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ARMY ALT &



Army Knowledge Management

In This Issue:

- Army Acquisition Workshop
- CDG Orientation
- R&D Organization Awards

THE ARMY WELCOMES AN EXPERIENCED LEADER

The U.S. Army is proud to welcome Claude M. Bolton Jr. as the new Assistant Secretary of the Army for Acquisition, Logistics and Technology. His distinguished career has spanned the acquisition arena and allowed him the opportunity to gain vast experience with the Department of Defense (DOD) acquisition process and major systems acquisition. He is at the forefront in acquisition and logistics reform. He understands the delicate balance among cost, schedule, performance, and supportability. He recognizes the promise of technology as the enabler for the Army's future combat capabilities. He knows that warfighters depend heavily on the acquisition, logistics, and technology community.

Claude Bolton brings a warfighter's perspective to his job. A veteran of more than 30 years of Active military service, he recently retired as a Major General in the United States Air Force (USAF) following a highly decorated career.

A command pilot with more than 2,700 flying hours in more than 30 different aircraft, Mr. Bolton flew 232 missions over Vietnam—40 over North Vietnam. He became a test pilot for some of America's finest military aircraft: the F-4, the F-111, and the F-16. And, he knows all too well the dilemmas facing program managers and program executive officers because he's been there. Among his assignments were tours as the Program Executive Officer for Air Force fighter and bomber programs including the F-22, F-15, F-16, F-117, B-1, and B-2 programs. He served as the Program Director for the Advanced Cruise Missile System Program Office and as Deputy Program Director for the B-2 System Program Office. In addition, he served as the first Program Manager for the Advanced Tactical Fighter Technologies Program, which evolved into the F-22 System Program Office.

Mr. Bolton also knows the value of a well-trained, well-educated acquisition workforce. He served as Commandant of the Defense Systems Management College (DSMC) when then Secretary of Defense William J. Perry introduced DOD to a revolution in

acquisition reform. Secretary Perry's message to dramatically improve our efficiency so that *more* was spent on warfighters and modernization and *less* was spent on overhead was echoed in DSMC classrooms. Educating DOD's acquisition professionals took on a new importance and, during Mr. Bolton's tenure, DSMC was hailed as a center of excellence for program management education, training, and research.

As his last assignment on Active duty, Mr. Bolton commanded the Air Force Security Assistance Center at Headquarters, Air Force Materiel Command, Wright-Patterson Air Force Base in Ohio. There, he managed foreign military sales programs—complex and challenging international cooperative programs—that were valued at more than \$60 billion and supported more than 80 foreign countries. He understands the importance of a worldwide, technologically advanced, and competitive Defense industrial base. And, he understands that nations must work together for a more secure, more prosperous world.

Mr. Bolton received his USAF commission in 1969 through the University of Nebraska's Air Force ROTC Program, where he was a distinguished graduate. His education includes a bachelor's in electrical engineering from the University of Nebraska, Lincoln; a master's in management from Troy State University, Troy, Alabama; and a master's in national security and strategic studies from the Naval War College, Newport, Rhode Island.

Among his military honors are the Defense Distinguished Service Medal with Oak Leaf Cluster (OLC), the Legion of Merit, the Distinguished Flying Cross with OLC, the Meritorious Service Medal with 2 OLCs, the Air Medal with 16 OLCs, the Vietnam Service Medal with 3 Service Stars, the Republic of Vietnam Gallantry Cross, and the Republic of Vietnam Campaign Medal.

Mr. Bolton is married to the former Linda Roll of Alma, Nebraska. They have two adult daughters, Cynthia and Jennifer.

January-February 2002; PB 70-02-1

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COVER

Knowledge management, which connects people, information, and technology, is clearly a key initiative in supporting the warfighter.

INTRODUCTION TO ARMY KNOWLEDGE MANAGEMENT

LTG Peter M. Cuiello

“ . . . The dream behind the Web is of a common information space in which we communicate by sharing information. Its universality is essential: the fact that a hypertext link can point to anything, be it personal, local or global, be it draft or highly polished . . . [And] that once the state of our interactions was online, we could then use computers to help us analyze it, make sense of what we are doing, where we individually fit in, and how we can better work together.”

—Tim Berners-Lee
Inventor, World Wide Web, 1989

This early, prophetic vision is reflected in the Army transformation effort toward world-class, network-centric, knowledge-based capabilities. We may not be able to predict the future with knowledge management, but we can better anticipate the unexpected. The fluid, adaptive principles that form the underpinnings of knowledge management will provide the Army with a clear objective vision—a road map to the future.

We must streamline our processes, leverage information technology to our strategic advantage, and use best-business practices to gain maximum efficiencies. Above all, we must empower and enable our people by advancing the sharing of information through the development of new communication channels and supporting key innovation elements, for people are our most important strategic resource. This effi-

cient generation, organization, utilization, and sharing of information will provide the basis for support to the warfighter. Army knowledge management is the strategic transformer for the Internet-age Army. It will deliver improved information access and sharing, while providing infostructure capabilities across the Army so that warfighters and business stewards can act quickly and decisively. Army knowledge management connects people, knowledge, and technologies. It is this connection that leads to innovation and breakthrough thinking for the Army of the future.

In this issue of *Army AL&T* magazine, several contributors have presented excellent examples of initiatives, programs, and concepts that exploit knowledge management tools and principles. The Secretary and Chief of Staff of the Army expect your advocacy and full support as we collectively achieve the enterprise Army knowledge management goals in support of Army transformation.

LTG PETER M. CUIELLO is the Director of Information Systems for Command, Control, Communications, and Computers and the Army Chief Information Officer. He holds a B.A. in political science from Canisius College and a master's in business administration in operations research and systems analysis from the Florida Institute of Technology. LTG Cuiello's e-mail address is peter.cuiello@us.army.mil.

ARMY KNOWLEDGE MANAGEMENT: THE ARMY'S INFORMATION REVOLUTION

Miriam F. Browning

"The Revolution was effected before the war commenced. The Revolution was in the minds and hearts of the people . . . this radical change in the principles, opinions, sentiments, and affections of the people was the real American Revolution."

—John Adams, 1818

U.S. President, 1797-1801

Introduction

In the early 19th century, John Adams correctly assessed the will of the American people calling for change. While not as dramatic as the American Revolution, Army knowledge management (AKM), nevertheless, is a pioneering, strategic concept to transform the Army into a network-centric, knowledge-based force. AKM is the information revolution for the Army in the 21st century.

AKM has its conceptual roots in Army transformation, the global e-business model, and the imperatives of electronic government. The germinating seed for AKM has been Army Knowledge Online (AKO), the Army's enterprise portal and gateway for information access. During the past year, AKM has been a change catalyst not only for the Army's information technology (IT) world but also for the functional and major command (MACOM) communities that use the enabling power of IT. A summary of AKM follows.

A Dynamic Concept

AKM strategy is the center of the Army's information revolution. It is the enabler for mission operations, knowledge generation, information delivery, and technology innovation.

The AKM vision encompasses a transformed Army, with agile capabilities and adaptive processes, powered by world-class, network-centric access to knowledge systems and services, interoperable with the joint environment. It embraces Army and DOD imperatives for information dominance, and integrates technology, e-business, and knowledge management (KM) concepts.

The AKM framework, as shown in the graphic on Page 4, consists of three interrelated components: intellectual capital, infostructure, and change catalysts. Intellectual capital is the expertise, experience, and insights that reside in the workforce—military, civilian, and industry partners—coupled with new strategies for harnessing human capital. Infostructure is the hardware, software, and communications information technologies and associated architectures and facilities that ensure universal access, security, privacy, and reliability of Army and Defense networks. The change catalysts are the innovative policies, governance structures, and culture changes that create a network-centric environment and a knowledge-based workforce.

The AKM Strategic Plan, endorsed by both the Secretary of the Army and the Army Chief of Staff in August 2001, delineates five goals:

- Adopt governance and cultural changes to become a knowledge-based organization;
- Integrate KM concepts and best-business practices into Army processes to improve performance;
- Manage the infostructure as an enterprise to enhance capabilities and efficiencies;
- Scale AKO as the enterprise portal to provide universal, secure access for the entire Army; and
- Harness human capital for the knowledge organization.

As a strategic concept, AKM will continuously incorporate change. The AKM vision, framework, and strategic plan goals are constant guideposts, while the specific objectives associated with each goal will change as actions are completed and new initiatives are started.

Army Transformation Link

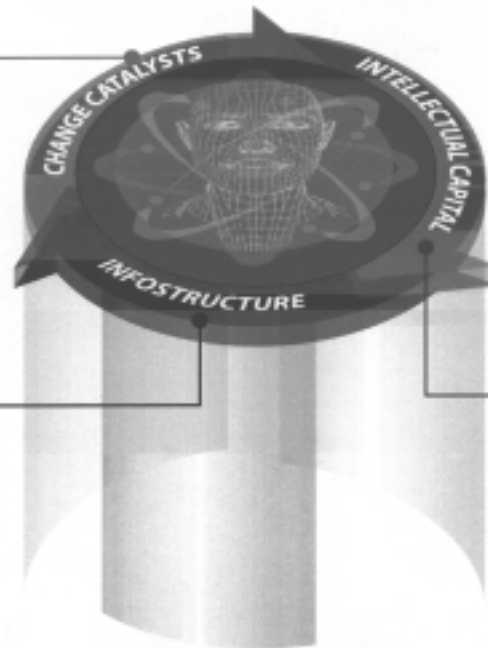
AKM is not your typical KM program. Its sweeping scope makes it a strategic transformer for managing information and IT at the enterprise level. Contrast this strategic focus with a traditional KM program that focuses on information sharing, the acknowledgment of tacit as well as explicit information, and processing.

Army Knowledge Management Framework

The Knowledge-Based Organization

The policies, resources, management, culture, processes, and education that are required to optimize an adaptive organization and enterprise network-centric environment

The information technology (computers, software, architecture, security, communications, programs, and facilities) required to support the network-centric Army



VISION

A transformed Army, with agile capabilities and adaptive processes, powered by world-class network-centric access to knowledge, systems, and services, interoperable with the joint environment

Individual, team, and enterprise knowledge, systems, services, and workforce strategies that are necessary to improve operations and decision-making

A classic definition of KM is the process of organizing, accessing, improving, sharing, and benchmarking explicit and tacit information for mission results.

In many organizations, communities of interest evolve to share information to get the job done better. For example, in the late 1990s, the Army established many of these grass-roots level communities such as medical; personnel; command, control, communications, and computers; and acquisition. They developed Web sites and used collaborative tools to access, organize, and share knowledge.

Communities of interest are incapable of surviving unless they are an integral part of the larger environment that sustains them. Thus, AKM was created as a strategic concept linked to Army transformation. AKM

goals and objectives are integrated into the Army Transformation Campaign Plan. In addition, functional areas and MACOMs have integrated AKM concepts into their own transformation plans. The link between AKM and Army transformation plans has brought energy and synchronized results across a broad spectrum of Army operations.

