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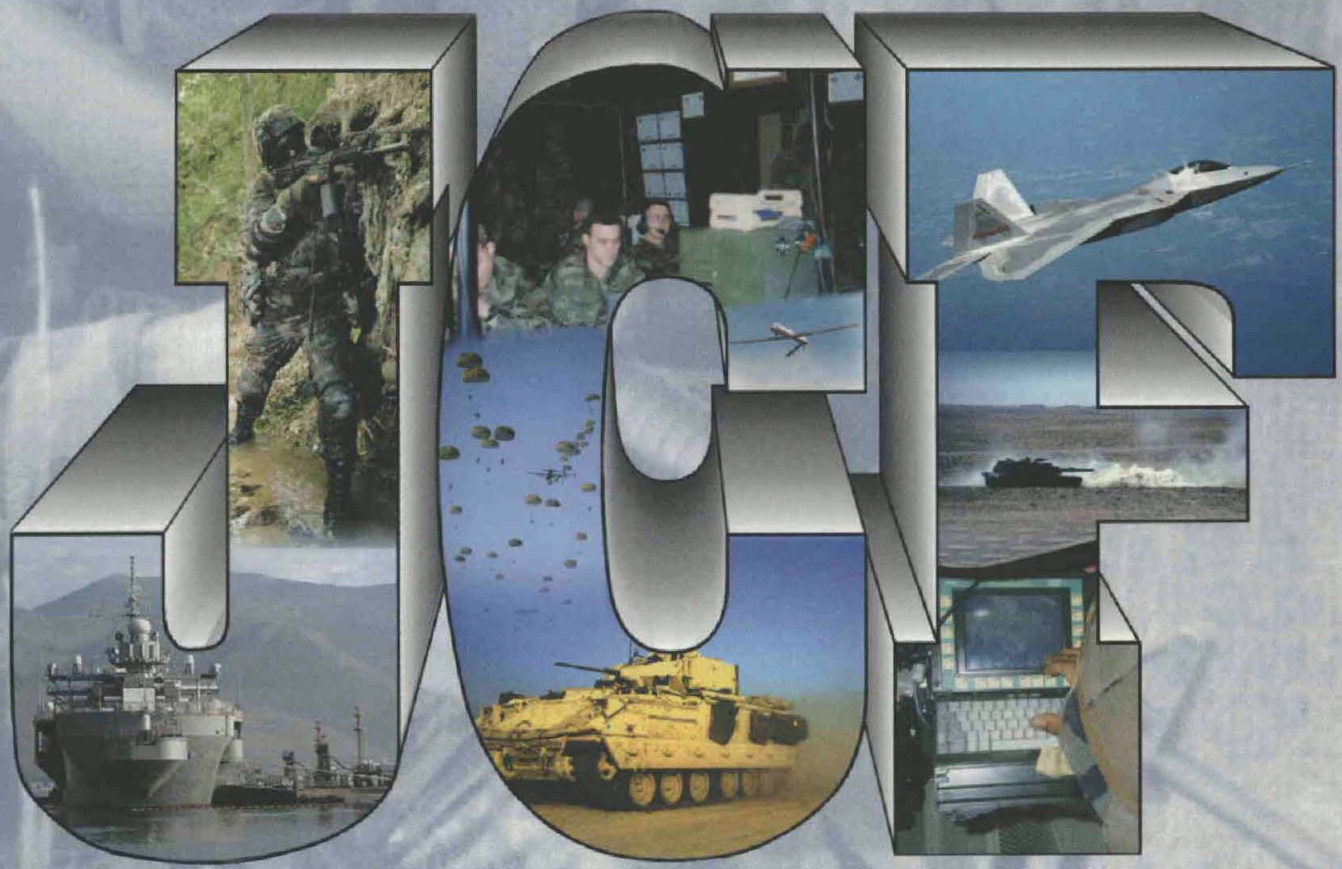
ARMY AL&T

JULY–AUGUST 2000

JOINT CONTINGENCY FORCE



ADVANCED WARFIGHTING EXPERIMENT

FROM THE ARMY ACQUISITION EXECUTIVE

Discovering The Best Path To The Future

We know what we know. How do we find out what we don't know? There are really two ways. In combat operations, the answers are found at the price of casualties. In experiments, the answers are found without that high cost. During experimentation, we explore the most effective use of new equipment and technology advances to develop doctrine and concepts of operations. Here we cooperate with other Services and allies to discover the best path to the future.

Several years ago, the Army embarked on a program of experimentation to gain insights that are guiding our top-level decisions. Our advanced warfighting experiments, combined with our battle labs, advanced concept technology demonstrations, advanced technology demonstrations, and other plans and studies, are helping us design and build the future Army. For example, compelling experimental success in advanced warfighting experiments such as Task Force XXI and Division XXI allowed us to make decisions that accelerated the pace of modernization and digitization of our heavy forces.

We also recognize the value of experimentation as a means to interact with our sister Services in developing doctrine and materiel to promote interoperability. Future warfare demands that we fight as a joint team. In fact, we believe that joint experimentation and increased integration of our common developmental efforts are central to that process. We have many mechanisms in place to foster and support various cooperative efforts of development and experimentation among our sister Services. Joint experimentation offers significant potential to save time and money while increasing total force capabilities.

This fall, the Joint Contingency Force Advanced Warfighting Experiment (JCF AWE) at Fort Polk, LA, will take lessons learned and core systems from prior experiments and rapidly apply them to modernize our light forces. The experiment's focus is to improve capability in command, control, communications, computers, intelligence, surveillance, and reconnaissance; Military Operations in Urban Terrain; and early entry. Articles in this issue provide additional details.

This is the first joint experiment endorsed by the Joint Forces Command, a command created from the U.S. Atlantic Command in October 1999 to serve as the executive agent for joint warfighting experimentation to include efforts to improve our interoperability and effectiveness with multinational partners.

The Joint Experimentation Program, another important initiative, is designed to complement, not replace, existing Service experimentation efforts. The debut event within the Joint Experimentation Program for this year will be Millennium Challenge 00. This experiment provides an overarching joint context and scenario for the integration of four Service-based experiments into a single joint event. The Service events are the Army's JCF AWE, the Navy's Fleet Battle Experiment Hotel, the Air Force's Joint Expeditionary Force Experiment 00, and the Marine Corps' Millennium Dragon.

Our aim is to achieve full-spectrum dominance so our forces can operate unilaterally or in combination with multinational and interagency partners to defeat any adversary and control any situation across the full range of conflict. With full-spectrum dominance, our forces will be able to conduct prompt, sustained, and synchronized operations with combinations of forces tailored to specific situations and with freedom to operate in all domains—space, sea, land, air, and information. Let's take a look at some of our joint programs for which the Army is the lead Service or jointly executes the program.

- The Joint Biological Point Detection System will be installed on vehicles, ships, and at fixed locations to automatically detect and identify biological warfare agents.
- The Joint Service Lightweight NBC Reconnaissance System will provide field unit commanders with intelligence for real-time field assessments of nuclear, biological, and chemical hazards.
- The Joint Service Lightweight Integrated Suit Technology System is in development as the next generation chemical/biological protective system. It will provide our warfighters with the highest level of protection while reducing heat strain, weight, and bulk to an absolute minimum.
- The Army Common Ground Station (CGS), housed in a lightweight multipurpose shelter mounted on a High Mobility Multipurpose Wheeled Vehicle (HMMWV), is the commander's situational awareness, battle management, and targeting tool. First used during Operation Desert Storm, CGS receives, stores, processes, manipulates, displays, and disseminates near-real-time radar imagery data from the Air Force's Joint Surveillance Target Attack Radar System aircraft and many other systems as well.
- The Joint Tactical Ground Station disseminates warning, alerting, and cueing information on theater ballistic missiles and tactical events throughout the theater by using existing communication networks.
- The Joint Tactical Terminal is an intelligence and targeting information dissemination terminal for all Services. It is the critical data link to battle managers, intelligence centers, air defense, fire support elements, and aviation assets.
- The Joint Land Attack Cruise Missile Defense Elevated Netted Sensor or JLENS is an airborne sensor platform that provides over-the-horizon land attack cruise missile defense for joint forces.
- The XM777 Joint Lightweight 155mm Howitzer will provide close and deep fire support to Army light forces and Marine Corps maneuver forces.
- The Joint Tactical Radio System (JTRS) had its genesis in lessons learned from inter-Service communication problems during the Grenada Operation and Operation Desert Storm. JTRS is a family of radios that builds on a common open architecture for interoperability.

These and other programs, together with our advanced warfighting experiments, will help us achieve the full potential of Joint Vision 2020. As stated by Chairman of the Joint Chiefs of Staff GEN Henry H. Shelton, our objective is "a joint force that is persuasive in peace, decisive in war, and pre-eminent in any form of conflict." If we conduct our experiments right, we will discover the best path to the future without paying the ultimate price in soldiers' lives lost.

Paul J. Hoeper

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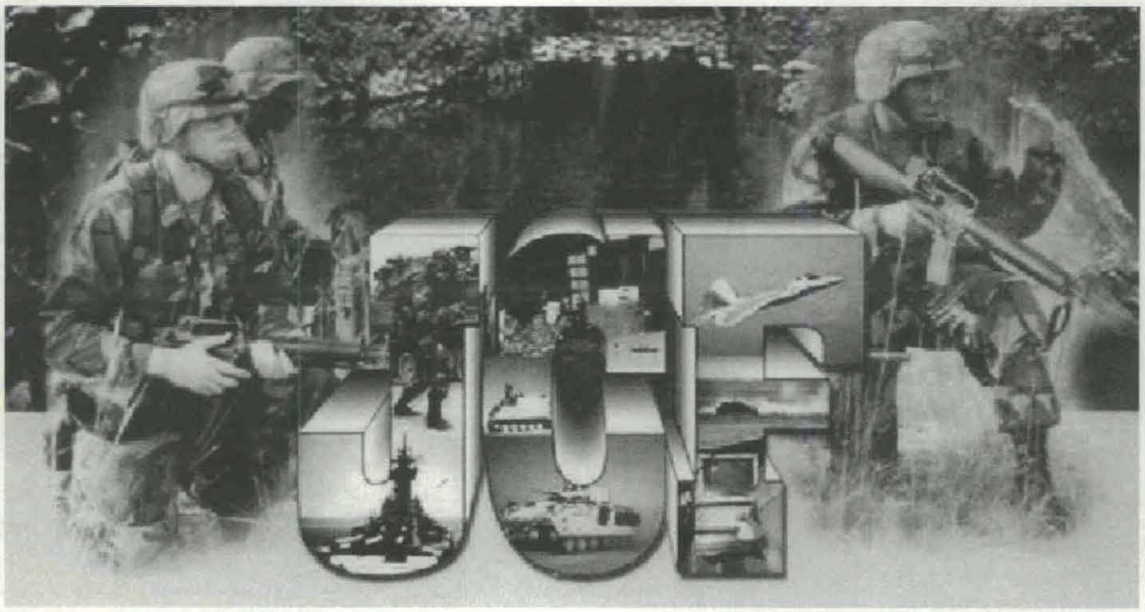
FEATURES

DEPARTMENTS

COVER

The Joint Contingency Force Advanced Warfighting Experiment is combining information technology, the materiel developer, and the warfighter to provide the operational foundations to further transform the Army.



Transforming The Army's Light Forces . . .

THE JOINT CONTINGENCY FORCE ADVANCED WARFIGHTING EXPERIMENT

Van E. Brewer

Introduction

By incorporating experimentation and information technology enablers, the Joint Contingency Force Advanced Warfighting Experiment (JCF AWE)—which will be executed in September 2000 at the Joint Readiness Training Center (JRTC), Fort Polk, LA,—will pave the way for more mobile, lethal, survivable, and responsive Army forces. In particular, the JCF AWE will focus on the "light-axis" component of the Army Experimentation Campaign Plan (AECP), an ongoing experimental process for rapid technology and operational concept integration. The JCF AWE will take lessons learned and core systems from earlier AECP events (Task Force XXI and the Division AWE in 1997) and add capabilities such as the Enroute Mission Planning and Rehearsal System (EMPRS) and Land Warrior (see article on Page 7 of this magazine).

The JCF AWE will employ a Digitized Light Infantry Brigade Task Force (centered on the 1st Brigade, 10th Mountain Division) that will be equipped and trained to execute contingency force operations. Ultimately, future digitized divisions and the Interim Brigade Combat Team will further contribute to the Army's transformation.

Experimentation

The AECP's principal focus is gaining insight into potential improvements in doctrine, organization, training, materiel, personnel and leader development (DOTMPL) that are made possible by technology enablers. The AECP combines materiel development with operational experimentation; in doing so, systems are developed and fielded in less time but with more operational focus. The AECP, which focuses on the Army's major and supporting commands, formulates an operational hypothesis describing the expected impact of emerging technologies on warfighting capabilities and then creates a real-world laboratory environment to assess the hypothesis and determine its impact across the DOTMPL spectrum. These results are fed back into the development process, a process known as "spiral development," which has been demonstrated in major exercises to date and will continue to support the ongoing transformation of the Army into the future.

An AWE is based on a hypothesis, which guides the capabilities to be

examined, the design of the experiment, and the development of the assessment methodology. The JCF AWE hypothesis is as follows:

IF knowledge-based battle command capabilities, gained through enhanced digital connectivity and new equipment, exist across the DOTMPL areas during JCF operations,

THEN JCFs will achieve increases in lethality, survivability, and operational tempo.

Supporting objectives are then derived to provide additional detail for structuring the experiment. The JCF AWE supporting objectives are:

• *Command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR).* Improve joint C4ISR effectiveness and efficiency through digitization, enhanced communications, and joint interoperability of systems, processes, and procedures.

• *Military Operations in Urban Terrain (MOUT)* (see article on Page 13 of this magazine). Enhance JCF ability to execute operations in urban and restrictive terrain.

• *Early Entry.* Enhance JCF ability to plan and conduct forced and early entry operations.

The U.S. Army Training and Doctrine Command (TRADOC) Battle Labs submit initiatives and arguments supporting these objectives, which are assessed by integrated process teams (IPTs) for inclusion into the JCF AWE. Additional IPTs work to develop scenarios, force structures, assessment plans, and all required components to execute a real-world experiment to demonstrate and employ, assess, or gain insights against the key supporting objectives.

While the focus of the JCF AWE will be on the AECP's light axis, the heavy axis experimentation process will continue with the Division Capstone Exercise (DCX) in FY01, in which the 4th Infantry Division (Mechanized) (commonly known as the 4th ID(M)) will incorporate updated versions of the Army Battle Command System (ABCS) and the Force XXI Battle Command Brigade and Below (FBCB2). The DCX will be followed by the Corps AWE, scheduled to be executed by III Corps in FY03.

Digitization

Core systems build on and extend the architectures of earlier AWEs. Battlefield functional area and foundation systems provide enhanced capabilities across the battlefield operating systems (maneuver, fire support, intelligence, air defense, mobility, logistics, etc.). By extending digitization to below brigade, FBCB2 will provide digital capabilities for vehicles. Furthermore, for the first time in a large-scale experiment, the JCF AWE will include a significant surrogate dismounted FBCB2 capability, providing an opportunity to examine the impact of digitization at the individual soldier level. All of these systems are linked together via a Tactical Internet comprised of radios, routers, and networks providing data throughout the task force. In total, the AWE system architecture will take the digitized capabilities of the 4th ID(M), adapt them to dismounted operations, and extend them to accommodate light-force requirements.

The EMPRS represents a new capability for contingency forces. This system, characterized as "ABCS-on-the-fly," will link the aircraft carrying forced and early entry forces to each other and to JTF HQ. By extending the Tactical Internet to this phase of the mission, JTF HQ will be able to pass updated intelligence and orders to the commander en route, as well as provide the ground feed to the common operating picture. The task force will then use its ABCS over a "flying local area network" to update, modify, and rehearse plans. Although the EMPRS is not an objective system, its use highlights the purpose of experimentation—using surrogate capabilities to determine the operational impact of new technology.

The Land Warrior, provided to a platoon of the 3-325 Infantry, 82nd Airborne, will participate in the forced-entry and MOUT phases of the JCF AWE. Land Warrior includes a modular weapon system (to include pointing lasers and advanced sights), laser rangefinder, digital compass, and daylight digital sight; a day and night helmet-mounted display of computer and sensor inputs; night vision capability; protective clothing and individual equipment enhancements (body armor and chemical equipment); and an individual soldier computer/radio. Participation in the forced-entry and MOUT phases of the JCF AWE will provide an early look (prior to customer acceptance tests) at a key light-force modernization effort in a realistic free-play force-on-force environment and a night assault event. The JCF AWE will provide a venue to assess the system's potential to increase the lethality and survivability of the dismounted soldier.

The JCF AWE will also examine 54 distinct initiatives from across the spectrum of light-force operations. These initiatives range from simulations of new weapon systems, to products and systems as varied as mobile kitchens and ration heating systems, to display windowing systems for the commander's information center. Here again, the JCF AWE will provide the opportunity to use surrogate or limited numbers of actual systems, or simulations of new systems, permitting the assessment of operational impacts in a large-scale, free-play, realistic environment. This will allow future development of these systems to be more closely tied to warfighter requirements.

Finally, the JCF AWE will be executed in coordination with the Millennium Challenge, the Joint Forces Command exercise that will test the environment for large-scale cooperative experimentation. During the Millennium Challenge, all Services will conduct exercises within the same timeframe as the JCF AWE—the Navy Fleet Battle Experiment-Hotel, the Marine Corps Millennium Dragon, and the Air Force Joint Expeditionary Force. JTF HQ, initially designated JTF-2 as the Second Fleet commands during the first phase of Millennium Challenge, will hand off command to JTF-XVIII at Fort Bragg, NC, with the Joint Force Air Component

Commander remaining onboard the *USS Mount Whitney*. For the execution of the forced and early entry missions, the Global Command and Control System, ABCS, and EMPRS will link Fort Polk, en route aircraft, Fort Bragg, and the *USS Mount Whitney* in a large-scale demonstration of joint interaction.

Execution

As noted earlier, the JCF AWE will equip and train a Digitized Light Infantry Brigade Task Force (centered on the 1st Brigade, 10th Mountain Division) with XVIII Corps and 4th ID(M) components, to execute forced and early entry operations. Four main "fights" will be executed: forced and early entry using EMPRS; the digitized brigade fight with the bulk of information technology enablers; the dismounted digital fight centered around ABCS, dismounted FBCB2, and Land Warrior; and the overarching joint execution of Millennium Challenge. Each fight will provide the environment—working systems, trained soldiers, and a tactically realistic scenario—to support a credible assessment of each system's operational impact.

Following execution of the forced entry using the EMPRS, the 3-325 Infantry will execute a battle handover to the 1st Brigade Task Force, which will execute a typical series of JRTC engagements to allow for baseline comparison. This includes search and attack, defend, low-intensity conflict, and MOUT, including Land Warrior participation in several phases. Using a cost-efficient architecture, only nine of the tactical operations centers (TOCs) involved will be functioning as rolling TOCs. The balance will operate from fixed sites or from buildings, providing the surrogate capability to examine the effects of information technology enablers while minimizing the development and infrastructure costs for the experiment.

An auxiliary simulation environment, augmenting the normal capability used at JRTC, will be integrated with the live fight to extend the size of the forces involved, implement the effects of initiatives used solely in simulation, and enhance the fidelity of representation. This federation of simulations includes JANUS (a computer simulation that models large-scale warfighting engagements), the extended air defense simulation, and field artillery simulation; and is integrated with the ABCS to provide direct sensor feeds, situational awareness messages, and over-the-air integrated simulation of artillery messaging.

The TRADOC Analysis Center at White Sands Missile Range, NM, is leading the analytical effort in preparation for the JCF AWE. This effort coordinates the complex interaction of initiatives, scenario development, instrumentation, data collection, and analysis to achieve the goals of the JCF AWE.

The AECP was initiated to reduce the Army's development cycle to keep up with the accelerated pace of commercial innovations, within fiscal limitations, and in doing so support the Army's continuous adaptations to new missions in a dynamic geopolitical environment.

Conclusion

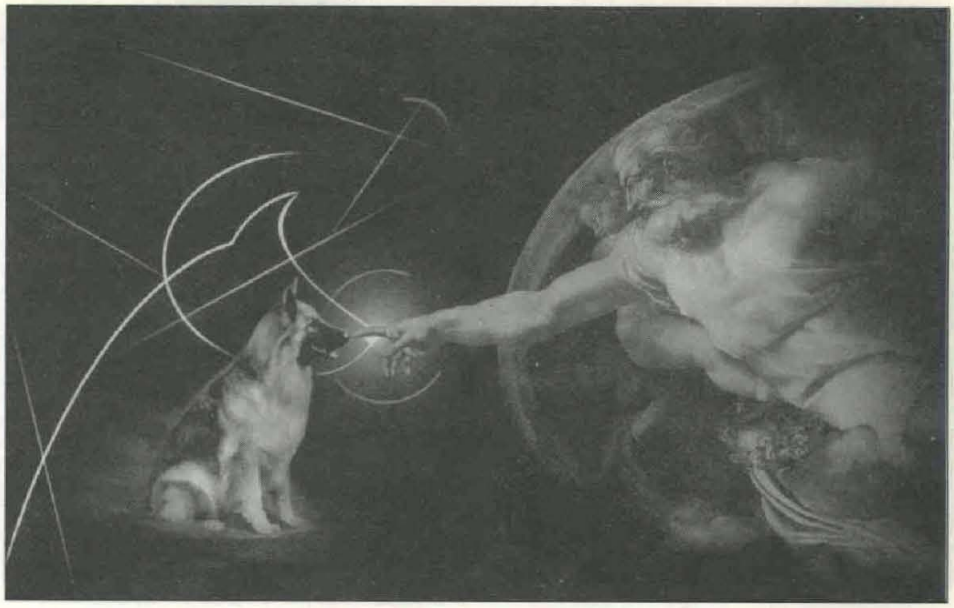
The AECP was initiated to reduce the Army's development cycle to keep up with the accelerated pace of commercial innovations, within fiscal limitations, and in doing so support the Army's continuous adaptations to new missions in a dynamic geopolitical environment. The JCF AWE highlights this process, bringing together information technology, the materiel developer, and the warfighter. This team of industry, civilian, and military personnel has created a laboratory environment for the Army to gain critical operational insights before investing heavily in additional development.

The spiral development process has enabled the Army to develop major new software capabilities in the space of a few years instead of decades, in a way that allows the swift development of operational and organizational concepts with new, significant capabilities. Successful execution of the JCF AWE will provide the materiel and operational foundations for further transformation of the Army, ensuring that future warfighters have state-of-the-art technological capabilities and the operational know-how to employ them—reaching the goal of overmatching combat power across the spectrum of Army missions.

VAN E. BREWER, an employee of Computer Sciences Corp., supports the JCF AWE program management effort in TRADOC's Joint Venture Directorate. He has a B.A. in physics from the University of Tennessee at Knoxville and an M.S.E.E. from the University of Alabama at Huntsville.

"Never forget that a small group of dedicated individuals can change the world. Indeed, nothing else ever has."

—Margaret Mead



THE MAKING OF A DOG'S NOSE

Dr. Regina E. Dugan

Introduction

In 1997, the Defense Advanced Research Projects Agency (DARPA) accepted a great challenge. The post-conflict problem presented by landmines had achieved notoriety as a problem of global humanitarian importance. The international community estimated that more than 100 million landmines were buried in approximately 60 countries, which represented a considerable military challenge. Reports from U.S. field soldiers consistently listed landmines as one of the top three threats they faced in Bosnia. In fact, during the Bosnia conflict, more than 2 million landmines were laid in a country less than half the size of Colorado. As a result, mine detection had taken on great urgency.

The problem of landmines, however, is not new. "For the last 60 years, a sharply increasing percentage of American soldiers have been killed or wounded by landmines. From World War II to Somalia, the percentage of casualties caused by landmines has grown from 2.5 percent to 26 percent," noted LTG Paul J. Kern, Military Deputy to the Assistant Secretary of the Army for Acquisition, Logistics and Technology.

Although there had been some technological progress in landmine detection, the problem was made more difficult by the wide-scale production of cheap, low-metal-content plastic mines. The best mine detection systems available in 1997 were technologically superior to the 1940s-style metal detector, but only barely. Indeed, the only landmine detection equipment issued to U.S. soldiers in the field were the metal detector and a sharp, pointy stick. In conflicts around the world, landmines were going in the ground at a rate of millions per year and were only being removed at a rate of hundreds of thousands per year—in a good year. Further, for every 5,000 landmines removed, one deminer was killed or maimed. The United States was falling behind and in desperate need of a technological breakthrough in landmine detection.

Background

DARPA's goal in 1997 was to develop a new mine detector with unparalleled performance. We (DARPA) began with an idea from humble origins—the dog. Canines are exquisitely good at landmine detection and are able to search for the explosive material itself. This dramatically decreases the advent of false alarms. Indeed, if we could find a way to search for the explosive material itself, we could fundamentally change landmine detection.

Conventional mine detection involves searching for features associated with the mine, such as small changes in the electric or optical properties or the small amount of metal associated with the fire pin. As a result, there are approximately 1,000 or more false alarms for every actual mine found. Nature causes many changes in electric and optical properties, and there are many small pieces of metal anywhere humans have been. All of these seriously confound traditional sensors. Philosophically, a more robust solution was to search for what was unique to the mine.

Chemically Specific Detection

Canines provided the incentive for our idea: chemically specific detection via the explosive material. But, humans are capable of many creative interpretations of biology. DARPA devised many engineering designs. Some were based only on the overarching principle of chemically specific detection, while others mimicked the actual design of the biological system. Indeed, there is something fundamental that nature has taught us about odor detection. The biological system uses a broadband array of sensors, none specific to the chemical of interest. Dogs do not have trinitrotoluene (TNT)-specific sensors. Rather, they use a sensitive but highly cross-reactive array of sensors and provide for high-fidelity processing of the signals from this array.

It is this processing that provides for the capability to learn new odors. You may never have smelled orange juice, cut grass, or full-bodied wine, but the mammalian olfactory system has the ability to discern, learn, and remember new and complex odors. This, combined with a well-designed and adapted sampling system, provides for the miracle of mammalian olfaction.

Research And Development

With this basic approach, we set out to build new landmine detection systems to serve those in the field. In our pursuit of this goal, we focused not only on the technical tasks before us, but also on the people we were serving. To develop something of use, our researchers had to understand the problem; they had to understand our customer. Therefore, we took them to the field—again and again. We constructed a 22-acre, state-of-the-art experimental facility at Fort Leonard Wood, MO, home of the U.S. Army Engineer School. Because this facility was constructed to test explosive detection systems, it allowed us to move systems out of the laboratory and into the field quickly. It also allowed us to be close to our customer.

We showed our researchers how landmine detection is accomplished now, from breaching to probing. We had Ph.D.s use metal detectors and pointy sticks to search for booby-trapped mines. We taught them about the threat and had them talk to sergeants and generals. A subset of the

Dog's Nose Program researchers learn mine-clearance techniques.

researchers visited actual operational fields—humanitarian mine-clearance efforts in Mozambique and Bosnia—and brought the message back to the group. We worked to ensure that the problem was realistically identified and that we understood what was happening in the field—to Mozambican deminers, to Bosnians, and to our soldiers and Marines. We put faces and names on the problem and made it personal because we believed that the ultimate test of success would be measured by the confidence and enthusiasm of the user.

We built a team through common experiences and common purpose. Their commitment broke down institutional barriers and interdisciplinary work became more exciting. The team of researchers worked nights and weekends to solve the landmine detection problem. They were absolutely uncompromising; good enough simply wasn't.

