taylor, Horace D.	CPT
Lee, Tsung-Han	1LT	Urbanic, Matthew S.	CPT
McClintock,		Vroonland, Clifford L.	CPT
Robert E. Jr.	CPT	Williams, Robert E.	
Mikesh, Robert J.	CPT*	Williams, Tiffany D.	
Nichols, Clifton D.		Willis, Tiffanie D.	
Owens, James M.		Wilson, Gregory A.	
Patrick, Jonathan M.	CPT	Wright, Darryl	
Ryan, Thomas J.	MAJ	* Distinguished Graduate	

Additional AABC information can be found at <http://www.almc.army.mil/hsv/index.asp>.

9th TSC Soldiers Become First Army Reserve Acquisition Course Graduates

SPC James E. Martin

Photos by LTC Joseph F. Thompson

Two Soldiers from the 9th Theater Support Command (TSC), Fort Belvoir, VA, recently broke new ground in the field of military contracting. 1LT Lisa Hendrick and SSG Yolanda Brown became the first U.S. Army Reservists to graduate from the Army Acquisition Basic Course (AABC), the 58-day course conducted at the Army Logistics Management College's (ALMC's) Huntsville, AL, campus.



SFC Tracy Haywood is presented with an AABC diploma by COL Robert J. McNeil, Commandant, ALMC.

Previously, the course trained midlevel, Active Duty (AD) officer and DOD civilians with the contracting skills they need to perform their assigned missions. The course provides a graduate-level curriculum in various functional areas, including program management, contracting, requirements determination, acquisition logistics and information technology.

The 9th TSC is a multicomponent unit with an AD headquarters based at Camp Zama, Japan, and a Reserve Component element operating from Fort Belvoir's Mosby Reserve Center. The unit provides logistics and other combat service support in the U.S. Army Pacific Command area of operations. Additionally, the first AD noncommissioned officer (NCO), SFC Tracy Haywood, recently graduated from the AABC and is now assigned to the 9th TSC in Japan.

The 9th TSC Contracting Director, LTC Joseph F. Thompson, sought out the training for Hendrick and Brown because he realized the importance of having junior officers and NCOs develop critical acquisition skills.

"In today's high operations tempo environment, we don't have time to overcome sharp learning curves," Thompson remarked. "The Army expects to deploy Soldiers who are proficient in their specialties and able to perform their duties at the same level as their AD counterparts. The 9th TSC needs to have NCOs and officers with advanced specialist training, and this course provides them with the requisite skills."

Hendrick, an Adjutant General Corps officer serving with the 9th TSC as a contracting officer, said she definitely benefited from attending the course and will be able to apply the lessons learned to her work with the unit. "Attending the course will be a big help for me when we are deployed," Hendrick said. "The subjects helped prepare me to accomplish my mission. I found the entire course challenging, and I think it's a very beneficial course for Reservists to attend because it provides us with the same training as our AD counterparts."

Hendrick said that while many Army Reserve Soldiers may not have as much acquisition field experience as AD Soldiers who work in the field every day, sharing a common training base allows for better integration when Reservists deploy.

Thompson mirrored Hendrick's sentiments. "There is a definite need for our junior officers and NCOs serving in a theater support command to develop skill sets that allow them to talk to senior officers and technicians using the language of the acquisition profession," Thompson commented.



1LT Lisa Hendrick receives her AABC diploma from COL McNeil at ALMC's Huntsville campus.

Brown said that learning the language in an environment traditionally tailored for commissioned officers wasn't always easy, but it was very rewarding. "The course gave an overview of the acquisition process from start to finish," she continued. "It gave a lot of information about different aspects of the acquisition field. I'm new to the field, so I was glad to learn as much as possible."

Brown also indicated that being an NCO actually allowed her to make some important contributions to the course. "Everyone had different experiences and we were able to contribute to the group in our own way," the 9th TSC Procurement NCO continued. "It was very interesting to learn in a class with many different people from different career fields. It was a good training experience, and I'm grateful for the opportunity to attend the course," Brown concluded.

Editor's Note: SFC John Valceanu contributed to this article.

AHRC Notes



FY04 Army Experimental Test Pilot Board Announces Selections

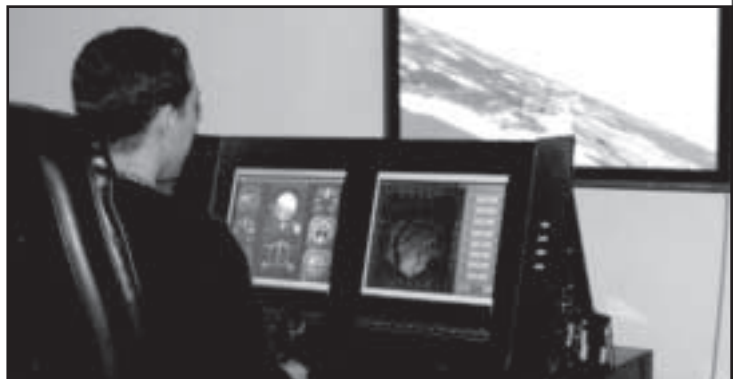
The FY04 Army Experimental Test Pilot (XTP) Board convened at the U.S. Army Human Resources Command (HRC) on Feb. 18-19, 2004. The board's mission was to select the best qualified commissioned and warrant officers as candidates to attend the U.S. Naval Test Pilot School (USNTPS) at Patuxent River Naval Air Station, MD, with ultimate certification as U.S. Army XTPs for accession into

the Army Acquisition Corps (AAC) (for the commissioned officers). Four commissioned and five warrant officers were chosen.

This year's board was extremely competitive. Selection for the Army XTP Program required a strong engineering academic background in conjunction with diverse flying experience, substantial flight time and strong file quality.

HRC extends its congratulations to the following commissioned and warrant officers for selection as *primary* U.S. Army Naval Test Pilot Training Program candidates:

Name	Rank	Name	Rank
Braddom, Steven	CPT	Magonigal, Dean	CW3
Czarnecki, Kenneth	CW3	Ott, Carl	CPT
Henderscheid, Edward	CW3	Scola, Dominic	CPT
Lewis, Richard	CW3	Snyder, Mark	CPT
		Tulley, Sean	CW3



Radar simulation training. U.S. Navy photo by Darren Wagner, USNTPS.

HRC also extends congratulations to the following commissioned and warrant officers for selection as U.S. Army Naval Test Pilot Training Program *alternates*:

Name	Rank	Name	Rank
Armstrong, Mark	CW4	Markow, Tanya	CPT
Boyle, Michael	CW3	Mouser, Adam	CW2
Curry, Nathaniel	CPT	Mullis, James	CW4
Guner, Baris	CPT	Nadeau, Cary	CW2
Lindquist, Douglas	CPT	Whiffin, Harold	CPT

Observations from this year's board and previous Army XTP experiences have prompted changes in the application process. Individuals who want to apply for the FY05 board should note the following:

- Applicant files must clearly identify that calculus and physics/mechanics requirements have been met.

- Commissioned officers must be branch-qualified and hold the rank of captain.
- All applicants must submit any past or current medical waivers with the application packet to determine the ability to meet Naval aeromedical flight requirements.
- Applicants must ensure that they are confident swimmers capable of passing Navy swim test requirements.

Any questions or comments pertaining to the Army XTP Board or career management can be directed to MAJ Sharlene Donovan, AAC Assignments Officer, at (703) 325-5479, DSN 221-5479 or by e-mail at sharlene.donovan@hoffman.army.mil.

News Briefs

ARL MSRC Increases Computer Capability

The U.S. Army Research Laboratory Major Shared Resource Center (ARL MSRC) in Adelphi, MD, one of DOD's four supercomputing sites for its High Performance Computing Modernization Office (HPCMO), announced that it is increasing its computing capability from 9.1 trillion to 36 trillion floating-point operations (TFLOPS) by adding three computing systems to its already robust spectrum. The added power will make the ARL MSRC one of DOD's



CISD Acting Deputy Director Charles J. Nietubicz stands near several computers in the Scientific Visualization Laboratory at Aberdeen Proving Ground, MD. U.S. Army photo by Brian Simmonds, ARL MSRC Outreach Teams.

largest computing centers, an investment estimated at \$20 million.

“This increase in computing capability will give DOD scientists and engineers the ability to solve complex, 3-D, time-dependent, physics-based problems in a timeframe that can provide the data necessary to assist with weapon development and procurement decisions,” said Charles J. Nietubicz, Acting Deputy Director, Computational and Information Sciences Directorate (CISD).

The three systems, which are the first major commodity-based symmetric multiprocessor supercomputers used in the HPCMO, will be introduced at ARL this summer. The most powerful of the new systems, a 2,132-central processing unit (CPU) Linux NetworX Evolocivity II® system, will increase ARL MSRC computational capability by more than 15 TFLOPS. The system will consist of 1,066 nodes, each equipped with two Intel® Xeon™ 3.6-GHz processors, 1.5 GB of memory per CPU and will use the Myrinet™ interconnect. This system will be ranked as one of the top 10 most powerful computer systems in the world.

A second system, a 2,304-CPU cluster from IBM®, will comprise 1,152 dual-2.2 GHz AMD Opteron™ processors and a Myrinet interconnect. The system will increase ARL MSRC computational capability by more than 10 TFLOPS. This system will also have a top 10 world-computer system ranking.