Participatory Governance

Two critical governance aspects of AKM are the chartering of the Army Chief Information Officer (CIO) Executive Board and the establishment of strategic partnering between the Army CIO and the Army's functional and MACOM communities. Both of these governance mechanisms require strong, committed participation from all stakeholders.

The Army CIO Executive Board, composed of the CIOs from the MACOMs and a Senior Executive Service (SES) or general officer from each HQDA staff agency, functions as a proactive decision body for all AKM matters. The board, chartered in April 2001, meets quarterly and is actively engaged in AKM policy, governance, and investment decisions through working-level groups and virtual communication channels. A separate, access-protected Web site has been established for executive board members and their action officers. Draft guidance and policies are coordinated through the Web site. Even though response times may be aggressive and, at times, the tasks difficult, the basic philosophy is one of inclusion and collaboration to get the job done well.

Strategic partnering is customer outreach between the Army CIO community and the Army functionals and MACOMs. Fundamental to the success of strategic partnering is the idea that the Army CIO, as lead AKM change agent, can be counted on to assist Army communities with information and IT initiatives—ensuring a link to AKM and providing advice and counsel on a wide range of related issues. Similarly, Army functional and MACOM communities can improve the CIO's effectiveness by including CIO community members and providing them with more in-depth knowledge of their areas.

The Army CIO has initiated a formal program called the Functional Exchange Officer (FEO) Program. The immediate purpose of the FEO Program is for the CIO, functional, and MACOM communities to work together to streamline and expedite the placement of applications on AKO by July 2002. The long-term benefits of the FEO Program are to enhance customer relations between the CIO community and the rest of the Army and ensure that Army transformation strategies are synchronized.

AKM Guidance Memo

The *AKM Guidance Memo* dated Aug. 8, 2001, signed by both the Secretary of the Army and the Army Chief of Staff, designates the Army CIO as the change leader across a broad spectrum of Army initiatives, many of which are outlined in the memo:

- A fundamental change in the IT world to the enterprise (versus MACOM or functional) management of systems, networks, and information access;
- The centralization of IT dollars for Army CIO oversight and prioritization;
- The designation of AKO as the Army's enterprise portal and gateway for information access; and

- The enterprise consolidation of the Army infostructure.

The memo includes the capturing of best-business and KM practices in the Army for collaborative use across the organization and the identification of innovative ideas and initiatives for reshaping to a knowledge-based workforce.

AKM set the bar high for change in the Army. The commitment of both the Secretary of the Army and the Army Chief of Staff to change rapidly translates into similar executive commitment throughout the Army. To effect change in their own organizations, MACOM and functional communities are using the concepts of the memo (i.e., consolidations, central management of investments, streamlining processes, and doing business on the Web).

AKM Accomplishments

AKM initiatives have resulted in many accomplishments to date. AKO, the Army's enterprise portal and gateway to information, has built enterprise capabilities for universal e-mail, robust search engines, personnel authentication, etc. Three initial pilots demonstrated the value of AKO: the Program Executive Office for Command, Control and Communications Systems Acquisition Knowledge Center; the Office of the Army Deputy Chief of Staff for Operations and Plans Smart Office Knowledge Center; and the Military Personnel Command Officer Knowledge Center. The first two pilots built collaborative communities of interest, and the last pilot re-engineered and streamlined military personnel processes for use on AKO. All three pilots demonstrated cost and cost-avoidance savings in areas such as reduced time spent on accessing and analyzing information, reduced travel dollars attributable to the use of online collaborative tools, reduced manpower requirements attributable to internal Web site consolidations, and a reduction in software licensing

costs attributable to applications sharing.

Other AKM results include the establishment of the Army CIO Executive Board; linking AKM to the Army Transformation Campaign Plan; the establishment of more than 35 AKM communities; the use of AKO for electronic personnel surveys; the establishment of the annual Army KM Symposium, jointly sponsored by the Army CIO and Center for Army Lessons Learned; the development of the Army Knowledge Leaders Program for outstanding scholar civilian interns; and the completion of the Army Science Board study on knowledge management technologies for the Objective Force.

Summary

Leading the Army's information revolution, Army knowledge management is the strategy to transform the Army into a network-centric, knowledge-based force. AKM as a strategic transformer will improve Army mission capabilities, enabling the Army vision for the cyber age. That vision is "*Soldiers on Point for the Nation . . . Persuasive in Peace, Invincible in War.*"

MIRIAM F. BROWNING is the Principal Director for Enterprise Integration, Office of the Army CIO, and provides a full range of strategic and operational senior executive leadership in the Army's information technology areas. She holds a B.A. in political science from The Ohio State University and an M.S. in information technology from The George Washington University. Browning's e-mail address is miriam.browning@us.army.mil.

BUILDING KNOWLEDGE ECOSYSTEMS FOR ENABLING ARMY TRANSFORMATION

Dr. Dana L. Ulery

“... Transformation encompasses every aspect of our Army. It is more than just an Interim Armored Vehicle, a beret, or Future Combat Systems. Every aspect of the Army—doctrine, organization, training, leadership, materiel and equipment, recruiting and advertising, acquisition, infrastructure, and much more—must all change together in a holistic manner.”

*—Thomas E. White
Secretary of the Army
Senate confirmation hearing
May 2001*

Introduction

Setting forth his major objectives at his confirmation hearing before the Senate Armed Services Committee, Secretary of the Army Thomas E. White emphasized the paramount importance of implementing the Army's transformation as a total system whose separate parts must work in concert to achieve the essential whole.

Knowledge management (KM) can play a critical role in meeting this goal. KM is the emerging discipline aimed at understanding and implementing complex distributed systems made up of people, technologies, policies, and processes so that the factors are interwoven to form a holistic solution. KM is about knowing, about putting information to

work. It's about sifting through a glut of data and finding the relevant, trusted, valuable information people need in dynamic, complex situations where devising options, let alone answers, is hard to do. It's about using information to formulate the right problem in the first place, a tremendous and often unrecognized challenge in itself. Knowing the state of business at various levels of the Army enterprise, or knowing the state of the force in an active battle situation, demands that relevant information about all kinds of things, people, and the connectedness among them be quickly and accurately found. The information and its context must be clearly presented in a way that enables people to synthesize it into appropriate action.

AMC KM Initiative

The Army Materiel Command (AMC) launched a major KM initiative in July 2000 to invest in a focused effort to build KM capabilities and solutions to meet AMC's immediate and future challenges. The Army Research Laboratory (ARL) was designated AMC Knowledge Management Executive Agent, tasked to provide leadership throughout the command from early research and concept formulation stages through solution implementation. Key

aspects of this initiative are the AMC KM Council, the ARL Rainbow Ecosystems Model, and alignment with Army knowledge management directions.

The vision for this initiative is an AMC Knowledge Enterprise characterized by three elements:

- *Efficiency.* Using knowledge to improve productivity, increase speed, and reduce cost—getting it right.
- *Innovation.* In new service processes, creating new knowledge and enhancing old knowledge.
- *Effectiveness.* Increasing application of high-quality, relevant knowledge.

To achieve the vision, we have established six strategic goals:

- Focus KM initiatives to achieve AMC business goals,
- Apply KM principals to develop a world-class KM improvement process,
- Apply the KM improvement process to implement a world-class knowledge enterprise model at AMC,
- Build active AMC knowledge communities of practice,
- Implement the KM improvement process and the knowledge enterprise model to build knowledge organizations throughout AMC, and
- Leverage the KM improvement process for AMC executive agents to use for other focus areas.

The AMC KM Council, a knowledge community of practice with representatives from all AMC subordinate commands and HQ AMC, is a critical part of this initiative. The KM Council is an active “network of champions,” linked to command chief information officers (CIOs) and functionals, which meets regularly to build KM awareness, share experience and tools, and develop tactics for implementing strategic goals within their own sphere of influence. The council has a controlled-access Web site that allows members and AMC CIOs to interact through online

discussions and share documents, briefings, lessons learned, and proven KM tools.

Rainbow Ecosystems Model

ARL is considering KM complexities from a systems perspective, focusing on the whole as part of its larger environment and examining the interdependencies of the parts, rather than taking the whole and analyzing each part separately. Exciting new research approaches, from artificial intelligence to small-world phenomenon to immune systems theory research, are being used to analyze the dynamics of complex, decentralized systems' behavior. ARL and other organizations find that conventional approaches to design and build static structures like bridges and buildings are ineffective when applied to dynamic and complex KM problems. ARL is, therefore, conceptually drawing from these newer, bolder approaches; exploring the analogies; and seeking ways to adapt these findings to build robust KM systems. We are considering a range of emerging technologies. These include social technologies that address organizational attitudes, values, and behavior, as well as information technologies that address automated networking, applications, and data.

The ARL Rainbow Ecosystems Model is a knowledge-based systems architecture that includes an integrated automated system of intelligent portals, military business transaction applications, knowledge discovery tools, and a foundational enterprise knowledge warehouse. This architectural model is viewed as a living system for meeting the dynamic computing, people, and process needs of KM. The model also forms the basis for both horizontal (supplier-customer) and vertical (superior-subordinate) relationships.

The conceptual inspiration for the Rainbow Ecosystems Model is a biological, social whole whose parts work together and adapt to change in

a way that makes the system robust. ARL calls it an ecosystem model because it is being used to learn about the behavior of knowledge in the context of its environment, the culture in which the knowledge exists and is used. The Rainbow Model does not assume that we know what we are trying to build ahead of time or what information we will be looking for later because our experience has revealed that most often the system and the needs become intertwined. Starting with some perceived needs, a system is built which, when demonstrated, typically opens up new ideas and new ways to handle the initial problem. This in turn changes the perceived needs. A good example of this phenomenon is the way perceived needs of consumers change as they became familiar with buying goods over the Internet.

The Rainbow architecture encourages an iterative design process with frequent interaction between problem formulators and problem solvers. This perspective is especially valuable when the solution involves a system using commercial-off-the-shelf components that embody practices that are new to the enterprise. For these new practices to be effective, new ways of thinking about the way knowledge is applied to human work must be internalized and cemented through policy. The Rainbow Model can help people learn, through iteration, how to adapt new work processes as part of a total business system.

The ARL Knowledge Management System (AKMS) implements the Rainbow Ecosystems Model to provide a foundation for business innovation and knowledge sharing throughout ARL. AKMS is an ecosystem of software that adapts and changes to the composition of its clients and the changing technological landscape. ARL has an equally important second KM system, the Knowledge Management Research System (KMRS), which is a distorted mirror of the AKMS. KMRS is a sys-

tem where innovative ideas and software are researched and tested. Those that prove successful are nurtured until they have evolved to a level of maturity where they can be migrated from KMRS to AKMS for regular use by the ARL community.