Quadrupole Resonance System

In the 3 short years of the program, detection of underground explosives was successfully demonstrated using three different prototype systems, both in the laboratory and in the field against real explosives buried in the ground. With our quadrupole resonance system, which is not explicitly a mammalian olfaction design, we can now detect very small amounts of explosives, the size of antipersonnel mines, with near-perfect detection rates and almost no false alarms.

The improvements in system performance increased dramatically. In 1997, we were able to detect hundreds of grams of RDX; in 1999, we were able to detect as few as 10 grams. The detection of small quantities of TNT is the Holy Grail of mine detection, and the ability to detect TNT using quadrupole resonance was largely believed to be impossible. In December 1999, this last scientific obstacle fell. The prototype quadrupole resonance system was tested at the U.S. Army Engineer School. The prototype system detected 100 percent of all TNT, RDX, and plastic and metal mines with no false alarms after a single rescan of initial alarms. Detection of TNT in the field using quadrupole resonance technology *was* possible afterall.

Electronic Noses

We also had two electronic noses sniff landmines underground. The initial field results must be reproduced, improved, and verified, but the principle is proven—one can construct a sensor to detect a landmine via its chemical signature. We have demonstrated detection sensitivities 10,000-fold greater than current airport security sniffers. Another system is able to determine not only the presence of a landmine, but also the odor of the local environment. The sensor learns the smell of the ground and is able to adapt to new field settings. It provides a rich "image" of smell.

Recently, researchers exposed an electronic nose to a variety of odors and recorded the response in a two-dimensional digital movie. The movie shows the changing response across an array of sensors to a variety of chemicals as changing colors. In other words, it allows a human to *see* odors. These nose technologies promise to revolutionize chemical sensing in warfare environments. The first goal is landmine detection, but the future impact of providing a soldier with the olfactory acuity of a canine has not yet be realized.

A great challenge for any revolutionary technology development is transition to the user. While it is necessary to prove the basic principles in prototypes, it is not sufficient. Transition requires a whole new set of participants dedicated to the fielding of equipment, and the timing of these transitions is critical. In DARPA's rapid-pace developments, there is often little time for a graceful transition.

Other Programs

The most important breakthroughs in the Dog's Nose Program occurred at the end of the third year. Just 1 year earlier, we did not know if the objectives of the program were achievable. Despite the late-breaking developments, the Project Manager for Mines, Countermine and Demolitions began an aggressive $12 million, 3-year program to further develop and field quadrupole resonance equipment for landmine detection on roads. As part of this effort, the U.S. Army Communications-Electronics Command Night Vision and Electronics Sensors Directorate initiated an immediate multimillion dollar science and technology "bridge" program to address the most critical technical challenges for using quadrupole resonance technology on vehicles. Simultaneously, the U.S. Marine Corps, in cooperation with the Office of Naval Research, laid out a program to field quadrupole resonance for hand-held detection applications.

Conclusion

As a result of these efforts, LTG Paul J. Kern commented, "We enter the 21st century with new optimism. Quadrupole resonance technology holds great promise for our soldiers because it will detect a mine in place and eliminate the need to conduct exceedingly dangerous manual probing. We finally have a viable solution to a problem that has indiscriminately plagued soldiers and civilians for more than 6 decades."

Throughout this program, individuals with courage and commitment made the difference. During the last 3 years, a group of heroic scientists and engineers, soldiers and Marines, and civilians and contractors waged a quiet battle against landmines. And they won.

DR. REGINA E. DUGAN is a Program Manager at DARPA. She was selected as DARPA Program Manager of the Year in 1999. Dugan has a B.S. and an M.S. from Virginia Polytechnic Institute and a Ph.D. from California Institute of Technology, all in mechanical engineering.

Supporting The JCF AWE . . .

LAND WARRIOR CAPABILITIES

COL Henry Kinnison and COL Bruce D. Jette

Introduction

Land Warrior is the U.S. Army's premier program for integrating infantry soldier combat capabilities into a warfighting system optimized for close combat. In addition, Land Warrior is a key component in the overarching vision of modernizing infantry soldiers as weapon platforms. It not only provides enhanced capabilities at the infantry-soldier level, but also increases the combat effectiveness of infantry teams, squads, crews, and platoons to achieve overmatch in the close fight.

Land Warrior will participate in the Joint Contingency Force Advanced Warfighting Experiment (JCF AWE) in September 2000 at the Joint Readiness Training Center (JRTC), Fort Polk, LA. Land Warrior's participation enables the Army to obtain soldier feedback, collect technical performance data, and begin to demonstrate the increases in combat effectiveness at the platoon level and below that Land Warrior provides. Because Land Warrior provides capabilities that current infantry soldiers do not possess, the results of the JCF AWE (the largest exercise of Land Warriors operating together to date) will be valuable in refining the system capabilities and defining new tactics, techniques, and procedures (TTPs).

JCF AWE Missions

The JCF AWE version of the Land Warrior is commonly referred to as Version 0.6 (Figure 1). Fifty-five systems will be fielded to the 2nd platoon and other elements of C Company, 3rd Battalion of the 325th Airborne Infantry Regiment for use during the JCF AWE. In addition to supplying the rifle platoon and its assigned medic and forward observer, systems will also be provided to a portion of the company headquarters, a mortar section, and to fire support and sapper personnel.

Figure 1.
Land Warrior for JCF AWE

Land Warrior-equipped elements of the 3rd Battalion will be limited to approximately 7 days of combat operations and three major missions. In the first mission, the 325th will perform a night airborne assault and seizure of a flight landing strip held by an opposing force. Once the initial airhead is secure, the 325th will conduct search-and-attack operations to expand the lodgment surrounding the landing strip.

Once the 325th hands the battle over to the 1st Brigade of the 10th Mountain Division, the 2nd platoon, equipped with the Land Warrior, will begin planning and preparing for its second mission: a platoon assault into the Shughart/Gordon urban training facility. At Shughart-Gordon, the 2nd platoon of Company C will conduct a live-fire seizure of an urban target at night. Following the attack into the Shughart/Gordon complex, the 2nd platoon will plan, prepare for, and execute its third mission: a night live-fire ambush. These three missions will provide a broad spectrum of operations in a short period during the JCF AWE.

Preparation

Training for the Land Warrior platoon began at Fort Bragg, NC, in June. Performance-oriented training on the Land Warrior equipment, use, functions, and TTPs is being conducted into July. After the performance-oriented training, the infantry platoon will conduct unit-training exercises to become proficient with system capabilities and

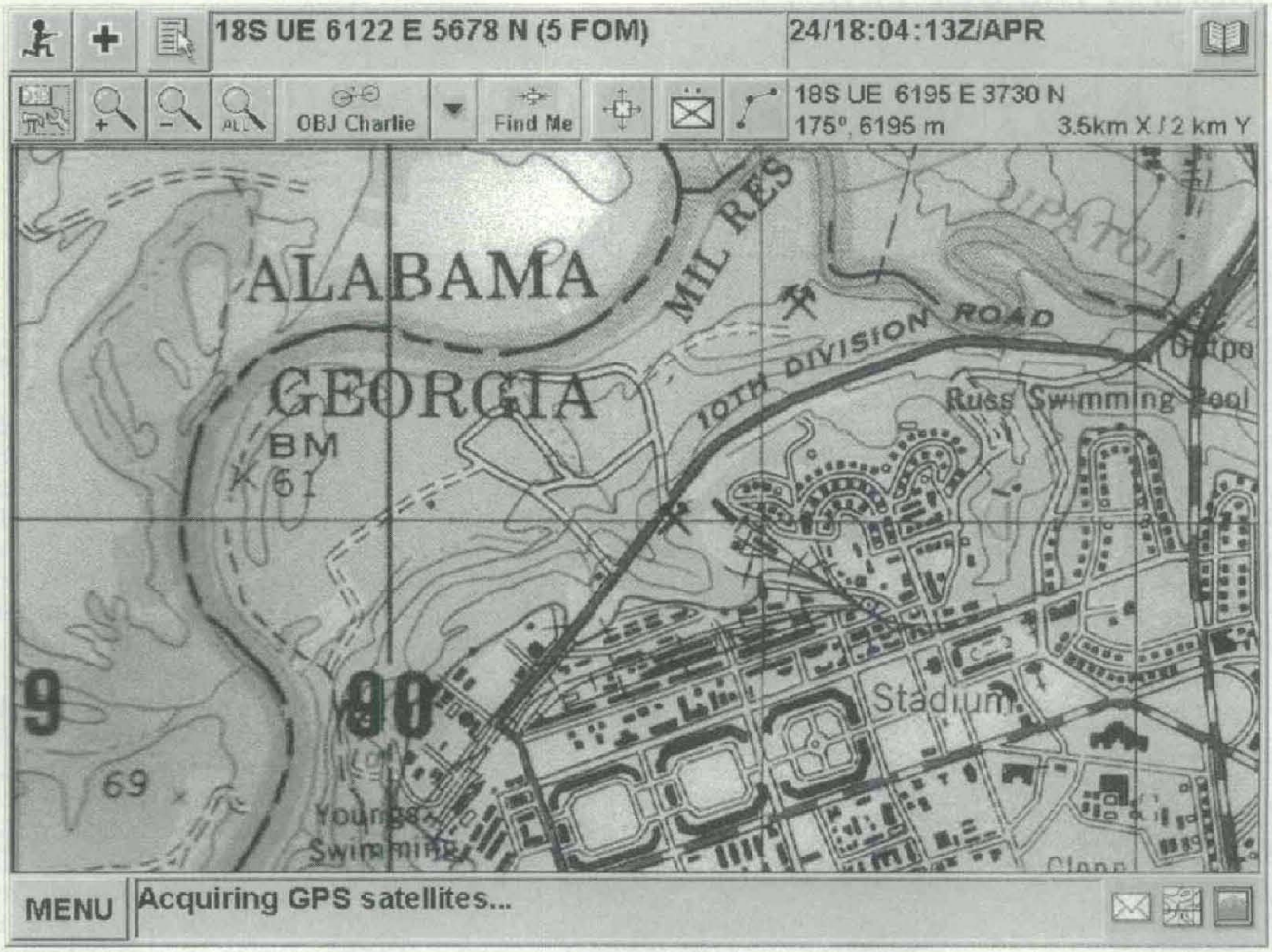


Figure 2.
Land Warrior navigation screen

employment prior to deployment to the JCF AWE in September. Training will also include a 2-week deployment to Fort Benning, GA, to conduct training at the McKenna urban training facility and other facilities in preparation for the JCF AWE.

Land Warrior is currently in engineering and manufacturing development with a production decision scheduled for FY03. While the Land Warrior prototype systems in the JCF AWE will not be fully compliant with the Land Warrior Operational Requirements Document (ORD), key performance parameters, and threshold requirements, the systems will provide the platoon many capabilities they do not currently possess.

Land Warrior Version 0.6

The following is a brief summary of capabilities to be included in Land Warrior Version 0.6 to be employed during the JCF AWE. Selected infantrymen, sappers, medics, and forward observers will be equipped with a suite of electronic equipment integrated onto the modular lightweight load-carrying equipment, assault helmet system, and weapon system. Integration of the equipment on the soldier is a fundamental challenge because the human platform is quite variable, dynamic, and mobile. Land Warrior uses a systems approach to provide a suite of equipment that is adaptable for the mission to be performed. The JCF AWE will provide soldier feedback to further improve the physical integration of the equipment on the soldier for the production version.

Land Warrior will also have data communications provided by integrated electronics and a military global positioning system. Infantrymen can accurately identify their location and the location of their fellow members by glancing at an electronic color map (Figure 2). The maps can be annotated and transmitted within the squad and platoon to clearly communicate mission changes to each squad member. The system also provides a dead-reckoning capability for position location when soldiers are in restricted terrain where global positioning satellite communications are obscured, such as in an urban area.

The soldier will have the ability to engage targets around corners and from under cover by using weapon-mounted sights with the image shown on the helmet-mounted display. The daylight video sight provides daylight visual targeting capability, while the thermal weapon sight provides target acquisition

in day, night, and smoky battlefield conditions. Images from each of the sights can be captured, annotated, and transmitted within the platoon. Transmission of images can be used to clearly identify the objective, identify lanes of fire, and send intelligence data back to headquarters.

Some capabilities will not be incorporated or will be partially incorporated into Land Warrior for the JCF AWE, but will be fully incorporated into the system prior to production. For example, full Tactical Internet connectivity with a full complement of Dismounted Joint Variable Message Format (JVMF) messages passed to Force XXI Battle Command Brigade and Below (FBCB2) is required for the production system but will not be available for the JCF AWE. However, this capability will be demonstrated by digitally sending messages to and from the rifleman up through the squad leader and platoon leader to the Tactical Internet. Seven key JVMF messages (4 of which are two-way messages for a total of 11 messages) have been selected to demonstrate the connectivity between Land Warrior and FBCB2. These messages include position, situation, and medical evacuation reports.

Other capabilities of the JCF AWE Land Warrior that will not yet meet full ORD compliance include interoperability with combat identification, full operational temperature range, erasure of computer data if captured, threat laser detection, and interoperability with the Joint Chemical Agent Detector. These capabilities are being worked for the next version of Land Warrior, Version 1.0, which will undergo the formal testing and become the baseline for Milestone III.

The Land Warrior for the JCF AWE is powered by a 2.4-pound state-of-the-art, lithium-pouch-cell primary battery that provides reliable power for 12 mission hours. During the training at Fort Bragg, a lithium rechargeable battery was used to power Land Warrior. This same technology will be used for production, but the battery will be reconfigured into a 1.6-pound version. The technology provides for an extremely safe and stable battery that can be punctured yet continue to work without risk to the soldier. Additionally, the battery can be discarded as normal waste instead of the usual requirements for the disposal of hazardous waste. Power management in the electronics and software combined with lower power consuming hardware will reduce the total power consumption and enable the lighter weight battery configuration.

In providing the Land Warrior hardware and software, PM, Soldier has taken a streamlined acquisition approach involving rapid prototype development and a teaming effort with industry.

The Project Manager, Soldier (PM, Soldier) and the TRADOC System Manager-Soldier (TSM-Soldier) are working together to prepare Land Warrior for the JCF AWE. In providing the Land Warrior hardware and software, PM, Soldier has taken a streamlined acquisition approach involving rapid prototype development and a teaming effort with industry. Teaming provides daily interaction between government and industry where expertise from both is responsible for various aspects of the program in parallel. The result is rapid progress in providing solutions and incorporating user and technical improvements. TSM-Soldier is the interface to the JRTC and Fort Bragg user community and is working on the training and operational aspects of preparing the Land Warrior for the AWE.

Summary

In summary, many of the Land Warrior capabilities will be included in the JCF AWE Version 0.6 to enable the infantry to experiment with determining the best TTPs and provide recommended improvements in Land Warrior prior to production.

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USING FLUORESCENCE IMAGERY AND MICROBES FOR ORDNANCE AND MINE DETECTION

Robert L. Fischer, Dr. Robert S. Burlage, Dr. John DiBenedetto, and Michael J. Maston

Introduction

The cost to remediate sites that contain landmines, unexploded ordnance (UXO), and contamination from high-explosive (HE) materials is staggering. Because of the ever-increasing demand for land resources, this problem will continue to grow in importance, both within and outside of the United States. Landmines and other forms of UXO cover vast areas in countries such as Bosnia, Angola, and Cambodia. As such, their impact is immense in terms of civilian casualties and the loss of productive farming and grazing land. Within the United States, injuries caused by these devices are rare, but their impact on restricting land use is still high.

Cost-effective methods must be developed to survey and remediate installation impact areas, training zones, and munitions disposal sites before they are considered for new usage (under legislation such as Base Realignment and Closure (BRAC)). If the locations of the landmines, UXO, and contamination are accurately mapped, remediation can be done safely and at a substantially reduced cost.

A new approach with exciting implications is to combine fluorescent biosensors and Laser-Induced Fluorescence Imaging (LIFI). This technique was originally developed to locate landmines, but can be used on all types of explosive devices. Usage requires only that a minute amount of explosive leak from the device. The detector is a strain of genetically engineered bacteria that produces a fluorescent protein when in contact with trinitrotoluene (TNT). This innovative technique is a potentially powerful tool in detecting landmines, UXO, and HE contamination. Because both bacteria delivery and detection can be accomplished from airborne platforms, this technique is far safer than ground-based systems and can cover large areas in short periods of time.

Background

The actual detection system is composed of two parts. The first part is the microorganism *Pseudomonas putida*, a naturally occurring, innocuous soil bacteria that has a protein that recognizes TNT and expresses (turns on) a gene in response. This bacterial gene has been genetically fused to a second gene called *green fluorescent protein* (*gfp*), by scientists at the Oak Ridge National Laboratory (ORNL). The *gfp* gene, found naturally in the jellyfish *Aequoera victoria*, produces a protein that has a strong fluorescence in the green region (510nm) of the visible light spectrum. When in the presence of TNT, these bacteria are very easy to detect because of the *gfp* fluorescence. The bacteria can be grown and harvested in high numbers using standard growth media. When applied in the field, the bacteria will search for organic molecules that they can use as food. When the bacteria come into contact with TNT, they will attempt to digest it with their enzymes, but will instead produce the fluorescent protein.

The second part of the system involves detecting the fluorescent microbe. The detection instrument used is the LIFI system developed by Bechtel Nevada Special Technologies Laboratory (STL). The LIFI system was initially developed to detect surface uranium contamination. The LIFI instrument is a 35-pound backpack portable system that includes a laser power supply and onboard computer. LIFI uses an eye-safe, pulsed ultraviolet (355nm) laser as the excitation source. An intensified charge-coupled device camera captures ambient background and fluorescence imagery. Onboard hardware and software controls the laser, captures imagery, eliminates the background, and produces a real-time display showing fluorescence intensity. All imagery can be saved to a hard disk for processing and further analysis.

Initial Test

This combined technology was demonstrated at the National Explosives Waste Technology and Evaluation Center (NEWTEC) in Edgefield, SC. The site was proposed as a realistic minefield, with surrogate landmines containing TNT filler planted at locations unknown to the scientific team. The mines were buried approximately 3 months before the demonstration took place to allow the mines enough time to leak explosives into the soil. The resulting conditions were similar to actual abandoned minefields in temperate woodland climates. All targets were buried at least 4 inches beneath the surface with no evidence of soil disturbance.

Using a tractor equipped with an agricultural sprayer and a modified agricultural spraying boom, the bacteria were applied to the quarter-acre test plot. The application solution was prepared by loading a quantity of the bacteria into a 150-gallon reservoir, then adding site well water (nonchlorinated) to bring the total volume up to the desired level. Four-and-a-half liters of bacterial solution, containing approximately 10^{13} total bacteria, was added to approximately 75-80 gallons of water. The test plot was first sprayed with water to saturate the soil prior to applying the bacterial solution.

Both a gantry system and mobile platform were used to position the LIFI sensing head in a nadir orientation over the test area. Typical working distances were 4-8 meters above the surface. The LIFI system located four of the five blind targets within a distance of 2 meters. The remaining target was identified about 3 meters from its actual position. Two false positives were also identified, one of which involved TNT migration caused by heavy rainfall. The second false positive was not near any buried mine, however, soil sampling showed TNT on the surface of this location.

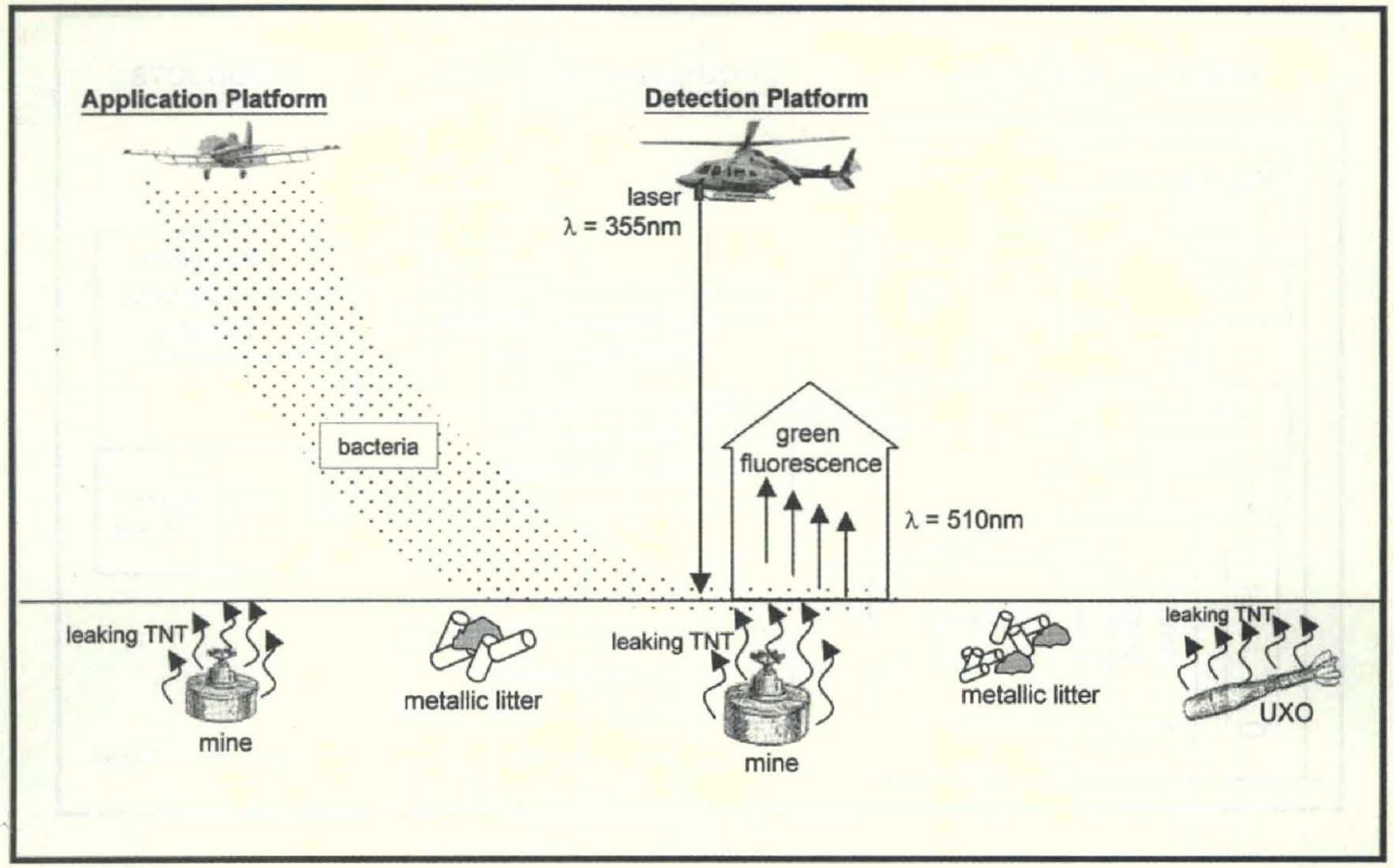

Figure 1.
Proposed operational system

Full System Development

Based upon these encouraging results, a multiagency team (ORNL, STL, U.S. Army Engineer Research and Development Center, and Los Alamos National Laboratory) is pursuing funding to further test and eventually develop an operational mine detection system (Figure 1). A fully operational system would consist of bacteria creation and airborne delivery components, airborne laser-induced fluorescence and imaging components, and software to perform signature matching and geographic information system (GIS) product generation. A breakout of the airborne detection and ground-based components is shown in Figure 2.

Of the three components, bacteria growth and delivery is the most mature. Techniques for growing large amounts of bacteria are well known, as are methods of aircraft delivery via crop dusters. However, research is still needed on the bacteria to amplify the fluorescence signal, on refining the position of the wavelength maximum, and for adapting more bacterial strains to detect other explosive materials, such as RDX (hexahydro-trinitro-triazine).

Scaling the current LIFI system to an airborne platform is feasible. STL has built two airborne fluorosensor systems, one of which is similar to the technology used in the NEWTEC experiment. The system could be fielded in Army helicopters without airframe modification. Increased laser power would be required to illuminate larger areas from higher altitudes, and the imaging hardware would require improvement to detect lower fluorescence levels. Hardware capable of meeting these requirements should be commercially available within the proposed 4-year development cycle.

The software system would produce a georegistered mosaic by combining the aircraft's Differential Global Positioning System (DGPS) and inertial measurement unit (IMU) with the fluorescence imagery. The imagery would then be compared to emission spectra from a spectral database to separate out background features (i.e., soils and vegetation) and identify "hot" regions. The final product would be multiband fluorescence images and overlays that are compatible with existing GIS and image processing systems.

The goal for a fully functional system is to cover approximately 25 acres per hour. If this technology succeeds, it will represent a breakthrough in coverage capability.

Concerns

As with any new technology, certain drawbacks, limitations, and assumptions must be addressed. The public perception of using genetically modified bacteria is an obvious concern. Hopefully, these concerns can easily be dispelled. The Environmental Protection Agency has reviewed the bacteria construction and has approved limited releases. Functionally, the genetically altered bacteria have no competitive advantage over nonengineered bacteria. The only major difference is that the modified bacteria "turn on" the *gfp* when they come into contact with the target substance (in this case TNT).

As with any detection instrument, the proposed system should be tested under a variety of different environmental and meteorological conditions. Questions about TNT transport and chemical interaction with the soil must also be addressed. Other researchers in this field have studied many of these parameters and their results should

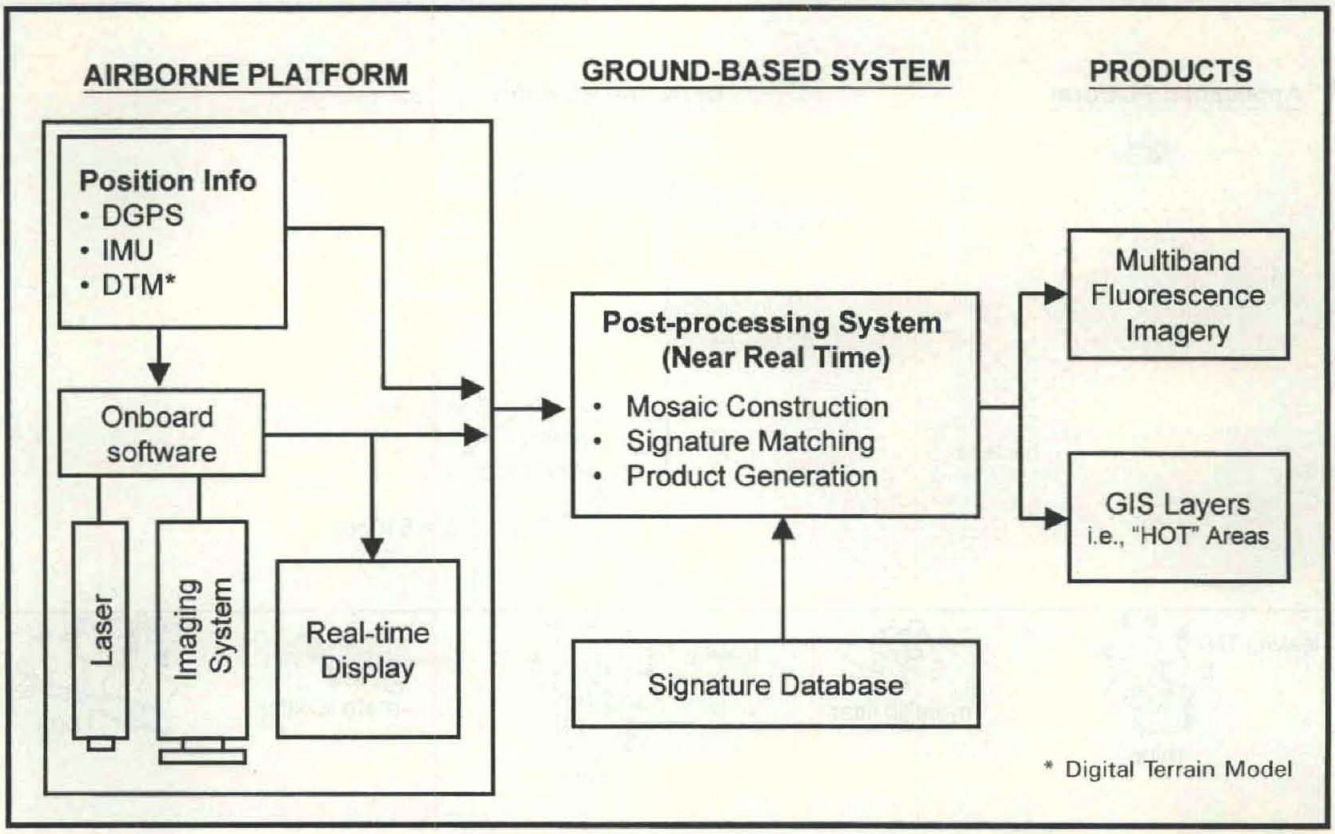

Figure 2.
Block diagram of airborne and ground-based components

provide insight into the full capability of this system.