The third system, a Silicon Graphics® 256 processor single system image SGI® Altix® system with SGI NUMalink™ interconnect, will add an additional 2 TFLOPS to the high-performance computing (HPC) environment.

Raytheon engineers will work with government partners to integrate, install, test and transition these new systems for production use by fiscal year end. This acquisition and system integration will be the HPCMO's first major introduction into the commodity space, and ARL will be the program leader in production commodity clusters. With these upgrades, ARL will become the first and only center in the HPCMO providing greater than 10 terabytes (10,000 GB) of memory.

“The ARL MSRC serves a diverse, technically challenging HPC user population,” said Denise P. Brown, Acting ARL MSRC Center Director. “The selection of Linux NetworX, IBM and SGI systems provides the flexibility to meet users' diverse challenges.”

Established in 1996, ARL MSRC helps DOD focus and exploit HPC technology for military advantage across the battlespace. This customer-focused, world-class computational facility supports DOD's research and development, science and technology and test and evaluation communities with some of the world's newest, scalable, parallel computers. These supercomputers feature shared and distributed memory architectures. Researchers use ARL MSRC facilities to model and simulate systems, explore chemical reactions, study and design weapon systems, analyze sensors and experimental data and develop new composite materials.

This new equipment is part of the HPCMO's Technology Insertion 2004, an initiative to modernize DOD's HPC capabilities. For more information, contact Tonya Johnson at (301) 394-4456 or ltjohnson@arl.army.mil.

Army Dedicates Aeromedical Research Laboratory

The U.S. Army Aeromedical Research Laboratory (USAARL) was dedicated in memory of MG Spurgeon H. Neel, a soldier, physician, visionary and leader. The ceremony was held on April 2, 2004, at USAARL, Fort Rucker, AL. USAARL is one of the six research laboratories of the U.S. Army Medical Research and Materiel Command (MRMC), Fort Detrick, MD. MG Lester Martinez-Lopez, Commanding General (CG), MRMC, was the host. Alice Neel unveiled the bronze plaque dedicated to her late husband. The USAARL building will be named the Neel Aeromedical Science Center.

Neel was born and educated in Memphis, TN. He entered active duty in October 1943, following his internship at Methodist Hospital in Memphis. At World War II's end, Neel was a medical company commander in Europe. During the following 40 years of his career, Neel was involved in all phases of field and aviation medicine. He established a formal program for board certification in aviation medicine for Army medical officers and instituted the Army Aviation Medical Training and Research Programs.

Neel was a pioneer in developing the principles for aeromedical evacuation (aerovac) of battlefield casualties. His guidance and suggestions were implemented during the Korean conflict, resulting in increased numbers of injured soldiers aerovaced from the battlefield. Based on his experience during that conflict, he developed medical evacuation policies,

procedures and organizations that became the foundation for aeromedical operations today.

As the hostilities in Vietnam increased in the mid-1960s, then COL Neel was assigned as the Chief Surgeon, U.S. Military Assistance Command and Senior Medical Advisor to GEN William Westmoreland. Following his promotion to brigadier general in 1968, Neel became the CG, 44th Medical Brigade. After returning to the United States, Neel became the Deputy Army Surgeon General, a post he held until 1973, when he became the first Health Services Command CG.

Regarded as the Father of Army Aviation Medicine, Neel envisioned a research facility designed to provide direct aviation medical research support to all Army aviation and airborne activities. His goal was realized in 1962 when the U.S. Army Aeromedical Research Unit, Fort Rucker, was created. Neel's vision grew into today's USAARL, a center of excellence devoted to world-class research on health hazards of Army aviation, tactical combat vehicles, selected weapon systems and airborne operations.

CarboPack Restores Energy

Extra energy for strenuous military operations is now conveniently supplied with the Carbohydrate Supplement Pack, or CarboPack, developed at the U.S. Army Soldier Systems Center (SSC). The CarboPack contains one carbohydrate-rich bar and two packages of flavored carbohydrate-electrolyte sports beverage powder to mix two 8-ounce servings. It is intended to complement current and future military rations.

"Studies show that Soldiers in intense, prolonged physical activity for more than 3 hours need calories beyond what's provided in rations," said Julie Edwards, a food technologist at the DOD Combat Feeding Directorate. "Most of what they need is provided in their rations," she explained. "This is designed to make up the difference in calorie needs during prolonged exercise."

The CarboPack adds another 400 calories to the battlefield diet. By comparison, a day's worth of Meals, Ready-to-Eat (MREs) is more than 3,600 calories. Research that went into the CarboPack will give troops a product that's proven to perform while saving troops money.



“We identified a need because Soldiers were buying their own bars and drinks, which opened up potential pitfalls,” Edwards said. “By providing Soldiers with the right products, we can decrease the chances that they will bring the wrong type of item to the field with them that may potentially hurt their performance.”

Combat Feeding’s Individual Combat Ration Team, the U.S. Army Research Institute of Environmental Medicine at Natick, MA, Office of the Surgeon General and Army Center of Excellence Subsistence worked together on product guidelines. The drink mix is similar to Gatorade®, with a combination of electrolytes and carbohydrates meeting military specifications and has lower sugar content than an MRE mix, according to Edwards. Fruit punch, grape, orange and lemon-lime flavors were chosen because they are the most popular for this type of beverage, and each CarboPack holds two different flavors. Each mix is stored in a trilaminate pouch with a tear-off top used to pour in water, shake and drink so warfighters can avoid using a separate drink holder, such as their canteen cup.

“A resealable drink pouch was one of the recommendations of Soldiers from Fort Campbell, KY, and Fort Polk, LA, who participated in focus groups and evaluations, and is in development,” Edwards said. “The drink pouches are folded over twice and fit inside another trilaminate pouch along with the bar wrapped in the original manufacturer’s package. Chocolate and apple cinnamon HooAH! and oatmeal-raisin and chocolate bars similar to Gatorade and PowerBar® brands were chosen as the energy bars because of their nutritional content, acceptability rating in taste-testing and ability to reach at least a 2-year shelf life,” Edwards explained.



“All three types in their respective flavors will be represented in the CarboPacks. Having a variety of products and flavors for the drinks and bars helps increase acceptability and consumption,” Edwards continued. “HooAH! was created by Combat Feeding food scientists and is getting another opportunity to be fielded as a new commercial manufacturer has picked up the production. Another product evaluated was commercial gel, but Soldiers were concerned because the gel packs would burst inside their full rucksacks,” Edwards remarked. “They will be considered again when product packaging has improved,” she concluded.

The first 42,000 CarboPacks were scheduled for delivery to Iraq in early 2004. For more information on CarboPacks or SSC, visit our Web site at <http://www.natick.army.mil>.

COL Elias Nimmer Awarded Purple Heart

Donna Miles

Deputy Secretary of Defense Paul Wolfowitz presented the Purple Heart to U.S. Army COL Elias Nimmer at the Pentagon during a ceremony held March 26, 2004. Nimmer was seriously wounded when the Baghdad hotel he was staying in came under attack by Iraqi insurgents last October.

Wolfowitz, who was also staying at the Al Rasheed Hotel during the Oct. 26 attack, met COL Nimmer at the 28th Combat Support Hospital, where Nimmer and four others who worked for the Coalition Provisional Authority were treated for serious injuries from the attack. Nimmer was the only service member hospitalized. Another soldier, LTC Charles H. Buehring from Army Central Command Headquarters (Forward), was killed during the attack.

As Wolfowitz presented Nimmer the Purple Heart, he recalled how inspired he had been by Nimmer’s commitment to the coalition mission in Iraq.

When the two men first met, Nimmer was being administered oxygen and was receiving treatment for shrapnel injuries to his spine, nerve damage and a perforated eardrum. Wolfowitz said he asked Nimmer, a native of Beirut, Lebanon, how he felt about rebuilding a new Middle East. Nimmer, who asked the medical staff to remove his oxygen mask so he could meet the deputy secretary, responded with a “thumbs up,” Wolfowitz said.



Deputy Secretary of Defense Paul Wolfowitz presented the Purple Heart to COL Elias Nimmer for injuries he sustained when Iraqi insurgents attacked the Baghdad hotel where both men were staying Oct. 26, 2003. U.S. Army photo by Robert Ward.

Nimmer's wife, Leann, said she attributes her husband's up-bringing in a war-torn country with giving him the instinct to immediately roll from his bed onto the floor when the first rockets hit the hotel just after 6 a.m. He remained face-down on the floor as a barrage of rockets hit the hotel, one impacting directly inside his room.

During the ceremony, Wolfowitz praised Nimmer as an example of the "tremendous courage" that all members of the Armed Forces exhibit on a daily basis as they take the front lines in the war on terror. Nimmer, a Medical Service Corps officer, deployed to Iraq in June to serve as an adviser to Iraq's Ministry of Health.

Wolfowitz said Nimmer also typifies the "extraordinary contributions" immigrants have brought to the United States and to the U.S. military.

"This is a day I will remember as long as I live," said Nimmer as he accepted his Purple Heart. He thanked his co-workers within the Office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology for their support, and the medical community for its part in his recovery.

"After I realized that I couldn't move, I knew that I would be taken care of, and I was," he said.

Air Force LTC John Bowersox, Nimmer's roommate at the Al Rasheed Hotel who was away from Baghdad on the day of the attack, praised the staff at the 28th Combat Support Hospital for providing quick, decisive care that has enabled Nimmer to walk today. Bowersox, a physician also working with the Iraqi Ministry of Health at the time of the attack, particularly credited LTC Rocco Armonda

for conducting surgery immediately to remove shrapnel from Nimmer's spine.