Conclusion

Knowledge management promotes the importance of focusing on knowledge as the sum of what the enterprise has learned, and applying that knowledge to the right solution to achieve success for the enterprise as a whole. The challenge of this new discipline is that it requires a profound paradigm shift, from thinking about problems analytically to thinking about problems holistically. The ARL Rainbow Ecosystems Model, which is at the center of the AMC KM initiative, is helping us meet that challenge. It is designed to help AMC design system solutions to context-specific complex problems. The AMC KM Council is a vital dimension of the Rainbow architecture. KM Council members influence and contribute to the evolution of the Rainbow system and have a high stake in its success. Our journey is demonstrating that knowledge is enhanced when it is shared, and that innovative use of knowledge requires holistic, innovative thinking together with disciplined hard work.

DR. DANA L. ULERY is Chief of the Knowledge Management Center, Army Research Laboratory, and Chair of the AMC KM Council. She holds a B.A. in both mathematics and English literature from Grinnell College and M.S. and Ph.D. degrees in computer science from the University of Delaware. Dr. Ulery's e-mail address is dana.ulery@us.army.mil.

LIFE-CYCLE PLANNING FOR KNOWLEDGE MANAGEMENT

Dr. Moonja P. Kim and Wayne Schmidt

Introduction

Life-cycle planning is essential for the implementation of knowledge management (KM) efforts. Many KM efforts start with an information technology solution in mind and proceed with the concept, "If we build it, they will come." This approach fails to consider the user community's tendency to avoid change unless there is a clear and driving rationale. However, careful life-cycle planning, with full consideration of all the important components of KM, will significantly enhance the chance of success. The following five factors are cited in most literature as important components of KM efforts: leadership, culture, business process, performance measurement, and information technology.

KM experts contend that if more than 25 percent of any effort involves information technology, it cannot be considered as a KM effort. The other components will typically consume a majority of the resources in a successful KM effort.

This article describes lessons learned from a case where a knowledge management system (KMS) was developed and implemented, with a significant level of effort focused on changing the culture and business processes. This change required a large amount of time and resources to convince people to accept the system as a useful tool and to use it to the maximum extent.

P3L KMS

The P3L (People, Product, Publication Locator) KMS—also called TIPS (Technology Information Products and Services)—was developed to help research and development laboratory customers locate information regarding expert scientists and to search products and publications produced at the Construction Engineering Research Laboratory (CERL), U.S. Army Engineer Research and Development Center (ERDC), Champaign, IL. The P3L provides an excellent way to help customers find solutions to problems. It also suggests names of experts for additional advice and consultation. For example, a customer can ask about drinking water problems at Camp Zama and receive the names of experts with potential answers to this question, as well as what publications are available regarding this issue.

The P3L also encourages researchers to share knowledge on product development and publications and serves as a common point of publication storage, thus enhancing a researcher's ability to find relevant literature. The P3L supports researchers by simplifying business processes, implementing standard corporate Web pages for various research topics, eliminating redundant data calls, and increasing accuracy of current data. The system allows researchers to update their own data and supervisors to approve changes for researchers

they supervise. This capability is password-protected.

Background

The initial system was developed to enhance communication between researchers and customers as well as among researchers involved in environmental conservation activities and publications. Subsequently, program managers in other business areas recognized the value and benefit of P3L and requested it be expanded to include all CERL business areas. As the system was modified to include other business areas, the implementation plan was developed, including training and a business process change.

In February 2000, an initial training session was conducted for 15 supervisors who would review and approve resumes, products, and publications. Training sessions continued until March 2001 to teach 200 researchers how to enter their resumes, products, and publications into the P3L. Currently, all researchers and supervisors are trained, and their data are entered into the system. It took more than a year of encouragement by supervisors to have all researchers committed to entering and updating their data.

Change Of Business Process

A change of business process for publishing internal technical reports that are generated by research projects helped encourage the entry of new publications. Today, the only way for a researcher to get approval of a publication is through use of the P3L. Thus, all new publications are captured into the system, and the electronic file of the report is saved under the appropriate business area and the author's name. This is an improvement over the old manual process where a memo for approval or a report document was sometimes lost, thus delaying the publication and causing researcher frustration.

Leadership Commitment

Top management support and commitment was essential to the system's success. From system implementation, CERL's Director was a strong proponent and allocated enough funding to conduct training and system enhancement. This ensured that the system worked reliably and provided

users with help-desk type support. Without top management's commitment, funding becomes a difficult issue. Without funding, a system cannot be maintained with the appropriate level of help-desk support.

Knowledge-Sharing Culture

Today, organizations often hire smart people and then overload them with tasks, leaving them no time for conversation and little time for thought. Knowledge is transferred in organizations regardless of whether the process is managed. When one computer programmer asks another if he/she has encountered and solved a particular problem, the second programmer will share that knowledge. These natural knowledge transfers are part of organizational life. However, they are fragmentary. The larger and more complex an organization, the greater the chance that the knowledge needed exists somewhere in the organization, but it may be difficult to find. Spontaneous, unstructured knowledge sharing is critical to an organization's success.

Outdated industrial-age theories of the nature of work influenced management to assume that water-cooler socializing is a waste of time. However, most water-cooler conversation is work-related, even though some of the talk is about sports and the weather. People talk about current projects, they bounce ideas off one another, and they can get good advice on how to solve problems. Their conversations are work. In his article "What's So New About the New Economy?" in *Harvard Business Review* (January-February 1993), Alan Webber said that in the new economy, conversations are the most important form of work. He said, "Conversations are the way knowledge workers discover what they know, share it with their colleagues, and in the process create new knowledge for the organization."

A benchmark 1999 study on "Creating Knowledge Sharing Culture" by the American Productivity and Quality Center noted that in "best-practice" organizations, knowledge sharing is tightly linked to a core cultural value of the organization. In addition, the style of the knowledge-sharing approach closely matches the style of the organization as a whole. There is strong man-

agement and peer pressure for people to help each other and collaborate.

CERL's culture encourages teaming and knowledge sharing across branches and divisions. It is common to see water-cooler conversations where people talk about their projects. Because of this, the sharing of knowledge by using the P3L system was easily accepted. The resistance of researchers to enter their resumes and publications into the P3L was not due to an unwillingness to share, it was due to issues such as "what's in it for me," and "I don't want to waste my time." However, when new customers requested help from researchers via the P3L, the researchers were delighted to hear from those customers, and most researchers changed their attitude.

Performance Metrics Needed

Although the benefits of the system are obvious, quantitative data have not been collected. Hard data on the number of successful customer uses, failed customer attempts, expert points of contact obtained, and researchers who found another researcher's product or publication helpful would assist in documenting the system's benefits. When there is concrete data showing the system's benefits, it is much easier to persuade other ERDC laboratories to implement the system. The authors hope that some efforts will be made in collecting persuasive hard data in the near future.

Information Technology Factor

From its initial concept, the P3L system was developed as a Web application. Further, the P3L was to be maintained by the researchers directly, not by a webmaster. Thus, Macromedia ColdFusion server technology was selected as the implementation tool because it allows the system to be database-driven. Updates are accomplished by completing "fill-in-the-blank" forms, and updating the database immediately changes the system.

Recommendations

From this experience, we developed a checklist to follow for life-cycle planning of any KMS. The checklist covers the project from concept and design to implementation and maintenance, considering important KM factors such as business process changes

and cultural transition that an organization will face with a new KMS. The proposed checklist follows:

- Plan for life-cycle management of any KMS because it is critical.
- Obtain top management commitment. It is the most critical factor for successful system implementation and use.
- Allocate appropriate funding for implementation, publicity, user training, and system support. Nothing frustrates users more than a system with bugs that are not fixed in a timely manner.
- Demonstrate to users that the proposed KMS has advantages for them and makes their job easier.
- Train users how to effectively enter appropriate data. Some will want to know only the basics, while others will want a complete explanation. Consider different classes for different types of users. Valid data are essential and ensure that the system will be useful to customers, managers, and researchers.
- Link knowledge sharing to a core cultural value of the organization and match the style of the knowledge-sharing approach to style of the organization as a whole.

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ARMY MEDICAL DEPARTMENT KNOWLEDGE MANAGEMENT

COL Robin J. Tefft

Introduction

The delivery of health care is increasingly complex, with emphasis on quality, availability, and accountability in an environment of fiscal constraint and expanding missions. The ability to capture, share, and reuse knowledge is one way to improve the efficiency and speed of decisionmaking in health care delivery. Clearly, harnessing health care knowledge is a strategic imperative that has the potential to maximize scarce resources and improve the quality of care.

Background

The Army Medical Department (AMEDD) has applied knowledge management (KM) principles since 1997 when the Center for Healthcare Education and Studies (CHES) at the Army Medical Department Center and School launched the first-generation Web-based KM initiative, the Knowledge Management Network (KMN). The KMN was a comprehensive project that incorporated the fundamental features of KM: a collaboration tool, a library, a process for certifying knowledge, and a database of subject matter experts (SMEs). In 2000, the CHES evolved into the next-generation KM initiative, the AMEDD Knowledge Exchange (KE), which harvested the best of the KMN and focused on AMEDD strategic initiatives. With this redesign came the understanding that KM is not an information management or information technology (IT) tool, but a strategic imperative in its own right.

AMEDD KM Vision

Knowledge management was initially driven by technology, but it became apparent that organizational culture and processes were the true focus. Consequently, the CHES proposes the following vision for AMEDD knowledge management: "The AMEDD of the future leverages knowledge as a

strategic resource through integrated knowledge management systems and a culture that embraces knowledge sharing." This vision addresses the nexus of people, process, and technology, the triad of enabling factors that drive an organization. Using KM to integrate and improve health care delivery processes will yield greater efficiency and quality, but only if the organizational culture is ready to contribute collaboratively. Change management must be integrated into the transition to a collaborative environment.

KM must be corporately driven and collectively embraced to succeed. The CHES proposes an enterprise-level, integrated approach by forming the AMEDD Knowledge Management Steering Committee, comprised of a cross section of AMEDD personnel, to determine the strategic priorities that can be enhanced by KM. A charter has been proposed for this committee to develop policy, establish priorities for KM investment, monitor resources, measure progress, and serve as a liaison to other KM entities internal and external to AMEDD.

The following imperatives are proposed for consideration of a corporate KM strategy:

- Transform AMEDD culture so that the identification, collection, storage, dissemination, and use of knowledge is a strategic priority and a universally shared value.
- Create the AMEDD Virtual Library that includes the universe of AMEDD content (traditional libraries, content providers, and the AMEDD Digital Library).
- Create the AMEDD Digital Library as a central repository for AMEDD knowledge products.
- Create an AMEDD taxonomy and a search-and-retrieval capability for all knowledge.