A final concern is that the landmines or UXO would need a minimum amount of time to allow the TNT to reach the ground surface. This will probably limit the use of this technology in tactical situations. However, in most humanitarian and other civil applications, the landmines and UXO have been in place for several years and have been subject to considerable diurnal and seasonal effects.

Potential Payoff

Having a single technique work as a "silver bullet" for the landmine and UXO problem is unlikely. We would advocate the fusion of our proposed system with existing and future detection platforms. However, a new technology that can detect landmines and UXO over a wide range in a timely manner would be of substantial benefit. When considering both the worldwide humanitarian and monetary costs from landmines and UXO, any system that can provide even moderate safety and efficiency improvements would be a breakthrough.

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MOUT ACTD TO DEMONSTRATE NEW TECHNOLOGY AND TACTICS FOR URBAN WARFARE

Carol Fitzgerald, MAJ Richard E. Stockton, and Sheila Ryan

Introduction

The Military Operations in Urban Terrain (MOUT) Advanced Concept Technology Demonstration (ACTD) will conduct its Culminating Demonstration (CD) during the Joint Contingency Force Advanced Warfighting Experiment (JCF AWE) in September 2000. Soldiers from the 2nd Battalion, 22nd Infantry Regiment, 10th Mountain Division and Marines from K Company, 3rd Battalion, 6th Marines Regiment, 2nd Marine Division will demonstrate the military use of approximately 25 products in the MOUT ACTD "kit." This article summarizes the programmatic path leading to this significant event.

Responding To An Urgent Need

The military has traditionally avoided fighting in cities because they are often the most complex battlegrounds facing U.S. forces. Line-of-sight restrictions, limited intelligence, densely constructed areas, and the presence of noncombatants limit the capabilities of current U.S. technology. These realities were brought home in October 1993 when the U.S. Army's firefight with Somali militia in Mogadishu left 18 Americans dead.

The MOUT ACTD began in 1997 in response to the Defense Science Board's 1994 study, *Military Operations in Built Up Areas*, which recommended an ACTD be undertaken to address the needs of U.S. troops in future urban combat. The objective was to improve the operational capabilities of dismounted infantry in MOUT through the integration of advanced technologies and tactics, techniques, and procedures (TTPs). This developed into a three-part mission: to evaluate advanced technologies to provide dominance in MOUT, to provide interim capabilities to operational units with TTPs, and to set the stage for rapid acquisition of successful technologies.

The MOUT ACTD is a joint Army and Marine Corps effort led by the Army Training and Doctrine Command (TRADOC). The MOUT ACTD is managed by the Dismounted Battlespace Battle Lab (DBBL), Fort Benning, GA; the Marine Corps Warfighting Lab (MCWL), Quantico, VA; and the Soldier Systems Center, U.S. Army Soldier and Biological Chemical Command, Natick, MA.

An Innovative Approach

To achieve its objectives, the MOUT ACTD centrally involved the warfighter from the beginning. In MOUT ACTD-sponsored workshops, soldiers and Marines experienced in actual MOUT deployments identified deficiencies where the ACTD could pursue technological solutions. These deficiencies were refined into a list of 32 requirements that included areas such as personal protection, powered optics, and portable methods to gain entry into buildings and structures.

Once the two Services agreed on and prioritized the requirements, a system integration team began searching for technology solutions. The global search focused on commercial and government off-the-shelf technologies. The team identified more than 600 products through solicitation in the *Commerce Business Daily*, tradeshow attendance, Web searches, market searches, and a MOUT ACTD-sponsored Industry Day event.

Because of the diversity of both user requirements and candidate solution technologies, the MOUT ACTD team, in conjunction with the Institute for Defense Analysis, developed a technology assessment process to systematically evaluate each product and determine its military use "on paper." Each product was assessed against user-defined criteria for each requirement using commercial decision support software. All products then underwent qualification testing to determine if they performed as advertised; this limited the field to 230 products. Finally, the MOUT ACTD managers at DBBL and MCWL conducted an operational

"show and tell," where 128 products were selected for evaluation in live force-on-force experiments. These experiments were conducted at the McKenna MOUT site at Fort Benning and the MOUT Collective Training Facility at Camp Lejeune, NC.

Determining Operational Utility

Beginning in January 1998, the MOUT ACTD executed 10 quarterly experiments (6 Army and 4 Marine Corps), each of which examined a subset of the 32 requirements mentioned earlier. These "vertical" experiments, which typically lasted 21-30 days, were designed to compare the technology candidates for each requirement, assess their technical performance, and determine if they were user-friendly to soldiers and Marines. The experiments included technical side tests and tactical force-on-force squad- and platoon-level vignettes evaluated against a baseline. Evaluation criteria included specific measures of performance for each requirement, user acceptance ratings, and training impacts. In the end, the analysis of collected data, combined with qualified military judgement, formed the basis for selecting technology products for inclusion in the joint experiments.

Sufficient time for training was also part of the experimentation process, including training to standard for base case situations, new equipment training (NET), and individual and collective tactical training. This ensured that the technology was evaluated strictly on technical merits, given proper field use.

Integrating The Best Technology

While the focus of 10 vertical experiments was on individual technology candidates versus requirements, the two joint Army and Marine Corps experiments were designed to test the collective military use and interoperability of the 32 successful products as a "system of systems." Joint Experiment 1 (JE1), a company-level experiment, was conducted at Camp Lejeune in July 1999, and Joint Experiment 2 (JE2) was conducted at Fort Benning in September 1999. Marines from G Company, 2nd Battalion, 8th Marines Regiment, 2nd Marine Division and soldiers from the 2nd Battalion, 22nd Infantry Regiment, 10th Mountain Division participated as experimental forces (EXFOR).

The joint experiments evaluated the collective military use of non-line-of-sight communications, intelligence gathering systems, weapon optics, night vision devices, door-breaching munitions, blunt training ammunition, and several other technologies. One measure used to determine a technology's effectiveness as a system was the percent of casualties. As shown in the casualty summary below, the MOUT technologies system of systems dramatically improved the EXFOR performance.

Transitioning Technology

The success of any ACTD, including the MOUT ACTD, is determined by the amount of technology that is ultimately transitioned from the ACTD to the field. As such, the MOUT ACTD team has worked with several program management offices to facilitate the transition of promising technology to the soldier in the field. One such example is the Simon Breaching Launcher System, which is the solution to the door and window breach requirement. Shown in the photo on Page 15, this system was developed by Israel's Rafael armament development authority; was transitioned to the Army Warfighter Rapid Acquisition Program; and is being executed by the Program Manager, Small Arms as the Rifle Launched Entry Munition Program.

The Blunt Trauma Training Round technology has also been transitioned and approved as an FY01 Soldier Enhancement Program and is being executed by the TRADOC System Manager-Soldier. Additionally, the Shark Radio headset was transitioned to the Land Warrior Program for incorporation into the Land Warrior Version 0.6. Other nontraditional transitions include the modification of the joint Army/USMC Body Armor Operational Requirements Document to reflect capabilities of the Special Operations Command-developed body armor leveraged and used in the MOUT ACTD. Also, the MOUT ACTD has transitioned experimental operational lessons learned to the Center for Army Lessons Learned at Fort Leavenworth, KS.

Exploring The Way We Fight

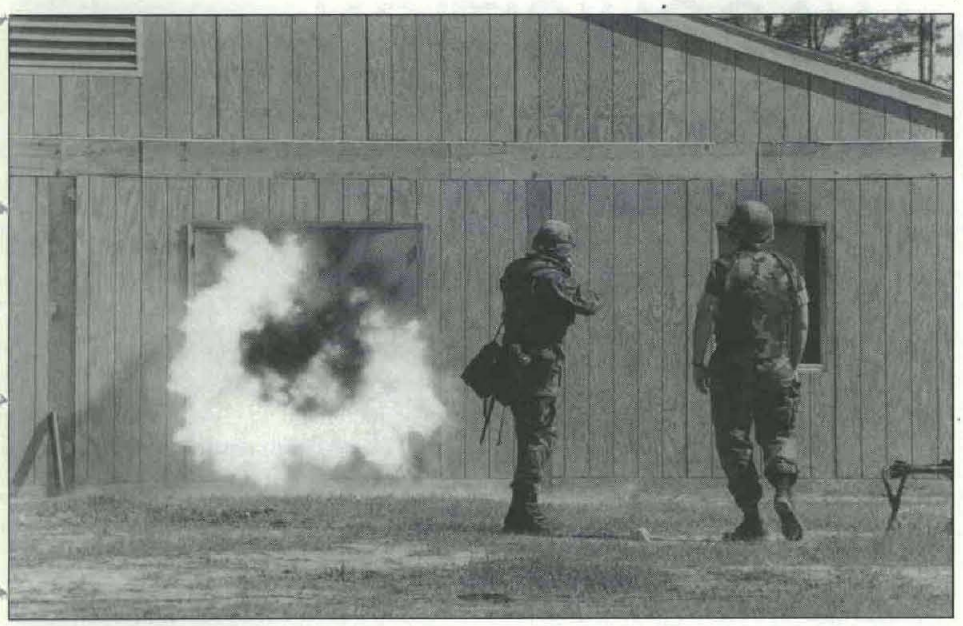
From the outset, the MOUT ACTD not only looked at technology to address the urban warfare challenges, but also the TTPs that will maximize the tactical employment of the candidate technologies. In support of experimentation, the MOUT ACTD developed eight TTP handbooks that are being used by the 10th Mountain Division in its MOUT Leaders Combat Certification Course and are incorporated into Marine Corps Training Standards. These handbooks have also attracted the attention of other U.S. Army Forces Command units. Seven of the handbooks cover urban tactics from individual level to infantry battalion level and the eighth is the training support package for MOUT ACTD technologies.

CD Preparation

The MOUT ACTD will conduct the CD, its final formal event, during the MOUT portions of the JCF AWE that will

CASUALTY SUMMARY

JE2	% Casualties EXFOR	% Casualties Opposing Force
Base Case	28%	55%
Experimental Case (with MOUT ACTD technologies)	17%	100%



A Marine fires the Simon Breaching Launcher System during the MOUT ACTD at Camp Lejeune.

be held at the Joint Readiness Training Center at Fort Polk, LA. The purpose of the CD is to confirm the collective military use of the MOUT ACTD system of systems at the battalion level and to finalize the composition of the residual package (discussed below). The MOUT ACTD is preparing for the event at a full-bore pace. Both the Army battalion and the Marine Corps company have completed NET and will continue to execute collective training events using the MOUT ACTD equipment through the spring and summer of 2000.

Interim Operational Capability

The technologies that demonstrate significant operational effectiveness during the CD, as determined by leaders of EXFOR units, will constitute the residual package. The residual package will be provided to the Army and Marine EXFOR for a 2-year extended user evaluation (EUE). This EUE is designed to provide the EXFOR an interim operational capability and additional data collection opportunities to further support technology transition and refinement of TTPs. Detailed planning for transition to the residual phase and EUE has been underway for 1 year.

Making A Difference

"In every way, the MOUT ACTD is a good news story. The primary focus of the MOUT ACTD is to enhance our warfighting capability in an urban environment at the tactical level," said BG Gary Speer, Assistant Division Commander–Operations, 10th Mountain Division. He added, "The evolving TTPs, equipment, and training manuals have already provided marked increase in unit capabilities. Already, the 10th Mountain Division has incorporated lessons learned from the MOUT ACTD into a comprehensive train-the-trainer MOUT course and platoon-focused training package that includes close-quarters marksmanship and TTPs for close-quarters combat; spreading urban warfighting skills to soldiers, squads, and platoons throughout the whole division."

Soldiers and junior leaders from the 10th Mountain Division have been involved in every step of the process from concept development and testing to assessment. "It has been a positive and professionally rewarding experience not only for the soldiers involved but for the entire division," said Speer. "The success of the MOUT ACTD to date is a direct result of the tremendous teamwork and combined efforts of technicians, vendors, researchers, and soldiers. It is a great training opportunity to help shape, for the future, the way our soldiers will fight in an urban environment," he added.

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MAJ RICHARD E. STOCKTON is the Chief of the MOUT ACTD at DBBL, U.S. Army Infantry Center, Fort Benning. He holds a B.S. and an M.B.A. from Troy State University and is a graduate of the Command and General Staff College.

SHEILA RYAN, an employee of Battelle Memorial Institute, provides contract support to the MOUT ACTD. She holds a B.S. from the University of Massachusetts and is a major in the Massachusetts Army National Guard.

THE PM/ACQUISITION COMMAND SELECTION PROCESS

Gail L. DiNicolantonio and
MAJ Brian C. Winters

Introduction

Does it seem to you like the command selection process is all done with "smoke and mirrors?" If so, read on to find out how the Army selects the "best-qualified individuals" and places them in centrally managed command positions. Simply stated, the Army uses the Command Selection process to select individuals to serve in "command positions." These positions represent all LTC/GS-14 (or equivalent) and COL/GS-15 (or equivalent) product/project manager (PM) and acquisition commander positions.

The purpose of this article is to describe to the Army's Acquisition Workforce the Acquisition Command Selection board process and the decision tools used to identify the best-qualified individuals, illustrate how the best-qualified methodology is applied to the selection board process, and provide information on how best to prepare your file for the board.

Selection Board Process

The selection of best-qualified individuals to fill command positions is based on statutory requirements stipulated in the Defense Acquisition Workforce Improvement Act (DAWIA). Because of the scope of responsibilities and importance of these positions, the Army Chief of Staff Command Selection List (CSL) board process is used to select the best-qualified individuals. The Secretary of the Army is the convening authority for acquisition command selection boards.

The process begins with the General Officer Steering Committee (GOSC). The GOSC, whose members represent a broad range of diverse acquisition commands, determines which command positions are to be filled by individuals selected by the CSL process. Potential command positions are submitted by acquisition major Army Commands (MACOMs) and are projected for up to 3 years in the future. The committee also designates "military-unique" positions and those positions that are "best qualified" (i.e., open to either military or civilian applicants). Positions will be filled by the best-qualified individual unless the MACOM can justify that the duties of the position require the unique skills of a military officer. The Army Acquisition Executive approves GOSC recommendations. Once this occurs, an acquisition CLS is established.

The next step in the process is establishing the list of individuals who will compete for the available command positions. The initial phase of this process differs slightly for military and civilian applicants. Military officers eligible to compete are automatically considered unless they formally decline. Eligible civilians interested in competing for these positions must submit an application in accordance with announcement instructions posted on the U.S. Total Army Personnel Command's (PERSCOM's) Web site. Once civilian applications are received and military officers choosing to compete are identified, a common process for both military officers and civilians is implemented.

Board Files

A board file is compiled for every individual competing for command positions. Acquisition Career Managers (ACMs) in PERSCOM's Acquisition Management Branch (AMB) personally review every file to ensure that it is complete, accurate, and best reflects the individual's career. This is an important, time-consuming task. ACMs spend many hours preparing files for a board and, if discrepancies are found, the applicant is asked to correct them.

Civilian board files are comprised of the Acquisition Career Record Brief (ACRB), a Civilian Qualification Record (DA Form 2302-R), and microfiche that contain the applicant's last six performance appraisals and Senior Rater Potential Evaluations (SRPEs). Other items submitted with the application, such as the mobility statement, tenure agreement, and SF-50, are retained in the file but not sent to the board. Military board files are comprised of an official photograph, the Officer Record Brief (ORB), and microfiche that contain the officer's evaluation reports and military awards.

During the civilian file scrub, the first item checked is the ACRB, a one-page document containing critical information that, if completed correctly, paints a complete picture of an individual's career. The ACRB is very similar to a military officer's ORB. A common problem in the past has been inconsistent information (specifically, education and assignment history) on the ACRB and the DA Form 2302-R. This causes confusion to board members and questions the validity or credibility of the board file.

Prior to producing microfiche for civilian applicants, ACMs verify that the latest performance report is dated within the last 15 months. The six appraisals are reviewed to ensure that there are no gaps in performance periods. If there are, the applicant will be asked to provide

rationale for the missing report or to account for the period not rated. ACMs also verify that the senior rater who signed the SRPE is the same one who signed the last performance appraisal. If there is a difference, the senior rater will be contacted for verification. ACMs review microfiche once they are produced to ensure they contain the correct reports on each individual and that the documents are legible and in chronological sequence.

During the military file review, the first item checked is the official photo. Does it belong to the officer, is it a good quality photo, and is it current? Next, the ORB is checked to ensure that education levels are correct, there is a recent physical examination annotated, and the current duty title is accurate and understandable by board members. Finally, the individual's microfiche are reviewed. Are all documents on the fiche in chronological order and legible? Are any documents missing or duplicated? Do all documents belong to the officer and does the information on the fiche match the information on the ORB?

Board Members

The selection board is comprised of Army Acquisition Corps members who have demonstrated outstanding performance in challenging assignments and who represent various functional area specialties and major commands. By statute, the board must have five or more members and all must be a higher grade or rank than those being considered. Additionally, members must not have served on the previous Acquisition Command Selection board. Policy requires members to possess a variety of acquisition skills and to be currently serving, or previously served, as CSL commanders. Policy also requires ethnic and female representation and that military members be graduates of the Command and General Staff College (LTC/GS-14 level boards) and/or Senior Staff College (COL/GS-15 level boards). Potential board members are nominated by AMB, but are selected by the Army Secretariat, the organization that conducts central selection boards on behalf of the Secretary of the Army.

Guidance And Regulations

The Secretary of the Army provides guidance to the board by means of a Memorandum of Instruction (MOI). The MOI is the only written guidance provided to board members and includes directions regarding equal opportunity, the minimum and maximum number of individuals to be selected, and any special requirements needed for the positions being filled. The actual MOI is published with the board results.

Communication with the board is limited to written correspondence from the individual under consideration and is governed by Army Regulation (AR) 600-8-29, paragraph 1-33.C.3. The AR states that no one may appear before the board in person and that no one may criticize or reflect on the character, conduct, or motives of any applicant under consideration. Letters by third parties may not be forwarded to the board unless endorsed by the applicant. Additionally, sending a letter to a selection board is an individual decision and should be made only after careful consideration and advice from an applicant's ACM.

Conduct Of The Board

Board members use the MOI, the person's board file, and their own experience and judgement to paint a word picture of the applicant. The word picture is then converted to a numerical score or vote. The vote of each board member is recorded on a "blind-vote" card. This blind-vote card protects the privacy of each vote by ensuring that board members cannot see the votes of others. Based on the votes of all members, Relative Standing Lists (RSLs) are produced. There is one RSL for principals selected and one for alternates.

When the board adjourns, AMB receives the RSL and prepares the slate. ACMs in AMB identify the requirements for each position to be filled, analyze the qualifications of selected individuals, and put "the right person in the right position" to best meet the needs of the Army, while addressing the needs of the individual. Once the slate is completed, it is briefed through the chain of command at PERSCOM. It is also briefed to the Military Deputy to the Assistant Secretary of the Army for Acquisition, Logistics and Technology; the Army Deputy Chief of Staff for Personnel; the Army Vice Chief of Staff; and to the Army Chief of Staff. When the slate is approved by the Army Chief of Staff, it is released to the MACOMs for review. The MACOMs have approximately 2 weeks to review the slate and, if desired, submit proposed changes (within their command *only*). After this process is complete, the slate is released to the field.

After AMB receives board results, the ACMs compare the files of those selected against those not selected to identify possible discriminators and perform a trend analysis. Board members do not out-brief ACMs on the board results. There is no sharing of personal knowledge, nor is there "social re-engineering" of the board results to meet quotas. The board process is a tried-and-proven one that has shown to be inherently fair to all applicants.

Conclusion

If you are considering applying to the Acquisition Command Selection board, we highly recommend contacting your ACM to review your file well in advance of the application deadline. This allows sufficient time to incorporate any needed changes to ensure that your board file is complete. The ACM review will help you prepare a competitive package that accurately reflects your accomplishments and your career.

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THE WARHEADS AND ENERGETICS TECHNOLOGY CENTER

Steven M. Nicolich

Introduction

The U.S. Army Tank-automotive and Armaments Command's Armament Research, Development and Engineering Center (TACOM-ARDEC) at Picatinny Arsenal, NJ, is the Army's focal point for ammunition and ammunition-related technologies. Today, this responsibility is more difficult than ever because of reduced spending, consolidation, and downsizing of government and industry. For example, the ammunition procurement appropriation is down 78 percent from the 1986 peak, and the number of ARDEC engineers and scientists has declined 21 percent with another 37 percent reduction planned for 2003. Sixty percent of current engineers and scientists could retire by 2004. The labor shortfall caused by the booming U.S. economy, as well as competition with the commercial technology sector, makes retention of key engineers a serious problem. Additionally, industry-independent research and development (R&D) funds, largely generated by production dollars, are greatly diminished.

The Plan

To deal with this adverse business environment, many government organizations have tried to develop long-term partnerships with industry. Traditionally, these relationships have taken the form of Federally Funded R&D Centers, University-Affiliated Research Centers, Centers of Excellence, or Cooperative R&D Agreements. However, these partnership arrangements are inadequate to meet the challenges of technology management in the current business environment of the munitions industry.

Because of its unique mission, TACOM-ARDEC is developing a new type of partnership with academia and industry to overcome the adverse business environment. Specifically, TACOM-ARDEC and the Army Research Laboratory (ARL) are partnering through use of a concept called an Industry, Academia, Affiliated, Research Center, now commonly known as the Warheads and Energetics Technology Center (WETC). An industry/academia consortium is an integral part of WETC. By using WETC capabilities, TACOM-ARDEC can focus all available resources on the technical challenges that the Army faces in warhead and energetics science and engineering. Other centers and consortia are planned in various key munition technologies.

The purpose of WETC is to provide a means to develop, maintain, and archive corporate knowledge and to facilitate technical expertise for the future. The center's major goal is to improve U.S. industry, government, and university abilities to sustain military supremacy in warhead and energetics research, development, engineering, and production.

TACOM-ARDEC and ARL must determine how to leverage available resources to their maximum potential in this environment of limited personnel and resources. To do this, several key questions must be answered. For example, in the area of warheads and energetics, where the expertise is gained through many years of on-the-job experience, how does the Army maintain experiential continuity? How will corporate knowledge be maintained? How will energetics and warheads be developed in the future, and how will the government define its role in the future of this technology? How will funding be maintained in the technology base? Finally, what is the future of the industrial base in a shrinking procurement environment?

Vision, Objectives, And Goals

WETC will integrate academia, industry, and the government into a single enterprise that will execute separate industry and government-funded projects and co-funded initiatives. It will jointly develop goals and objectives and share resources and assets. Cooperating with TACOM-ARDEC and ARL, the center will oversee warhead and energetics research, development, and engineering activities that address the Army's long-range goals. These goals will be consistent with the Army's Warheads and Energetics Strategic Master Plan.

Consortium members will team with other industries, universities, and government members for their mutual benefit. The government and consortium will enter into a long-term nontraditional partnership. This new partnership will give the consortium's industry and academia members opportunities for greater participation in the long-range planning of government research programs. One of the center's objectives is to develop a focused, goal-oriented, technology-driven program that is technically and programmatically sound.

WETC will develop and maintain a master plan that defines performance goals and maximizes the team's capabilities. With industry and academia included in the planning process, complete "buy-in" to overall plans should be achieved that will assist in executing a flexible multiyear integrated R&D plan. This new arrangement will provide a single team focused on aggressively addressing short- and long-term technical and programmatic objectives. Further, the arrangement will provide more efficient

use of capital and will encourage employee exchange to facilitate cross training and multiple expertise development.

The collaboration and collocation of technologists, systems integrators, producers, and customers will provide customer participation from the earliest stage of development. This will result in streamlined development and transition, close adherence to customers' system requirements, and high potential for horizontal technology insertion to other applications. In short, this collaboration will effectively and efficiently develop and transfer critical technology to the warfighter to maintain a decisive lethality overmatch.

How It Will Work

The government's role will involve directly participating in these collaborative efforts, providing funding, and sharing expertise and facilities. Non-government collaborators will share costs in warhead and energetics technology development and contribute their own resources, including personnel, materials, facilities, equipment, and instrumentation. These actions will be accomplished through other transaction (OT) agreements with the consortium, wherein members participate through articles of collaboration that define their purpose, goals, and responsibilities. These responsibilities include how the members will safeguard and share intellectual property.

Use of OT agreements and pre-agreed-upon articles of collaboration, especially regarding intellectual property, will greatly streamline the acquisition process. The basic structure of the National Rotocraft Technology Center and American Automobile Association are two examples of how WETC could ultimately be organized, with some specific variations attributable to the nature of the ammunition business. The government must still establish priorities and track progress to ensure deliverable dates are met.

The consortium will consist of industry (large and small businesses), universities, and nonprofit organizations working with TACOM-ARDEC and ARL personnel and their laboratories and facilities when necessary. Government funding estimates range from $3 to $4 million annually. The term of the agreement is expected to be at least 5 years.

As the WETC and the consortium develop, the other Services (Navy and Air Force) might join in the TACOM-ARDEC/ARL partnership. If this happens, it is anticipated that the Office of the Secretary of Defense and other key organizations would serve on the various committees in the center.

Comments from industry and academia during two Industry Days hosted by both ARDEC and ARL resulted in the following concerns being expressed.

- Tasks involving management of the consortium and any required dues should be kept to a minimum to encourage the highest amount of participation.
- Profitability must be a motivating factor for industry to remain in the consortium, especially if it is to provide cost-shared funds and show a reasonable return on investment with military technology that usually has minimal commercial application. To accomplish this, a much clearer link to transition and production must be established for all the technologies.
- The Army's role as a user advocate and an honest broker of industry must be maintained; i.e., it must support the Army's "smart buyer" capability.
- The competitive process should not be undermined.

The procurement process will be greatly simplified by using OT agreements to establish contracts with consortium members. Currently, about 45 members of academia and industry have expressed interest in joining the consortium.

Benefits

Although the WETC structure continues to evolve, we expect that this center will result in a unique world-class partnership among the government, academia, and industry for warhead and energetics research and development.

Other key benefits and payoffs include the following:

- An Army strategic plan for energetics and warheads that clearly defines the objectives, goals, and payoffs in terms that Congress and DOD can understand;
- A fully coordinated requirements definition and research, development, test, and evaluation activities;
- Time-phased and measurable programs;
- Reduced duplication of effort;
- A proactive role for industry and academia in R&D planning;
- Increased industry investment;
- Shorter procurement timelines;
- Focused resources;
- Full partnering;
- Development and retention of critical skills;
- Acceleration of technology transition to weapon systems; and
- Continued U.S. battlefield superiority.