Nimmer was taken to Landstuhl Army Medical Center in Germany the night of the attack and continued to receive treatment at Walter Reed Army Medical Center in Washington, DC. Following three successful surgeries, Nimmer is back to work at the Pentagon.

Donna Miles is a writer for the American Forces Press Service.

Developmental Robot Helps Save Soldiers' Lives

Paul D. Mehney and Rae Higgins

U.S. Army Tank-Automotive Research, Development and Engineering Center (TARDEC) researchers are in the U.S. Central Command's area of operations fielding advanced prototype robots designed to perform standoff vehicle inspections that will help protect U.S. Soldiers from improvised explosive devices and other contraband.

TARDEC scientists lead the Omni-Directional Inspection System (ODIS) program, an Army initiative to create a family of standoff inspection tools to enhance Soldier survivability and provide a variety of homeland defense applications.

Two TARDEC Department of the Army civilian engineers, in conjunction with the Army's Rapid Equipping Force

TARDEC is fielding an advanced prototype robot that can perform standoff vehicle inspections at a checkpoint in Iraq.



(REF), have fielded 10 advanced ODIS prototypes to units deployed in Iraq and Afghanistan. They will spend 2 months training Soldiers slated to use the system and collect operational data and lessons learned for integrating improvements into next-generation prototypes.

Equipped with a color TV camera and infrared capabilities, ODIS performs undervehicle inspections to detect explosives and contraband. In the future, ODIS will detect radiological, biological and chemical elements as well. Lead TARDEC engineer for the ODIS project, William Smuda, states that ODIS enables Soldiers to perform inspections from a safe standoff distance rather than using “mirrors on sticks.” ODIS will eliminate the need for Soldiers having to perform up-close inspections themselves and will ultimately help bring them home alive.

In Iraq, the robots are being used to augment both local Iraqi security forces and U.S. Soldiers at checkpoints around the Coalition Forces-controlled Green Zone. TARDEC engineers have been on hand since the first day ODIS arrived in Iraq. According to Smuda, Soldiers learned how to operate ODIS in less than an hour and were soon inspecting cars from a standoff location.

Once the robots were in use, TARDEC engineers worked with Soldiers to fix any unexpected problems. It was soon discovered that the suspensions on many Iraqi vehicles were worn down to the point that the car’s undercarriage barely cleared the pavement, which didn’t allow enough room for the 4-inch-tall ODIS to operate under them. TARDEC’s engineers called their laboratory in Michigan, and after collaboration soon found that moving an antenna would fix the problem. Being able to observe the situation firsthand and then communicate with TARDEC’s laboratory staff and project lead provided a quick fix and minimized downtime.

After encountering problems in the field, TARDEC engineers relayed data to the ODIS team in Michigan. Team members then placed the data into an advanced collaborative environment (ACE) allowing engineers and support staff to view the problem and quickly find a solution. ODIS Project Lead Henry Andrusz at TARDEC said “TARDEC’s ACE process allows all team members to access project information at any time and track events quickly to solve problems as they occur. The process is working well, enabling us to quickly provide critical support to the Soldier in real time.”

ODIS combines omnidirectional drive technology and robotic operations to allow users to precisely place the unit for close looks. Weighing a mere 40 pounds, ODIS is

man-packable and operates on a single charge via a nickel-cadmium Single Channel Ground and Airborne Radio System military pack battery for up to 2 hours.

“This is an example of Army research and development (R&D) at its best,” Smuda said. “We took ODIS out of the R&D pipeline on Sept. 12, 2001, and have worked hard to transition it to the field ever since.” Smuda is confident ODIS will prove beneficial in increasing Soldier survivability.

In addition to Soldiers using ODIS in Iraq and Afghanistan, TARDEC recently partnered with Virginia law enforcement officials. They are using ODIS to augment the security inspections associated with the Washington, DC, sniper trial. TARDEC is also partnering with national port authorities to explore homeland security applications, including airport and seaport inspections, hazardous substance detection and preliminary area surveillance during first-responder situations.

TARDEC’s ODIS program partners include the DOD Joint Robotics Program Office, technical research partner Utah State University and prototype manufacturer Kuchera Defense Systems.

ODIS’ future plans include integrating lessons learned in Iraq and Afghanistan on the next design spiral for the robot platform. These lessons, along with Soldier feedback, will also allow TARDEC robotics engineers to use similar technology to enhance other robot platforms to keep Soldiers out of harm’s way wherever possible.

Paul D. Mehney is a Marketing Specialist with TARDEC’s Operations Business Group.

Rae Higgins is employed as a contractor by TARDEC’s Research Business Group. She is an Army public affairs school graduate.

Microwaves Improve Processed Food Quality

Microwave energy, long used in homes to cook or reheat food, is gaining momentum in the United States as a method for processing more palatable shelf-stable foods for the military and commercial markets. These shelf-stable products are already successfully used overseas as an alternative to frozen or refrigerated packaged foods. The DOD Combat Feeding Directorate, Soldier Systems Center (SSC)



A Soldier eats an MRE near a mosque being built at Al Monsour Baghdad, Iraq. U.S. Marine Corps photo by SSGT Ricky A. Bloom.

in Natick, MA; Washington State University (WSU) in Pullman, WA; and several food processing, equipment and packaging companies have formed a partnership to process food through a microwave sterilization system. The partnership is backed by federal and private-sector funding.

The microwave sterilization project commenced in 2000 under the federal government's Dual Use Science and Technology program with packaged food giants Kraft Foods Inc. and Hormel Foods, and Truitt Brothers Inc., a food processing company. Packaging and equipment companies Rexam Containers, Graphic Packaging and Ferrite Components were also invited to join the project. Since then, Ocean Beauty Seafoods Inc. and Mars Inc. have joined the initiative to raise the quality of processed Alaska salmon and other traditionally processed food products.

Designed and located at WSU, the pilot-scale microwave system has successfully demonstrated the capability, and will now be able to take the next step — creating a preproduction plant for a larger-scale operation to research military and commercial foods, study shelf life and work on gaining approval from the Food and Drug Administration (FDA).

Unlike home microwave ovens, the microwave sterilization system is high-powered and treats prepackaged food submerged in water, allowing the microwaves to penetrate and uniformly cook packaged foods from the inside out, preventing burning around the

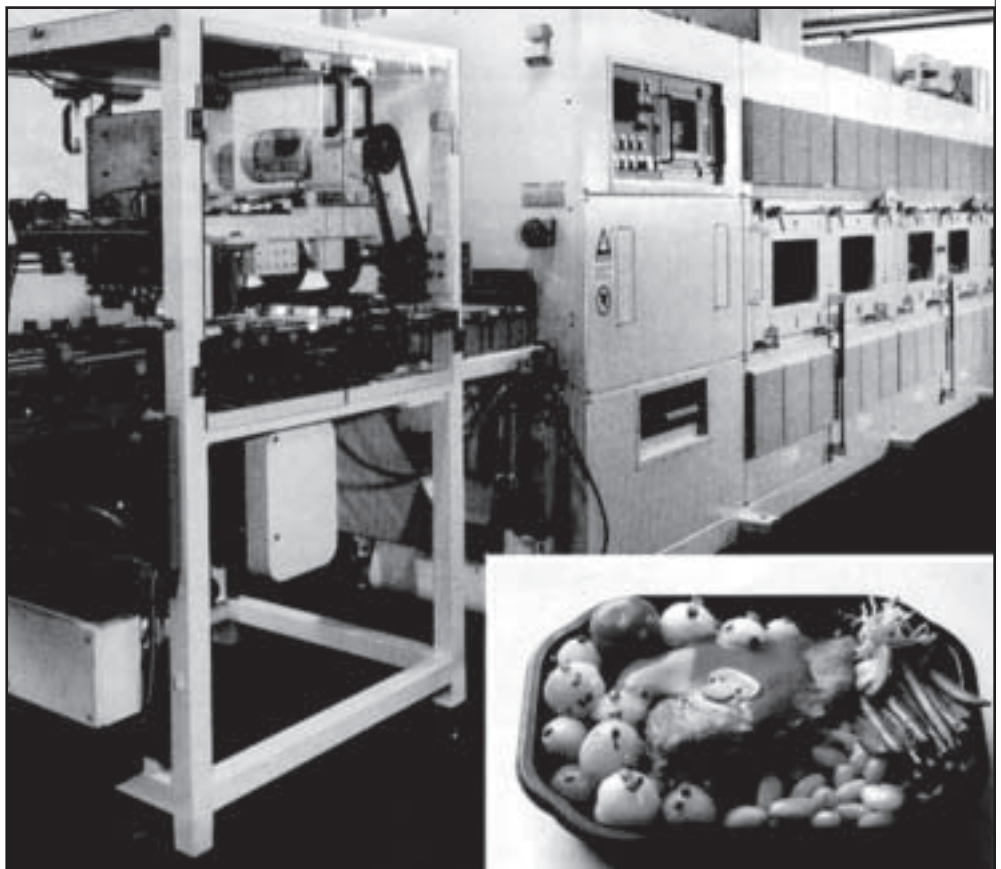
edges. To kill all bacteria quickly without damaging the food's texture or flavor, the package is sealed before cooking.