- Develop policy for standard system architecture to support e-business.
- Provide the capability for communities to create and share knowledge.
- Integrate health care information systems.
- Develop a single-user interface for KM.
- Provide multiple venues for knowledge sharing, such as local area networks, wireless devices, intranet, and Internet.
- Capture and share individual tacit knowledge.

AMEDD KM Renaissance

The next generation of KM recognizes the importance of focusing on the business of health care and the people who deliver and support it. The CHES knowledge services staff supports the AMEDD's strategic priorities using a three-tiered approach.

The fundamental tier is a self-service Web site (<http://ke.army.mil>) that provides AMEDD content. The second tier is the development and support of communities of practice (COPs). The third tier is customized Web-based programming to support AMEDD strategic initiatives. This three-tiered approach is adapted from *Three Approaches to Infrastructure*, a model developed by the American Productivity and Quality Center (APQC) (see <http://www.apqc.org>), a partner in developing KM for AMEDD. In addition to reformulating a conceptual framework for KM, the CHES redesigned the IT framework to improve efficiency, enhance flexibility, and save money.

AMEDD KE IT Infrastructure

The first-generation KM project was outsourced in its entirety and consisted of commercial products integrated into the Web site. Although this provided a high level of customization, it came at a price, both from the flexibility and fiscal viewpoints. The CHES concluded that

KM IT should be a core competency of the knowledge services staff. In the next-generation KM, staff and contract employees are integral to developing, deploying, and maintaining the Web site.

The system architecture is designed to provide continuous use with minimal downtime. This is accomplished using redundant servers in a secure server farm located at the Army Medical Department Center and School. The long-term goal is to house redundant servers in remote locations to minimize the impact of local network problems.

The backbone of the KE is a database. All data are stored as objects in a database, providing the capability to search and retrieve all data on the site. The data are delivered to the Web using PHP (hypertext preprocessor) programming.

Collaboration tools are custom-designed in hypertext markup language. The programming strategy is to provide basic tools needed by the user in applications and languages that are currently available in the AMEDD architecture. The programmers use applications that are available to most AMEDD users and avoid requiring users to download additional applications.

Self-Service

The self-service aspect is a new feature of AMEDD KE. The first-generation Web site was entirely password-protected and provided AMEDD users very little content. The requirement of a password to access information that did not need protection was the most prominent negative comment from users. The redesigned Web site provides unrestricted access to appropriate AMEDD knowledge, thereby facilitating knowledge sharing.

SMEs provide content using a custom templating process. Programmers meet with the SMEs to discuss their business process and create a template for the SMEs to enter information directly to the Web site. Often, the business process is streamlined as a result of these discussions. This creates a win-win situation: SMEs are empowered to publish information without requiring a webmaster, and AMEDD benefits by receiving information directly from the source quickly and accurately. The knowledge services staff maintains quality by granting access only to

authorized SMEs responsible for that particular subject.

Communities Of Practice

Knowledge sharing through collaboration is a hallmark of AMEDD KM. First-generation KM supported several successful COPs that were migrated to the new AMEDD Knowledge Exchange. Success stories from communities include reducing cycle time for curriculum development from 4 years to 3 months, improving patient care by sharing clinical practices, and providing justification for a single standard of education for accreditation of a graduate program. Two new COPs are being planned. The CHES is partnering with APQC to form a COP among deputy commanders for administration in AMEDD medical treatment facilities. The goal is to share best practices and solve common problems.

Another initiative is conceptual planning for the Warrior Knowledge Base. This COP effort is designed to allow both company-level units and soldiers training at combat training centers to develop an expert database. Ultimately, it will be transferred to soldiers stationed at fixed facilities.

Strategic Projects

The knowledge services staff supports AMEDD strategic projects by providing custom programming and assisting with process improvements. One of the goals of the Surgeon General's Reengineering and Quality Initiatives Working Group was to develop a process for sharing best practices across the AMEDD. The staff designed a custom application that allows best-practice entries to be submitted, reviewed and, if appropriate, posted for all to see. Another example is the development of a database-driven solution for personnel reporting in a medical battalion, which significantly reduced personnel time required to provide reports.

AMEDD Libraries

The ability to access AMEDD information easily and efficiently is a fundamental KM capability. The essential elements are the AMEDD Virtual Library, the AMEDD Digital Library, a taxonomy, and a search engine.

The AMEDD Virtual Library is the entirety of available knowledge products. This includes information from

traditional libraries, holdings that are purchased from content providers, and the contents of the AMEDD Digital Library.

AMEDD currently has no centralized system for archiving its unique knowledge products. The CHES is developing a pilot project for the AMEDD Digital Library in partnership with the Army Medical Research and Materiel Command (MRMC), AMEDD librarians, and functional experts. This library will be a central repository of knowledge products produced by the AMEDD, such as policies, briefings, information papers, and guidelines, and any products that are of corporate interest.

The development of an AMEDD-unique taxonomy is critical for search-and-retrieval capability. A taxonomy is a system of classification that groups content by subject headings, enabling more precise search and retrieval than a key-word search. The CHES, in partnership with MRMC, is researching the software and the process to develop a corporate taxonomy. Research on a search capability is targeted as a future initiative.

Conclusion

The goal of the Army Medical Department's KM effort is to allow sharing and reuse of AMEDD knowledge to improve health care. Realization of this goal is dependent on an enterprise approach to KM by formulating a clear vision and governance structure and determining priorities. It is imperative to develop an IT infrastructure, virtual repositories of AMEDD knowledge with robust search capability, and a culture that embraces knowledge sharing.

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THE C's OF KNOWLEDGE MANAGEMENT

Peter Johnson

Introduction

To change and find “the new cheese,” an organization has to first know itself, its people, and its unique culture. Time has aptly demonstrated that automation tools such as personal computers and e-mail do not create a paperless office, much less a useful base of knowledge. The Program Executive Office for Standard Army Management Information Systems (PEO, STAMIS) has tackled these problems by establishing Adapa. Named after the Babylonian god of knowledge and based on a foundation of modern state-of-the-art Oracle9iAS portal and database technology, Adapa is the result of PEO, STAMIS forming an elite and efficient government/contractor team to revolutionize its internal operations. This will be achieved by providing a completely Web-based ready access to data, building a variety of portal-based applications to support internal operations, and implementing various automated workflows of business processes.

As founding principles for Adapa, PEO, STAMIS developed the “C’s” of Knowledge Management as high-level guidelines. These portal system design, implementation, and management guidelines must be considered prior to a portal implementation. The remainder of this article provides a discussion of each of these guidelines.

C: Drive

Data on an individual’s C: drive is the enemy of knowledge management. Individual data retention denies the organization specific data and gives that person a power base of unique knowledge. No organization can function year after year with data kept on personal and individual computers. Eliminating data on the C: drive must be an initial and primary component of knowledge management. Similarly, server drives do not provide the structure for sharing because files can be named by anyone and placed anywhere on the server. To facilitate open sharing of data, a directory and structure must be pre-established. This allows a library-type system where data can be readily stored, accessed, and searched. A powerful search feature assists users to find contents.

Content

Content is king. A knowledge management system that has minimal content is worthless. A set of rich organizational content is essential. Management of the content requires it to be relevant to each community of users. To facilitate this, activities within the organization must be responsible for their own content. This also eliminates the need for a single webmaster to post all data, which is often a bottleneck. Portal technology that allows authorized

people to post data and content rapidly facilitates growth of the system.

Commitment

A knowledge management system is an investment. It is much richer than an organizational Web page, which can be relatively static. Organizationally, a knowledge management system requires a team of dedicated technical and process-skilled individuals to manage and continuously extend the portal. All levels of an organization must be committed to the portal because the investment will continue year after year.

Culture

A portal inherently changes how people do their everyday work. To some, this can be seen as an intrusion. Certainly, direct policy on portal use assists in the migration to the portal, as would technological changes like closing server files down. An easier benefit is to effect culture change slowly and make everyone an owner of the system. This can be done by placing value-added features on the portal, such as links to local traffic reports (a must when working in the Washington, DC, metropolitan area), or reprioritizing portal development when a certain user group desires a unique feature.

*An organization's capital investment
is in its people;
in turn, intellectual capital
is the lifeblood of an organization.
Information sharing
in a secure environment
ensures that everyone has access
to the work products
and subject matter expertise
that an organization controls.*

Conspiracy

Care must be taken to avoid the "Big Brother" syndrome. Unconstrained and unmanaged, a knowledge management system can become threatening. Workers in the organization need to see the portal as a tool and not as a replacement for their work or as a way to micromanage them. The portal is a tool for individuals to show their value to the organization. Authorship and individual contribution can be highlighted and recognized in a portal.

Capital

An organization's capital investment is in its people; in turn, intellectual capital is the lifeblood of an organization. Information sharing in a secure environment ensures that everyone has access to the work products and subject matter expertise that an organization controls.

Certainty

No one wants to pick up today's newspaper expecting current headlines and then realize they are reading news that is 4 months old. Even

worse is if the person expecting current news does not recognize that the news is outdated and uses that information as if it were current. The same principle applies to a knowledge management system. Maintaining absolute accuracy of data in the system is of paramount importance. Date tags, time-limited data, and purposely expiring data are technical methods to establish timely data. Portal technology now allows the portal itself to be the workspace, rather than just a place to post data or documents developed elsewhere. This method ensures that key data are always timely because there is only one place for the work to be done.

Commonality

Technology options today are vast; there are dozens of standards, hundreds of vendors, thousands of products, and millions of separate permutations of this landscape. Accompanying this is the ever-changing nature of the products, with version changes, patches, etc. If many different products are assembled into a functioning knowledge

management system, one future product change may interfere with the smooth operation of a portal if the change is not backward-compatible with other components. If a vendor goes out of business, the future of the system can also be jeopardized. The portal development staff must be focused on extending portal functionality. While technology will change, the technical staff shouldn't constantly be chasing integration issues as products change. If upfront care is exercised to minimize technology components, integration issues will be kept to a minimum.

Summary

Adapa is much more than a simple Web site of documents and links. It provides powerful applications that reside on a database that archives acquisition knowledge and technical information. Expansion is key to the system as new content and functionality is added every week. By implementing a highly secure roles-based environment, Adapa also provides secure access for PEO, STAMIS personnel anywhere in the world. The PEO, STAMIS' Adapa will grow from a place where people go to see their work, to a place where people go to do their work. Adapa seeks to capture that which is individually intangible, but collectively invaluable.

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TRANSFORMING THE ARMY BY MANAGING KNOWLEDGE

Jodi Santamaria and Emerson Keslar

Introduction

Knowledge management is playing a prominent role in the Army's transformation. This was best expressed in a memorandum signed by both the Secretary of the Army and the Army Chief of Staff in August 2001. In the memo, they stated, "Army Knowledge Management (AKM) is the Army strategy to transform itself into a network-centric, knowledge-based force." Prior to this memo, the Program Executive Office for Command, Control and Communications Systems (PEO, C3S) experimented with knowledge management methods and successfully applied them in its workplace.