Conclusion

The viability of providing world-leading energetics and warhead technology to future munitions developers will be sustained by constantly focusing and fully leveraging all resources. This will provide today's warfighters with world-class munitions and enable future warfighters to maintain a decisive lethality overmatch. Further information can be found at the Warhead and Energetics Technology Center Web site at **http://w3.pica.army.mil/wetc** or by contacting Ray Pawlicki at (973) 724-3386, Dr. David Downs at (973) 724-3016, or Albert Horst at (410) 306-0601.

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ACQUISITION EDUCATION AND TRAINING FOR THE 21ST CENTURY AT THE COMMAND AND GENERAL STAFF COLLEGE

LTC Scott Y. Higgins

Editor's Note: In an article in the July-August 1998 issue of Army RD&A magazine (Page 38), LTC Steve Boshears described the initiation of acquisition education and training at the U.S. Army Command and General Staff College (CGSC). This article updates developments addressed at that time.

Introduction

In the past, selection for the resident Command and General Staff Officer Course (CGSOC) was a mixed blessing for acquisition officers. While resident selection represented a significant mid-career achievement, acquisition officers knew that the year at Fort Leavenworth, KS, delayed them for a year from fulfilling acquisition career requirements mandated by Congress in 1990 through the Defense Acquisition Workforce Improvement Act (DAWIA). DAWIA required that officers achieve "certification" to qualify to work in acquisition positions. To accomplish this, officers completed appropriate college-level business and/or quantitative course requirements, attended specialized courses offered through the Defense Acquisition University (DAU), and gained multiple years of acquisition experience in specifically approved acquisition positions. However, the resident CGSOC curriculum did not include certification-compliant business and/or quantitative courses or DAU-equivalent acquisition courses. In 1996, Director for Acquisition Career Management (DACM) LTG Ronald V. Hite recognized this problem and initiated a plan to bring acquisition training to officers attending the resident CGSOC.

Area Of Concentration

Before 1996, the resident CGSOC curriculum required officers to select an area of concentration (AOC) based on their branch, functional area, and career goals. This process resembles a university student declaring a "major." Each AOC had specific elective course requirements. Officers could select from one of the following disciplines: combined arms studies, combat service support studies, joint and multinational studies, or general studies. Typically, acquisition officers were compelled to select an AOC that was aligned with their basic branch rather than their acquisition specialty.

Table 1.
Acquisition AOC Courses, AY 99/00

- Fundamentals of Contracting (CON 101)
- Fundamentals of Contract Pricing (CON 104)
- Intermediate Contract Pricing (CON 204)
- Government Contract Law (CON 210)
- Intermediate Systems Acquisition (ACQ 201)
- Intermediate Information Systems Acquisition (IRM 201)
- Advanced Acquisition Seminar
- Introduction to Simulation-Based Acquisition

The AETP

In July 1996, the DACM and the CGSC Deputy Commandant jointly signed a Memorandum of Agreement (MOA) that provided guidelines for establishing an Acquisition AOC, an in-house acquisition graduate degree program, and a state-of-the-art acquisition classroom. In addition, the MOA provided guidelines to acquire the personnel necessary to instruct and supervise. As such, the MOA resulted in establishment of the Acquisition Education and Training Program (AETP).

The Acquisition AOC

Under the Acquisition AOC, officers select from a full complement of DAU-equivalent and acquisition-related courses. DAU-equivalent courses enable most acquisition officers to complete the education requirements necessary to achieve DAWIA Level II certification. In addition to DAU-equivalent courses, two non-DAU courses are offered to all Acquisition Corps officers.

Table 2.
AGDP Curricula, AY 00/01

M.A., Procurement and Acquisition Management	M.A., Computer Resources and Information Management
Fall Term I	**Fall Term I**
PROC 5270 – Acquisition Management	COMP 5920 – Information Systems Applications
Fall Term II	**Fall Term II**
PROC 5220 – System Procurement and Project Management	COMP 5940 – Project Management of Information Systems
Spring Term I	**Spring Term I**
PROC 5810 – Acquisition Law	COMP 5960 – Systems Analysis, Design, and Implementation
PROC 5820 – Operations Management	COMP 5970 – Database Management
PROC 5830 – Pricing	COMP 5980 – Network and Telecommunications Management
Spring Term II	**Spring Term II**
PROC 5840 – Negotiations	COMP 5200 – Computer Security
PROC 5850 – Logistics	COMP 5220 – Internet Management Applications
PROC 6000 – Integrated Studies in Procurement and Acquisition Management	COMP 6000 – Integrated Studies in Computer Resources

The Advanced Acquisition Seminar and the Introduction to Simulation-Based Acquisition Course are unique to the CGSOC curriculum. The former has a guest lecturer format, bringing together senior DOD military and civilian acquisition leaders and representatives from the Defense industry to Fort Leavenworth to share ideas with CGSOC students. The Introduction to Simulation-Based Acquisition Course allows students to familiarize themselves with current DOD and Army policy on use of modeling and simulation for materiel acquisition, and how to apply it to a notional major Defense acquisition program. Table 1 includes a list of the Acquisition AOC courses offered during academic year (AY) 99/00 at CGSC.

The AGDP

In 1997, Webster University was competitively selected to provide an Acquisition Graduate Degree Program (AGDP) for acquisition officers attending the resident CGSOC. The terms of the AGDP allow students to acquire either an M.A. in procurement and acquisition management or a master's in computer resources and information management. To ensure that students successfully complete both the AGDP Program and the CGSOC, the MOA between the CGSC Deputy Commandant and the DACM allows most of the AGDP courses to count concurrently toward CGSOC elective requirements.

Both students and the Acquisition Corps benefit from the AGDP. Students benefit because the Acquisition Corps fully funds the program, and the curriculum is tailored to the government acquisition process. An additional move to attend a fully funded graduate degree program is not required. In addition, the program runs concurrently and at the same location as the CGSOC, thus students can return to acquisition assignments immediately after CGSOC graduation. The Acquisition Corps benefits because the costs of providing this program concurrently with the CGSOC are significantly less than transferring and funding an officer for an 18-month master's degree program at a separate institution. In addition, the trained officer is available immediately following CGSOC graduation.

A Webster University degree requires the completion of 36 semester hours. Students may transfer 12 hours from the resident CGSOC. Students may complete the remaining 24 semester hours by successfully completing evening Webster University courses at Fort Leavenworth throughout the academic year. To date, 41 acquisition officers have taken advantage of the AGDP through Webster University at CGSC. Table 2 shows the AGDP curricula offered during AY 00/01. Webster University AGDP courses offered during spring terms I and II are considered CGSOC electives.

Classroom Facilities

In addition to upgrading educational opportunities for acquisition officers, the MOA between the DACM and the CGSC Deputy Commandant established guidelines for a state-of-the-art multimedia

distance learning classroom at CGSC. Under the terms of the MOA, the CGSC would oversee the room renovation, to include providing partitions for subdividing classroom space, dropping the ceiling, installing improved lighting and new carpet, painting, and performing electrical upgrades. The DACM would oversee room furnishings as well as the installation and maintenance of the multimedia equipment, hardware, and software. The room would include student workstations equipped with Microsoft Windows NT and Microsoft Office Suite, an Intranet network server, a video teleconferencing (VTC) system, and an instructor's station. The instructor's station would include a VCR, an opaque and transparent document projector, and a remote-controlled projection system linked to the instructor's workstation. In fall 1999, all renovations were completed, all equipment was installed, and classroom 17 in Bell Hall became the new home of acquisition education and training at CGSC.

Distance Learning Capabilities

With the renovation complete and equipment online, classroom 17 exemplifies the full range of available instructional environments. In addition to routinely using the room for traditional lectures using projected presentations, instructors can conduct distance learning using student workstations and/or VTC equipment. For example, AGDP distance learning courses in AY 00/01 are being conducted in classrooms in Kansas City, MO; San Antonio, TX; and at Whiteman Air Force Base near Kansas City, MO.

Web-Based Learning

Network accommodations within the room also allow students to participate in Web-based instruction, including those provided by DAU. During the first two terms of AY 99/00, more than 30 CGSOC acquisition officers completed Web-based DAU courses such as Fundamentals of Systems Acquisition (ACQ 101) and Basic Information Systems Acquisition (IRM 101).

Computer-Based Training

With the technology the Acquisition Corps has provided through classroom 17 and its workstations, students can now participate in several computer-based training (CBT) courses that provide training in Microsoft Windows and Microsoft Office Suite applications. As a service to the CGSC, the Acquisition Corps also purchased "Smart Force" CBT software. Smart Force provides online training in 20 separate modules for various logistic support systems. The program went online in January 2000. This CBT has serviced 176 students accessing more than 900 courses per month.

Other CGSC Opportunities

The CGSOC's core curriculum provides officers with an in-depth study of the tactical and operational levels of war. In addition to the core curriculum, acquisition officers can participate in the annual Prairie Warrior exercise. Here they can serve in battlefield acquisition positions such as contingency contracting officers at division, corps, and echelons above corps levels. Officers with significant prior acquisition training can research acquisition-related topics. Selected officers may take the CGSC Partnership With Industry (PWI) Course sponsored by the CGSC Department of Logistics and Resource Operations. The PWI Course links student teams with local industries in the Kansas City metropolitan area to study and solve real-world business problems. The Acquisition Corps officer's curriculum at CGSC can also include writing research papers ranging from 5 to 10 pages or preparing a thesis leading to a master's in military art and science.

Postgraduate DAU Onsite Courses

Immediately after graduating from CGSOC, acquisition officers can stay at Fort Leavenworth and participate in several onsite DAU courses, including Intermediate Contracting (CON 202); Intermediate Systems Planning, Research, Development and Engineering (SYS 201); and Intermediate Test and Evaluation (TST 202). The Contingency Contracting Course (CON 234) is scheduled to be added to the AY 01/02 course listings.

The Future

CGSC provides a state-of-the-art curriculum and learning environment, and the Army Acquisition Corps is poised to incorporate any appropriate technological or procedural advancement that might enhance its officers' education. Distance learning and Web-based and computer-based training techniques continue to evolve. The challenge will be to use these resources while balancing the synergy that students experience through interaction, group work, sharing, and dialogue with classmates and instructors. Whatever the future holds, acquisition officers slated to attend the resident CGSOC are certain to have a wide range of training and educational opportunities that will prepare them to assume the most challenging assignments the Acquisition Corps has to offer.

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SBCCOM'S CONTRIBUTIONS TO TRANSFORMING THE FORCE

BG J.A. Mangual

Introduction

Army Chief of Staff (CSA) GEN Eric K. Shinseki stated that "the soldier remains the centerpiece of our formation." To this end, the U.S. Army Soldier and Biological Chemical Command (SBCCOM), through its research, development, and application of soldier, soldier-support, chemical-biological defense, and smoke/obscurant technologies, is committed to the soldier and to creating an enhanced force that is deployable, survivable, and sustainable. Moreover, SBCCOM is committed to developing innovative technologies to meet Shinseki's vision of improved strategic responsiveness and a reduced logistical footprint for deploying and sustaining U.S. forces.

Outlined below are the contributions of SBCCOM's Research, Development and Engineering Center (RDEC) and program/project/product managers (PMs) in support of the CSA's vision.

PM, NBC Defense Systems

The PM, NBC Defense Systems is addressing nuclear, biological and chemical (NBC) threats to the interim brigade by providing technologies and new equipment supporting detection, protection, and early warning and reporting of NBC events. These capabilities will be integrated into the interim brigade's primary fighting systems and into unique reconnaissance and digital NBC warning and reporting equipment. Initially, four six-wheeled Fox M93A1 digital NBC reconnaissance systems will be provided to the brigade. With its crew size reduced from previous versions, the Fox system operates with advanced sensors at a significantly reduced operation and support cost.

Concurrent with the Fox fielding, the Chemical, Biological and Radiological Integrated Reconnaissance System (CBRIDS) is funded and in development, with prototypes available for the interim brigade's initial operational capability. CBRIDS sensors will be integrated into the interim brigade's selected Interim Armored Vehicle and provide significantly improved capabilities. These capabilities will include on-the-move, standoff chemical detection—a far more sensitive detection capability that detects toxic industrial chemicals—and for the first time on a single vehicle, fully integrated chemical and biological detection. CBRIDS is based on a modular design for future sensor upgrades (with intuitive software, advanced diagnostics, and onboard spares), which reduces costs for future developments, procurement, and operations and support.

The greatest improvement in NBC protection will be the Joint Service General Purpose Mask (JSGPM). Slated for introduction in 2005, the JSGPM replaces the M40 as the common mask for all ground forces across the Services. Lighter and less expensive than its predecessor, the JSGPM provides protection not only against chemical and biological agents on the battlefield, but against lethal industrial materials and toxins as well. The JSGPM will have an improved field of view, be compatible with all night vision and weapon sights, and allow for much easier breathing.

PM, Soldier

PM, Soldier is responsible for developing, integrating, testing, acquiring, fielding, and managing the total life cycle of soldier systems. For more information on PM, Soldier, refer to the article on PM, Soldier's Land Warrior Program in the March-April 2000 issue of *Army AL&T* magazine (Page 47).

PM, Soldier Support

PM, Soldier Support assists the soldier in strategic, operational, and tactical environments. PM, Soldier Support provides and develops systems that focus on strategic airdrop operations and soldier "life support." These systems include cargo and personnel airdrop equipment, and systems such as field laundries, showers, and latrines; nonpowered heaters; both rigid (hardwall) and softwall (tent-like) shelters; and field-feeding equipment.

Specific PM, Soldier Support initiatives that support the CSA's guidance to improve strategic responsiveness encompass the design, development, and fielding of airdrop systems in support of strategic C-17 and C-5 operations, mass airborne assaults, special operations, resupply, and humanitarian relief efforts. Support focuses on increasing strategic payloads, increasing operational flexibility, improving safety, and improving accuracy and reliability of airdrop equipment. Examples of strategic airdrop systems currently under development include the Dual Row Airdrop System, the Universal Static Line, and the Advanced Tactical (Personnel) Parachute System. To support the objective force, precision airdrop for the Future Combat Vehicle and low-altitude heavy precision airdrop will both be addressed.

PM, Soldier Support will also reduce the logistical footprint of deployed forces and enhance deployability by fielding a variety of soldier life-support systems. These systems support soldiers in austere field environments and enhance combat readiness, quality of life, and morale. The following items will support the initial or interim brigade: the family of Cargo Bed Covers, Lightweight Maintenance Enclosure, and the Modular General Purpose Tent System.

Examples of field-feeding and field-service systems that support the CSA's vision include the Containerized Kitchen, the Battlefield Kitchen, the Modern Burner Unit, the Advanced Food Sanitation Center, and the Laundry Advanced System.

Soldier support systems are wise investments. Wholesale aspects of the Army are improved for relatively low funding amounts.

PM, Smoke/Obscurants

PM, Smoke/Obscurants manages and directs development, production, and initial fielding of new and major modifications and product improvements to smoke and obscurant systems and products. Programs cover all technical disciplines in the acquisition life cycle necessary to provide Army forces with a state-of-the-art battlefield obscurant capability. These programs provide products and systems that focus on large-area and rapid-obscuration smoke. Large-area smoke provides visual, infrared, and millimeter-wave obscuration capability to our forces. Rapid obscuration also provides visual, infrared, and millimeter-wave obscuration capabilities, but is designed primarily for self-protection for maneuver vehicles.

PM, Smoke/Obscurants provides systems that defeat threat sensors across the electromagnetic spectrum. Obscurants provide a low-cost, lightweight alternative to expensive and logistically burdensome heavy armor and munitions and electronics-based countermeasures. In addition to threat systems operating in the visual band, obscurants block thermal target sights, laser designators, laser range finders, radar systems, and millimeter-wave guidance systems for a full-spectrum defeat capability.

PM, Force Provider

Force Provider, the Army's premier base camp, contributes to Shinseki's vision by increasing operational readiness and enhancing the quality of life in support of military forces deployed all over the world. Force Provider modules, which can support 550-plus soldiers each, offer climate-controlled billeting; quality food and dining facilities; hygiene services; and morale, welfare, and recreation facilities. The ongoing insertion of new technology will continue to increase the efficiency of the base camp while decreasing operation and maintenance costs.

SBCCOM RDEC

The SBCCOM RDEC focuses on technology developments that will transition through the engineering and manufacturing development process before they are embedded in a fielded item. SBCCOM's RDEC achievements will primarily find their way to the objective systems of the new vision (2012) and, to a lesser extent, the interim and initial systems.

SBCCOM's RDEC is the result of the merger of the Edgewood and Natick Research, Development and Engineering Centers. The combined RDEC is benefiting from increased efficiencies, business opportunities, and joint ventures. Within the new single RDEC, however, the identities of the soldier and the chemical/biological mission areas remain largely intact. The two centers have been renamed the Edgewood Chemical Biological Center (ECBC) and the Natick Soldier Center (NSC). The DOD Combat Feeding Program is part of the Natick Soldier Center.

NSC

NSC is perfectly poised to enhance the new Army vision by conducting technology and engineering research and development that maximizes the soldier's survivability, sustainability, mobility, combat effectiveness, and quality of life.

Challenges to today's warrior systems are overall weight, power, energy, fightability, and affordability. The Army vision's goals will be significantly enhanced by integrating the efforts of multiple agencies in applying technology aimed at meeting the thresholds established for future warfighters. For instance, today's power threshold for a 12-hour mission is 1.6 pounds. In 2010, power for a 72-hour mission will meet a threshold of 0.5 pounds. These challenges can be achieved only through the coordinated efforts of multiple agencies with a single clear goal of an enhanced, integrated soldier system.

An airdrop development program involving pneumatic muscle technology will result in vehicles that can roll on or off an aircraft with less rigging. Significant deployment enhancements will be achieved along with training of the sustainment personnel required to support the deployment. This capability will be available in the FY08 timeframe and be ready for use with the objective vehicles for the Army vision.

DOD Combat Feeding Program. The intent of the Department of Defense Combat Feeding Program (part of NSC) is to provide combat feeding systems (combat rations and field food service equipment and systems) that are lighter, require less fuel and water, and enable rapid power projection.

Innovations in equipment and energy technologies, particularly thermal fluid heat transfer and cogeneration, will revolutionize combat field-feeding equipment. These innovations will reduce the logistical footprint and replenishment demands through a near 30-percent weight and cube reduction and a 50-percent fuel and water reduction.

Self-heated meals for remote site feeding will incorporate advances in chemical heating to provide compact, self-contained, self-heating meal modules that automatically heat meals for remote site feeding. This will reduce meal preparation costs, logistical footprint, weight, and labor for remote site feeding.

Combat ration-enhanced warfighter logistics efforts are expected to create a system that tailors the components to the combat situation and improves mobility. Revolutionary combat ration processing and packaging technologies and modeling and simulation will be used to develop a sensor-based ration selection and logistics tracking system and an integrated ration supply and distribution system. This ration system will ensure that warriors receive the right nutrients at the right time to optimize performance and ensure sustainability at every point along the spectrum of operations. Biosensors will be developed to provide real-time rapid detection of food quality and safety.

ECBC

ECBC supports the Army vision through a series of technology transitions, beginning almost immediately and continuing throughout the life of the objective force.

In support of the interim brigade, the portable Sorbent Decontamination System will be used for immediate decontamination. Immediate decontamination removes gross contaminants, prevents the spread of chemical contamination, and preserves the integrity of mission-oriented protective posture gear.

A new generation of chemical and biological agent decontaminants, based on enzymes, natural products, and enzyme-compatible chemical catalysts, will be developed for use wherever water can be tolerated (vehicles, equipment, large facilities, and possibly personnel and casualties). The material would be packaged as a powder, representing a 25- to 50-fold reduction in the current quantity of decontaminants required. The decontaminant would be prepared in the field by dissolving it in water or any available water-based material. It will be relatively nontoxic, noncorrosive, nonflammable, and environmentally safe. This will be available for the objective force and may be available for the interim force.

Regenerative filtration offers several opportunities to provide filtered air inside future combat vehicles. Regenerative filtration involves several chemical agent removal processes that differ from the current single-pass filtration approach. The filters renew themselves, thereby eliminating or greatly reducing the logistics train associated with filter replacement.

The ECBC also conducts the Army technology base program in smoke and obscurants. In an environment of lighter, "less armor" protection vehicles such as those of the Future Combat System, smoke technologies that provide visible, infrared, and millimeter-acquisition and hit-avoidance protection from enemy weapon systems will improve survivability.

Through biotechnology, materials will be created for incorporation into low-observable coatings or for obscurant systems. These materials will be nontoxic, biodegradable, and absorb electromagnetic radiation from the ultraviolet to the near-infrared regions of the spectrum.

Conclusion

As Shinseki pointed out, "Soldiers enable America to fulfill its world leadership responsibilities of safeguarding our national interests, preventing global calamity, and making the world a safer place." By taking care of our soldiers with the latest advances in food, clothing, and shelter technology, SBCCOM enables our soldiers to best serve their Nation and the world. SBCCOM is also contributing to improved national security by addressing nuclear, biological and chemical threats.

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THE ACQUISITION CAREER EXPERIENCE PROGRAM

Sallie Flavin and Emily Clarke

Introduction

It's coming, we all know it, we've all talked about it at length—a train wreck is about to happen because more than 50 percent of DOD's Acquisition Workforce becomes eligible for retirement in the next 5 to 10 years. The Army acquisition community is not just talking, it's doing something about the problem this year—testing a U.S. Army Materiel Command (AMC)/Army Acquisition Corps (AAC) pre-intern program—the Acquisition Career Experience (ACE) Program.

ACE is a 2-year program in which college students enrolled in integrated science and technology and business degree programs work in Army acquisition organizations for the last two summers of their undergraduate studies. The students learn about the issues and challenges faced by the Army's acquisition community and offer their ideas in a working environment. The intent of this program is to build the relationships necessary to encourage successful ACE students to opt for a government service career by becoming interns in one of the acquisition career fields after graduation from college.

Background

The idea for the ACE Program began in 1998 with an initiative called the Contracting XXI Blueprint. This effort was led by senior members of the AMC contracting community, who examined issues that would affect the future of contracting and the entire acquisition community. Blueprint developers throughout the command identified a number of business areas needing improvement for the future success of Army contracting. One of the most critical areas identified was workforce revitalization.

Representatives from HQ AMC in Alexandria, VA, and the U.S. Army Communications-Electronics Command (CECOM) Acquisition Center Army Acquisition Workforce Development Group in Fort Monmouth, NJ, developed a program outline that incorporated the Blueprint developers' consensus that the future acquisition professional will need to assume a broader integrating role. Because of this, the program outline reflects an innovative educational approach combining business and the sciences into one degree program. A chance discovery identified a university that had recently worked with industry to develop a new, multifunctional degree program that very nicely paralleled future educational needs outlined in the ACE Program. That university is James Madison University (JMU) in Harrisonburg, VA.

The largest hurdle facing the program was finding a sponsor with seed money to test the concept. Finally, in late 1999, this problem was solved when Emily Clarke, AMC Procurement Analyst; Melinda M. Darby, AMC Deputy Chief of Staff for Personnel; and Sallie Flavin, AMC Assistant Deputy Chief of Staff for Research, Development and Acquisition–Acquisition, Contracting and Program Management presented the idea to then Army Deputy Director for Acquisition Career Management (DDACM) Keith Charles.

The Acquisition Career Management Office (ACMO) agreed to support a pilot ACE program, but with a broader application to all acquisition areas. Since that time, the ACMO has played a significant role in locating and developing target positions for the students as well as handling other important implementation details. In February 2000, a formal partnership was established between AMC and the ACMO to conduct a pilot ACE Program. Participants included the DDACM; the AMC Deputy Chief of Staff for Personnel and the AMC Assistant Deputy Chief of Staff for Research, Development and Acquisition-Acquisition, Contracting and Program Management, both at HQ AMC; and the CECOM Acquisition Center.

Key Program Elements

ACE is a 2-year summer program that provides students an opportunity to work in Army acquisition organizations. During this period, they will rotate between acquisition organizations at least once to receive the broadest possible perspective.

Students will be assigned a government mentor and a university faculty advisor. The government mentor will ensure the student is provided meaningful assignments and will introduce the student to the AAC.

Many aspects of the new degree program at JMU are especially appealing in the ACE context. The program is called the Integrated Science and Technology (ISAT) Program. It is designed to provide a broad-based understanding of business, science, and technology using the computer as a problem-solving tool. Students learn to solve problems in a "real-world" context, using a collaborative approach, and they are taught to be sensitive to political, social, and ethical issues. As an added benefit, the JMU faculty welcomes the pilot program as an opportunity for students to get hands-on experience.

Students majoring in the JMU ISAT Program must do a senior thesis on a real-world problem to graduate. Participating acquisition organizations should provide students many opportunities to find a thesis subject that will challenge them and at the same time provide the Army with a useful assessment or solution.

Those students who successfully complete their educational program and receive favorable ACE evaluations will be offered an opportunity to enter directly into one of the acquisition intern programs or another similar program like the AMC Fellows Program.

During the pilot test period, the ACE Program will focus on the students in the multidisciplined ISAT Program and business disciplines at JMU. The first students will be placed at host sites in the National Capital Region and the Fort Monmouth, NJ, area. The program will be expanded and refined as program administrators gain experience; the base of universities will be broadened as other schools with innovative programs are identified; and additional host sites at other acquisition organizations will be used.

Conclusion

Army acquisition leaders identified multifunctional education, training, and experience as desirable qualities for acquisition leaders of the 21st century. The ACE Program is a positive step toward solving this urgent need. Hopefully, ACE participants will find challenges and rewards in this program that will encourage them to stay with the Army in an intern program—and beyond—to become the Army's future acquisition leaders.

For further information on this program, visit the Web site at **http://www.monmouth.army.mil/cecom/ac/train/aac.html**.

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THE ACQUISITION LIFE CYCLE OF A SOLDIER

MAJ Matthew T. Riordan

Introduction

The Lockheed Martin Orlando [FL] Program Support Team (PST) oversees the U.S. Army Multi-Purpose Individual Munition/Short Range Assault Weapon and the Target Acquisition Designation Sight/Pilot Night Vision Sensor Programs. The PST, along with its military Program Integrator, recently participated in the 3-day U.S. Army Greening Program at Fort Benning, GA, home of the Army Infantry and Airborne School. The Army Greening Program supplements the Defense Acquisition Workforce Improvement Act (DAWIA) certification process and provides hands-on, operational experience to Acquisition Workforce members. "Greening" refers to placement of civilians in a military operational environment.

Day 1

On the first day of the program, the PST met soldiers who had been in the Army for 2 days or less! The team learned about the indoctrination of new recruits and how the Army provides them medical shots, clothing, and housing. In addition, the PST was briefed on the 14-week initial training program conducted by the Infantry Training Brigade. Later that morning, the team observed soldiers practicing hand-to-hand combat and hand-grenade training.

In the afternoon, the Noncommissioned Officer in Charge of the U.S. Army Pathfinder School took the PST to the field to observe pathfinder training in progress. Pathfinders are trained to maneuver on the ground and to secure and operate landing sites for multiple aircraft. Just as the PST arrived, the instructors issued a "FRAGO" (fragmentation order) to the pathfinder student team. The Army developed the FRAGO as a quick method to update the current situation and assign a new mission.

The pathfinder student team was required to plan, coordinate, rehearse, and configure a load that could be lifted by helicopter (called a slingload) within 2 hours. As scheduled, two UH-60 BLACK HAWK helicopters arrived and successfully picked up the pathfinder team's gear on a slingload under the aircraft. Additionally, the helicopters picked up the soldiers. The PST departed the field site on a "deuce-and-a-half" (2.5-ton truck) and a "hummer" (High Mobility Multipurpose Wheeled Vehicle (HMMWV)).