"We're talking about a quantum leap in food quality," said Tom Yang, a senior food technologist at the SSC Combat Feeding Directorate, comparing the new process to conventional retort processing, which is currently used for the Meal, Ready-to-Eat (MRE) entrees, tray rations and most canned commercial foods.

Microwave sterilization is a high-temperature, short-duration form of processing. Instead of retort's 250 degrees F for 90 minutes, the microwave cooks at 265 degrees F in 10 minutes.

"We can introduce a larger variety of foods to warfighters and improve products currently fielded," Yang said. "We'll be able to introduce a lot of products that we currently can't with retorting. The MRE menu of 24 different entrees is continually being improved to keep only the best items," Yang remarked.

Certain foods were out of the question until microwave sterilization. "A challenge to us is to have a whole muscle product that looks and tastes like a freshly broiled fillet,"



A commercial microwave sterilization system in Europe continuously processes packaged foods for consumers.

said Patrick Dunne, Senior Technical Advisor at the Combat Feeding Directorate. "With retorting, it often ends up being tough and overcooked in the process of killing bacteria. We also see this technology as doing a really great job with seafood and other products, such as macaroni and cheese, scrambled eggs and mashed potatoes," Dunne continued.

Besides quicker processing and improved quality, other microwave sterilization advantages are preserving nutritional benefits that are degraded during retort and less need for freezers or refrigerators in the field.

First developed in the 1990s at WSU and led by Juming Tang, a professor in WSU's Department of Biological Systems Engineering, Natick food technologists contributed to the project by helping solve the problems of uneven heating and heat distribution monitoring. They also provided technical advice on quality and sensory evaluation. "The companies [in the project] are bringing their expertise in marketing to reach out to consumers with products people want," Yang commented. "We can tailor the energy distribution appropriate to each different food in a tray to have the ultimate quality," Yang said. "Although promising, the technology presents some challenges."

"Formulation and preparation by culinary specialists before microwaving are still as important as ever to food quality," Dunne emphasized. He also said that the food industry, a conservative high-volume, low-profit-margin sector, will need to be convinced that the technology is worthwhile before investing.

The microwave sterilization system now has the capacity to cook foods in small batches, but the plan is to transition to a "semicontinuous" process in the near future and, eventually, a continuous process where food packages move out nonstop as is currently being done in many other countries. Pending FDA approval and selection of a suitable packaging system, Yang said microwave processing would begin to supplement some retort-processed military rations.

For industry, highly targeted marketing campaigns will be necessary to convince consumers of shelf-stable food's appeal over conventionally-processed foods and, quite possibly, over the perceived freshness of widely-available frozen or refrigerated foods.

For more information about SSC, go to <http://www.natick.army.mil>.

Navy Firesuit Expands Coverage



The First Attack Firesuit stores in a pillow-sized package. Loops are available to hang the firesuit at various locations around a ship.

The new First Attack Firesuit, developed by the U.S. Navy Clothing and Textile Research Facility at the U.S. Army Soldier Systems Center in Natick, MA, was driven by reduced manpower requirements for the Navy's next-generation DD(X) (a multimission surface combatant) family of ships. The firesuit resembles a dark-colored pillow until one seam is opened to unfold a coverall-style uniform donned in about 1 minute to protect sailors responding to shipboard fires.

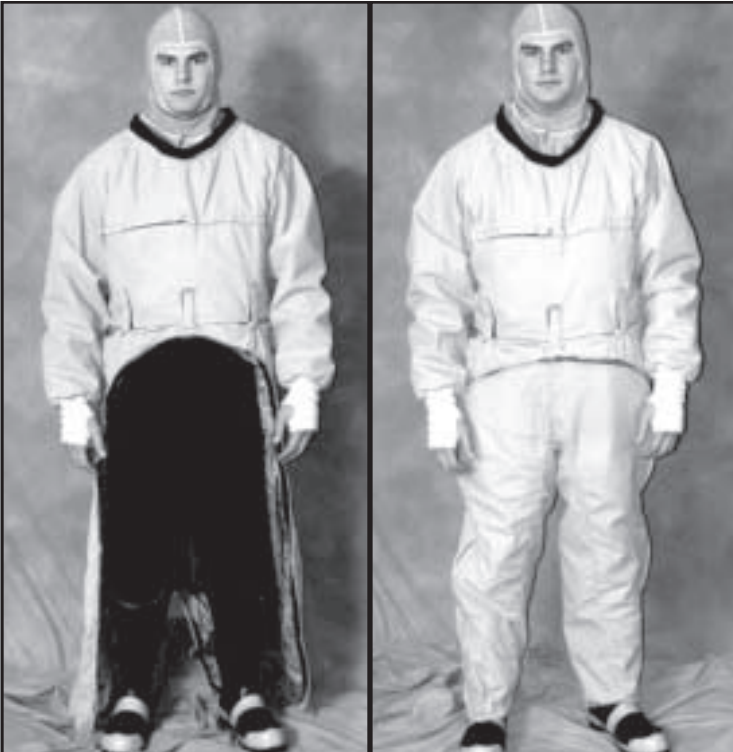
With ships at one-third manning, the Navy can't afford to have as many dedicated firefighters and will need more sailors to assist in putting out fires, said Harry Winer, a textile technologist and project officer for the First Attack Firesuit.

"The concept [of the new firesuit] is to get to the fire at an early stage and decrease damage and loss because of speedy deployment of the suit," he said. "We plan on hanging the suits along the ship where any sailor can use them. We expect every sailor to be able to be a firefighter."

By contrast, the standard firesuit is now stored in three rooms aboard the ship. When the alarm is sounded, firefighters head to the fire locker to get dressed and then move to the fire, which by then may have grown much larger, according to Winer. The new firesuit will allow the nearest sailor to don the suit and put out the fire.

This capability is possible due to the firesuit's two convenient sizes instead of the standard firesuit's 18 sizes. Winer estimated that 75 percent of the population will fit into the smaller size with the rest fitting into the larger size. Velcro fasteners around the waist adjust leg length for a better fit. Once removed from the pocket bag, sailors simply pull the new firesuit over their heads and close the zipper that starts at one ankle, follows an arc peaking along the stomach and then stops at the other ankle.

The suit material is composed of a filament slick liner to slide more easily over clothing, an intermediate barrier and outer



Once unfolded and slipped over a sailor's uniform, the suit is zipped following an arc from one ankle to the other. Total donning time is about 60 seconds.

shell made from the latest fire-resistant fabrics. It comes with an attached hood, attached thumb wristlets and a back cargo pocket. Loops for hanging the suit are stitched to the bag, and gloves are included separately. Compared to the standard suit, the new firesuit is expected to cost 40 percent less and weigh 5 pounds instead of 8.5 pounds. "Flame and heat protection of the material is slightly lower, but the difference is negligible," commented Winer.

"It's almost like a big sack pulled over you. That gives you a lot of trapped air, which is good for insulation from the fire and heat," he said. "It's best if it's a loose suit. The old suit is a form-fitting garment and can't be packed up."

A coverall-style firesuit is desirable because the clothing is less likely to get caught in the confined spaces shipboard, and it restricts hot air and gases that might enter with a two-piece garment. Two different dark-colored pockets will be used to indicate the two sizes, and the firesuit will be labeled with reflective lettering that glows in the dark to aid visibility if the lights go out.

Firefighters aboard a fire research ship evaluated the new suits last year, and designers are preparing for the final laboratory demonstration with instrumented thermal manikins, followed by another demonstration on the fire research ship in the near future. Winer said everyone

preferred the First Attack Firesuit to the standard firesuit. The lower weight contributes to improved comfort, which reduces the amount of stress on firefighters. Although designers wanted few frills, they provided the cargo pocket on request.

"In testing, the firefighters said they felt no heat," Winer continued. Initial firesuit fielding is expected to begin in about a year.

One technology that might be adopted is reflectivity built into the outer-shell fabric to replace reflective stripes attached along the arms, legs and torso. Winer said the fold-into-its-own-pocket design, unique for any piece of protective clothing, draws initial disbelief, but it soon wins over naysayers.

"When firefighters first see it, they say 'Oh no,' but when they wear it, they fall in love with it," Winer concluded.

For more information about the Navy Clothing and Textile Research Facility or the U.S. Army Soldier Systems Center, please visit the Web sites at <http://www.navy-nex.com/command/nctrf/nctrf-index.html> and <http://www.natick.army.mil>.

Scientist Honored by Army Engineers

Stuart Leigh, Deputy Director of the Countermine Division of the Communications-Electronics Command Research, Development and Engineering Center's Night Vision and Electronic Sensors Directorate was honored by the Corps of Engineers Association with the de Fleury Bronze Medal for outstanding service to the U.S. Army, the Corps of Engineers and the Engineer Regiment.

The medal was established by the Engineer Regiment as an award for the values demonstrated by the man for whom it was named, LTC Francois Louis de Fleury, a French engineer volunteer to the Continental Army. The award has been presented every year since 1989 to outstanding individuals.

In the citation, Chief of Engineers LTG Robert Flowers praised Leigh's work as an integral part of the team responsible for the recent fielding of a much-improved mine detector. This detector, the Hand-Held Standoff Mine Detection Sensor, is described as a "quantum advancement" in countermine systems and is the first hand-held detector deployed that finds both metal and plastic mines in all soil types.