This effort started in 1997 with a request from LTG Paul J. Kern, then Military Deputy to the Assistant Secretary of the Army for Acquisition, Logistics and Technology (now with his fourth star and Commanding General, Army Materiel Command), and LTG William H. Campbell, then Director of Information Systems for Command, Control, Communications, and Computers (DISC4) (now retired). A PEO, C3S pilot program was chartered to demonstrate the positive outcome that could result when knowledge management techniques and principles are used within an organization and to provide a process for institutionalizing these concepts across the Army

acquisition community. In addition, the pilot program's team members were required to provide the PEO, C3S organization (including its headquarters, project manager suborganizations, Defense contractors, and supporting agencies) automated tools and business processes; a collaborative environment; and access to information required to plan, implement, and execute their critical missions despite their decentralized locations.

While the tactical Army digitized the Army's battlefield, the institutional arm of PEO, C3S embraced the opportunity to act likewise. As a result, the secure intranet/extranet PEO, C3S Knowledge Center was created to share information and collaborate on areas such as program planning, scheduling, budgeting, congressional briefings, maintaining configuration management, resolving interoperability issues among products, and developing new training and logistics strategies.

Since its inception, the knowledge center has met both of its chartered objectives and has extended beyond the borders of PEO, C3S as a consortium of functional business partners. Following a briefing to Army leaders and Office of the Secretary of Defense sponsors in spring 2001, the knowledge center team was asked to add members and initiate

another pilot program. This time, the plan was to establish the acquisition portal on Army Knowledge Online (AKO) in concert with AKM goals. The intent was to integrate the functional tools that a PEO community needs into an enterprise portal everyone will use.

Creative Imperatives

"Adapt or perish!" This timeless and prophetic phrase by Charles Darwin encourages us to remain relevant despite the constancy of change. This is a true challenge as the speed of technical advances rapidly increases and the slope of the curve describing Moore's Law grows steeper. (Moore's law is a prediction by Dr. Gordon E. Moore, Chairman Emeritus of Intel Corp., that the number of transistors per integrated circuit would double every 18 months.) Creative imperatives have always driven us to adjust to survive and, in this respect, times have not changed.

During the 1990s, the Army experienced significant workforce downsizing while the number of missions and responsibilities for Active duty soldiers increased. Knowledge management was seen as an enabler to transform the institutional Army into an information-age, networked organization that can leverage its intellectual capital to better organize,

train, and equip a strategic land-combat force. While the Army continues to transform, its personnel will need to undergo yet another cultural change to succeed in the newly created environment.

The collaborative tools used by industry are repackaged for use by project management offices (PMOs) while they develop acquisition requirement packages, conduct source selections, and communicate with their industry partners. Processes remain true to the regulations to ensure “repeatability,” while the technical solutions are flexible enough to meet the needs and style of individual teams. Technologies that assist the self-aware and adaptive leaders in the field are now available in the business offices that support them. This permits us to “eat our own dog food,” or better understand our users, and take advantage of technology insertion when possible. Formation of the acquisition portal and further integration with AKO presents this possibility.

Evolution Or Revolution?

When presenting a fair depiction of the situation, we must describe the barriers that were conquered as the knowledge center was developed and implemented—those ever-present cultural issues. Although it sounds sophomoric, people must learn to share. Any natural inclination not to disclose information was stamped out by staunch general-officer level leadership support, reinforced over a 3-year period. Slowly, the organization moved up the curve depicting the IBM Consulting Model. The IBM model is a KM model proposed by IBM’s Consulting Group that describes eight different KM stages (including the critical enablers at each stage) that organizations must go through while transitioning from beginners to a knowledge enterprise.

Throughout the years, we have tried a number of incentive programs to reward and recognize our contributors. We feature their success stories and photos on our site and present awards whenever possible. Further, in September 2001, an even stronger motivator was established to ensure participation. In particular, the Program Executive Officer, C3S directed each of the PMOs to establish knowledge managers, responsible for managing useful, relevant, and current content. Simultaneously, he approved the ultimate incentive—knowledge contributions that affect individual performance appraisals. This novel concept will be enacted during the next rating cycle.

Charting The Knowledge Map

The first step is typically the hardest, but in this case, it was the second step. The challenge after quickly gaining the program executive officer’s support was identifying, collecting, and organizing the information to be preserved. “Less” may not seem like “more.” But by early focus on what sets the organization apart, we can harness the knowledge essential to survival in the future. This may seem straightforward, but it is anything but simple. And it is powerful advice, so take it. Years of gathering information left us with the daunting task of constantly maintaining and arranging it in a user-friendly, searchable format. We have adopted the AKO’s search tool for uniformity within the Army enterprise. Our taxonomy has centered on the acquisition process and our programs. Still, there is work to be done. Focus energies on our core mission upfront, collect related knowledge, and learn from our predecessors to take courage and forego what is less important.

Where We Go From Here

Our immediate plans are to integrate with our PEO counterparts and the Army Research, Development and Acquisition Information Systems Activity to complete the acquisition portal within the AKO. This will avail our users of personalization and AKO Web mail in addition to the acquisition offerings. We are further enabling communities of practice through collaborative automation tools and e-learning on a local level. And, through an improved relationship with human resources personnel, we are identifying the assets that will be lost through retirement. This will allow us, via video archives, to capture the “tacit” knowledge embedded in their experience before they depart. Overall, we strive to impart knowledge that provides consequence and ensures successful missions with other members of the Army’s knowledge enterprise. For more information, contact Emerson Keslar at emerson-keslar@us.army.mil or Jodi Santamaria at Jodi.Santamaria2@us.army.mil.

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Introduction

Information assurance (IA) and logistics operations permeate all areas of the Army transformation. IA is critical to distribution-based logistics operations because timelines and pipelines for delivery of logistics packages are increasingly constrained by environmental factors that are rarely under direct Army control. Short timelines are critical to the success of OCONUS military operations, but they clearly challenge operational planners more than ever. The convergence of emerging logistics and information technologies, in-transit visibility systems, new players, and advanced delivery capabilities reflect more complexity than Army logisticians have previously encountered.

The U.S. Army Criminal Investigation Command (CID) is responsible for enforcing three critical factors involved in distribution-based logistics operations: IA, fraud deterrence, and logistics security (LOGSEC). The CID provides law enforcement and criminal investigative support for information assurance and pre- and in-transit delivery of logistics packages, including preconfigured loads. In fact, LOGSEC is a strategic mission for the CID. The command considers it a key force protection capability that it can uniquely offer to the Army.

Although responsible for only three of the factors that add to the complexity of modern logistics operations, the CID is modeling its role and interfaces into the entire LOGSEC knowledge-management process, understanding that criminal investigative support is critical to logistics operations throughout the logistics process. This article examines some initial intersections of the CID's roles and research in IA, knowledge management, and logistics security.

DISTRIBUTION-BASED LOGISTICS OPERATIONS

LTC Carl W. Hunt

Because of the complexity of the logistics system and its information support systems, and the countless threats to these systems, a new approach by criminal investigators is required. The CID is conducting preliminary research into new areas of modeling and simulation, known as agent-based modeling. This research involves studying the intersections of critical nodes and their linkages to produce insights for those responsible for the direction of logistics and IA operations.

Initially directed at the criminal investigation domain, the CID has initiated research into knowledge-management support for advanced network intrusion defense and forensics capabilities for IA. Supported by the Office of the Deputy Under Secretary of Defense for Advanced Systems and Concepts, the CID and the Krasnow Institute for Advanced Studies at George Mason University (GMU) are working jointly to model roles and actions of important players in the IA world.

Findings from this joint research will support logistics operations in at least two important ways. First, any improvement in IA will directly benefit LOGSEC and strengthen the role of the CID in supporting in-transit security of logistics packages. Second, in keeping with the extensibility of new agent-based modeling tools, insights gained from understanding networks of communication nodes will likely have significant application in logistics preparation and distribution. Research will be peripher-

ally directed at the convergence of IA and LOGSEC, both in support of the CID's role in IA and LOGSEC as well as all logistics operations for the Army.

Agent-Based Modeling

Agent-Based Modeling (ABM) is an emerging modeling technology for enhancing inference about complex problems. ABM complements deduction and induction as a method of testing what American philosopher Charles S. Peirce called abductions (creative reasoning in uncertainty for which we have little or no probabilistic support). Abductive reasoning enhances the processes of discovery and incorporating theories and explanations about relationships for which we initially have only scant proof.

This new modeling technique encourages visualization of complex relationships and agent interaction. Agents are software manifestations of objects (animate or inanimate) used to represent the components of a problem domain. These agents are typically imbued with constraints (rules) to govern their behavior in an environment, and characteristics that may include movement, self-awareness, and processing capabilities such as learning and memory. Agents typically act on our behalf or sometimes on the behalf of themselves or others.

Using agent-based modeling, analysts and investigators can develop novel strategies for protecting and delivering both information-rich logistics support and the more conventional physical objects such as "beans and bullets." ABM supports transportation planning and operational deployment as well because complex scheduling problems lend themselves nicely to an agent-based modeling environment. (See agent-based modeling resources at <http://www.cna.org/isaac/> for

more background on these important new modeling techniques.)

Generally, ABM is an excellent starting point to uncover meaningful and often nonlinear relationships among diverse objects in circumstances where planners are not certain where to begin their planning and development efforts. While not explicitly incorporated into the Army acquisition and logistics community's modeling and broad-reaching simulation effort called Simulation and Modeling for Acquisition, Requirements and Training (SMART), ABM clearly has a role in both strategic and tactical applications of logistics operations.

Roles And Research

The CID applies distinct efforts toward protecting and enforcing Army information assurance and logistics operations. Two essential CID units in these efforts are components of the 701st Military Police (MP) Group headquartered at Fort Belvoir, VA. The Computer Crime Investigative Unit (CCIU) is the Army's leading IA enforcement agency and is responsible for investigating felony intrusions of all Army information technology assets. The Major Procurement Fraud Unit, also a 701st MP Group asset, currently investigates criminal activity associated with the production and delivery of Army materials from manufacturer to points of embarkation. Garrison and deployed CID elements take up LOGSEC responsibilities from the points of embarkation through theater delivery of logistics. Likewise, local and regional CID computer crime coordinators support the CID and CCIU in the IA arena.

The CID began its ABM research with the introduction of the Agent Based Evidence Marshaling (ABEM) model. This model visually reflects the results of interactions among all agents to which a complex crime is only partially visible. Through these interactions, relevant agents build

time-space vectors of their existence from the time they were first involved in the crime (either as witnesses or supporting objects otherwise associated in the crime).