Day 2

The second day began with formation at 0450. After this early start, the PST marched to the physical fitness field with the airborne students while they loudly sang cadence. Everyone paused at the sound of reveille at 0600. The team then joined the students in their physical fitness training. This was all before 0730!

Next, the PST observed soldiers load an Air Force aircraft for an actual parachute jump. While the aircraft's engines idled, each team member was allowed to board and watch the airborne students prepare for their first jump. To get the feel of jump preparations, PST members also donned parachutes. The airborne cadre explained to the PST the behind-the-scenes operation of buying, packing,

The Army Greening Program supplements the Defense Acquisition Workforce Improvement Act certification process and provides hands-on, operational experience to Acquisition Workforce members.

and repairing parachutes and providing quality assurance. Finally, the PST met members of the Silver Wings, an elite free-fall parachute team, and received explanations of how a parachute works and the details of advanced airborne training.

Day 3

On the final day, the PST watched airborne students fall with an open parachute from the 250-foot tower. This activity provided students an opportunity to experience the effects of wind on the parachute with the guidance of an airborne instructor on the ground.

Next, the PST observed advanced rifle marksmanship training performed by personnel from the Sniper School and basic rifle marksmanship training performed by initial-entry soldiers. These activities illustrated the range of skills and methods used to ensure that soldiers are prepared for battle.

An additional highlight of the day was a lunch consisting of Meals, Ready-to-Eat (MREs). This lunch helped to dispel rumors about the taste of MREs and, at the same time, gave the team renewed respect for the soldier.

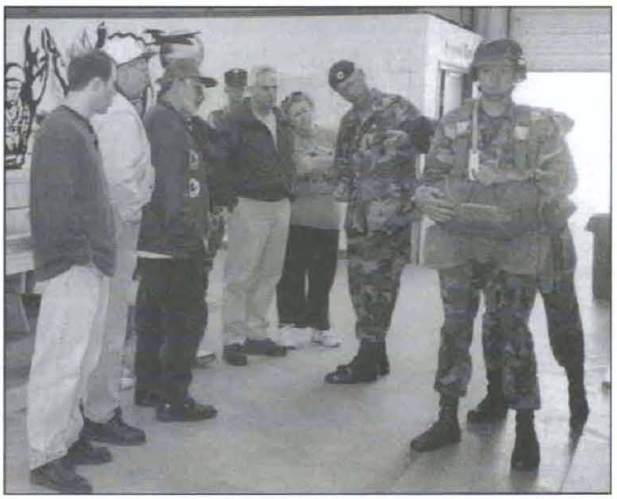
To put the infantry soldier into perspective, the PST visited Fort Benning's National Infantry Museum. As a final activity, the PST visited Andersonville, a prisoner-of-war camp from the Civil War. This was an enlightening and emotional experience for each PST member.

Conclusion

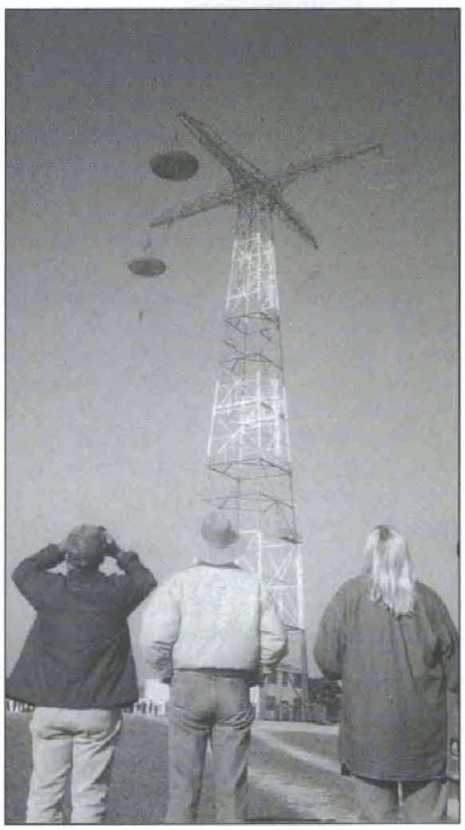
The Army Greening Program was an innovative training opportunity (attendees received Continuous Learning Points) and a good way to connect to soldiers on the ground. The following comments from participants illustrate the success of the 3-day Army Greening Program:

• "The trip was so impressive and outstanding. ... From indoctrination to specialized training, we watched civilians being shaped into our country's fighting elite (AIRBORNE)!"

• "The tremendous benefit to me was a newfound appreciation of the training facilities needed and the quality of troops and training investment we (taxpayers and civil servants) put into them. ... The visit to Andersonville highlighted the ultimate sacrifices made generation after generation by our service men and women."



Participants receive an explanation of how a soldier is inspected before a jump.



Watching soldiers "fall" from the 250-foot tower

The team spent many hours talking about issues of concern to soldiers on the ground, including weight of weapon systems, lack of training funds, housing, and international relations. The program provided a great team-building exercise, and the team will never look at a soldier or C-130 aircraft in quite the same way again! **Hooah**!

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THE SINGLE PROCESS INITIATIVE

Michael Hutchison and Glenn Harris

"The Single Process Initiative is a vital key to bringing about . . . wholesale transformation in the way the Department [of Defense] does business."

—Jacques S. Gansler
Under Secretary of Defense for Acquisition, Technology and Logistics

Introduction

What is the Single Process Initiative (SPI) and how did it start? SPI is a method to reduce or consolidate multiple contractor processes to a single process and save money. Contractors can use it to propose the elimination of duplicate or overlapping processes. It's a way to save money or reduce the costs of buying goods within DOD, the Federal Aviation Administration (FAA), and NASA. It's an integral part of DOD acquisition reform and the overall shift toward performance-based contracting. SPI is also a vehicle to achieve DOD's goal of integrating civilian and military processes at contractors' manufacturing facilities. Finally, it's a way for the Army to use industry's best practices and commercial standards.

The SPI Program is an outgrowth of an earlier effort to use performance rather than design specifications to acquire goods and services. In December 1995, the Office of the Secretary of Defense (OSD) targeted block changes on existing contracts as a means of streamlining and provided guidance for the elimination of overlapping or redundant facility practices. Further, OSD requested that the Defense Contract Management Command (now Defense Contract Management Agency (DCMA)) be the program administrator for DOD, the FAA, and NASA. To show support, the Assistant Secretary of the Army for Acquisition, Logistics and Technology committed the Army to successfully apply the SPI concept.

How SPI Works

Initially, the contractor identifies potential overlapping or redundant processes that are candidates for SPI proposals; for example, a contractor facility currently using three or four different contract property management reports that could be replaced by a single commercial process. After informally discussing the new concept with the government "customer," the contractor submits a concept paper (a written proposal) to the facility's management council. The Services, the Defense Logistics Agency (DLA), or both, evaluate the technical merits of the proposal and approve it, if warranted. Once the approval occurs, the administrative contracting officer (ACO) issues a block change modification to all contracts affected by the proposal.

Benefits from the approved proposal can accrue in several ways, including reduced future unit prices, additional units or services, or, in some cases, negotiated reductions in the value of the contract(s).

For example, the XYZ Co. makes its "spectacular widget" for all the Services, and there are minor differences in the surface machining processes that each Service wants. The XYZ Co., recognizing an opportunity for improvement, then puts together a proposal to establish one machining process that will meet the needs of all the Services. The Services then review and approve (if warranted) that proposal.

The ACO then negotiates a 10-percent price reduction on all future spectacular widgets produced by XYZ and an equivalent increase in the logistics support that XYZ provides for the product. Finally, the ACO issues a block change to modify all contracts where that new machining process occurs. The accompanying figure provides an overview of SPI and the approximate amount of time each segment takes.

Key Players And The Army's Role

DCMA is the lead government facilitator for implementing SPI proposals. The DCMA Commander chairs the local management council. The council generally meets quarterly to discuss SPI proposals and other topics of interest to the contractor and its government customers. The local management council is comprised of personnel representing the contractor, DCMA, and the Defense Contract Audit Agency (DCAA), and Service or DLA customers who have significant acquisition programs with the contractor.

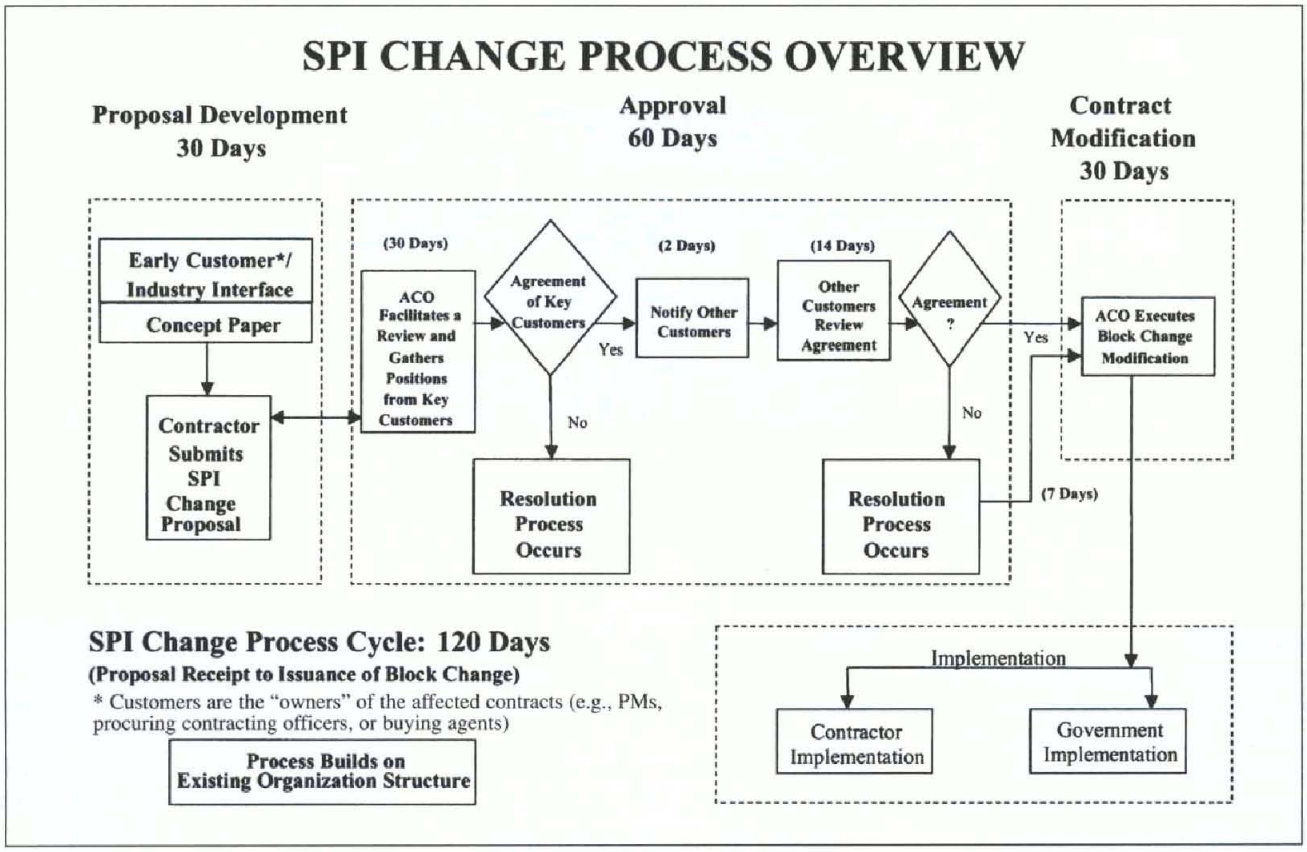
Component team leaders are the key individuals for the Services and DLA. They have five main responsibilities: serve on the local management council, assist DCMA in coordinating Army customer evaluations of contractor proposals, represent Army customers in the acceptance (or denial) of contractor proposals, resolve disagreements among Army customers concerning contractor SPI proposals, and establish the Army priority list for any contract savings that result from a proposal.

Corporate-level councils have also been established for the largest Defense contractors. These councils meet periodically to consider corporate issues related to SPI, acquisition reform, or other top-level policy issues.

Technical experts from program executive offices, project management offices, and the major subordinate commands of the Army Materiel Command (AMC) review and approve those proposals that will significantly benefit the Army. Designated Army representatives attend regional and national-level council meetings.

AMC is both the designated Army program manager for SPI and the Army representative on the SPI Management Team (SPIMT). The SPIMT's goal is to facilitate and expand use of the SPI concept. Team members are from all Services, DLA, NASA, FAA, DCAA, and the Office of the DOD Inspector General.

Additionally, the Department of the Army is a member of the SPI Executive Council, whose members include senior-level acquisition managers from all Services. This organization sets broad DOD policy and guidance on the SPI Program.



Benefits To The Army

Thus far, the largest single benefit of the SPI Program was a $9 million savings on the acquisition of the AH-64 Apache. Improvements to this Army front-line system that are directly attributable to SPI occurred in several areas, including wiring harnesses, soldering, quality standards, and management of subcontractors and suppliers.

For example, improvements introduced through the SPI Program will help to reduce maintenance costs on the Apache because of the adoption of new processes that call for use of aluminum and titanium alloys to extend the service life of parts. In addition, two concept papers led to a change in the paint used on the exterior of the Apache, which resulted in both a cost savings and more environmentally friendly paint compounds. Because of one concept paper, the Army is now using a significant portion of Boeing's metrics for surveillance of subcontractor activity. This resulted in an overall $2.8 million savings, part of which was shared with the Army.

Smaller benefits have also been achieved for the Apache and a number of other programs. Some of these benefits are also nonmonetary, such as no-cost storage agreements.

The Downside

Like many Army and federal programs, SPI has its critics. In part, they focus on more recent SPI proposals that haven't generated "instant" savings or the same level of returns achieved from some of the program's earlier initiatives. To some extent, these arguments are valid. The earliest SPI proposals focused on the most visible problems or opportunities, so these were the ones most likely to have a high payback. An organization's normal resistance to change can also lead to objections to programs like SPI that are change-oriented.

More recently, a number of implemented SPI proposals achieved respectable cost avoidances. That is, the Army didn't get money back or an immediate reduction in a contract price, but was able to avoid spending a number of dollars through improved processes. While cost avoidances are harder to measure and don't result in "cash in hand," their value can be potentially significant. For example, OSD currently reports a DOD-wide cost avoidance figure of $521 million that is attributable to SPI.

The real value of SPI over the long term will likely be its contribution to DOD's goal of integrating civilian and military assets. Part of the goal of this program is to provide incentives to industry to merge their civilian and military facilities and practices. Each SPI concept paper that is approved and implemented is another step toward this end.

SPI's Future

In 2000, there should be some overall process improvements as a result of suggestions from attendees at a 1999 SPI workshop held at Fort Belvoir, VA. There will be more use of pilot programs to test specific new concepts. For example, one process is an ongoing test to determine the possibility of replacing DOD packaging standards with best-commercial practices.

The scope of SPI concept papers will expand to include commercial applications, as well as facility-oriented proposals. Finally, the SPIMT will continue to advocate the benefits and expanded use of the SPI concept.

Future success of the SPI depends largely on the support of DOD's acquisition community. Continued commitment and support of SPI by senior and working-level acquisition professionals will help DOD realize its reform goals and foster more long-term partnerships with industry.

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ACQUISITION PROFESSIONAL (AcqPro) SOFTWARE

MAJ Kennedy E. Jenkins and Donna Brady

Introduction

In July 1997, Deputy Secretary of Defense John J. Hamre established a corporate policy that digital operation be the method of choice for all acquisition-management and life-cycle support information. He directed that by the end of 2002, the majority of DOD acquisition and logistics operations be based on digital methodologies and products. Thus, paperless acquisition was born.

In today's technology-driven environment, the Army is looking for software programs that will support that digital environment for the entire acquisition life cycle of systems. Current paperless initiatives focus on life-cycle phases of weapon systems related to their solicitation, contract award, modifications, sustainment, contractor payments, and contract close-out actions. Software programs such as the Procurement Automated Document Distribution System, the Standard Procurement System/ Procurement Desktop Defense (SPS/PD2), and the Joint Computer-aided Acquisition and Logistics Support System support these processes in a paper-free environment. However, none of these software programs support the paperless generation of requirements and pre-solicitation documentation, a critical aspect of the paperless process. Acquisition Professional, or AcqPro, fills the "holes" in the paperless process.

What Is AcqPro?

AcqPro was originally developed as the Procurement Management Information System (ProMIS) software program to update the U.S. Army Simulation, Training and Instrumentation Command and the Armament Research, Development and Engineering Center. Other Armed Services and Army commands recognized its potential, and a Joint Configuration Control Board (JCCB) was formed in 1997 to examine its attributes further. The JCCB includes members from the U.S. Navy's Space and Naval Warfare Systems Command; the U.S. Air Force Aeronautical Systems Center, Eglin Air Force Base, FL; and the Program Management Office (PMO), Abrams Tank System, located at the U.S. Army Tank-automotive and Armaments Command (TACOM) in Warren, MI. PMO, Abrams chairs the JCCB, and that office has provided the majority of the funding and support as part of its paperless contracting and integrated data environment efforts.

AcqPro is designed to be a knowledge-based document generator that benefits from in-house expertise.

AcqPro is an affordable alternative that provides an easy-to-use "tool" to create critical document text while providing samples and online screen guidance. No other software program currently available is specifically targeted for "smart" document generation of all kinds. Although currently targeted for the pre-solicitation and requirements-generation phases of the acquisition cycle, it can also fill document generation needs wherever the current structure does not.

AcqPro uses a WIN95/NT operating system and functions as a "knowledge-based" document generator for pre-solicitation documents. Some of the documents it creates include acquisition plans, justifications for other than full and open competition, source selection plans, multiyear approvals, data items, and scopes of work. AcqPro currently runs on an Oracle database, a Microsoft SQL Server database, or a stand-alone Personal Oracle database. It operates on IBM-based personal computers in a Microsoft Office environment using an Intranet for communication between the computers and the server-located database.

AcqPro is designed to be a knowledge-based document generator that benefits from in-house expertise. It provides a structured framework that includes a Service's or command's best practices validated by subject matter experts and the latest policy and guidance. Experts in acquisition,

systems management, engineering, logistics, quality, and procedures at TACOM are developing the question and answer (Q&A) sessions, document templates, and best-practice samples that will allow use of the system. The key to effective use of AcqPro is development and maintenance of the Q&A sessions and document templates in the database and to keep them current using the most recent command directives and acquisition reform initiatives.

How AcqPro Works

The program begins a user session by opening the "Package Wizard." The Package Wizard consolidates all the document-generation requirements for a specific type of action into one grouped package, selected by answering questions like "Are you buying systems, services, or spares?," "What is the estimated price?," and "Will this be competitive or sole source?" After answering those questions, the program generates a "basic package." The package consists of the document templates, files, and forms needed for that particular acquisition. Once the basic package is developed, the user initiates document generation by opening a Q&A session, answering the questions, and performing a "build." This build is where users receive a document that is tailored to their needs based on the answers provided to the system.

AcqPro builds the document and supports the multiple scenario environments by allowing the user to answer the questions in as many ways and as many times as necessary. If a user is having difficulty answering a question, AcqPro provides online guidance. During document generation and editing, users have built-in access to the guidance (laws, regulations, standard operating procedures, and manuals) needed to help them determine the right documents to use and the final content of the document. This includes direct Internet links to the latest government information sources and samples of comparable documents that are located in AcqPro. The document can be edited in AcqPro by paragraph or as a complete MSWord document.

AcqPro also has the ability for users and guests to review generated documents. Reviewers can add comments and recommendations by using CLIP-IT NOTES, which can be reviewed by the document owner and by other users. This allows the centralized document to be reviewed by other offices and for these offices to recommend changes or approve the documents electronically. Control over changes is managed using the AcqPro security system, which first uses security passwords to limit access to the system. Security also allows the owner of a document to select who can access the document and the limits of that access.

The security system also allows a document owner to pass responsibility and control of a package between users in the system. For example, once the presolicitation documentation is finished, reviewed, and approved by a requirements office, control of the package can be transferred from the procurement analyst to the contract specialist in the acquisition office doing the procurement. The contract specialist can import documents such as a scope of work directly into a solicitation and electronically file the imported document and other documents that will be part of the solicitation package.

Other Applications

Although AcqPro has been developed primarily to support requirements offices in their documentation development and approval processes, it is not limited to this function. Procurement offices can use it for document and approval requirements not directly related to or provided by the SPS/PD2. Other offices can also use it to develop documentation and processes as well. Alternate uses of AcqPro depend on the types of documents, templates, and Q&A sessions developed by the using agency. For example, a legal office could put in procurement law data and then develop a Q&A session that would guide legal review of procurement documents submitted to the office. By accessing the correct Q&A session, the lawyer would be provided with the legal requirements the document should include, samples of prior approved documents, and have the guidance for the review immediately available to them in AcqPro.

Conclusion

PMO, Abrams is currently in the process of loading, training, and testing AcqPro for use by its requirements and procurement offices. These offices are currently updating and expanding the database put in by the AcqPro team. The current version is being used at TACOM to train new system administrators in data input. It is also being used on a limited basis at TACOM for doing acquisition plans, justifications for other than full and open competition, and management decision documents. PMO, Abrams is currently expanding use of the program at TACOM with all sites expected to be using AcqPro by Oct. 1, 2000.

AcqPro is currently available to any U.S. government office. Inquiries about AcqPro and requests for copies of AcqPro presentations may be submitted to **bradyd@tacom.army.mil**. An AcqPro Web site is currently being developed and will be available by August 2000.

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DONNA BRADY is a Procurement Analyst for the Project Manager, Abrams Tank System. She has a B.S. in family studies from the University of Missouri and is Level II certified in acquisition.

TEST COMPLEX EXAMINES FUTURE MUNITIONS

Chuck Wullenjohn

Introduction

Driven by major scientific advances, weapon systems and munitions have evolved rapidly in recent years and will continue to do so in the future. Ground combat operations in the 21st century will incorporate more frequent application of electronics and artificial intelligence than ever before. Even to the casual observer, many weapons and electronic systems seen in movie classics such as *Star Wars* and *2001: A Space Odyssey* no longer seem so far-fetched.

A new test complex at U.S. Army Yuma Proving Ground (YPG) symbolizes the installation's commitment to the future. Through careful planning, innovative thinking, and a close partnership between private industry and the proving ground, the newly constructed Smart Weapons Test Range complex was dedicated in late January.

The Smart Weapons Test Range was developed to allow testing of sensors and "intelligent" weapon systems in a desert environment with minimal disruption from noise or vibration. The test site represents not only an important investment in the future of munitions testing at YPG, but is also a significant step toward reducing the worldwide danger to civilian populations posed by unexploded ordnance.

The vast range area, approximately 15,000 acres, features relatively flat terrain and restricted airspace. The test complex consists of a solar power plant, control building, target tracks, an instrumentation power grid, and access roads. Jay Marchant, Mine, Countermine and Demolitions/Unexploded Ordnance Team Leader, says that about 20 YPG employees will work at the site during active test operations, supplemented by another 10 to 15 flying in from around the country.

Purpose

The Smart Weapons Test Range will be used to test and evaluate modern munitions incorporating "smart" computers that enable them to discriminate between targets. These smart weapons will operate only when programmed to do so. The complex's solar power facility will generate and provide electrical power for the complex, which is located about 5 miles from existing power lines.

The isolated location will help ensure that the test site remains free from external noise and vibration and that people, property, and the environment are not endangered in the unlikely event of an accident.

Alan Tinseth, who has 17 years of test experience at the proving ground, manages operations at the new range. He said formal planning began in 1996. "Construction of the building and the adjacent solar power field was ongoing for about 2 years," Tinseth explained, "and what we ended up with is a state-of-the-art facility that helps make Yuma Proving Ground a leader in the smart munitions test area. Because of the facility's size and remoteness, we can manage and operate several tests at the same time."

Current Testing

Items currently undergoing testing at the site include the Wide Area Munition (WAM), a smart weapon meant to destroy enemy armored vehicles, and various

The Smart Weapons Test Range was developed to allow testing of sensors and "intelligent" weapon systems in a desert environment with minimal disruption from noise or vibration.

The WAM currently being tested at the Smart Weapons Test Range incorporates a characteristic common to all modern U.S. mines that ensures they won't become a long-term hazard. They are designed to either self-neutralize or self-destruct at the completion of the mission.

Soviet T-72 tank is killed by a WAM submunition

offshoots of WAM. Countermine operations, which often involve using explosives to clear minefields, are also being tested. Future tests include designing and constructing a minefield to test airborne detection systems aboard drones or satellites. Directed energy weapons may also be tested.

The WAM currently being tested at the Smart Weapons Test Range incorporates a characteristic common to all modern U.S. mines that ensures they won't become a long-term hazard. They are designed to either self-neutralize or self-destruct at the completion of the mission. This interval of time, which ranges between 4 hours and 30 days, is set by the person deploying the device.

In the desert southwest, a variety of unexploded military ordnance has been discovered in long-abandoned training areas, some dating back to World War II. Some of these areas are now public lands. Unfortunately, many of these 50-plus-year-old explosives remain potentially lethal. Though some were removed safely or detonated with no injury, others may still remain. This problem will not occur as a result of the self-neutralizing or self-destructing systems tested at the Smart Weapons Test Range. Test activities at the range will help leave a positive legacy for future generations.

The site's solar power facility was developed through a cooperative research and development agreement (CRADA) between YPG and Arizona Public Service, a power utility. This facility represents the proving ground's first attempt at using southwest Arizona's abundant sunshine to dependably provide the large quantities of energy needed. The proving ground has numerous other solar power sites at a variety of locations, one dating back to 1978, but this is the only test site totally dependent on solar power. To establish the power facility, the proving ground provided solar panels, the building, and storage batteries. Arizona Public Service provided computer software and valuable electrical monitoring expertise.

"We're on the forefront of developing joint partnerships like this with private industry," explained Bob Allen, Chief of YPG's Public Works Directorate. "The benefit is that it demonstrates the applicability of this renewable energy source in the testing arena. This helps to further the development of this technology, which could be intensely important to everyone in the future," he added.

Electrical power generated by the sun is an alternate energy source that has many advantages over conventionally generated power. Most important, solar power is not dependent on the Earth's limited supply of fossil fuel, results in fewer environmental pollutants, and decreases America's reliance on foreign oil. Less than half of the petroleum needed by our Nation is produced domestically.

Conclusion

The Smart Weapons Test Range is another important investment that helps make YPG a leader in the munitions test area.

CHUCK WULLENJOHN is Chief of the Public Affairs Office at U.S. Army Yuma Proving Ground, AZ. He is a graduate of Humboldt State University and has completed post-graduate work at San Jose State University and Hayward State University, all in California. He is a frequent contributor to this magazine and other military publications. He is also an active Reservist in the U.S. Coast Guard.

ARMY WATER PURIFICATION MISSION LEADS TO SUCCESSFUL PARTNERING EFFORT

Introduction

The Army recently focused its attention on Guam and other areas of the Pacific to test new technologies for converting field water into drinking water and to determine if these technologies will meet the Army's needs in the 21st century. The success of this story is not only in the technology itself, but the successful partnering effort of various agencies that will ultimately benefit DOD and other agencies on Guam and throughout the world.

With very short notice, the Army is sometimes requested to send personnel to remote sites to provide assistance in emergency conditions. The single most essential element necessary for human survival in these conditions is drinking water. The key word, however, is *safe* drinking water.

Water Purification

The Reverse Osmosis Water Purification Unit (ROWPU) is a miniature water plant that processes tainted or dirty water and makes it safe to drink. ROWPUs are widely used by the military to produce drinking water in emergency or wartime conditions. ROWPUs are assigned to various units among the Services and come in different sizes to accommodate the amount of water to be processed.