TARDEC Develops Water From Exhaust

Paul D. Mehney

In extreme conditions, the average soldier requires 3 gallons of water per day to prevent dehydration — which amounts to nearly one third of the Current and Future Force's daily sustainment requirement. U.S. Army Tank-Automotive Research, Development and Engineering Center (TARDEC) researchers are developing and testing innovative water-purification, generation and recovery technologies to reduce the logistical footprint of large-scale water use.

Reducing water logistics is achieved by pursuing two complementary objectives. First, develop advanced water-purification technologies that are more energy efficient, lightweight and compact than current systems. Second, generate and recover potable water from alternative sources such as vehicle exhaust or ambient air.

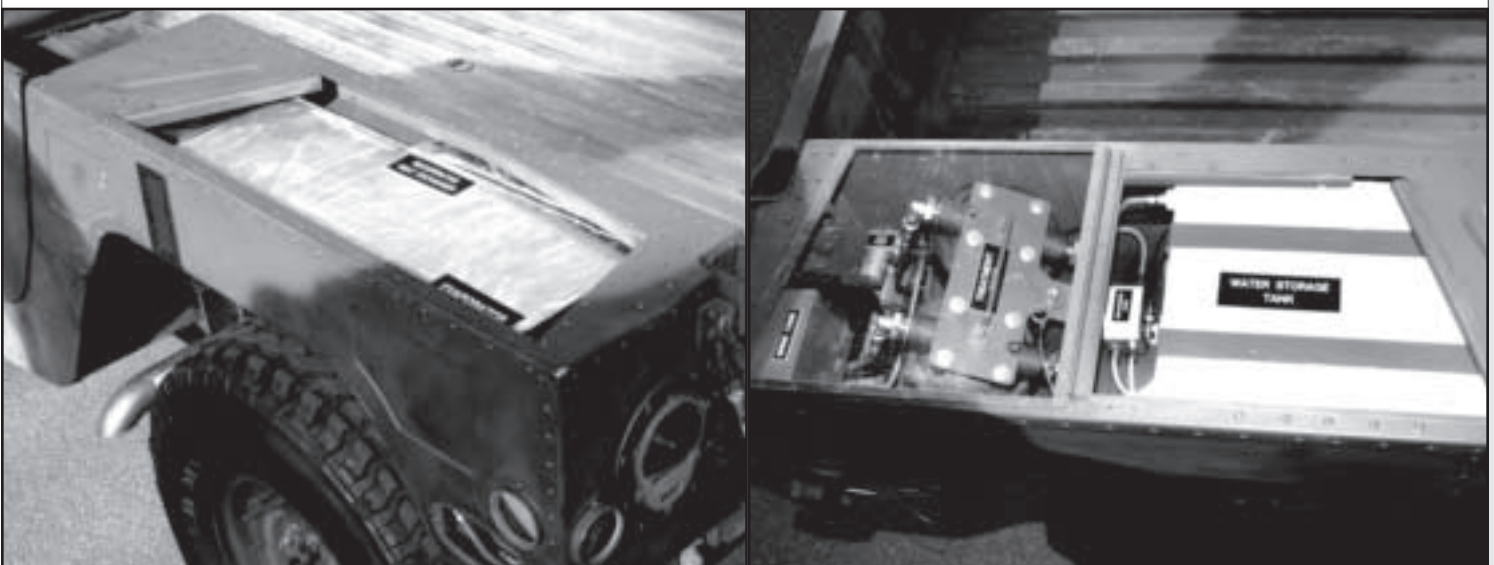
The water-from-exhaust system is undergoing development in a standard Humvee for Current Force needs and integration into the Future Combat Systems (FCS) Lancer Test Demonstrator for Future Force requirements. Mounted in a standard military Humvee, the water-from-exhaust system, jointly developed by TARDEC and industry partners, Lexington Carbon Company LLC and Hamilton Sundstrand, is capable of producing about 0.5-0.6 gallons of clean drinking water per gallon of fuel consumed.

According to TARDEC's water-from-exhaust system manager, Dr. Jay Dusenbury, "The water-from-exhaust system concept is based on water formed during the combustion process as the hydrogen present in fuel is oxidized by the oxygen present in air. The result is water in the exhaust." On the test Humvee, the water-from-exhaust unit is mounted in the vehicle's wheel wells. One side contains a heat exchanger that lowers the temperature of the exhaust and the other side contains a water-purification system. The reduced heat exhaust is then pumped into an evaporative cooler where the temperature is further lowered to a point where water condenses.

From there, the condensate — which resembles muddy water and smells of diesel — is sent to a small receiving tank before being pumped to the vehicle's other side where a water-purification system awaits. The filter, capable of treating up to 150 gallons of water and easily exchangeable in the field, uses particle filtration, granular-activated carbon, ion exchange resin and a MIOX-mixed oxidant generation system to make the water drinkable. To monitor the filter's life, sensors are mounted inside the vehicle's crew compartment, allowing Soldiers to control the system.

Once enough potable water is present in the on-board storage tank, Soldiers can draw water from a tap located near the vehicle's rear passenger side.

The purified water has been tested by an independent Environmental Protection Agency (EPA) certified laboratory for EPA priority pollutants. None of these contaminants has been found to exceed the drinking water standard. The Army Surgeon General's Office is conducting health and risk



TARDEC researchers are developing a water-from-exhaust system that generates and recovers potable water from vehicle exhaust. The system consists of a heat exchanger (left) and a water-purification system (right) mounted in the test Humvee's wheel wells.

assessments of the water for field use. Future plans for the water-from-exhaust system include technology demonstrations of systems embedded in a 20-ton armored vehicle, a Humvee and a 10-kilowatt generator. When asked about transition, Dusenbury replied, "Interest has significantly increased for technology insertion into the Current and Future Forces. We are providing data to support FCS and U.S. Army future tactical truck systems as well as developing a proposal for providing Humvee-based demonstrators for field demonstration and evaluation." Whether used in Current or Future Force operations, water-from-exhaust will hydrate Soldiers in desolate conditions, while reducing the logistics footprint.

Paul D. Mehney is a Marketing Specialist with TARDEC's Operations Business Group.

Conferences

Total Life Cycle System Management Seminar



The Institute for Defense and Government Advancement is holding a 3-day seminar July 26-28,

2004, at the Wyndham City Center, Washington, DC, to explore the best technologies, processes and research associated with Total Life Cycle System Management (TLCSM).

TLCSM is the implementation, management and oversight by the designated program manager (PM) of all activities associated with the acquisition, development, production, fielding, sustainment and disposal of a DOD weapon system across its life cycle. TLCSM drives nearly every aspect of defense acquisition and sustainment. Defense Total Ownership Cost (TOC) — and its related processes — have matured since its beginning 5 years ago. These processes include performance-based logistics, whole life costing, risk management, earned value management and value engineering, all of which fall under the DOD TLCSM concept.

All services will be represented at this seminar. Speakers include:

- Nancy L. Spruill, Director of Acquisition Resources and Analysis, Office of the Under Secretary of Defense for Acquisition, Technology and Logistics (OUSD(AT&L)).
- Alan R. Shaffer, Director of Plans and Programs, Office of the Director of Defense Research and Engineering.
- Robert Skalamera, Deputy Director of Systems Engineering and Enterprise Development, OUSD(AT&L).
- Elizabeth Rodriguez-Johnson, PM, Office of the Secretary of Defense, Reduction of TOC, OUSD(AT&L).
- COL Janet Wolfenbarger, C-17 Program Director, U.S. Air Force.
- COL Paul Croisetiere, PM, U.S. Marine Corps H-53 Upgrades.
- Anna-Marie Van Brunt, Deputy Product Manager, Robotics and Unmanned Sensors, Program Executive Office (PEO) Intelligence, Electronic Warfare and Sensors.
- Thomas Garrett, Assistant PEO (Research, Development, Testing and Evaluation), Naval Air Systems Command, under AIR-1.0 PEO.
- Ronald B. Smith, Chief, System Support Division, Unmanned Aerial Vehicle Systems Project.
- Nannette Ramsey, Army Materiel Command Value Engineering Manager, U.S. Army Materiel Systems Analysis Activity.

For more TLCSM Seminar information or to register, go to www.idga.org.

Worth Reading

The Commander's Tool — Reflections on van Creveld's Histories of Logistics, Technology and Command

This review focuses on the three van Creveld books that appeared in the Sep-Oct 2003, Nov-Dec 2003 and Jan-Feb 2004 issues of Army AL&T Magazine. The books' reviewer, Geoffrey French, is a Counterintelligence Analyst with General Dynamics and former Logistics Specialist for the U.S. Marine Corps Reserve.

"Military history may be an inadequate tool for commanders to rely on," Martin van Creveld writes, "but a better one has yet to be designed." For this reason, among others, military personnel have long turned to studying the past to provide

counsel for the future. Examining people's successes or failures helps address problems similar to those we face today and can illuminate some steps to take or avoid, depending on the historical outcome. Thus, history serves as the foundation on which military theory is built — in fact, the only possible basis, van Creveld argues. It is for these reasons that van Creveld wrote his histories and the reasons we should return to them for fresh insight.