The agents share information and learn to infer the importance of other agents' time-space vectors to their own, producing a global visualization of the crime. This results in emergent, self-organized databases capable of producing and testing hypotheses about their existence in the overall environment of the crime. This work has been extended in projects supported by the Defense Advanced Research Projects Agency and the Office of the Secretary of Defense (OSD).

In the ABEM model, each agent has only incomplete local knowledge about the crime. By allowing these agents to interact and build a self-organizing database, the knowledge about the crime dynamically emerges in a time-space relationship. The agents communicate with each other by means of tuples (a message-passing schema). (See <http://www.msiac.dmsomil/journal/hunt23.html> for more information about the ABEM model.)

In August 2001, the CID began collaborating with the Krasnow Institute for Advanced Studies at GMU and Bios Group Inc. to extend the ABEM work by building an agent-based model of network intrusions in support of an OSD advanced concept technology demonstration. This collaboration, known as Advanced Network Intrusion Defense, will involve studying the feasibility of using ABM. The CID-GMU collaboration will create agent-based representations of the major players in a network intrusion activity.

The objects and their interactions studied in this model include computer intruders (e.g., hackers); network assets (routers, switches, and host computers); computer users; law enforcement officials; and the legal/policy environment. A proposal under consideration is a sce-

nario involving a logistics distribution event, further demonstrating the important intersections of IA and LOGSEC.

Future research in this area may also embrace agent-based modeling of fraud cases to study the complex relationships of various animate and inanimate objects associated with such crime. Such a model could aid individuals in visualizing the people, surroundings, equipment, and supporting documents as agents capable of interacting to produce novel behaviors. This will enhance discovery of important relationships. These future agents could interact on their own behalf to build associations that chart the environment of the crime, much as the ABEM model tracks relationships of witnesses to inanimate objects empowered to act on their own behalf.

Summary

The CID plays an important role in securing logistics distribution for the Army as well as enforcing federal laws that protect information assurance. Because IA and LOGSEC are integral components of successful distribution-based logistics operations, the CID's force protection contributions are essential to those emerging logistics processes envisioned in the Army transformation. The CID is studying the role of innovative modeling and simulation support to IA and LOGSEC. This initial research is expected to support the transformation of Army logistics operations, thus resulting in effective and reliable tools for all commanders to enhance their force-protection capabilities.

LTC CARL W. HUNT is Commander of the U.S. Army Criminal Investigation Command's Computer Crime Investigative Unit. He received his Ph.D. in information technology from George Mason University and can be contacted at carl.hunt@us.army.mil.

USARPAC KNOWLEDGE MANAGEMENT EFFORTS

Libby Christensen and Maria Sadd

Introduction

The abundance of knowledge-management (KM) tools coming onto the market provide structure and knowledge repositories for identifying, organizing, and disseminating information. However, KM is not only about the tools. In fact, individuals who rely solely on the tools may not be successful in implementing KM. Furthermore, KM tools frequently require a substantial upfront investment as well as costly and recurring maintenance. Not only is there more to knowledge management than just the tools, but there are also less costly ways to implement an effective KM Program.

HQ, U.S. Army, Pacific (USARPAC) implemented a highly effective KM program that is transforming USARPAC into a knowledge-based organization at minimal cost. Our strategy emphasizes business process and tool reuse, which increases effectiveness by using what is familiar, and contributes to minimizing cost by reducing the need for new tools and training.

One KM challenge facing USARPAC is the organization's dispersed nature, which today spans 16 time zones and consists of Active and Reserve Army forces in Japan, Hawaii, and Alaska, and Reserve forces in Washington, Guam, and American Samoa. Therefore, while our current KM effort is focused at USARPAC, it is designed to enable knowledge sharing with major subordinate commands (MSCs) and Army KM and other Service components.

USARPAC Approach

KM is a critical enabler as we undergo the Army transformation. USARPAC defined the return on investment for KM as improved product quality and workplace morale. Our goal

is to "empower the USARPAC workforce to actively leverage our Intellectual Capital as a critical enabler for Army Transformation and Joint Vision 2020, and to become an effective Knowledge-based organization."

Recognizing that KM is overwhelmingly more about people and processes than about technology, we have focused our program on business processes, particularly those that support our core priority missions. We contracted with the U.S. Army Information Systems Engineering Command (USAISEC) KM group to facilitate a series of focused meetings, or charrettes. To achieve KM buy-in, we included staff members from all levels and functional areas in defining the top program priorities and solicited input from senior leaders, subject matter experts, action officers, information officers, system administrators, and administrative personnel. The charrettes gathered input on the current and desired state of knowledge sharing in USARPAC by posing questions on knowledge culture, sources, accessibility, and responsibility, as well as tools, policies, business practices, and issues. Participants were invited to define how to transition to a learning organization. Through discussion and consolidation, we identified seven top priorities that included issues that both apply to the KM Program and that will effectively complement and augment our KM initiative.

USARPAC KM Implementation

USARPAC's KM implementation is an ongoing process that includes incorporating knowledge management into new and existing programs, modifying business practices to improve efficiency and increase process reuse, and deploying additional tools to support business practices. A significant

key to our success is the strong support from our senior leaders.

To incorporate KM into the organization structure, USAISEC analyzed the network information infrastructure to ensure that it would support the required information flow and ensure that planned upgrades would continue to support KM implementation. The analysis addressed the local infrastructure and wide area networks. This effort included the Common User Installation Transport Network upgrades to ensure that our architecture was optimized to support the KM implementation and information flow. The analysis took a total systems approach, including the DOD Information Technology Security Certification and Accreditation Process, training, and user support.

The charrettes helped USARPAC knowledge workers identify those practices and processes with the most impact on our core priority missions. Key processes included resource management, strategic planning, suspense tracking, and training. A review of these key processes revealed redundancies, inefficiencies, and opportunities for process reuse. Many of the processes were streamlined and improved by using automation and by turning tacit knowledge into guidelines and checklists for routine and repetitive tasks.

After evaluating the business process requirements and achieving widespread buy-in, we identified KM tools suited to our needs. Some of our tool selection criteria include low cost, user friendliness, portability, and reusability. Because workflow processes are a large part of KM improvements, the Workflow Management System (WMS) tool, based on Microsoft Outlook, was selected to meet our requirements. In fact, the Office 2000 suite, which minimizes our acquisition costs and training requirements, is already our standard. To implement and customize individual views of the USARPAC portal, we selected Microsoft Digital Dashboard 2 portal framework, in compliance with the Defense Collaborative Tool Suite.

USARPAC KM is an evolving process that can be modified based on changing roles and missions. Our Information Management (IM) Panel is also evolving to support KM imple-

mentation, advancement, and continued buy-in. Several best practices approaches, including the IM Panel, are discussed below.

Best Practices

Program Integration. KM impacts all aspects of our organization; therefore, we incorporate KM into any new or upgraded system. The previously mentioned example is the infrastructure analysis, where the upgrade was evaluated with KM requirements in mind. Another example is the USARPAC command and control functional matrix, which provides information on the level of interaction that must be supported between command elements.

The IM Panel. The IM Panel was previously chartered to support the *Clinger-Cohen Act* objectives for managing the information technology acquisition process, and for establishing goals and performance measures to improve the efficiency and effectiveness of agency operations. USARPAC staff principals are represented on the IM Panel and raise, review, and discuss IM issues to disseminate information on initiatives and to solicit ideas from their respective staffs. Their activities support the top program priorities identified during the charrettes. The IM Panel adopted the KM goal to transform USARPAC to a knowledge-based organization.

A significant IM Panel objective is to transition the USARPAC into a knowledge-management organization. This cultural impact is often overlooked when implementing KM because of the tendency to focus on new technologies. Because few use these technologies, this can easily lead to a KM Program failure. By communicating and representing their functional area staff, panel members maintain interest and participation in the KM Program, promote process ownership, and maintain buy-in across the organization.

The IM Panel reviewed issues identified in the KM charrettes and addressed them. After assessing the ineffective use of e-mail ("pushing" information such as blood drives and social events that are more appropriately "pulled") and the forwarding of large and unnecessary files, the IM Panel disseminated guidelines for e-mail users. Another issue they considered is the Army Knowledge Man-

agement Strategic Plan objective to incorporate KM into individual performance plans. The panel tackled problems such as measuring the effectiveness of KM practices. In the process, the IM Panel determined that a modification to individual job descriptions is not needed to add KM to individual performance plans.

A third example demonstrates cultural impact. The USARPAC senior leader proposed sharing and viewing calendar information. When the IM Panel members polled their staffs, they discovered that people were unwilling to share detailed calendar information. The panel modified the proposed objective to allow only individual availability information to be shared. Thus, headquarters buy-in became possible, and the KM objective was met.

Assessed Environment. The KM effort focuses on USARPAC. However, we recognize that for KM to be effective, knowledge sharing must occur outside the organization as well as within. Our assessed environment included higher headquarters and joint commands including the Department of the Army, U.S. Pacific Command, Marine Forces Pacific, U.S. Pacific Fleet, and Pacific Air Forces. We incorporated plans for interoperability and also came away with implementation ideas such as reuse of the Digital Dashboard portal frameworks, Digital Dashboard library, conference room scheduling software, and Workflow Management System.

Internally, the assessed environment reflects the fact that different functions have different knowledge needs. The charrettes were organized to ensure that KM requirements were gathered from individual knowledge workers across all functional areas of the organization. The IM Panel ensures that those knowledge workers continue to be involved in KM's evolution.

Modeling. We selected four of the key business processes identified during the charrettes and developed models of the existing processes, as well as proposed target processes. This enabled us to develop metrics and determine whether changing the target processes would produce the anticipated return on investment, develop and validate requirements for appropriate KM tools, and support *Clinger-Cohen Act* objectives.

Future Prospects

USARPAC encourages our MSCs to use the KM modules by ensuring that our program continues to evolve with interoperability as a critical objective. Interoperability is facilitated by selecting standards-based technologies. XML (eXtensible Markup Language) is one software technology that shows promise as a means to seamlessly exchange information between different applications and databases. USARPAC envisions that files and objects such as Digital Dashboard modules will be ported between external communities of interest using this technology.

We will continue to foster the success of our KM Program, evolving our KM strategy and objectives to meet our Army transformation requirements. Our long-term goals focus on extending effective knowledge sharing with the joint community and maintaining awareness of the KM Programs, both within and outside the command. As our KM Program, organizational culture, and technologies mature, we will continue to remain on point in the Pacific.

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ARMY FLOW MODEL

MAJ John McKittrick

The Army Flow Model (AFM) is an HQDA knowledge management system that provides the Army staff with the capability to analyze and assess actual or notional policy decisions over time. The AFM's primary purpose is to provide an effective and efficient means to assess the feasibility, supportability, and affordability of current, programmed, and hypothetical HQDA initiatives, and their impact on force readiness over time. The AFM accomplishes this by transforming and integrating raw data into knowledge to aid senior decisionmakers in assessing policy decisions. The AFM provides an integrated cross-functional view of the Army and consists of an integrated database, a suite of functional models, and data output. The AFM is an Internet-based system that is easily accessed via the Web.