The ROWPU is a dependable piece of equipment that does a tremendous amount of good. However, it *does* present a challenge. Because the ROWPU filters out a lot of the "junk" from the water, the ROWPU system must be periodically cleaned to unclog its filters.

One cleaning process involves reversing the water to unclog the filters. This process creates "backwash." Another process using chemicals and detergents to clean the system generates "brine." This backwash and brine is nonpotable water that must be properly treated so it can be placed back into the environment.

Disposal Of Nonpotable Water

The Guam Army National Guard (GUARNG) faced the problem of how to dispose of brine and backwash and turned to the U.S. Army, Pacific (USARPAC), for assistance. Under environmental regulations in effect at that time, Guard units were not allowed to dump the backwash or brine back into the ocean, nor were they allowed to place it in the municipal wastewater. There were concerns that the backwash and brine would be detrimental to the environment and would disrupt operations at the wastewater plant.

USARPAC's search for solutions began. Eventually, USARPAC's Environmental Engineering Office and Logistics Office worked closely to bring together the private sector and every portion of the military as participants in finding the solution. (ROWPU backwash disposal turned out to be a concern throughout DOD and many other government agencies.) The following agencies had a role in the effort to find solutions: Office of the Army Deputy Chief of Staff for Logistics (ODCSLOG); U.S. Army Forces Command (FORSCOM); U.S. Army Tank-automotive and Armaments Command (TACOM); National Guard Bureau; GUARNG; U.S. Navy Public Works Center, Guam; Guam Environmental Protection Agency (GEPA); and Guam Water Authority (GWA).

New Filtration System

During the search, USARPAC linked with FORSCOM in Atlanta, GA, which had been encountering the same disposal problems. FORSCOM had a new technology that met their needs—the Multi-Modular Fluid Filtration System (MMFFS). The MMFFS is a compact filtration system that can be easily retrofitted and added to existing ROWPUs. It provides additional filtration capabilities to help reduce the wear and tear on the ROWPU and help minimize the byproducts of nonpotable wash waters. In Guam, TACOM tested the new MMFFS using Army standards for tropical-seawater conditions.

Information Sharing

Because of its strategic location between time zones from Guam to the eastern United States, USARPAC orchestrated extensive coordination among all agencies prior to a meeting in Guam to test the MMFFS. The participants' information sharing about the ROWPU process and technology, as well as the challenges faced by the Guam Army National Guard, helped foster communication and the spirit of cooperation at the Guam meeting.

The GEPA began to discuss possible options for allowing the nonpotable water to be disposed of at or near the test site. In addition, GWA initiated discussions with GUARNG for a potential joint project. During GUARNG's exercises with the ROWPU, GWA would accept the nonpotable water, usually high in salt minerals, for use in other plant operations. Hopefully, this would improve the plant's efficiency, create a method for GUARNG to dispose of their nonpotable water, and provide a benefit for GWA.

This initiative brought together expertise from the U.S. Navy in Guam; TACOM engineers and laboratory personnel from Warren, MI; and MMFFS manufacturer Global Environmental Technologies in Pennsylvania. In addition, FORSCOM supported the effort with the loan of a new MMFFS. Lab testing of the water products is ongoing.

Conclusion

The potential wastewater disposal solutions developed for Guam may contribute to the disposal solutions throughout the Department of the Army, DOD, and the private sector. The bottom line of this "win-win" story, however, is cooperation and partnering—with everyone benefiting!

The preceding article was written by Mark Mitsunaga, an Engineer in the Office of the Deputy Chief of Staff for Engineering, USARPAC; Arthur Inabata, Supply Management Specialist, ODCSLOG, USARPAC; and MAJ Randy Zelenka, Petroleum Staff Planner, ODCSLOG, USARPAC.

DEVELOPING AN INTEGRATED DATA ENVIRONMENT AND KNOWLEDGE-CENTRIC ORGANIZATION

Natalie A. van Dam

Introduction

The need to create a digital infrastructure that will provide a seamless flow of information has resulted in a natural shift from computer desktop systems to an integrated data environment (IDE) and a knowledge-centric organization. This shift is underway in the Program Executive Office for Aviation (PEO, Aviation) at Redstone Arsenal, AL. An IDE will allow an organization to perceive and react to its environment in a timely, effective, and efficient manner.

A knowledge-dominant environment is critical to conducting efficient business processes with both internal and external business partners. An environment in which knowledge is easily accessible and shared will provide a decisive edge because people will be integrated with technology. Benefits will be realized not only in terms of cost savings, but also in having a more intelligent and efficient workforce.

Integrated Data Environment

An IDE is a natural outgrowth of the need for seamless business and information flow, which is the lifeblood of a successful business. By centralizing information and making real-time data readily available, an organization can better respond to environmental challenges and requirements. Intranet and Internet systems and tools will facilitate customer interface by establishing seamless links between internal and external business contacts. As data flow is maximized, business cycles are compressed and simplified. The ultimate result is improved strategies for business operations.

Strategy

PEO, Aviation has implemented a strategy for an IDE and knowledge-centric organization that is evolutionary. Because the effort is immense, it has both short- and long-term goals. A structured approach is critical not only in the conversion of legacy systems and ways of doing business, but also in gaining the commitment and changing the mindset of individuals. The IDE and knowledge management effort avoids the use of rigid rules and management hierarchies. At the heart of the effort are working groups, which are structured to give optimum time and attention to completing projects.

Three main groups were formed: the IDE Overarching Integrated Product Team (OIPT), the Integrated Product Team (IPT), and the Working Integrated Product Teams (WIPTs). The OIPT is composed of the PEO's top management personnel and is the final voting authority on all issues and decisions pertinent to the IDE and knowledge management effort. The IPT is composed of members from each program management office (PMO) and the Information Management Office (IMO) and is the liaison between the OIPT and the WIPTs. The IPT, a results-driven group, maintains the momentum of the IDE effort by meeting regularly to review status reports from the WIPTs and to discuss proposed actions and recommended solutions.

After interviews with each PMO to determine critical and immediate issues requiring resolution, 10 informal WIPTs were formed to address the following issues: Engineering Drawings with Boeing; ASAALT (Assistant Secretary of the Army for Acquisition, Logistics and Technology) Mandate Paperless Acquisition 2002; Electronic File Management; Workflow Manager; ECP (Engineering Change Proposal) Processing; Electronic Signatures; CITIS/CIDS (Contractor Integrated Technical Information Service/Contractor Integrated Data Services); Paperless Contracting Mandate 2000 (includes Contract Data Requirements Lists); Integrated Master Calendar; and the PEO, IMO Initiatives. Each WIPT has a process lead, a technical lead, and members from the PMO seeking resolution. Additionally, each working group has outlined a plan to resolve any problem or issue.

Ideologies

Comprehensive identification of business requirements and the consideration of organizational culture are two primary ideologies PEO, Aviation recognizes as intrinsic to IDE and the knowledge management strategy.

Also central to the WIPT strategy are thorough business processes and requirement definitions. Defining requirements will include process innovation as conventional methods are converted or streamlined. This will help optimize and integrate technological solutions with human resources. The IMO will be instrumental in researching recommended solutions to ensure that they meet requirements and interface with existing technologies and external customers. Rapidly changing technology requires a hands-on approach to discover the correct, requirements-driven solution.

People represent the heart and soul of any successful business, and knowledge sharing is a human behavior, not a technological tool. Therefore, any technological solution to a business need must include a change in the workforce mindset. People must be convinced of the enhancements and benefits of an enterprise solution. Negative responses must be transitioned into positive actions.

Conclusion

PEO, Aviation is proud to share its beliefs on knowledge management and its development of the IDE effort. The integration of technology and human resources is an unbeatable equation for success, and the PEO is fortunate to have project managers who know the benefits of information technology and are willing to commit resources in the pursuit of improvements. Our future as a superior military fighting force in the next millennium depends on evolving management of our business efficiencies.

NATALIE A. VAN DAM is the Chief Information Officer for PEO, Aviation. She has a bachelor's degree from Seattle University and is pursuing an M.S. in management with an emphasis in information systems from the Florida Institute of Technology.

FROM THE DIRECTOR ACQUISITION CAREER MANAGEMENT OFFICE

After celebrating our own exciting first decade, I was pleased to join in recognizing the Army Acquisition Executive Support Agency's (AAESA's) first decade of success as it celebrated its 10th anniversary on May 1, 2000. I was delighted to have been part of more than 100 luncheon guests who participated in paying tribute to AAESA's accomplishments during the past 10 years. Congratulations AAESA and my best wishes for another decade of success!

During my travels, I am frequently asked what we can do to create a professional career path for our noncommissioned officers (NCOs) working in contracting. Creating a new NCO career field is certainly no easy task. We recently took what we consider the first big step in developing a contracting military occupational specialty (MOS) for our NCOs. CW2 Cevilla Mosby has been assigned to the Acquisition Career Management Office with duty in the Total Army Personnel Command's Enlisted Personnel Management Directorate. Her primary responsibilities include development, implementation, and monitoring of career development policies and programs for NCOs performing contingency contracting duties and warrant officers performing special qualification identifier duties. CW2 Mosby has hit the ground running, and we are excited about the potential for expanding our involvement with and support to the operational forces. She can be contacted at **mosbyc@sarda.army.mil**.

Under our new regional framework, career managers are available to provide you with "help-desk" support. A contact list with all Acquisition Career Managers is on the Army Acquisition Corps (AAC) home page at **http://dacm.sarda.army.mil/contacts/CareerManweb.htm**. I also encourage you to visit the AAC home page for the latest information on acquisition career management. Last summer I emphasized the importance of updated personnel files. This continues to be true. FY01 Colonel/GS-15 Project Manager/Acquisition Command Board results are in this issue on Pages 38-39. You will notice that because of the competitiveness for command, AAC officers and civilians must pay close attention to the components of their board files to ensure accurate and updated information is provided.

Among the benefits of being a member of the Army Acquisition Workforce is being able to take advantage of excellent educational opportunities and degree programs. The Office of the Deputy Under Secretary of Defense for Acquisition Reform now offers workforce members online courses, and the Naval Postgraduate School offers an excellent distance learning program. The *Acquisition Education, Training and Experience (AETE) Catalog* is accessible on the AAC home page at **http://dacm.sarda.army.mil** (click on **Career Development**). The AETE Board will have selected the individuals to participate in the Operational Experience Program by the time you read this issue. To read about one individual's operational experience, see MAJ Matthew T. Riordan's article on Pages 26-27.

The Year Group (YG) 01 Competitive Development Group (CDG) 3-year program will be formally kicked off during an orientation session the week of Aug. 7, 2000, in the National Capital Region in Springfield, VA. This year's orientation will include a graduation ceremony for the first CDG class, YG97. The CDG Program remains at the center of our initiatives to develop multifunctional, broad-based, flexible leaders for the future Acquisition Workforce. Real evidence that our leaders value the attributes gained through the CDG Program is the fact that 17 of the 25 YG97 selectees were promoted to leadership positions even before they completed the program. Be sure to read the feature article on the CDG Program orientation in a future issue of *Army AL&T* magazine.

As you know, the AAC celebrated its 10th anniversary in October 1999 with a ball and associated ceremonies. We plan to continue the tradition again this year. This year's Annual Acquisition Ball will be held at the Fort Belvoir Officer's Club. Once again, the event will coincide with the annual meeting of the Association of the United States Army. To find out more about this dress blue/black tie event, contact LTC Greta Lehman at **lehmang@sarda.army.mil**.

COL Roger Carter
Director
Acquisition Career Management Office

Online Graduate And Undergraduate Courses

The Office of the Deputy Under Secretary of Defense for Acquisition Reform (ODUSDAR) is offering Acquisition Workforce members an opportunity to take courses online through several educational institutions. These are traditional college courses that adhere to conventional grading, writing, and other procedures. Specific programs and colleges may have different requirements. The start and end dates are definite, and when students enroll, they are expected to finish all program credit hours. All courses are conducted in conjunction with the college or university's academic calendar. Announcements by Acquisition Career Managers (ACMs) will provide more detailed information.

Priority will be given to individuals requiring business courses to become Corps Eligible or those in critical acquisition positions who lack the required business credits. The target audience is civilians GS-11 through GS-15 (or payband equivalent) and O-3 through O-6 military officers.

Funding for the student's application fee to the college and the cost of tuition will be provided by DOD. Students must pay for their own textbooks.

Interested individuals should contact their ACM. For a listing of ACMs, go to **http://dacm.sarda.army.mil/contacts/CareerManweb.htm.**

Naval Postgraduate School Update

Among the benefits of being a member of the Army Acquisition Workforce is the opportunity to earn a master's degree through the Naval Postgraduate School (NPS) distance learning and resident acquisition programs. The Army Acquisition Corps (AAC), which sponsors the NPS Master of Science in Program Management (MSPM 836) distance learning program, also now sponsors the Master of Science in Contract Management (MSCM 835) distance learning program for the Army. The MSCM 835 distance learning

program focuses on management skills in an acquisition environment. Additionally, the AAC sponsors two resident acquisition degree programs in Acquisition and Contract Management (815) and Systems Acquisition Management (816).

The Office of the Deputy Assistant Secretary of the Army for Procurement implemented the MSCM 835 program at Fort Monmouth, NJ, in September 1999. Six individuals are participating in the 27-month program. The curriculum consists of 50 credit hours completed in 9 quarters. For the first eight quarters, classes are held via video teleconferencing with the classroom in Monterey, CA. The last quarter of the degree program is completed through an accelerated 8-week session in residence at NPS in Monterey. The curriculum satisfies the mandatory Defense Acquisition University contracting course requirements of the Defense Acquisition Workforce Improvement Act.

A briefing on the MSCM 835 program for prospective students was held in April 2000 to expand the program at Fort Monmouth. Another briefing was held in May 2000 to inaugurate the program in Huntsville, AL. One-on-one counseling sessions were also provided to explain the application process and to allow prospective students to ask questions. The Acquisition Education, Training and Experience Board (AETE) will convene August 15 to review applications and select participants for the program. Individuals interested in more details on MSPM 835 should refer to the AETE Catalog table of contents in the **Career Development** link on the AAC home page at **http://dacm.sarda.army.mil/**. Scroll down to the **Educational/Academic** section in the table of contents. Application procedures are also provided at this site.

AAESA Celebrates 10th Anniversary

A luncheon marking the 10th anniversary of the Army Acquisition Executive Support Agency (AAESA) was held May 1, 2000, at the Fort Belvoir, VA, golf facility. More than 100 attendees joined hostess Karen A. Walker, AAESA Director, in celebrating a decade of success. Among the special guests in attendance were LTG William H. "Bud" Forster (USA, Ret.), former Military Deputy to then Assistant Secretary of the Army for Research, Development and Acquisition; and COL James A. Thomas Jr. (USA, Ret.) and LTC Adolph H. Ernst III, both former AAESA Directors.

COL Roger L. Carter, Acting Deputy Director, Acquisition Career Management; and Director, Acquisition Career Management Office; presented welcoming remarks and introduced guest speaker Keith Charles, Director, Future Workforce and Career Development, Office of the Secretary of Defense. Charles used a historical perspective to recall significant events in AAESA's growth. He congratulated all those who contributed to the agency's accomplishments during the past 10 years and wished continued success in the future.

On May 1, 1990, AAESA was established as a staff support agency under the Office of the Army Acquisition Executive (AAE), HQDA. Today, AAESA serves as the AAE's agent for achieving military supremacy through acquisition life-cycle management of major and significant nonmajor weapon and information systems. The strategic plan is to research, develop, test, evaluate, produce, field, and sustain the best weapon and information management systems; maintain a trained, motivated, and experienced Acquisition Workforce; and provide an integrated network of information systems that deliver a seamless flow of data to customers.

In closing remarks, Carter paid tribute to the present and former AAESA directors and applauded their contributions that resulted in AAESA's success.

FY02 Congressional Fellowship Program

Headquarters, Department of the Army (HQDA) has announced that the FY02 Congressional Fellowship Program will be conducted August 2001-December 2002. This program offers top Army officers an outstanding opportunity to receive valuable training and experience by serving as staff assistants to members of Congress. Fellows are typically given responsibility for drafting legislation, arranging Congressional hearings, writing speeches and floor statements, and briefing Congressional members for committee deliberations and floor debates.

The Acquisition Management Branch, U.S. Total Army Personnel Command (PERSCOM), will conduct a review board Sept. 12, 2000, to nominate Army Acquisition Corps officers for the program. The Army Congressional Fellowship Selection Board will then review the list of nominees Dec. 12, 2000, and make final selections.

To be eligible for the program, officers must meet the following criteria:

- Hold the rank of major or lieutenant colonel with no more than 17 years Active federal commissioned service as of Jan. 1, 2001;
- Be a graduate of Command and General Staff College (resident or nonresident);
- Be branch qualified at current rank;
- Meet height and weight requirements in accordance with Army Regulation (AR) 600-9, *The Army Weight Program*; and
- Have no adverse actions pending.

The Congressional Fellowship Program begins with an August-December 2001 HQDA orientation and attendance at the Force Integration Course and a variety of meetings and seminars. Following the orientation, fellows complete a classroom phase and then serve as staff assistants to members of Congress from January-December 2002. After completing the program, officers will incur an Active duty obligation of approximately 51 months (per AR 350-100) and then serve a 2-year utilization assignment in a position that requires knowledge of Congressional activities.

To apply for the FY02 Congressional Fellowship Program, officers should complete DA Form 4187, *Personnel Action*, requesting consideration. The form must be approved and signed by the individual's field grade supervisor or equivalent and forwarded by Sept. 6, 2000, to PERSCOM, ATTN: TAPC-OPB-E (Paula Bettes), 200 Stovall Street, Alexandria, VA 22332-0411.

Additional information on the Congressional Fellowship Program is available at the Office of Chief of Legislative Liaison Web site at **http://www.hqda.army.mil/ocll**.

AMB Personnel Changes

The U.S. Total Army Personnel Command (PERSCOM) Acquisition Management Branch (AMB) recently bid farewell to five officers and welcomed six new ones.

The following personnel departed the AMB staff:

LTC Paul Myrick departed AMB for an assignment in the Program Executive Office for Tactical Missiles, Redstone Arsenal, AL.

MAJ John Masterson was selected as a Congressional Fellow and continues to reside in the Military District of Washington (MDW).

MAJ Steven Decato began a Training With Industry assignment in the MDW area.

MAJ Thomas Deakins was selected for advanced civil schooling and is now attending Webster University.

MAJ James Norris departed AMB for an assignment with the Defense Contract Management Agency, Lockheed-Martin, Dallas, TX.

The following personnel joined the AMB staff:

MAJ James Simpson reported to AMB following attendance at the Command and General Staff College, Fort Leavenworth, KS. His previous acquisition assignments include Chief, Osan Contracting Office and Contingency Contracting Officer, Fort Campbell, KY. Simpson's new position is Lieutenant Colonels Assignment Officer for year groups (YGs) 81-84.

MAJ Neil Thurgood served formerly at the Simulation, Training and Instrumentation Command, Orlando, FL, where he was Assistant Product Manager for Aviation Training Systems. Thurgood's position in the AMB is Majors Assignment Officer for YGs 80-87 (last names beginning with letters A-K).

MAJ Jeff Gabbert joined the AMB staff following an assignment at the Aviation and Missile Command, Redstone Arsenal, AL, where he served as Apache Assistant Project Manager. His previous acquisition experience includes assignment as Chief, Logistics Support Branch, Defense Supply Center, Philadelphia, PA. Gabbert is serving as Majors Assignment Officer for YGs 80-87 (last names beginning with letters L-Z).

MAJ Jon Rickey came to AMB following an assignment as Test Officer at the Army Test and Evaluation Command, Fort Hood, TX. Rickey is currently serving as Majors and Captains Assignment Officer for YGs 88-89.

MAJ Phillip Viersen is a recent graduate of the Command and General Staff College, Fort Leavenworth, KS. His previous acquisition experience includes assignment as Computer Staff Officer, Defense Information Support Agency, Reston, VA. Viersen is the new AMB Distribution Manager.

CPT Mo Gutierrez reported to AMB from Fort Carson, CO, where he was a Cavalry Troop Commander. His AMB position is Majors and Captains Assignment Officer for YGs 90-93.

FY01 Colonel/GS-15 PM/Acquisition Command Board Results

The Acquisition Management Branch (AMB), U.S. Total Army Personnel Command, recently completed an analysis of the FY01 Colonel (COL)/GS-15 Project Manager (PM)/Acquisition Command (AC) Board results and overall command opportunity for Army Acquisition Corps (AAC) officers and civilians. Results and possible trends are summarized below. The FY01 Lieutenant Colonel (LTC)/GS-14 PM/AC Board results were still being staffed at the time this article was written, and the analysis of those results will be in the next issue of *Army AL&T*.

Overall Results

Board members reviewed the files of 76 AAC members. These files included 32 Active duty officers and 44 civilians. From this population, the board selected 28 principals and revalidated one officer for PM and AC assignments. Of the 28 principals selected, 5 were civilians. This is the largest number of civilians selected for command by an AC board since the Army began holding "best-qualified" boards in 1996.

Who Got Selected?

- Twenty-two (95.6 percent) of the 23 Army officers selected as principals were selected on their first time considered. Of the five civilian selectees, two are currently serving as PMs and were selected for a second project; the other three civilians are current or former PMs.
- All of the officers and civilians selected have advanced degrees.
- Sixteen of the officers selected and one of the civilians selected are Senior Service College (SSC) graduates, five of the officers are SSC selectees, and one officer is currently enrolled in the SSC distance learning education course.
- Twenty-seven (97 percent) of the 28 principals selected for COL/GS-15 acquisition command served as LTC/GS-14 PM/commanders. Two of the civilian AAC members are currently serving as career selection list GS-15 PMs. The other three civilians selected are current or former PMs. The only officer selected without previous PM experience was in the Army Medical Department category.

General Observations

The file quality of PM/command selectees continues to be high. Competition is tough for these key positions. Generally, officers are selected for COL/GS-15 PM/command assignments the first or second time considered after successful completion of SSC and LTC/GS-14 PM/command assignments. For civilians to be competitive for PM/command assignments, previous program office experience coupled with LTC/GS-14 PM/command assignments continues to be the most important combination. However, there is no evidence that consecutive or repetitive program office tours better qualify an individual for PM selection. On the contrary, a successful PM tour, coupled with successful performance in a major headquarters, is a common formula for PM selection. Contracting officers require extensive contracting training and experience in pre-award and post-award contracting along with a very successful contracting command. Again, success in a major headquarters enhances overall file strength toward selection.

Additional Information For Officers

Prior to future PM/command boards, it is imperative that officers take the time to personally "scrub" their Officer Record Brief (ORB) and microfiche to ensure accurate information is conveyed to board members. Before the board meets, AMB sends a packet to each officer in the zone of consideration. This packet includes an ORB, a microfiche request form, and a checklist. Officers should use this packet to prepare their file for the board. The photo is an important part of the board file and officers should consider getting a new photo if theirs is more than 3 years old. Prior to taking a new photo, officers should check their awards, branch, U.S. insignia, etc. Attention to detail makes a difference.

This was the first year the Electronic Command Preference sheet was used to submit preferences through the Internet. About 97 percent of the officers used the Electronic Command Preference Sheet. This online process appears to be a great success. The goal is to incorporate competing AAC civilians into the process for the FY02 Command Board.

Additional Information For Civilians

Civilians should also ensure their board application package is complete. Special attention should be given to the accuracy of the Acquisition Career Record Brief (ACRB). Dates reflected on the ACRB should match dates shown on DA Form 2302, *Civilian Qualification Record*. Acquisition Career Managers will help ensure that "clean" ACRBs are in each board file. Any discrepancies in the record (such as missing evaluations) should be explained.

Summary

The file quality of the FY01 PM/AC selectees was very high. Because of the competitiveness for command, AAC officers and civilians must pay close attention to the components of their board files to ensure accurate information is presented for board members to make an informed decision. The trend continues to be for command boards to select acquisition professionals with a diverse acquisition background coupled with a successful LTC/GS-14 PM/AC assignment.

FY01 COL/GS-15 PM/AC Selectees

Project Manager

Rank/Grade	Name	Branch/Series
LTC(P)	Cole, Thomas M.	FA
COL	Danley, David L.	MED
GS-14	Davis, Debra	340
LTC(P)	Dellarocco, Genaro J.	QM
GM-14	Flamm, Kevin J.	340
GS-14	Frazier, Carlyn	340
COL	Grobmeier, John R.	FA
LTC(P)	Haynes, Jacob N.	TC
LTC(P)	Holmes, Sharon L.	MI
LTC(P)	Johnson, Theodore E.	IN
LTC(P)	Johnson, William R.	AR
LTC(P)	Jones, Mark W.	FA
LTC(P)	Justice, Nickolas G.	AG
LTC(P)	Kotchman, Donald P.	OD
LTC(P)	Lake, William G.	AV
COL	McChesney, Michael K.	OD
GS-15	McElveen, Wesley	340
LTC(P)	Ogg, Robert D.	AR
LTC(P)	Reyenga, Robert L.	FA
GS-15	Winkler, Gary	340

Acquisition Command

Rank	Name	Branch
COL	Barnes, Robert S.	AD
LTC(P)	Brown, Mary K.	OD
LTC(P)	Cripps, David B.	AV
LTC(P)	Leach, Kim C.	QM
LTC(P)	Jorgenson, Charles H.	OD
LTC(P)	Miller, Gregory S.	QM
LTC(P)	Sans, Luis D.	AD
COL	Wargo, James D.	OD
LTC(P)	Petty, Frank S.	AV

IMPORTANT NOTICE

If you are an individual who receives *Army AL&T* magazine and you have changed your mailing address, do not contact the *Army AL&T* Editorial Office! **We cannot make address changes regarding distribution of the magazine.** Please note the following procedures if you need to change your mailing address:

- Civilian members of the Army Acquisition Workforce must submit address changes to their Civilian Personnel Advisory Center (CPAC).

- Active duty military personnel must submit address changes to their Military Personnel Office (MILPO).

- Army Reserve personnel must submit address changes to the U.S. Army Reserve Personnel Command (ARPERSCOM) in St. Louis, MO.

- National Guard personnel must submit address changes to the Army National Guard Acquisition Career Management Branch at **perkindc@ngb-arng.ngb.army.mil** or call DSN 327-7481 or (703) 607-7481.

Your attention to these procedures will ensure timely mailing of your magazine.

FROM THE ACQUISITION REFORM OFFICE. . .

As promised in the March-April 2000 issue of Army AL&T magazine, the progress made in achieving the goals and objectives of the revolution in business affairs (RBA) will be discussed in this acquisition reform column. This column also addresses the substantial progress by DOD and the Army in improving acquisition practices and policies through acquisition reform, and transforming logistics systems to integrated supply chains driven by modern information technologies and best business practices. These progress reports are taken from Under Secretary of Defense for Acquisition, Technology and Logistics Dr. Jacques S. Gansler's March 2000 draft report, The Road Ahead.

The Revolution In Business Affairs Progress Report

The primary focus of the RBA has been on three top-level goals. These goals and the progress made in achieving them are as follows:

Goal 1: Field high-quality Defense products quickly and support them responsively.

Progress: The average Major Defense Acquisition Program (MDAP) cycle time for post-FY92 starts has been reduced 26.5 percent (from 132 months to 97 months—2 months below the objective of 99 months).

In addition, DOD has reduced the logistics response time from an average of 36 days (in FY97) to the target of 18 days in FY99. Asset visibility and accessibility have improved from 50 percent in FY96 to 94 percent in FY99. DOD supply inventory has been reduced by $12 billion, from $67 billion in FY96 to an estimated $55 billion in FY99.