Van Creveld, a renowned historian at the Hebrew University of Jerusalem, has long been a resource for the U.S. military as a lecturer and author. An appealing aspect of his work is his ability to address the most complex or abstract issues of warfare — those issues that play an integral role but are somehow elusive. For example, logistics and technology affect every aspect of war, from planning to execution. Their effects may be felt most in the area of command. Taken as a set, logistics, command and technology can be seen to constitute not merely the *background* for battle, but the *backbone*. If each fulfills its role well, they do not simply allow battle to happen, they can decide victory before battle ever begins. Although they do not attract as much attention as strategy and tactics, they are no less important. For this reason, subject matter experts from the military, government and academia pay close attention to these issues. From a military history perspective, van Creveld does each a service in his military classics *Supplying War* (1977), *Command in War* (1985) and *Technology and War* (1991). Their continued relevance can be seen in their timeless lessons.

Logistics Importance



The relationship between logistics and strategy is not self-evident. Logistics appear to be an ancillary issue, clearly subordinate to strategic considerations. Historically, however, the relationship has not met that ideal. In fact, logistics have often played a tyrannical role in the past, making strategy a secondary priority. There are numerous historical examples of campaigns where brilliant strategists could not overcome the severe constraints imposed by logistics. Napoleon's campaign into Russia (1812) and Erwin Rommel's operations in North Africa (1942) are two that come to mind immediately. Conversely, logistics can play a positively decisive role as in the Franco-Prussian war where the Prussian advantage in speed of mobilization

translated directly into victory on the battlefield (see Chapter 3 of *Supplying War*). This is not to say that extensive logistical planning guarantees success.

The Allied invasion of France in World War II proved that detailed planning itself might be something that needs to be overcome rather than accommodated. LTG George S. Patton's breakout in August 1944 was accomplished despite logistics plans that ground other commanders to a slow creep. In other words, overemphasis on logistics detail can be almost as crippling as failure to account for logistics considerations. This is especially pertinent as the U.S. military builds tomorrow's logistics system.



insurmountable. Similarly, Rommel's superior tactics simply could not overcome the Allied control of the Mediterranean Sea and airspace. Van Creveld argues that no amount of investment in logistics could have given Rommel enough of an edge to achieve strategic victory in North Africa.

In *Supplying War*, van Creveld comes to some surprising conclusions about the logistics of several campaigns. Napoleon paid a great deal of attention to the logistics plans for the 1812 invasion of Russia, and the troops arrived in Moscow with strength to fight. The enormous distances, few roads and sparse resources in Eastern Europe, however, proved

Joint Vision 2020 refers to focused logistics — “the ability to provide the joint force the right personnel, equipment and supplies in the right place, at the right time and in the right quantity, across the full range of military operations.” Military planners must ensure that this focus is flexible enough to meet many unanticipated needs rapidly. Van Creveld calls war “the most confused and confusing of all human activities.” History has shown that war can thwart the concept that command is simply “the regular unfolding of carefully laid plans.” Military strategists must take care of logistics first, but bear in mind that overly meticulous logistics plans may be too rigid to handle unexpected contingencies on unpredictable battlefields.

Centralization Temptation

Improvements in communication technology clearly have benefits in military operations. Today's information technology allows data to be instantly collected from and distributed to an extremely large number of units and individuals simultaneously. The temptation this poses to high-level commanders is micromanagement. This temptation becomes almost irresistible when the forces make mistakes or encounter difficulty. The U.S. military saw this in the Persian Gulf War when the allied commander had to approve all bombing targets personally after a civilian shelter was mistakenly targeted. Van Creveld dissects two campaigns where the decision by high-level commanders to retain central authority led to a series of mistakes — Israeli Defense Forces in 1973 and the U.S. military in 1965-68. In both instances, communicating information up the chain of command became more important than communicating back down. Subsequently, the focus was on the rear rather than on the front-line troops, resulting in decisions being made at the wrong level, without the proper information and resulting in direct military consequences.

In contrast, Helmuth von Moltke's response to tactical errors in the Prussian campaign against Austria in 1866 was to decentralize more authority to low-level commanders, to ensure that the overall strategy could adapt to tactical failures (see Chapter 4 of *Command in War*). In the Information Age, high-level commanders will have more information than their predecessors and the temptation to retain authority rather than to trust front-line commanders will be even greater. Strategists must recognize that this is a failed model that is most likely to lead to poor integration, poor decisions and poor outcomes.

In *Command in War*, van Creveld examines specific command structures and campaigns that serve to typify their periods. In examining the opening of the 1973 Yom Kippur War, van Creveld concludes that the system was the exact opposite of the Israeli ideal of "optional control." Instead of allowing subordinate commanders maximum flexibility with occasional interference, Israeli General Headquarters reserved the important decisions for itself, meaning each subsequent commander reined in the one below him. Only a change in command personnel and dynamics improved the situation. The U.S. military experienced a similar situation in Vietnam when the Office of the Secretary of Defense often specified targets, mission parameters and personnel requirements, causing local commanders to ignore the tactical situation to meet their specified orders.

Technology Limitations

Van Creveld's examination of technology and war shows that all technology has strict limitations. If history is any indicator, U.S. dependence on technology for a portion of its military superiority — the quality and training of its personnel certainly account for a majority of it — will lead to vulnerabilities over time — whether in terms of adversary adaptation, political manipulation or exploitation of gaps in integration. Van Creveld argues that opportunities for exploiting these vulnerabilities will "increase rather than diminish with the complexity of the technology in use."

The U.S. military has already begun to see the limits of its sensors and automated systems. More will be exposed and exploited as the United States continues to engage adversaries around the world. In a more immediate sense, the United States is relearning technology's limitations as it tries to apply its technological superiority against terrorist groups such as al Qaeda and guerilla forces such as the remnants of the Iraqi military. The long-range sensors and lethal firepower that make the United States an unmatched conventional force are not ideal for these environments. And our adversaries will purposely exploit the political and technological vulnerabilities of the U.S. system (see Chapter 20 of *Technology and War*) to meet their own ends. This scene has been repeated often in modern war and should affect U.S. strategic thought by modifying foreign policy and military engagements to avoid or account for likely low-intensity or unconventional warfare.

In *Technology and War*, van Creveld looks at the myriad ways that technology has affected war and vice versa. Looking at the effect of technology over time clearly shows its strengths and limitations. The telegraph provided a great improvement in rapidity of communications, but was limited to specific physical locations for transmission and receipt of messages. The battleship went from being the focus of naval warfare to obsolescence for several reasons. Primarily, naval forces' ability to detect each other soon outdistanced battleships' artillery range. Simultaneously, air power in naval warfare tipped the balance toward aircraft carriers. Computers revolutionized information processing, but skewed information gathering (in Vietnam, in particular) so that it focused exclusively on quantifiable data, ignoring the very "factors that make war what it is." Nuclear weapons transformed warfare itself, but soon became unusable for fear that employing one would invite an unrecoverable strike.

Structure in Command

In a similar vein, technology cannot be confused with capability. Simply infusing high technology or improving communications will not improve command and control. Commanders must continually deal with less than optimum information, even though today's commanders may be inundated with information. Moreover, much of this information will be conflicting, inaccurate or irrelevant (see Chapter 8 of *Command in War*). The consequential uncertainty is best addressed by allowing the organization to react at the proper level — tactical commanders with the best understanding of situation and need — and, based on clear command authorities and training — that is the underpinnings of the command structure. When considering command structure, it is important to remember that Napoleon's revolutionary command was not due to a radical improvement in communication technology, but rather a drastic change in the approach to logistics and organization. This clearly demonstrates that technology is not as important as its implementation. Moreover, it implies that as technologies change, so must command systems.

Napoleon



The Napoleonic revolution in military affairs was based on several concepts. One was the realization that siege warfare was unnecessary. This simultaneously eliminated the need for an enormous logistics footprint to supply a stationary army and allowed an emphasis on

mobility that provided a strategic advantage. Another success was his system of command. Napoleon standardized the composition and staff of independent corps. These were deployed interchangeably, allowing a high degree of flexibility that was amplified by their ability to operate for significant periods of time on general orders.

Precipice of Revolution

Taken together, these books highlight the real revolution possible for the modern American military — the liberation of strategy. Van Creveld's works show that since logistics is a leader concern, strategy has tended to be limited, if not subjugated, to logistics concerns. Technology has traced a similar path. Ideally, technology provides commanders with new

capabilities to execute strategy. Historically, though, technology has been as limiting as it has been enabling. For every technological breakthrough that has brought battlefield advantage — tanks and the armored division — technology has also brought complications that include, but are not limited to, fuel, ammunition and spare parts, requiring even more complex logistics support.

The revolution possible for the U.S. military is to finally put strategy alone at the top, with transparent, flexible and ubiquitous logistics and technology support. The lessons that history teaches indeed show that integrating technology is difficult, and that logistics planning is demanding. But it also shows that commanders who integrate technology well understand its limitations and take advantage of its capabilities. Today's U.S. military is in a position to fully exploit technological superiority and integrate it into today's and tomorrow's command systems.

Similarly, logistics has become increasingly more complex with countless systems and innumerable parts requiring various equipment and repair specialists. In another sense, however, U.S. forces now enjoy relatively unmatched lethality, survivability and sustainability on the modern battlefield. Commanders who handle logistics well know when to take risks, and well-timed risks often lead to victory. Van Creveld's histories show the trappings of logistics, technology and command, but they also show promise for those who need history's lessons.

Editor's Note: Historical photos provided courtesy of Military Review.



LTG George S. Patton, LTG Omar Bradley and GEN Sir Bernard Montgomery meet to discuss the progress of the French Campaign. Reproduced by Signal Corps Photo Lab.