The AFM is built from an integrated database of approved data outputs collected from the functional areas of the Army. These data are processed and placed into a data warehouse of historical, current, and programmed information. The AFM system architecture allows it to easily integrate data from outside systems. The capability to accept and integrate data from legacy systems is one of the AFM's strongest assets. This system flexibility provides information dominance through the ease of linking and mining data.

The AFM maintains a suite of functional models in its integrated database. These functional models address force structure, logistics, personnel, stationing, and the budget. These models apply HQDA business rules to the integrated data to produce analytical intelligence from raw data. Each model is linked via the database to ensure that output and analysis are consistent across the system. A summary of each of the functional models follows.

The Force Structure Model's primary function is to maintain the historical, current, and projected HQDA-

approved locked force structure. These data form the baseline for force-structure assessments and the other functional models. Logistics and Personnel Model data are integrated to form a complete header file for the Force Structure Model across the Program Objective Memorandum years.

The Logistics Model's primary function is to project equipment distributions over a 10-year period and provide equipment on-hand readiness calculations at both the line item number and unit identification code levels. The Logistics Model identifies equipment shortfalls, provides equipment costs, and produces the HQDA Total Army Equipment Distribution Plan. The Logistics Model also maintains historical, current, and future readiness projections and distributions.

The Personnel Model is designed to project trained strength across the force structure. This model allocates projected strength by distribution management level and at unit level by military occupational specialty and grade. The model applies rotation, promotion, reclassification, conversion, separation, and accession policies and trends to the enlisted population for distribution across the force structure. The Personnel Model also maintains historical and current assigned projections.

The Stationing Model is used to assess stationing impact as a result of force structure and stationing changes. This model provides an installation view of the units, equipment, and personnel located at the base for all components. The stationing model also maintains historical and current data on installation readiness.

The Budget Model provides costs for equipment acquisitions and standup and shortage costs for equipment, and calculates destination costs associated with relocating resources.

Data in the AFM are viewed via the Internet. The AFM consists of a series of graphical user interfaces that produce tabular and graphical data repre-

sentations. The AFM can also be customized so that specialized views and Web pages can be created for the analyst to support specific studies.

The AFM directly supports numerous HQDA policy assessments. The AFM's ability to provide integrated data from across the functional areas of force structure, logistics, personnel, stationing, and budgeting make it the cornerstone from which the Army studies are based. The ability to integrate vast quantities of data and provide quick turnaround answers has greatly increased the accuracy and timeliness of the Army's critical assessments. These proven capabilities have made the AFM the Army's analytical model of choice.

The Army Flow Model is designed to be fully compatible with the current systems in use by the Army. The system provides on-screen tools that allow analysts to manipulate data directly from the model. However, data can be transferred directly to Microsoft Office applications for integration into briefing slides and action reports. Data management flexibility is a key capability of the AFM. The functional proponent for the AFM is the Director of Force Management, Office of the Deputy Chief of Staff for Operations and Plans. The technical proponent for the AFM is the Director of Information Systems for Command, Control, Communications, and Computers (DISC4).

MAJ JOHN MCKITRICK is the Project Officer for the AFM and the Data Sharing Initiative, Chief Technology Office, ODISC4. He received his master's degree in systems management from the Florida Institute of Technology and can be reached at John-mckitrick@us.army.mil.

THE ARMY TRANSFORMATION: SUCCESS TODAY, VICTORY TOMORROW

Cynthia D. Hermes

Introduction

The 2001 Army Acquisition Workshop, largely devoted to topics related to the Army's transformation, was held Aug. 6-9, 2001, in Atlanta, GA. More than 280 acquisition professionals attended the workshop, which annually provides a forum for the senior Army acquisition leadership to communicate directly with and present new guidance to program executive officers (PEOs); project, product, and program managers (PMs); deputies for systems acquisition; Defense Contract Management Agency (DCMA) commanders; and other acquisition commanders (ACs).

MG Daniel G. Mongeon, U.S. Army Forces Command's (FORSCOM's) Deputy Chief of Staff for Logistics (DCSLOG), the local co-host of the workshop, welcomed attendees and introduced then Army Acquisition Corps Director and Military Deputy to the Assistant Secretary of the Army for Acquisition, Logistics and Technology (ASAALT) LTG Paul J. Kern. Kern, who has received his fourth star and is now Commanding General of the Army Materiel Command (AMC), introduced his successor, MG John S. Caldwell Jr., then Commanding Gen-

eral of the Army Tank-automotive and Armaments Command. Kern outlined the Army's future challenges and discussed Secretary of the Army Thomas E. White's transformation objectives and commitment to invest in people, ensure readiness, and adopt sound business practices. Kern stressed the need to think in terms of networks and systems-of-systems, and determine how to fit all the pieces together. To achieve transformation, he concluded, the Army must accept the challenge of, quickly adapt to, and be pioneers of change.

Perspectives

COL(P) James R. Moran, Vice President of the Defense Acquisition University (DAU) and Commandant of the Defense Systems Management College, discussed significant changes at DAU. DAU has traditionally focused on resident training, but recently expanded its mission to include distance learning. DAU is reorganizing to enhance responsiveness, provide a full-service capability, support the Army Acquisition and Technology Workforce, and increase student productivity and morale.

LTG John M. Riggs, Director of the Objective Force Task Force, stated



LTG John M. Riggs, Director of the Objective Force Task Force

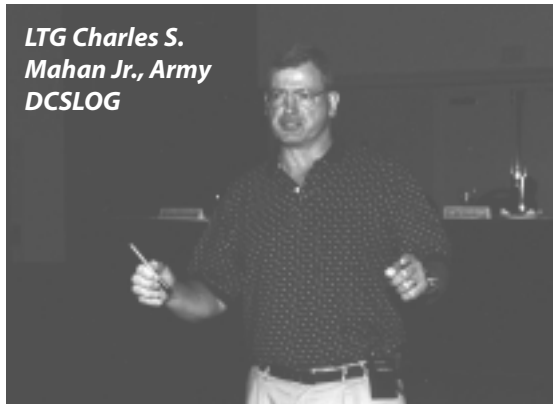
that the Objective Force encompasses a complete Army transformation that includes warfighting concepts, training and leader development approaches, organizational designs, and requirements for agile soldiers capable of performing echelons above their own. Riggs said the Army must "see first, understand first, act first, and finish decisively." To accomplish this, he said the Army needs advanced command, control, communications, computers, intelligence, surveillance, and reconnaissance; improved precision munitions; advanced mobile fire delivery systems; improved warning of nuclear, chemical, and biological hazards; advanced unmanned air and ground systems; and the integration of lighter, more effective armor.

Riggs was followed by a panel discussion on "Standards for the 21st Century," moderated by AMC Assistant DCS for Research, Development and Acquisition (RD&A) for Science and Technology/Science Advisor Renata F. Price. The panel discussed how the Army and industry could work together to ensure that 21st century commercial standards address Army transformation requirements. Panel members were Pandu Rao, Director of Engineering

Business Group, U.S. Army Tank-automotive and Armaments Command, Warren, MI; Thomas W. Rabaut, President and Chief Executive Officer, United Defense Limited Partnership; James W. Zwickey, Director of Defense Contracts at Oshkosh Truck Corp.; Kenneth Dabundo, Senior Manager of Materials, Process, and Standards Engineering for Boeing Corp.; Tim Brooke, Manager of Technical Committee Operations for the American Society for Testing and Materials; and Matthew Williams, Director of Standardization for Aerospace Industries Association.

LTG Charles S. Mahan Jr., Army DCSLOG, discussed the DCSLOG's transformation charter to enhance strategic responsiveness, meet deployment timelines, reduce the logistics footprint, and transform the institutional Army by reducing total obligation authority. He concluded saying, "At the end of the day, it's all about getting the right equipment with the right capabilities into the hands of our soldiers."

Following Mahan's presentation, awards were presented honoring the PMs and ACs of the year. (See article on Page 25.)



LTC Thomas Hogan, Chief of the U.S. Total Army Personnel Command's Acquisition Management Branch, provided an update on the new Officer Evaluation Reports and discussed the Command Select List Program, PM/AC Board membership, and the low number of civilians competing for PM positions.

MG Robert E. Armbruster, Deputy for Systems Management and Horizontal Technology Integration in the Office of the ASAALT, provided a recapitalization update. Attendees were urged to read the HQDA policy on recapitalization, meet with their supporting commodity commands, and understand their role in the recapitalization process. Armbruster added that aggressive recapitalization will reduce near-term operational risk, ensure combat

overmatch, and extend the service life of existing warfighting systems.

MG James R. Snider, AMC's DCS for RD&A, outlined the Materiel Release Tracking System, which manages and tracks the status of all materiel release activities and provides report-generating capability and automatic e-mail notification of upcoming and missed "get-well" dates.

MG William L. Bond, Director of Force Development in the Office of the Army Deputy Chief of Staff for Programs (ODCSPRO), discussed ODCSPRO's goal to develop, integrate, and synchronize programs to support the Army vision. ODCSPRO assists in the transformation process by fielding revolutionary new capabilities, responding to immediate capability shortfalls, and maintaining and improving existing capabilities. Bond said that new technology is key in providing robust, interoperable land forces.

COL(P) Jeffrey A. Sorenson, then Assistant Deputy for Systems Management and Horizontal Technology Integration in the Office of the ASAALT (now a brigadier general and the PEO, Smart Munitions (Tactical Missiles)), discussed the importance of the Quadrennial Defense Review. He added that the Secretary of Defense believes it is critical to transform entire DOD organizations, equipment, and concepts to meet 21st century national military strategies.

Dr. Walter F. Morrison, Director, Research and Laboratory Management in the Office of the Deputy Assistant Secretary of the Army for Research and Technology, discussed future science and technology (S&T) initiatives. Challenges for the S&T community include increasing resources to enable the Objective Force; maturing technology to expedite systems development; building the Future Combat Systems in this



MG Robert E. Armbruster, Deputy for Systems Management and Horizontal Technology Integration, Office of the ASAALT



MG William L. Bond, Director of Force Development, ODCSPRO

LTG Roy E. Beauchamp, AMC Deputy Commanding General



decade; and increasing momentum for the Objective Force Warrior, unmanned combat-armed rotorcraft, and the Institute for Soldier Nanotechnologies.

COL R. David Ogg Jr., PM, Brigade Combat Team (BCT), and Don Howe, PM, GM GDLS Defense Group LLC, the final formal speakers on the first day of the workshop, discussed BCT government and Defense integrated product teams. Specifically, Ogg spoke on the BCT's mission and management challenges, and Howe addressed the organizational structure of GM GDLS.