Goal 2: Lower the total ownership cost of Defense products.

Progress: DOD has maintained MDAP cost growth below the objective of 1 percent annually since FY98, but annual cost growth is expected to exceed the 1 percent objective in FY00. Since FY98 (and projected through FY01), DOD's average annual MDAP cost growth has been 0.1 percent, -0.3 percent, 3.1 percent, and 0.9 percent, respectively.

For fielded systems, DOD has reduced the annual logistics support cost per weapon system from the FY97 baseline of $82.5 billion to $77.9 billion, just slightly behind the $76.7 billion target.

Goal 3: Reduce the overhead cost of the acquisition and logistics infrastructure.

Progress: Funding for logistics and other infrastructure has been reduced from 64 percent of Total Obligation Authority (TOA) in FY97 to 60 percent of TOA in FY00, 2 percentage points better than the target.

DOD And Army Acquisition And Logistics Reform Progress Report

DOD and the Army have made exceptional progress in acquisition and logistics reform. Many dramatic changes have taken place and continue to evolve. Some of the examples are as follows:

- Defense Acquisition Pilot Programs, which include five major weapon systems specifically identified by Congress to be testbeds for many new acquisition practices, yielded savings as high as 50 percent over previous official cost estimates. These programs have been or are on schedule to be fielded more rapidly than DOD's normal 8-12 years.
- DOD uses credit cards for more than 90 percent of its transactions below $2,500, resulting in savings and cost avoidance in the hundreds of millions of dollars. The Army is the largest federal government user of the Commercial Purchase Card, leading DOD with 97 percent of micropurchases made with the purchase card in FY99. In addition, DOD asked the Army to establish and lead a joint program management effort to bring DOD to a 90-percent level by Oct. 1, 2000. In FY99, the Army led DOD to an overall performance rate of 92 percent use of purchase cards for micropurchases, 1 year in advance of its goal.
- By the end of 1999, the Army was electronically transmitting 88 percent of all contracting actions. Further, the Army fielded the DOD Standard Procurement System to 7,733 users at 350 sites throughout the Army and Air National Guard to replace legacy contracting systems. The Standard Army Automated Contracting System (SAACONS) was retired at the end of the year. The Army's Paperless Project Office continues to identify and fill gaps (such as a requirement generation tool for use on base and at installations) and to promote business process re-engineering of the contracting process. The Army remains on track to eliminate 90 percent of all paper used in the contracting process by the newly revised completion date of Dec. 31, 2000. This is in accordance with the goal established by the Office of the Secretary of Defense (OSD).
- The Single Process Initiative was launched to eliminate duplicative processes and introduce appropriate, commercial-like processes at Defense industry manufacturing facilities. This initiative enabled the conversion of more than 200 facilities to ISO 9000 standards (replacing DOD's traditional and unique quality standards) and saved or avoided more than $500 million.
- DOD has reduced its acquisition and technology workforce by nearly 50 percent during the last 10 years. DOD continues to devote significant resources to defining its long-term workforce requirements, in terms of both skills and numbers, for the years ahead.

ACQUISITION REFORM

Army Contracting Efficiency Progress Report

The analysis of the FY99 Army Procurement Statistical Reports and Summary of Procurement Actions has been performed and the annual progress reports have been prepared. The results are included in the FY99 *Army Procurement Fact Book,* which can be accessed at **http://acqnet.sarda.army.mil/library/factbook/98fact/sld001.htm.** Additional metric charts that will help to discern trends in Army contracting efficiency are available at **http://acqnet.sarda.army.mil/acqref/armetrc.htm**.

By examining historical data since the inception of acquisition reform efforts, conducting ratio analysis, and assessing the overall trends, individuals can reach important conclusions about the health of the contracting mission area in general, and the impact of Army acquisition reform in particular.

One key measurement tool in use since 1995 is the cost-to-purchase ratio. This ratio provides the cost expended (in cents) to purchase one dollar's worth of supplies or services. During the analysis period FYs 95-99, the cost-to-purchase ratio decreased 18 percent.

Another ratio under study is the average annual obligation per person. Between FYs 95-99, the average dollar awarded per person annually rose from $3.3 million to $5 million, an increase of 52 percent. This indicates that the average Army contracting professional has become significantly more productive in terms of total output. This increase in productivity can be attributed to various reasons, including personnel reductions, process improvements, and acquisition reform initiatives.

The average obligation per contracting action is being examined. Between FYs 95-99, this rose from $14,400 to $59,105, an increase of 309 percent. This reflects the increased use of the Commercial Purchase Card for satisfying micropurchase needs, as well as the continuing emphasis on consolidating contract requirements where possible and useful. The Army Centers and Satellites organizational concept has contributed to this success.

The point of contact for acquisition reform articles is Monti Jaggers at (703) 681-7571, DSN 761-7571, e-mail ***jaggersm@sarda.army.mil.***

CONFERENCES

Army Operations Research Symposium Announced

Approximately 200 invited government, academic, and industry leaders are expected to attend the 39th annual U.S. Army Operations Research Symposium (AORS XXXIX), Oct. 11-12, 2000, at Fort Lee, VA. This year's theme is "Shaping the Transformation Force." Symposium registration and a social will be held the evening of Oct. 10.

Concurrent special sessions will cover Information Operations; Survivability Enhancements—Adding Internetted Capabilities to Armor; Advances in Analysis and Simulations and Their Impact on the Transformation Force; Analysis of the Digitized Force; Integrated Test and Evaluation and Spiral Development; Force Development, Modernization, and Requirements; Reducing the Logistics Footprint; and Manpower, Personnel, and Training Systems. In addition to these special sessions, the Army Logistics Management College (ALMC) will conduct two tutorials the afternoon of Oct. 10.

The symposium will allow an exchange of information and discussions about experiences on significant Army analyses. The goal is to enhance analysis efforts and broaden the perspective of the analysis community. Papers that address the session topics listed above are being solicited.

The U.S. Army Test and Evaluation Command, directed by MG A.J. Madora, is responsible for the overall planning and conduct of AORS XXXIX. The U.S. Army Combined Arms Support Command and Fort Lee, commanded by LTG Billy K. Solomon; and ALMC, commanded by COL Samuel H. Jones III, will again serve as hosts.

For additional information, contact MAJ William M. Boruff or SSG Sakinah A. Hall at DSN 761-9887/9835 or (703) 681-9887/9835, Janet Green at DSN 458-0429 or (410) 306-0429, or the AORS Web site at **http://www.atec.army.mil/aors**.

49th Defense Working Group On NDT Schedules Meeting

The 49th Defense Working Group (DWG) on Nondestructive Testing (NDT) will meet Oct. 30-Nov. 2, 2000, at the Isle of Capri Crowne Plaza Resort, Biloxi, MS. The meeting will be co-hosted by Tinker Air Force Base, OK, and Keesler Air Force Base, MS.

Restricted to U.S. government employees, this annual meeting of engineers, scientists, and technicians is the only forum for military, Defense Logistics Agency, and Defense Contract Management Agency personnel to freely exchange information and discuss problems pertaining to NDT methods, equipment, and applications.

Additional information on the 49th DWG meeting is available at **http://members.aol.com/dodndt,** or contact Master Sergeant Dewey Buck at (228) 377-4279 or DSN 597-4279, or by e-mail at **dewey.buck@keesler.af.mil.**

BOOKS

Power & Politics in Project Management

By Jeffery K. Pinto,
Project Management Institute, 1996

Reviewed by LTC Kenneth H. Rose (USA, Ret.), Tidewater-Richmond Area Manager for WPI in Hampton, VA, and former member of the Army Acquisition Corps.

Practitioners of project management may have, on occasion, found themselves walking down the proverbial road with their hand on their head and a bump under it. An insightful, one-of-a-kind book by Jeffery K. Pinto, *Power & Politics in Project Management*, addresses a possible source for this condition.

The book is a progressive march through what could be a minefield. The words *power* and *politics* are often taken as pejoratives, suggesting unpleasant, even repugnant, activities. Pinto's premise is that neither the words nor the activities are intrinsically bad. They are naturally occurring elements of project management that must be understood and considered to avoid their disabling consequences.

Pinto shows that power and politics are inexorably linked by defining political behavior as "... any process by which individuals and groups seek, acquire, and maintain power." He describes how the organizational, life-cycle, constraint, and stakeholder aspects of the project environment combine to form a fertile field in which power and politics may flourish.

Early on, Pinto differentiates between power and influence, describing the latter as shorter lasting and narrower in scope. He discusses four common means of influencing others: persuasion, ingratiation, pressure, and guilt. Power—which tends to exist on a firmer foundation—arises from position, expertise, information, centrality, and nonsubstitutability. He candidly discusses the dark side of power and suggests ways to expand power that hold to the high road.

Politics receives the same kind of treatment. Pinto begins with a discussion of the three modes of power—authority, status, influence—and follows with a series of definitions of political behavior that is consistently negative. He counters this traditional view with six cogent propositions that define a more neutral path for applying power and politics to achieve project goals.

Such application, though, can be laced with danger. Pinto describes three characteristic approaches: naive (avoid politics), sensible (use politics to further organization goals), and shark (use politics for personal gain at the expense of others). Again, Pinto candidly addresses the realities, discussing 10 practical tools that range from predatory to benign. He does not advocate the use of predatory tools, but rather includes them so that readers may be informed, forewarned, and forearmed. He follows with several short case studies that may strike a chord of familiarity with many readers.

Perhaps the most valuable contribution of this book is in a topic not named in its title—negotiation. If the project disease is people playing political games in a relentless pursuit of personal power, Pinto prescribes negotiation as the cure. He offers advice on when to negotiate and suggestions for developing negotiating instincts. He discusses at length key tips for "principled" negotiations based on Fisher and Ury's 1981 book, *Getting to Yes*, and follows with advice for dealing with problem negotiators.

Pinto comes full circle with a closing discussion of conflict, including sources, processes, and resolution techniques. His final chapter answers the question, "What next?" by describing some specific steps that project managers can take to apply the information previously presented.

Politics is ubiquitous. It exists from the presidency to the PTA. In this kind of culture, *Power & Politics in Project Management* is a unique resource that addresses an often-avoided topic rationally and completely. Like an Internet recipe for an explosive device, the book could be misused by those so inclined. Its value lies in its contribution to those more nobly directed who would integrate and exploit the positive synergy of power, politics, and project management.

*This book is available from the Project Management Institute at **www.pmibookstore.org** for $26.35 for members and $32.95 for nonmembers.*

NEWS BRIEFS

Army Develops New Fuel

In February 2000, the Army announced the development of a low-toxicity fuel that ignites on contact (hypergolic) with nitrogen tetroxide or inhibited red fuming nitric acid. Known as Competitive Impulse, Non-Carcinogenic Hypergol (CINCH), the experimental fuel has been in development since 1994 and is a safer all-purpose replacement for a variety of hydrazine and hydrazine-based fuels. A recent test demonstrated that it could be used in satellite launchers that use Aerozine-50, a carcinogenic hypergolic fuel.

"CINCH is extremely versatile and can be used in many rocket propellant applications," said Darren Thompson, Chemical Engineer, U.S. Army Aviation and Missile Command (AMCOM), Redstone Arsenal, AL. "In 1998, CINCH was successfully tested in a monopropellant thruster. Theoretical calculations also indicate that CINCH performs better than RP-1 with hydrogen peroxide or liquid oxygen," he added.

NASA's Marshall Space Flight Center, Huntsville, AL, conducted a preliminary evaluation of the fuel. Edwards Air Force Base, CA, and the Marshall Space Flight Center have demonstration projects planned using hydrogen peroxide and liquid oxygen with CINCH. NASA intends to pursue the use of CINCH with several different oxidizers and as a monopropellant in a satellite launch vehicle. This would greatly reduce logistical costs because only one fuel would be necessary for an entire mission.

Unlike many developmental fuels, CINCH is available commercially. For example, 3M has a pilot plant producing CINCH to meet numerous requests from liquid propulsion developers.

Funding from environmental research organizations has helped advance the development of CINCH. For example, the Army Acquisition Pollution Prevention Support Office funded CINCH research through 1999. Currently, a pollution-prevention joint effort among DOD agencies and NASA is funding the project.

For more information, contact Dan O'Boyle at (256) 876-4162, Public Affairs Office, AMCOM, Redstone Arsenal, AL.

Assessing The Danger From Aging Chemical Rockets

For the U.S. Army Research Laboratory (ARL), Aberdeen Proving Ground, MD, troubleshooting is one of many support areas in which research is often unconventional. Assessing the hazards from the abnormal degradation of 35-year-old solid rocket fuel is no exception.

Background

Roughly 400,000 M55 chemical-agent rockets (each 115mm in diameter) were manufactured and stockpiled during the Cold War years 1961 to 1965. In 1981, these rockets were declared obsolete and scheduled for demilitarization. Although these rockets were built for long-term storage, unforeseen problems have transpired. Specifically, in some instances, chemical agents have leaked from warheads into fuel compartments. The agent-propellant reaction is exothermic and volatile, thus raising the temperature and pressure of the fuel. The question to be answered is whether there is a chance of autoignition in any of these unstable M55 rockets.

The Challenge

The Program Manager for Chemical Demilitarization (PM, CD) was tasked with finding the answer to this question. Working with PM, CD, contractors from Science Applications International Corp. (SAIC) estimated that the rate of energy release from the propellant-agent reaction is likely to be less than 10 watts for the entire 20 pounds of propellant. They concluded that although this seems small (less than the light bulb in most refrigerators), the critical factor is the cooling rate. With sufficient cooling, the temperature rise is inconsequential; however, insufficient cooling could cause the fuel to autoignite.

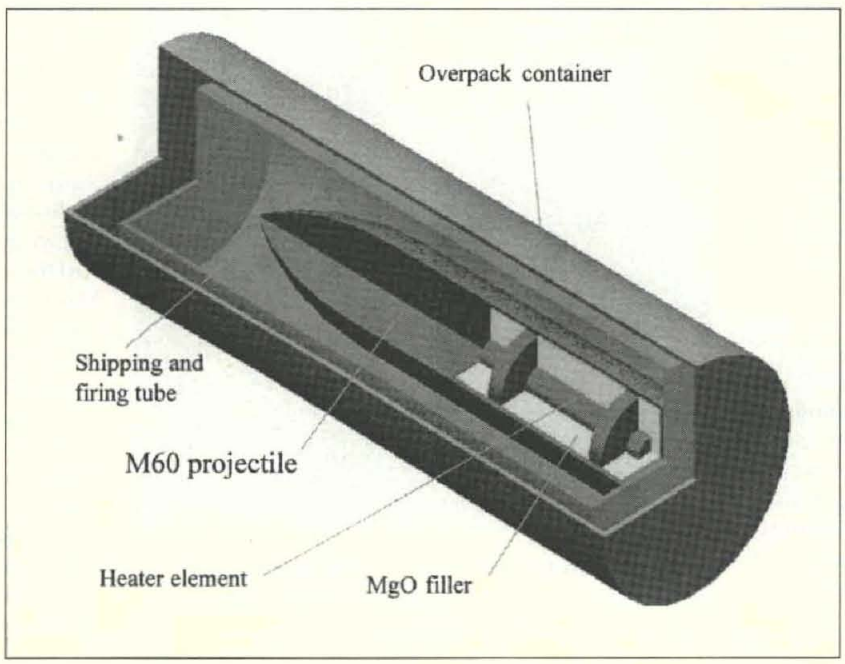
PM, CD called on ARL to design and conduct experimental studies to determine the key cooling rate factor. ARL's Aerodynamics Branch simulated the projectile heating and cooling conditions that could exist in the storage environment (magazine) of unstable M55 rockets and collected data over an extended time period. The degrading round's potential heat generation was simulated by a low-wattage tubular heater that was designed and fabricated by Thermal Devices Inc. to fit inside the fuel cavity of an M60 training rocket (inert surrogate of the M55). Granular magnesium oxide (MgO), having virtually the same thermal conductivity as rocket propellant, was poured around the heater to fill the void between the heater and the fuel compartment walls. Heat was thus conducted to all parts of the rocket motor case as it would be in the agent-propellant reaction being simulated.

The heater, M60 rocket, and concentric layers of containment canisters (overpacking that would normally surround a leaking M55; see accompanying figure) were instrumented with thermocouples. Several such overpacked M60s were prepared and strategically placed within a palletized stacking arrangement, typical of M55 storage.

Results And Conclusion

In all, 42 heating and cooling conditions were simulated for more than 3,000 hours. From this data, ARL computed heat transfer coefficients that were then used to assess the ordnance hazard. ARL also proposed and demonstrated an infrared imager that could be used to quickly survey the M55 stockpile and identify an unstable rocket via its thermal signature. ARL's collaboration with PM, CD and SAIC served a vital role in determining the properties of aging chemical rockets.

The preceding article was written by Jim Garner, an Aerospace Engineer, and Dr. Mark Bundy, a Research Physicist, both employed at the U.S. Army Research Laboratory, Aberdeen Proving Ground, MD.



M60 with heater and filler simulating an agent-propellant reaction

Mortar Developers Don Helmets

In late 1999, employees from the U.S. Army Tank-automotive and Armaments Command's Armament Research, Development and Engineering Center (TACOM-ARDEC), Picatinny Arsenal, NJ, attended a 1-week mortar familiarization course at Fort Benning, GA, hosted by the U.S. Army Infantry Command (USAIC). The objective was to give the Product Manager (PM), Mortar Systems, ARDEC Mortar Team experience in a realistic environment.

Participants from Picatinny Arsenal, the Army's "lethality center," represented every facet of mortar development and included logisticians, testers, contract specialists, contracting officers, and even an acquisition center branch chief. Attendance at this annual course has grown during the past few years as attendees return to their organizations and recommend it to their peers and superiors as an invaluable experience.

Classroom Training

The first day began with introductions and instruction on the general aspects of mortar operations—how to lay the mortar using the M16 plotting board and reading azimuths on maps, as well as the basic "call for fire." The afternoon included simulated night operations using light sticks and more instruction on mortar laying and the use of the M23 Mortar Ballistic Computer.

The most useful aspect of the classroom instruction was the identification of user needs—what infantry soldiers like and dislike and what they would like to see in the future. Important issues were the need for smaller, lighter equipment and the importance of fielding the Mortar Fire Control System. Classroom information was designed to provide a summary of mortar description, operation, and fire control.

Field Experience

The course instruction shifted outside to the field the following day, where participants got their hands dirty and experienced day-to-day mortar training operations.

The instruction, conducted at Fort Benning's Shelton Range, included hands-on training for deflection/elevation changes, aligning aiming posts, reciprocal laying, and bore-sighting, using operational Army equipment instead of training aids. Participants learned detailed misfire procedures (how to safely remove a live round that is stuck in a tube) and familiarized themselves with the M880 Short-Range Training Round. They also set up the M303 training barrel insert from which the M880 is fired. This was practiced on both 120mm mortar versions—the tracked carrier (M1064A3; basically an M113 personnel carrier with a mortar in it) and the ground-mounted version.

The highlight of the entire course was live firing of M933 120mm high-explosive and 120mm illumination rounds. Participants donned helmets, flak jackets, and ear protection and had the opportunity to hear and feel real ammunition being fired. To prepare for this experience, refurbishment and firing of the M880 with the M303 81mm insert was conducted and all safety procedures were reviewed. Participants handled an inert 120mm round to get a feel of hanging and dropping this much heavier round. They also executed the misfire procedure using the M120 ground-mounted mortar.

The afternoon instruction was conducted at the Red Cloud Range, where participants fired at surplus M48 tanks. To get the full experience, participants were taken through the entire operational procedure from removing the rounds from their packaging, setting the fuze, "cutting" the propellant charge, to firing live ammunition downrange. An evening demonstration of illumination rounds showed the dramatic impact on the battlefield provided by the 120mm mortar.

The course was well planned and executed by the training staff. In particular, they paid attention to detail and allocated plenty of time to respond to any questions and issues regarding military training and mortar equipment operation. "Their attention to detail and safety allowed us to grasp the mortar materiel and live fire ammunition with confidence," said one participant. "This is definitely an impact course and should be a requirement for all materiel developers involved with PM, Mortars [PM, Mortar Systems] or IOC [Industrial Operations Command] mortar programs," he added.

The 120mm illumination cartridge sits atop packaging ready to be fired at Red Cloud Range at Fort Benning, GA.

"We now have a better understanding of the training issues and warfighting issues associated with the deployment of the mortar systems that we buy right here at TACOM-ARDEC," wrote Harry Santa, Group Manager, Mortars and Warheads Contracting Group, Picatinny Center for Contracting and Commerce, in a recent trip report.

"This is truly a model program for the entire Army to follow. It is another way to bring the Acquisition/Materiel development community closer to the "USER" community—The Soldiers."

"Knowing that the materiel developers need to get side by side

with the combat developers has provided us with some of the best practical training that I have taken in my 16 years with the government," said James L. Wejsa, Developmental Project Officer, Mortar Smoke and Illuminating Cartridges.

"My three new mortar engineers did not want to leave because they had such an overwhelming experience setting up mortar weapons and handling and firing live mortar cartridge," he said. "I told them they would have to join the Army if they wanted to stay."

Conclusion

How can you get a better endorsement for a job well done by the USAIC mortar staff? The PM, Mortar Systems, ARDEC Mortar Team now has a deeper insight into the challenges a mortarman faces.

PM, Mortar Systems and the USAIC took the initiative to develop a mortars indoctrination program for the PM, Mortar Systems, ARDEC Mortar Team. The purpose was to put them in the boots of the combat infantryman. The result was a head-in-the-helmet, hands-on-the-ammo, weeklong mortar familiarization and live-fire training course for managers and technical staff. The acquisition community is now better informed and motivated to provide the best quality product to its customer—the soldier—having, for a short time, walked in the soldier's boots.

The preceding article was written by Patricia L. Felth, Deputy PM, Mortar Systems.

Body Scanner Helps Create Perfect-Fitting Uniforms

Researchers at the U.S. Army Soldier Systems Center, Natick, MA, are working to create virtually perfect-fitting equipment and clothing. Using a 3-D body scanner called the Whole Body Digitizer, researchers can retrieve between 20 and 30 measurements of the human body in about 30 seconds. The measurements can be used to fit soldiers with properly sized or custom-made uniforms, body armor, and chemical protective suits and masks. Produced by Cyberware in Monterey, CA, Natick's scanner is one of only eight in use around the world.

Anthropometry is the study of body measurements, especially variations within the general population. The Army's anthropometric database is being updated using data gathered from the body scans. Through a better understanding of the wide range of sizes and shapes among soldiers, researchers and designers seek to improve the design, fit, and sizing of military clothing and equipment.

The laser scanner works in the same manner as magnetic resonance imaging (MRI) technology, only the low-powered lasers in the Whole Body Digitizer do not penetrate the surface, said Dr. Brian Corner, Research Anthropologist.

A horizontal laser line is projected onto the subject and reflected onto a photoelectric panel. This process generates mathematical data that is sent to a computer to create a series of spatial reference points. The computer enhances the image by connecting the points, which then becomes a digital model of the subject's body surface. Scientists and engineers can manipulate the 3-D model through computer-aided design and engineering software.

According to Corner, the digitizer can also measure subjects that are difficult to quantify through conventional measuring methods. For instance, the digitizer and its software can measure the air trapped between layers of protective clothing. "When you wear a chemical or thermal protective garment, the air that is trapped between layers adds a certain amount of protection. One of the things we want to know is how much air is in the gap. We can measure the trapped air through scanning and then run tests to determine how much air provides optimal protection," Corner said.

The scanner can also create solid models for display on the computer screen. An item like body armor can then be manipulated onscreen to see if it provides better coverage with longer sides or a shorter front.

The Whole Body Digitizer can improve Army clothing inventories by having the correct sizes for everyone. Recruits could be scanned and their information updated annually. On deployments, the Army would have this information either in a central database or on a soldier's "smart card," eliminating the guesswork about uniform and equipment sizes. Smart cards store extensive personal information and are replacing Army dog tags. The Marine Corps is already using a digitizer to measure recruits for dress uniforms at the Marine Corps Recruit Depot, San Diego, CA.

In addition to clothing, the digitizer and software can help develop basic soldier equipment. Researchers could perform virtual fittings on soldier items like backpacks. For example, researchers can view onscreen how a soldier's load shifts when they lean forward, then design a backpack that adapts to a soldier's mobility. Researchers can also learn whether equipment accommodates different-sized soldiers.

Although Natick currently uses the scanner for improving soldier equipment and clothing, the Whole Body Digitizer has other applications. According to Steve Paquette, Natick's Anthropometry Group Leader, scanning was used successfully by medical professionals to create better fitting artificial limbs, as well as garments and masks for burn victims. Other medical uses include postoperative analysis of wound healing and preoperative assessments of facial features.

Corner said the scanner also has e-commerce applications. "Once an individual is scanned, we have a virtual version of that individual. You can take all kinds of measurements from this virtual individual. You could send this scan to a clothing retailer and then the retailer could come up with your correct size, since sizes can vary by retailer, and have it on record for future orders. The technology could also be used for custom-sizing," he said.

Corner said there is commercial interest in the scanner for use in creating cyberart and computer animation. Operators can scan a person and animate the resulting model.

Natick is part of the U.S. Army Soldier and Biological Chemical Command (SBCCOM). For more information about SBCCOM or the Soldier Systems Center, contact **http://www.sbccom.army.mil**.

Modeling For Manufacturing At Rock Island Arsenal

"If a picture is worth 1,000 words, then a good model is worth at least 10,000." This has become the unofficial motto of the employees at Rock Island Arsenal's (RIA's) Engineering Services Directorate. RIA's modelers can turn out solid and virtual models of any of the numerous items produced at RIA.

As a center in technical excellence for weaponry and support equipment, RIA manufactures gun mounts, artillery carriages, recoil mechanisms, and other equipment for the Armed Forces; and assembles tools, sets, kits, and outfits to support equipment in the field.

RIA's engineering staff can readily produce scaled-down or actual-size models of items ranging from a spare part to an entire weapon system. Process planners, engineers, designers, and others involved in the manufacturing process can study the models and use them to find ways to produce items faster, better, and cheaper.

High-quality models make rapid prototyping possible by putting that which the mind conceives into solid form. Models are also handy for assisting potential customers by supplementing and explaining the information found in drawings, charts, and written descriptions.

Solid models can be made small enough to fit in a suitcase. Detailed virtual models can be sent anywhere in the world via e-mail. With their global reach and universal value, models can integrate internal processes and link customers to the factory floor. When properly used, models can be the glue that holds together the various aspects of manufacturing.

Until recently, the state-of-the-art in solid modeling at RIA was the lamination object machine (LOM). Models can use the LOM to turn out highly accurate 3-D bonded and stacked-paper representations that have a woodlike appearance and can be used as a basis for manufacturing. While the LOM is still in use and will continue to play an important role in solid modeling, it has been supplemented by a new machine that produces plastic models.

The machine is called a 3-D printer, even though its medium is plastic rather than paper. Within a space measuring 8 by 8 by 12 inches, the machine automatically injects and shapes hot plastic to produce models detailed to within a resolution of .013 inches.

Modeling information can be fed into the 3-D printer from any workstation on RIA's computer-aided design (CAD) network. A few mouse clicks can then transform a model that was made using CAD into solid reality.

While the LOM has excellent resolution and can produce one-piece models measuring 32 by 22 by 20 inches, the 3-D printer is much faster and easier to use. Solid models can be turned out of the 3-D printer in 1 hour or less while the most detailed models can take up to 40 hours. Because the 3-D printer can operate unattended, those jobs can be programmed to run over a night or weekend.