Contracting Community Highlights



This issue's feature article highlights the Army's effort to keep our wheeled vehicles rolling for our Soldiers while they support *Operation Iraqi Freedom (OIF)*. As Humvees and other wheeled vehicles carried heavy loads over Iraq's rough terrain, tire conditions on these vehicles began to deteriorate.

In the midst of combat operations, it became increasingly important to replace the wheeled assemblies and tires very quickly. In an effort to accomplish this task and to mitigate the cumbersome effort of changing tires, the U.S. Army's Tank-automotive and Armaments Command (TACOM's) Tire Group established a Mobile Tire Service Center (MTSC) in Iraq and other areas to support deployed Soldiers in the field. As the concept materialized, the issue of funding posed potential problems. However, TACOM's Tire Group forged ahead with their plans. The MTSC concept was approved and the effort fully funded. Today, U.S. Soldiers in Iraq and other overseas locations benefit greatly from the TACOM Tire Group's efforts.

Ms. Tina Ballard
Deputy Assistant Secretary
of the Army
(Policy and Procurement)

MTSC Keeps the Army Rolling

Scott F. Rybicki

The TACOM MTSC is a blessing for any Soldier or Department of the Army civilian who dealt with defunct tires in Southwest Asia. Until now, replacing wheel assemblies and tires on Humvees and other wheeled vehicles was a hazardous job, sometimes taking more than 2 hours per vehicle. The self-contained MTSC can replace 6 tire assemblies in 1 hour, in a safe, air-conditioned workshop that expands from a 20-foot International Organization for Standards container.



Clifford Walker, a mechanic from Anniston Army Depot, AL, replaces a Humvee tire at an MTSC at Camp Anaconda, Iraq.

The Army needed a fast, safe and expedient method of changing tires when tire consumption skyrocketed during peak *OIF* operations. Humvees, the Army's workhorses, were often operating round-the-clock and, combined with heavy loads and treacherous roads, increased tire wear and tear exponentially. Recent historic data shows \$60 to \$70 million was spent annually for field tires. Because of high operations tempo, 2003 cost the Army more than \$250 million in tire acquisitions.

The TACOM Deployment Support Tire Group logistics team was asked by several Army officials to see what could be done to ease the logistics and maintenance burden. The team was aware that the Canadians were using some sort of portable service center. Market research revealed portable tire centers were common in European armies.

TACOM developed a concept, but securing necessary funding was the next step. TACOM Tire Group's Brian McCutcheon, Logistics Team Leader, and Jody Finnell, Logistics Project Officer, orchestrated a plan to sell Army leaders on the MTSC idea. Army Strategic Planning Board members were briefed on the MTSC concept and the board, impressed by the concept, approved the project requirements and the Army Materiel Command funded the contract.

A TACOM team of engineering, logistics, maintenance and contract specialists and price analysts inspected, tested, bought and then sent a first production unit on an emergency basis within 10 weeks to Iraq. The MTSC requirement also includes 6 months of spare/replacement parts and tools. McCutcheon and Finnell arranged the training for Anniston Army Depot maintenance specialists and TACOM Logistics Assistance Representatives. They also coordinated the initial

MTSC shipments to Southwest Asia and coordinated “user-in-the-field” changes and overall MTSC management.

Currently, one MTSC is operational in Balad, Iraq, collocated with a Humvee Service Center. Five more MTSC’s are in production — one going to Kuwait, one to Afghanistan and three to Iraq. As long as Army vehicles are subject to rough terrain, MTSC will provide fresh tires to field units while saving the Army time, money and manpower.

Scott F. Rybicki is a Contract Specialist at the TACOM Acquisition Center, Warren, MI.

Contracting Successes

Army Field Support Command (AFSC). The AFSC Contracting Team and Joint Munitions Command Large Caliber Ammunition Team are recognized for working together to award two separate 4-year multiyear firm fixed price contracts for 120mm tank training ammunition (M831A1 TP-T and M865 TPCSDS-T 120mm cartridges). These contracts were awarded to Alliant Techsystems Inc. and General Dynamics Ordnance and Tactical Systems. Proposals were submitted on Dec. 22, 2003, and awards were made Feb. 17, 2004. The two contracts’ total price for the multi-year period is approximately \$470 million.

U.S. Army Contracting Command, Europe (USACCE). The USACCE Emergency Essential Civilian program has



SFC Albert Armstrong helps Roy Marr fit his gas mask.

been in place since 1996. The 30 contingency contracting personnel (CCP) who constitute the program are medically screened DA civilians, hand-picked to deploy with Soldiers to foreign locations to provide on-the-ground contracting support. Employees are on an on-call roster and can be deployed with as little as 24-hours notice. So far in FY04, 22 percent of the deployments have been fulfilled by

CCPs — for 10- to 90-day time periods — to locations such as Greece, Hungary and Chad. USACCE has a robust training plan in place that is continually evolving to meet mission needs.

Aviation and Missile Command’s Unmanned Aerial Vehicle (UAV) Systems Contracting Team. The UAV Systems contracting team performed in an exceptional manner to prepare, negotiate and award several urgent wartime requirements in support of *Operations Enduring Freedom* and *Iraqi Freedom*. These accomplishments included the award of the Hunter UAV System’s multiple-year logistical support contract, the Raven Small UAV System production contract and several awards supporting the Shadow 200 UAV System. The UAV Systems team members are Gregory Wilson, Shirley Hill, Stephanie Smith, Michael Dwyer, Lloyd Smith and Randy Allen. The team worked through many unique challenges to successfully award these extremely urgent and complex contracts.



Shown left to right are: Lloyd Smith, Randy Allen, Shirley Hill, Michael Dwyer, Stephanie Smith and Gregory Wilson.

Communications-Electronics Command (CECOM) Supports Ongoing Counterinsurgency Operations. Anita Fischer, CECOM Contracting Officer, is recognized for awarding a contract modification valued at more than \$10 million for 23 urgently needed Lightweight Counter Mortar Radar (LCMR) systems for the Army Combined Joint Task Force “7” to support its ongoing counterinsurgency operations in Iraq. The LCMR system enables troops to determine the point of enemy fire, thereby significantly increasing their ability to destroy an attacking force before it becomes an imminent threat.

Surface Deployment and Distribution Command (formerly) Military Traffic Management Command. Contracting Officer Ruby L. Mixon is recognized for awarding the command’s first award-term contract in June 2003 for the Container Management Streamlining procurement

valued at \$186 million. Her efforts resulted in DOD's first worldwide performance-based Container Management contract to meet peacetime, contingency and sustainment operations in support of the warfighter. She co-led an integrated process team consisting of government and industry representatives to develop end-state objectives and a performance-based work statement. The contract has a base term, four 1-year options and potential for five 1-year award terms. Mixon prevailed over numerous difficulties to successfully award this contract.

Army Contracting Agency (ACA) Southern Region (Fort Campbell). The 101st Airborne Division (Air Assault) Contingency Contracting Team, Fort Campbell, KY, deployed in support of the division during *Operation Iraqi Freedom*. Team members accompanied the division on the first flight into Kuwait in February 2003 and returned in March 2004. The team satisfied the division's operational contracting requirements prior to, and during, major combat operations and during the ensuing stability and support operations in Northern Iraq. The team spent more than \$55 million on essential supplies, services and construction, with the vast majority of requirements being satisfied from the local economies of Mosul, Erbil and Dohuk in Northern Iraq.

ACA Director Visits NTC. Sandy Sieber, Director of the Army Contracting Agency, and COL Chuck Guta, Director ACA Southern Region, recently visited the National Training Center, Fort Irwin, CA.



Guta (left) and Sieber (right) receive a tour of the civilian-on-the-battlefield facility known as Tiefert City from LTC Anthony Nicolella (middle), NTC Acquisition Commander.

Looking for Career Broadening Opportunities? Then Look No More!

The Office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology (OASAALT) is offering 1-year developmental assignments for all DA employees at the GS-12 level (or Acquisition Demonstration broadband equivalent) in the Contracting and Acquisition Career Program (CP-14). The Contracting Career Program Office funds travel and temporary duty costs.

For details, see the Oct. 31, 2003, memorandum titled *FY2004/2005 Competitive Professional Development (CPD) Announcement for the Contracting and Acquisition Career Program (CP-14) (Updated)*. The memorandum is located online at <http://asc.army.mil/docs/programs/cp/fy04cpdannouncement.doc>. For additional information, contact Sally Garcia at (703) 805-1247.

The OASAALT has a developmental employee who will be happy to share her experience with you. For additional information, contact Linda Fowlkes at linda.fowlkes@saalt.army.mil.

Class for CP-14 Careerists. The Contracting Career Program Office is sponsoring a class for CP-14 careerists titled *The Commercial Business Environment — A Primer for Department of Defense Managers*. The class is scheduled July 11-23, 2004, at the Darden Graduate School of Business Administration, University of Virginia, Charlottesville, VA.

Congratulations to Michael R. Hutchison for being selected to attend the Industrial College of the Armed Forces!

CPA Employee Retires

Perry Hicks, the first leader of the Coalition Provisional Authority (CPA) Rear Support Office, retired in February 2004 after more than 27 years of federal service. Hicks joined the staff of the Deputy Assistant Secretary of the Army for Policy and Procurement (DASA (P&P)) in July 2000 as one of the Army's premier installation and operational contracting experts.