Although nothing compares to a good solid model, advances in CAD technology have made virtual models more realistic than ever. Using the latest CAD hardware and software, modelers using a "spaceball" can view and manipulate models from any angle. Modelers can also color-code different parts or classes of parts. Models can be moved and examined for "interferences," those points where two parts rub against each other. Manufacturing process adjustments can then be made.

This technology makes moving from model to manufactured item possible, but what about the reverse? This process, commonly known as "reverse engineering," has become easier and more accurate thanks to a 3-D portable digitizer arm. The tip of the digitizer arm can be moved over an item's surface. As it travels, the arm scans and plots all the points that it crosses.

After processing, the data gathered through the 3-D digitizer arm can be converted into a CAD model, which can then be made into a solid model. The digitizer arm gathers enough data to create models that are accurate to within .003 of an inch.

More information on RIA modeling and engineering capabilities can be found at **www.ria.army.mil.**

Fiber-Optic Cable To Be Installed At Yuma Proving Ground

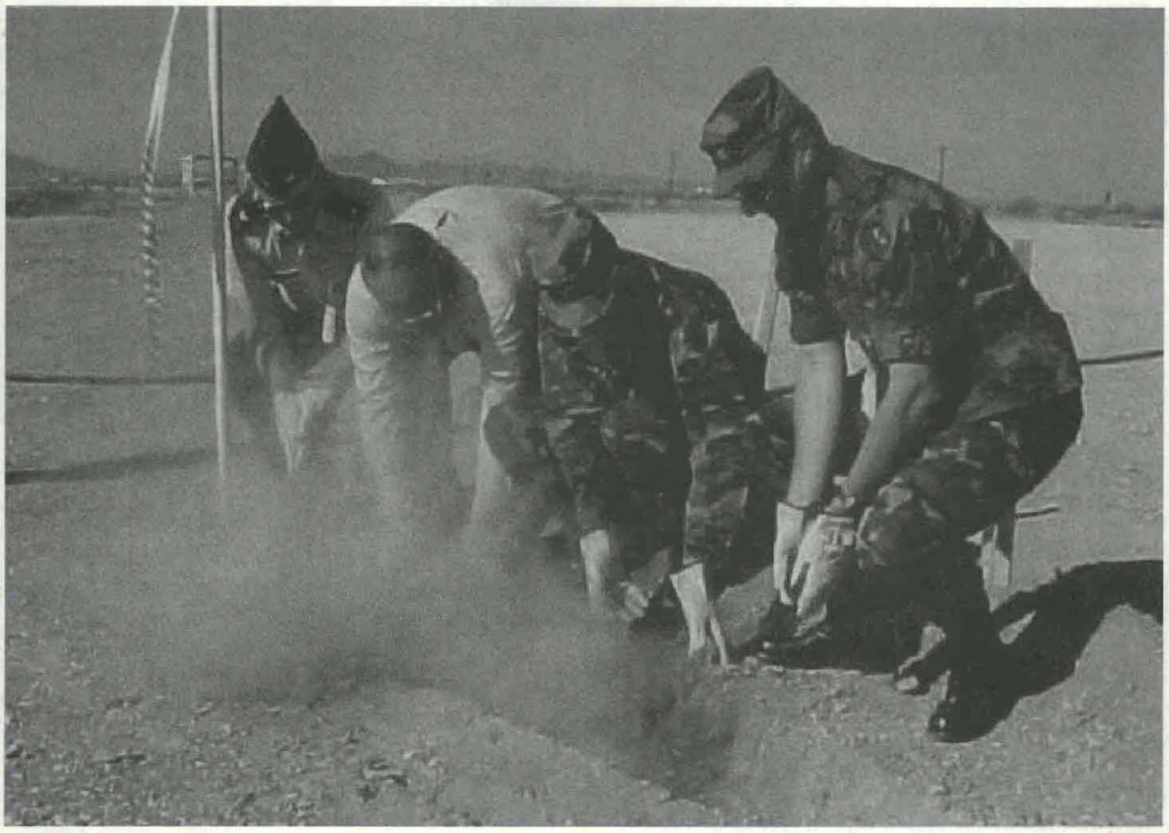
The extensive data requirements of weapon systems and munitions testing in the 21st century are being addressed head-on at the U.S. Army Yuma Proving Ground (YPG), AZ. At a dedication ceremony May 2, 2000, at Kofa Firing Range, the Army formally kicked off a project that will result in more than 600 miles of buried fiber-optic cable linking test facilities throughout the 1,300-square-mile range area.

The fiber-optic network, called the Range Digital Transmission System, will overcome a number of current limitations caused by antiquated equipment, congestion of radio frequencies, and the use of several data transmission systems. Some of the copper cable being replaced was installed nearly 40 years ago and is not capable of properly transmitting modern test data. The new system will allow automated and integrated voice, data, and video transmissions over a single transport system.

A major benefit of the project is that more extensive data requirements of upcoming tests will be easily met. Also, the time required to connect equipment at test sites will be dramatically reduced because workers will need only to plug in to the already installed fiber-optic system rather than lay new cable or use microwave transmitters.

Construction of the system, performed by contract personnel, will take 6 years at an estimated cost of $50 million. When completed, the system will link 400-plus test sites at YPG.

"This is one of the most significant forward steps I've seen at YPG," said YPG Commander COL Robert Filbey. "It will pay big dividends in years to come because of our significantly improved ability to acquire and move test data. This is the key to efficient testing in our information age. We've now graduated from copper wire and microwave data transmissions to fiber optics. This is clearly the next generation," Filbey added.



Burying the first length of fiber-optic cable. Shown left to right are COL Mark Russell, Project Manager for Instrumentation, Targets and Threat Simulators; Arizona Representative Jim Carruthers; COL Robert Filbey, Commander, YPG; and COL John Deal, Commander, Information Systems Engineering Command.

COL John Deal, Commander of the Information Systems Engineering Command, Fort Huachuca, AZ, said that there will be many lessons learned during this project that will be applied at other military installations. He added, "This project isn't just about Yuma—it's about digitizing the force, testing new technologies that are coming out at an incredibly rapid rate, and creating a template that we can adapt and distribute at other test ranges around the Department of Defense. My most immediate concern is the digitizing of Yakima Range, WA, which has terrain very similar to Yuma Proving Ground."

Digitizing a range is important because of the vast amount of equipment that can be used to gather data and the ultimate correlation of these data. Digitization allows engineers to manipulate and cross-correlate information much better than they could in the past.

"No one will let Yuma Proving Ground sit still after this great fiber-optic capability is installed," claimed Deal. "People will take advantage of and exploit this instrumentation capability—it will be great for the proving ground," he added.

At the project's dedication ceremony, Arizona Representative Jim Carruthers stated that fiber-optic capability will create a new communication threshold for YPG, which is exactly the state-of-the-art transmission capability that will make YPG even more valuable to future national Defense concerns. "Yuma Proving Ground is essential to keeping America free," said Carruthers.

As a part of the Army Test and Evaluation Command, YPG's primary mission includes testing medium- and long-range artillery, aircraft armament and fire control systems, cargo and personnel airdrop systems, and armored vehicles and automotive equipment. Last year, more than 167,000 rounds were fired, 36,000 parachute drops were made, and nearly 4,000 air sorties were flown at the installation.

The preceding article was written by Chuck Wullenjohn, Public Affairs Officer, U.S. Army Yuma Proving Ground.

Besson Awards Recognize Procurement Excellence

At a recent U.S. Army Materiel Command (AMC) conference, Elizabeth H. Moulder, MAJ Jeffrey A. Gabbert, and Joann M. Underwood received the 1999 Frank S. Besson Award for Procurement Excellence. Sallie H. Flavin, AMC's Assistant Deputy Chief of Staff for Research, Development and Acquisition-Acquisition, Contracting and Program Management, presided over a ceremony recognizing the awardees for their accomplishments.

The prestigious Besson Award was established in honor of GEN Frank S. Besson, the first AMC Commander, and his lifelong achievements in acquisition. The award recognizes individual excellence in the AMC contracting workforce. Selection for the award is based on demonstrated technical expertise and development and implementation of innovative procurement-related ideas or processes in support of AMC's mission. Awards are made annually to recognize exceptional achievements by an AMC civilian careerist, military officer, and intern.

Elizabeth H. Moulder, a civilian careerist, is a Lead Contract Specialist at the U.S. Army Aviation and Missile Command (AMCOM), Redstone Arsenal, AL. Moulder was honored for her diligence in leading a Team Redstone effort to develop a flexible and efficient program for the acquisition of contract advisory and assistance services, the Omnibus 2000 Program. Moulder's leadership enabled the team to create a program that provides many customers timely access to a broad range of cost-effective logistics and programmatic and technical expertise. She has both a bachelor's and a master's (Summa Cum Laude) degree in music, has completed a course of study in business, is Level III certified in contracting, and is a member of a number of professional organizations. Moulder has 19 years of tri-Service acquisition experience.

MAJ Jeffrey A. Gabbert, Apache Procurement Division Chief, AMCOM, Redstone Arsenal, AL, was recognized for designing and implementing a number of innovative paperless business processes. Gabbert created automated letter log and contract dissemination processes that will provide more than $450,000 in validated savings during the next 5 years. He collaborated with contractor representatives to create a secure Web page that is used in an "Alpha-contracting" approach to facilitate communications and cut acquisition lead times. Gabbert instituted metrics that improved his organization's ability to demonstrate the value it provides to its customers and developed a system to integrate these metrics with employee performance objectives. He holds a B.A. in business management and is certified in both contracting (Level III) and program management (Level II). During his 14 years of military service, Gabbert has received numerous military awards and decorations.

Contract Specialist Joann M. Underwood, the intern recipient of the 1999 Besson Award, started her contracting career with the U.S. Army Communications-Electronics Command, Fort Monmouth, NJ, in 1997. Underwood was commended for her efforts in defining the item pricing structure, creating a complex cost-evaluation model, and for serving on a source selection board to support the Army's Infrastructure Solutions acquisition. She was also praised for her efforts in expeditiously developing and issuing one of the Army's first enterprise software licensing agreements, which resulted in a 42-percent savings for the Army. Underwood holds a B.A. in economics and political science, is Level II certified in contracting, and received an exceptional intern performance award in 1998.

Pictured (left to right) are Edward Elgart, Principal Assistant Responsible for Contracting (PARC), CECOM; Underwood; Gabbert; Moulder; Marline Cruze, PARC, AMCOM; Flavin

Each October, AMC requests nominations for the Besson Award. Procedural guidance for the award is contained in AMC Regulation 672-10 and can be accessed at **http://www.amc.army.mil/amc/rda/rda-ac/besson/besson.htm**. For additional information, contact Scott Crosson at (703) 617-0544 or **scrosson@hqamc.army.mil**.

Secretary Of Defense Awards For Excellence

Three Department of the Army employees were chosen from more than 100 participants on the Section 912c Product Support Reengineering Implementation team to receive the Office of the Secretary of Defense Award for Excellence. They distinguished themselves and their organizations by providing critical assessments and making substantial technical and analytical contributions to ensure the *Product Support for the 21st Century* report reflected attention to enhanced warfighter agility, improved customer service, and integrated logistics chains. This report comprehensively identified efforts to re-engineer the weapons system product support process to use best-commercial practices, competitive sourcing, continuous technology refreshment, and expanded prime vendor processes. These three employees served as an effective bridge between OSD and the Army in coordinating and resolving many implementation issues associated with this complex and far-reaching strategic change initiative. This plan is a critical part of the DOD Logistics

Transformation strategy and is the centerpiece for integration of acquisition and logistics initiatives, a key tenet of acquisition reform. The Army honorees and their contributions are as follows:

Betsy McChesney is a Materiel Acquisition Specialist in the Office of the Deputy Assistant Secretary of the Army for Plans, Programs and Policy. As the Army acquisition organization lead on the implementation team, McChesney played a key role in organizing Army staff and subordinate command participation. McChesney was vital in supporting efforts to identify competitive sourcing strategies to improve weapon system performance and reduce total ownership costs.

Larry W. Hill serves as the Chief of the Integrated Logistics Support Branch in the Office of the Deputy Chief of Staff for Logistics. He was the Army logistics organization lead on the implementation team and played a key role in organizing Army staff and subordinate command participation. Hill was vital in supporting efforts to identify best commercial and government practices to re-engineer product support.

Michael Rybacki works as an Operations Research Analyst at the Army Logistics Integration Agency. He led the implementation team in examining how to increase the application of best-commercial practices to DOD logistics operations. These efforts served as an architectural backdrop for all other product support re-engineering initiatives. Rybacki was vital in performing analysis that contributed to the concept of operations for product support. He also identified key outcome measures to guide product support implementation.

Bradley Team Wins EPA Award For Halon Replacement Program

In September 1999, the Bradley Project Management Team, Program Executive Office for Ground Combat Support Systems (PEO, GCSS) won the Environmental Protection Agency's (EPA's) prestigious 1999 Stratospheric Ozone Protection Award. The team was recognized for its development of a halon retrofit program. This program marks a significant trend in the Army's continued commitment to protect its soldiers and their environment.

Discovering a superior means to extinguish fires using an ozone-friendly agent, while simultaneously protecting the soldier, became team Bradley's mission from 1994 through 1999. This effort resulted in the first halon retrofit program for any major U.S. weapon system. The program will result in removal of approximately 55,000 pounds of Halon 1301 from the field by 2001.

When notified that his team was to receive the award, Ted Vician, Lead Engineer in the Bradley Fighting Vehicle System (BFVS) Project Management Office, stated, "The conversion will ultimately extract all existing halon out of the entire fleet of Bradley's engine compartment fire suppression systems and replace [it] with a safer, less expensive firefighting agent."

Benedict DeMarco, Chief of the Bradley Engineering Team, represented the Bradley team at the award ceremony. The team joined an elite group of award recipients from around the world, all hailed for advancements in the areas of ozone and climate control.

Robert Perciasepe, EPA Assistant Administrator, described the participants' efforts as a "technology breakthrough," eliminating ozone-depleting chemicals and saving consumers billions of dollars. He further described the award recipients as "exemplifying the forefront of our efforts to protect the ozone layer and to mitigate the effects of global climate change." (The ozone layer prevents many detrimental health effects by filtering ultraviolet radiation from the Earth.)

The Bradley has long been an intrinsic asset in the Army's weapons arsenal and is identified as a turreted, full-tracked combat vehicle that weighs 30-35 tons, depending on model and configuration. It functions as an infantry-fighting (M2) and a cavalry-fighting (M3) vehicle. As such, the Bradley sees frontline combat action in conjunction with the M1 Abrams tank.

An inherent threat of fire to the Bradley exists because it carries several hundred gallons of diesel fuel, missiles, and multiple rounds of ammunition. It can be in danger from opposing infantry-fighting vehicles, landmines, or artillery.

The Army currently has more than 6,500 fielded Bradleys equipped with an engine compartment fire suppression system (FSS). This system protects the crew and vehicle by preventing uncontrollable engine fires. These fire extinguisher systems were initially designed using Halon 1301, a gaseous, colorless, and odorless fire-suppression agent that has been used for more than 30 years.

Before being recognized as an ozone-depleting chemical, halon was chosen as the best fire-suppressant agent on the market because it is relatively harmless to people. Its combination of low weight and low toxicity deemed it capable of extinguishing a fire in less than 250 milliseconds, the military requirement for an FSS.

More than a quarter second's exposure to the intensity of fire that can occur in the Bradley's crew area can be hazardous to the soldier. Exposure of less than 250 milliseconds, however, generally limits injuries to first-degree burns.

The fire detector operates in 100 milliseconds, leaving 150 milliseconds to extinguish the fire. The current FSS extinguishes the fire by releasing 10 pounds of Halon 1301 stored in two high-pressure bottles on the curbside of the vehicle, just behind the turret. When the valves open, halon streams out of each nozzle and rapidly evaporates, filling the volume of the vehicle to draw the heat away and suppress the fire.

In 1989, DOD issued a directive to identify halon applications and to decrease dependence on them. This directive stemmed from the requirements of the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer, an international treaty negotiated through the United Nations. Under the terms of the Montreal Protocol, the manufacture of halon was halted Jan. 1, 1994, in most countries.

The great concern in protecting the ozone layer was expressed by an EPA assistant administrator at the award ceremony when he said, "Ozone levels over Antarctica fall by over 60 percent some years. In 1998, NASA/NOAA [National

Oceanographic and Atmospheric Administration] satellites determined the Antarctica ozone thinning covers the largest expansion of territory since the depletion was first identified in the early 1980s."

Though the Bradley team knew replacing halon would be no easy task, in 1994 it began the systematic, detailed investigation of the performance of the engine compartment FSS, the operational requirements associated with that system, and characteristics of various commercially available, ozone-friendly fire-suppression agents.

In 1996, Steve McCormick, an Engineer with the U.S. Army Tank-automotive and Armaments Command's (TACOM's) Tank Automotive Research, Development and Engineering Center, provided data that narrowed the research to two possible halon replacements: a dry powder and a gaseous agent. The dry powder is primarily sodium bicarbonate (baking soda) pressurized with nitrogen, and the gaseous agent is halon substitute HFC-227ea.

Initial testing of the two agents revealed that both could be used on the Bradley. However, use of the dry powder would require rework of the FSS, whereas the gaseous chemical was nearly a "drop-in" replacement for halon.

Consequently, HFC-227ea, known by its trade name FM-200, was chosen. FM-200 contains no bromine, the ozone-depleting agent in halon. The fluorine in FM-200 reacts readily with water to form a strong acid so it never rises high enough in the atmosphere to harm the ozone layer.

FM-200 was patented in 1992 by Great Lakes Chemical Co. and has the lowest observable adverse effect level (LOAEL) relating to toxicity. The LOAEL is 10.5 percent, or 105,000 parts per million. The technical design goal for an FSS using FM-200 is 7 percent, well below the LOAEL.

The retrofit program in progress at Red River Army Depot, TX, is based on an engineering change to the bottle-valve assembly of the BFVS engine compartments' fire extinguishing system. The cylinder is reused, as is the valve. The valve is remanufactured to change some items. These remanufactured assemblies are installed in production vehicles as they leave the factory.

A retrofit team from United Defense Limited Partnership, the prime contractor for the Bradley, is installing remanufactured bottles in fielded vehicles around the world.

The widespread interest in the halon replacement mandate has caught the attention of military teams managing many different systems. In addition, the PEO, GCSS Bradley team routinely answers inquiries from others about the halon retrofit program. In fact, the Bradley team has been discussing the retrofit with Program Manager (PM), Light Armored Vehicles and PM, Advanced Amphibious Assault Vehicle.

EPA's Dr. Stephen O. Andersen told the audience at the award ceremony, "I hope you can appreciate that in the history of stratosphere ozone protection and now in climate protection, the United States military has been a leader and has won many of these awards."

The BFVS Project Management Office is continuing its efforts in halon replacement in crew areas. The office is also looking into integration of potential replacements using modeling and simulation.

This effort represents just one part of an overall effort by PM, Bradley to maintain a broad commitment to environmental stewardship. The Bradley Environmental Management Team has won the Secretary of the Army Pollution Prevention Award for Weapon System Acquisition Teams for 1995-97, and in April 2000 received the Secretary of the Army Pollution Prevention Award for 1999.

For more information on this matter, contact Ted Vician in the BFVS Project Management Office at (810) 574-7650.

To read more about ozone matters, visit the Web site at **http://www.nas.nasa.gov/Services/Education/Resources/TeacherWork/Ozone/Ozone.homepage.html**.

The preceding article was written by Margaret Compton, a Staff Writer in TACOM's Public Affairs Office, Warren, MI.

CG USAREUR Incentive Awards Presented

At a ceremony held in Heidelberg, Germany, late last year, two individuals received the 1998 Commanding General, U.S. Army, Europe (USAREUR) Annual Incentive Award for contracting and acquisition achievements. Their contributions helped acquire quality supplies and services in a cost-effective manner.

Bill Mysliwiec was recognized for his superior performance as the Chief of the Contracting Division at the Regional Contracting Office, Seckenheim, Germany. He distinguished himself by personally working to help adopt several acquisition reform initiatives. This included serving as Team Leader on the Acquisition Development Assistance Team, which won Vice President Gore's Hammer Award; developing a new multitrade construction, repair, and maintenance contract format; and marketing and fielding the new customer, contracting, and commerce modified two-step contracting process.

MAJ Daniel Rosso was commended for his selfless service, innovation, and leadership during several deployments in 1998. During those deployments, he fostered close ties with NATO contracting offices in the Balkans and streamlined operations in the local Hungary office. He served in Greece on a host-nation exercise and was deployed to Israel in support of Operation Desert Fox. Rosso's knowledge, skills, and abilities set him apart as an ultimate contracting professional. Rosso was the initial contracting officer that spearheaded support for Task Force Hawk in Albania. His leadership and team efforts made contracting a key element in support of combat operations.

Mysliwiec and Rosso were also acknowledged for improving the overall quality, efficiency, and effectiveness of the acquisition cycle; demonstrating excellence in relationships with contractors, co-workers, and management; and for maintaining a high level of professional standards and demonstrating the ability to effectively solve acquisition issues and problems.

MEDIA RELEASE

ADVANCE NOTICE

22nd ARMY SCIENCE CONFERENCE

"Accelerating the Pace of the Transformation to the Objective Force"

12-13 December 2000

Baltimore, Maryland

CONFERENCE OVERVIEW

The **22nd Army Science Conference**, sponsored by the Assistant Secretary of the Army (Acquisition, Logistics and Technology), will be held at the Renaissance Harborplace Hotel, Baltimore, MD, 12-13 December 2000. The conference theme is "***Accelerating the Pace of the Transformation to the Objective Force***." This biennial event was inaugurated in 1957 to provide a forum for presentation, discussion, and recognition of significant accomplishments by U.S. Army scientists and engineers in their efforts to support the combat soldier of tomorrow.

The conference will feature presentations of papers and posters judged as best among those submitted by Army scientists and engineers. Authors of the most outstanding papers will be selected to receive special recognition and awards. The audience will include representatives from academia, industry, U.S. Government and allied nations.

OBJECTIVES

- To present the Army's best research to the international scientific and engineering community for critical review and discussion;
- To provide a forum for the cross fertilization of ideas among the many scientific and engineering disciplines relevant to the Army's missions;
- To highlight the refocusing of Army Science and Technology toward Future Combat Systems and the Objective Force; and
- To publicly recognize the important technical achievements of Army scientists and engineers.

PRESENTATIONS

Presentations will be in the areas of:

- Advanced Materials and Manufacturing
- Microelectronics and Photonics
- Advanced Propulsion Technologies
- Engineering Sciences
- Environmental and Geosciences
- Biomedical and Behavioral Sciences
- Force Protection (Includes WMD Defense)
- High Performance Computing and Simulation
- Soldier Systems
- Sensors and Information Processing

WHO SHOULD ATTEND

Defense (particularly U.S. Army personnel), academia and industry representatives involved with new scientific initiatives and ongoing modernization activities focused on near-term and long-range U.S. Army combat capabilities. Attendance at this conference will be beneficial to both management and technical personnel from industry, government and academia who have an interest in the application of new scientific and engineering technologies.

MORE TO FOLLOW

A follow-up invitation will be sent in the near future and will provide information concerning registration, hotel reservations, travel discounts, and an agenda update. To receive an invitation or if you have further questions, call the Army Science Conference Registration Desk at (757) 357-4011, fax requests for information to (757) 357-5108, E-Mail asc2000info@aol.com, or visit the 22nd Army Science Conference website at: www.asc-2000.com.

FOR YOUR CALENDAR

Dates: 12-13 December 2000

Place: Renaissance Harborplace Hotel
202 East Pratt Street
Baltimore, Maryland 21202
(410) 547-1200
(800) 535-1201

The 2000 *Weapon Systems* handbook has been published and is available electronically on the Assistant Secretary of the Army for Acquisition, Logistics and Technology home page at **http://www.sarda.army.mil**. (Click on **Document Center, Regulations/Handbooks, 2000 Weapon Systems Handbook**.) The entire handbook, individual PDF files, and individual system photographs can be downloaded.

In addition, hard copies may be purchased from the U.S. Government Printing Office (GPO) for $46.00 by writing the Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954. Orders may be placed by calling GPO at (202) 512-1800. The handbook is also available at the GPO Bookstore, 710 North Capitol Street, NW, Washington, DC, (202) 512-0132. The 2000 *Weapon Systems* handbook GPO identification number is ISBN 0-16-050302-7.

Additional questions can be submitted via e-mail to **hti@sarda.army.mil**.

ARMY AL&T WRITER'S GUIDELINES

http://dacm.sarda.army.mil/publications/rda/

Army AL&T is a bimonthly professional development magazine published by the Office of the Assistant Secretary of the Army (Acquisition, Logistics and Technology). The address for the Editorial Office is DEPARTMENT OF THE ARMY, ARMY AL&T, 9900 BELVOIR RD, SUITE 101, FT BELVOIR VA 22060-5567. Phone numbers and e-mail addresses for the editorial staff are as follows:

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Purpose

To instruct members of the AL&T community relative to AL&T processes, procedures, techniques, and management philosophy and to disseminate other information pertinent to the professional development of the Army Acquisition Workforce.

Subject Matter

Subjects may include, but are not restricted to, professional development of the Army's Acquisition Workforce, AL&T program accomplishments, technology developments, policy guidance, information technology, and acquisition reform initiatives. **Acronyms used in manuscripts, photos, illustrations, and captions must be kept to a minimum and must be defined on first reference.**

Length of Articles

Articles should not exceed 1,600 words in length. This equates to approximately 8 double-spaced typed pages, using a 20-line page. **Do not submit articles in a layout format. ARTICLES CONTAINING FOOTNOTES OR ENDNOTES ARE NOT ACCEPTABLE.**

Photos and Illustrations

A maximum of 3 photos or illustrations, or a combination of both, may accompany each article. Photos may be black and white or color. **Illustrations must be black and white and must not contain any shading, screens, or tints. Submit illustrations in separate files from text.** Photos and illustrations will not be returned unless requested. **All scanned photos and illustrations must have a resolution of at least 300 dpi (JPEG or TIFF). Glossy prints of all photos should also be submitted via the U.S. Mail, FedEx, etc.**

Biographical Sketch

Include a short biographical sketch of the author/s that includes the author's educational background and current position.

Clearance

All articles must be cleared by the author's security/OPSEC office and public affairs office prior to submission. The cover letter accompanying the article must state that these clearances have been obtained and that the article has command approval for open publication.

Offices and individuals submitting articles that report Army cost savings must be prepared to quickly provide detailed documentation upon request that verifies the cost savings and shows where the savings were reinvested. Organizations should be prepared to defend these monies in the event that higher headquarters have a higher priority use for these savings. All Army AL&T articles are cleared through SAAL-ZAC. SAAL-ZAC will clear all articles reporting cost savings through SAAL-RI. Questions regarding this guideline can be directed to SAAL-RI, Plans, Programs and Resources Office, (703) 693-2685, DSN 223-2685.

Submission Dates

Issue	*Author's Deadline*
January-February	15 October
March-April	15 December
May-June	15 February
July-August	15 April
September-October	15 June
November-December	15 August

Submission Procedures

Article manuscripts (in MS Word), illustrations (300 dpi), and photos (glossy prints or 300 dpi JPEG or TIFF) may be submitted via e-mail to **bleicheh@aaesa.belvoir.army.mil**, or on a 3 1/2-inch floppy disk or a 100-MB ZIP disk via U.S. mail to DEPARTMENT OF THE ARMY, ARMY AL&T, 9900 BELVOIR RD, SUITE 101, FT BELVOIR VA 22060-5567. All submissions must include the author's mailing address, office phone number (DSN and commercial), and a typed, self-adhesive return address label.

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