Hicks, a U.S. Navy veteran when he joined federal civilian service in January 1981, served in progressively more responsible contracting positions at several CONUS locations until his assignment to Korea in 1983. From 1983 to 2000, Hicks served in various contracting assignments with the Eighth U.S. Army, including Director of Contracting and Acting Deputy Commander for the U.S. Army Contracting Command Korea. He held an unlimited warrant and supervised more than 150 employees responsible for contracts worth an estimated \$400 million per year. Additionally, Hicks chaired several task forces for the Eighth U.S. Army, U.S. Forces Korea and as the co-chairman of the Status of Forces Agreement for Commerce with the Korean Minister of Commerce.

In 2001, the Acting Assistant Secretary of the Army for Acquisition, Logistics and Technology personally selected Hicks as the Acting Principal Assistant Responsible for Contracting and Acting Commander of the U.S. Army Contracting Command, Korea. In this capacity, Hicks established credibility for Army contracting with the Eighth U.S. Army and all subordinate units on the Korean peninsula.

When the Deputy Secretary of Defense delegated the Army as the executive agency for contracting support to the CPA, the DASA (P&P) selected Hicks to form and lead the Army's contracting office supporting Ambassador Paul Bremer and his efforts to rebuild Iraq. Since July 2003, Hicks orchestrated billions of dollars worth of high-priority, immediate-need commercial support for this vital and historic U.S. foreign policy and security mission.

During his tenure on the DASA (P&P) staff, Hicks performed myriad additional tasks including service as the Army's focal point for Javits Warner O'Day Program support and as the Army's liaison to the President's Committee for the Blind and Severely Handicapped.

Hicks was known at DASA (P&P) for his great stature, laugh and memorable quotes. The acquisition community bids him a fond farewell and best wishes for the future!

The DAR Council Corner

Ed Cornett

There has been a change to the Defense Acquisition Regulatory (DAR) Council Web site. The new Web site is now <http://www.acq.osd.mil/dpap/>.

Defense Federal Acquisition System (DFARS) Case 2003-D097 – Contract Period for Task and Delivery Order Contracts. An interim rule to implement *Section 843, Public Law 108-136 of the National Defense Authorization Act for FY 2004* was published in March 2004. The rule limits task order and delivery order contracts, *DFARS Part 217*, to a total period of not more than 5 years. The 5-year period includes all options, modifications or other mechanisms that would extend the contract's duration period beyond 5 years. The rule is effective on all solicitations issued on and after the *DFARS* interim rule was published in the *Federal Register*.

Both the Senate and House versions of what was ultimately enacted as *Section 843* demonstrate an unequivocal intent on limiting the duration of task and delivery order contracts. The *Authorization Act*, as passed by the Senate, limited the total contract period to 8 years (5 years with up to 3-year extensions per agency procedures). The *Authorization Act*, as passed by the House, limited the total contract period to 10 years (5 years with up to 5-year extensions per agency procedures). The *Conference Report* language limited the total contract period to 5 years. DOD submitted a request to change the legislation because both the Senate and the House intended a period of up to 5 years with possible extension, if required. To review *Federal Acquisition Regulation/DFARS* cases or make/review comments of current cases, go to <http://www.acq.osd.mil/dpap/>, then go to the *DAR Council* link at the top of the Web page.

Ed Cornett is an Army DAR Council Representative.

"Are You Wearing Your Dog Tags?"

Does that question surprise you? It might if you view peace as our default condition and war the exception. Our new reality is very different:

- A conflict of irreconcilable ideas with a disparate pool of potential combatants.
- Adaptive adversaries seeking our destruction by any means possible.

- Evolving asymmetric threats will relentlessly seek shelter in those environments for which we are least prepared.
- A foreseeable future of extended conflict in which we can expect to fight every day — real peace will be the anomaly.

This new reality drives the transformation under way in the Army and is the lens that shapes our perception and interpretation of the future and governs our responses to its challenges. It is the logic for a campaign-quality Army with Joint and Expeditionary capabilities. *Are you wearing your dog tags?*



How Many U.S. Army 5-Star Generals Have There Been and Who Were They?



U.S. Army Center of Military History

The temporary grade of “General of the Army” (5-star) was provided for by **Public Law 482, 78th Congress, approved Dec. 14, 1944, and became permanent on March 23, 1946, under provisions of Public Law 333, 79th Congress.** Below are the 5-star generals and their dates of rank:

- **General of the Army George C. Marshall: Dec. 16, 1944.**
- **General of the Army Douglas MacArthur: Dec. 18, 1944.**
- **General of the Army Dwight D. Eisenhower: Dec. 20, 1944.**
- **General of the Army Henry H. Arnold: Dec. 21, 1944. Arnold was redesignated General of the Air Force pursuant to Public Law 58, 81st Congress, May 7, 1949.**
- **General of the Army Omar N. Bradley: Sept. 20, 1950.**



George C. Marshall

The grade of General of the Armies of the United States is associated with two officers in our history, GEN George Washington and GEN John J. Pershing, although only Pershing actually held it.

After Washington's death, an *Act of May 14, 1800*, specifically authorized President John Adams to suspend any further appoint-

ment to the office of General of the Armies of the United States, “having reference to economy and the good of the service.” Although the office was not expressly referred to in any of the actions taken to reduce or disband forces that had been raised in contemplation of war with France, it ceased when it was not mentioned in the *Act of March 16, 1802*, which determined the peacetime military establishment.

Congress enacted legislation authorizing the grade of General of the Army July 25, 1866. On that date, the new grade was conferred on LTG Ulysses S. Grant. The grade was recognized and continued in various acts until the *Act of July*



Douglas MacArthur

15, 1870, which contained the requirement that “the offices of general and lieutenant general shall continue until a vacancy shall exist in the same, and no longer, and when such vacancy shall occur in either of said offices shall become inoperative, and shall, by virtue of this act, from thence forward be held to be repealed.”

LTG William T. Sherman, Grant's successor, was appointed as General of the Army on March 4, 1869, and after retiring in February 1884, was placed on the retired list as General of the Army. Under the provisions of the *Act of March 3, 1885*, authorizing the appointment of a “General of the Army on the retired list,” this grade was also conferred on Grant shortly before his death on July 23, 1885. The title ceased to exist as a grade of military rank upon Sherman's death on Feb. 14, 1891.

Sherman's successor was LTG Philip H. Sheridan, who could not be promoted to General of the Army because of the 1870 law.



Dwight D. Eisenhower

ferred on Sheridan and was discontinued when he died while still on active duty Aug. 5, 1888.



Henry H. Arnold

War Department General Orders No. 92, Oct. 26, 1872, changed the insignia to two silver stars with the arms of the United States in gold between them. Sherman and Sheridan both wore the new insignia.

Congress revived the grade of General of the Armies of the United States by *Public Law 45, Sept. 3, 1919*, to honor Pershing for his wartime service. He retired with that rank on

Congress, however, enacted legislation June 1, 1888, shortly before Sheridan's death, that discontinued the grade of lieutenant general and merged it with that of General of the Army. The grade of General of the Army was conferred on Sheridan and was discontinued when he

Congress revived the grade of General of the Armies of the United States by *Public Law 45, Sept. 3, 1919*, to honor Pershing for his wartime service. He retired with that rank on Sept. 13, 1924, and held it until his death on July 15, 1948.

War Department General Orders No. 75, Sept. 5, 1866, prescribed that the insignia for the newly authorized General of the Army grade would be four stars. Grant wore this insignia, as did Sherman, until *War Department General Or-*

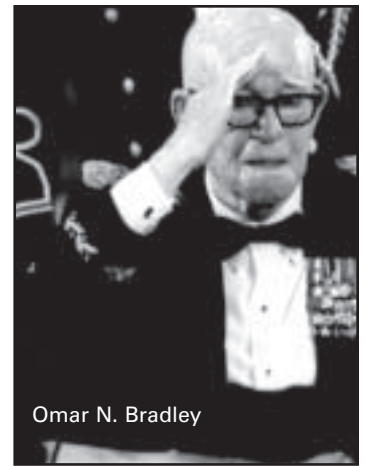
Sept. 13, 1924, and held it until his death on July 15, 1948. No other officer held this specific title until 1976, when President Gerald R. Ford posthumously appointed George Washington General of the Armies of the United States and

specified that he would rank first among all officers of the Army, past and present.

When Pershing was appointed General of the Armies, he continued to wear the four stars that he, as well as

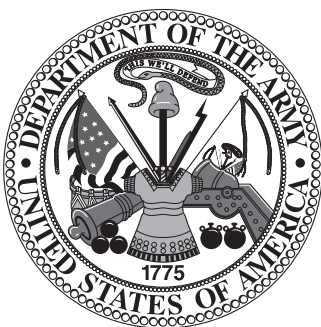
GENs Tasker H. Bliss and Peyton C. March, had adopted under the provisions of then current uniform regulations, which permitted them to prescribe the insignia denoting their grade. *Army Regulations 600-35, Personnel: The Prescribed Uniform, Oct. 12, 1921*, and all subsequent editions during Pershing's lifetime, made no mention of insignia for General of the Armies but prescribed that generals would wear four stars. Pershing at no time wore more than four stars.

Following the establishment of the General of the Army grade on Dec. 14, 1944, *Army Regulations 600-35* were changed to prescribe that Generals of the Army would wear five stars. Although Pershing continued to wear only four, he remained pre-eminent among all Army personnel, by virtue of Congressional action and Army regulations governing rank and precedence, until his death.



Omar N. Bradley

DID YOU KNOW?



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