Additional Briefings

J. Stephen Koons, FORSCOM Assistant DCSLOG, began the second day of briefings with a discussion of logistics challenges and the

DCSLOG's mission to provide world-class support for FORSCOM's power-projection Army.

MG John Marcello, Commanding General of the Army Test and Evaluation Command (ATEC), discussed the ATEC Web-based Test and Evaluation Management System and the ATEC Decision Support System (ADSS)-Web, which provides test and evaluation (T&E) status on more than 350 systems, detailed system descriptions, and the capability to review T&E data. Angie Craddock, ATEC's Information Technology PM, also provided an overview of ADSS-Web and suggested that everyone register at the site.

LTG Peter M. Cuvillo, Director of Information Systems for Command, Control, Communications, and Computers, discussed transformation from an information perspective. He said there are numerous security implications in a computer-enabled world. Although Web-based systems are more capable, they are also more vulnerable to attack, he noted. The Army must control access, demand security in purchased software, and develop security architects. He also stressed that knowledge management has significant importance in global operations; thus, the goal of Army knowledge management is to

LTG Peter M. Cuvillo, Director of Information Systems for Command, Control, Communications, and Computers



have world-class, network-centric access to knowledge, systems, and services interoperable within the joint environment. By July 2002, the Army will be conducting the majority of its internal business via Army Knowledge Online (AKO), and all personnel will operate from an AKO account.

Allan M. Resnick, DCS for Combat Developments at the U.S. Army Training and Doctrine Command (TRADOC), discussed TRADOC's mission in training soldiers for war, establishing standards and requirements, and commanding installations.

BG Edward M. Harrington, DCMA Director, discussed DCMA's strategic, operational, and tactical missions. He also provided an overview of industrial intelligence



MG John Marcello, Commanding General, ATEC



BG Edward M. Harrington, DCMA Director

and contingency and operational deployment. A key transformation issue for DCMA is to support warfighter readiness. He closed by stating that throughout the acquisition process, DCMA's primary focus is the customer.

COL(P) James A. Kelley, FORSCOM Assistant Deputy Chief of Staff for Operations, provided a FORSCOM perspective on Army acquisition testing, fielding, training, and operations. FORSCOM, he noted, must accomplish its mission with a strategy that balances testing, modernization, and training requirements. He also outlined FORSCOM's 5-year plan and the strategy for implementing and maintaining it.

COL Frank C. Davis III, Deputy Director of the Acquisition Career Management Office, discussed acquisition career management and the goal of enhancing the professional development of Functional Area 51 officers under the Officer Personnel Management System for the 21st Century (OPMS XXI). Davis also discussed transitioning the Materiel Acquisition Management Course at Fort Lee, VA, to the Army Acquisition Qualification Course; the intermediate-level education concept; advanced civil schooling; and acquisition branch qualification.

Donald L. Damstetter, Acting Deputy Assistant Secretary of the Army for Plans, Programs and Policy, provided specific Program Objective Memorandum FY03-07 guidance and discussed challenges such as the growing requirements for light force development, unit set fielding, recapitalization versus modernization, and the Objective Force.

Keith Charles, then Acting Director, Acquisition Education, Training, and Career Development, Office of the Deputy Under Secretary of Defense for Acquisition Reform, provided an update on the Acquisition 2005 Task Force and described various hiring authorities available to managers. He urged attendees to

read *The Acquisition Managers Recruiting, Hiring and Retention Handbook*, written in coordination with the Under Secretary of Defense for Personnel Readiness and available online at www.acq.osd.mil/yourfuture. Charles said the quickest way for supervisors to obtain the authority to hire and adequately compensate employees is to enter the Civilian Acquisition Workforce Personnel Demonstration Project.

Closing Remarks

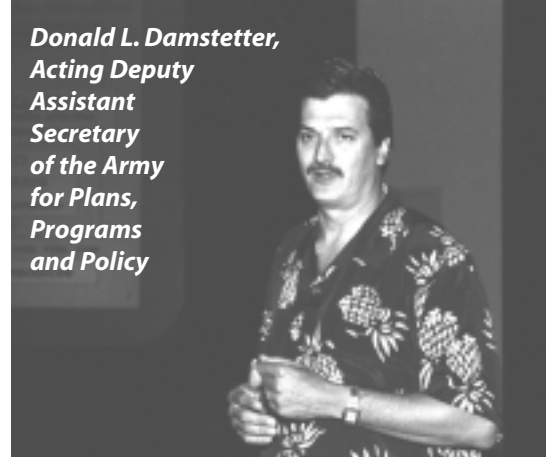
LTG Roy E. Beauchamp, AMC Deputy Commanding General, concluded the formal workshop saying that information is now a capital asset, and our lives are about to change in ways that none of us can foresee. As a result, we must view change as a friend who works for our benefit.

Kern thanked everyone for participating, noting that the next few years will be exciting because never before has the Army simultaneously downsized, maintained its readiness, and transformed itself. He also said that we should be proud that our Army is the one that the rest of the world still tries to emulate.



COL(P) James A. Kelley, FORSCOM Assistant Deputy Chief of Staff for Operations

Donald L. Damstetter, Acting Deputy Assistant Secretary of the Army for Plans, Programs and Policy



Note: Elective sessions were held following the formal workshop. Topics were *Media Training Workshop; Conditional Materiel Release/Total Package Fielding/Unit Set Fielding; Technological Solutions for the Future; Center for Acquisition Lessons Learned; Environmental Quality Requirements for Army Weapon Systems; Activity-Based Costing; Operational Requirements Documents and Key Performance Parameters; U.S. Military Academy Partnership; PM Predictive Staffing Model; Embedded Diagnostics and Horizontal Technology Integration; and Training With Industry at the Logistics Management Institute*. Additionally, an executive session was held at FORSCOM for PEOs and senior acquisition leaders. Topics included *Civilian Placement of PMs-IPT Report Out, Threat Brief, and Organizing for the 21st Century*. To request detailed information on the elective sessions, contact Joan Sable, PEO/PM Support Manager, Army Acquisition Executive Support Agency, at (703) 805-4357/ DSN 655-4357 or joan.sable@aaesa.belvoir.army.mil.

CYNTHIA D. HERMES is Managing Editor of Army AL&T magazine. She has more than 21 years of federal government service.

PMs AND ACQUISITION COMMANDERS OF THE YEAR HONORED

Heather J. Kohler

Introduction

Awards recognizing outstanding achievements of the Army's project and product managers (PMs) of the year and two acquisition commanders (ACs) of the year were presented Aug. 7, 2001, at the annual Army Acquisition Workshop in Atlanta, GA. The awards were presented by LTG Paul J. Kern, then Military Deputy to the Assistant Secretary of the Army for Acquisition, Logistics and Technology and Director of the Army Acquisition Corps (now with his fourth star and Commanding General of the Army Materiel Command).

Project Manager Of The Year

COL Patrick J. O'Reilly, Project Manager, Theater High Altitude Area Defense (PM, THAAD), received the Project Manager of the Year Award for FY00. He was cited for managing activities and leading the THAAD Program through the successful Milestone II Defense Acquisition Board Review in June 2000. Within 5 weeks, the \$3.8 billion THAAD engineering and manufacturing design contract was signed. O'Reilly developed the innovative contract award fee structure, providing the contractor with incentives for early and successful flight tests and the government with a means to recover the costs of unsuccessful flights. O'Reilly also implemented numerous cost-reduction initiatives, avoiding or saving more than \$10 billion

throughout the program's life cycle. One initiative involved O'Reilly and his team partnering with the automotive racing industry to incorporate revolutionary pit-stop technologies into the THAAD design. This effort reduces maintenance diagnostics and repair times from hours to seconds, resulting in dramatically reduced maintenance costs.

Product Manager Of The Year

LTC Edward L. Mullin, Product Manager, PATRIOT Advanced Capability-3 (PM, PAC-3) Missile Program, received the Product Manager of the Year Award for FY00. Under Mullin's leadership, the PAC-3 Program achieved an unprecedented seven consecutive hit-to-kill intercepts in developmental testing without a single failure—a 100-percent success rate. These hit-to-kill intercepts, often compared to "hitting a bullet with a bullet," were conducted against threat-representative theater ballistic missile and cruise missile targets. Mullin was also cited for spearheading a three-pronged effort to reduce the average unit procurement cost of the PAC-3 missile by as much as 40 percent, saving the government \$1.5 billion in procurement costs. Through his innovative and rigorous ground test program involving a combination of digital simulations and hardware-in-the-loop testing at the system component level, Mullin set the standard for simulation-based acquisition and significantly reduced

the number of live flight tests required and, consequently, overall program costs.

ACs Of The Year

COL William N. Phillips and LTC George P. Slagle were each recipients of an Acquisition Commander of the Year Award for FY00.

Phillips was recognized for his achievements as Commander, Defense Contract Management (DCM)-San Francisco, responsible for managing more than 5,000 contracts valued at more than \$21 billion and involving more than 800 contractors. Phillips was cited for demonstrating significant fiscal achievements by implementing a streamlined process to track canceling funds. As a result, his command saved \$38.1 million during the fiscal year—all "hard dollars" returned to the Services. Because of Phillips' outstanding leadership, DCM-San Francisco was transformed from one of the poorest commands to one of the best in the agency. By initiating sweeping reforms in organization, process control, and managerial oversight, Phillips overhauled his command. He did this while maintaining and significantly improving mission accomplishment and support to the customer. This enabled DCM-San Francisco to be commonly used as a benchmark by other commands to assess their performance.

Shown on the left in each photo is LTG Paul J. Kern, then Military Deputy to the Assistant Secretary of the Army for Acquisition, Logistics and Technology and Director of the Army Acquisition Corps (now with his fourth star and Commanding General of the Army Materiel Command).



COL Patrick J. O'Reilly, PM, THAAD, accepts the Project Manager Of The Year Award.



LTC Edward L. Mullin, PM, PAC-3, accepts the Product Manager Of The Year Award.



COL William N. Phillips, Commander, DCM-San Francisco, receives an Acquisition Commander Of The Year Award.



LTC George P. Slagle, AC, National Training Center, receives an Acquisition Commander Of The Year Award.



COL(P) Paul S. Izzo, DSA, U.S. Army Communications-Electronics Command, receives a Deputy for Systems Acquisition Charter.

Slagle was recognized for his contributions as the Acquisition Commander, National Training Center (NTC). He is responsible for the surveillance and contract management of 1,200 contractor employees for NTC's 10-year base operations contract; the \$182 million logistics support contract; and the administration of more than \$100 million in supply, service, and construction contracts. Slagle was instrumental in supporting the NTC command group's \$256 million budgetary expenditures for FY00. Slagle was cited for successfully transitioning

the Directorate of Contracting into the newest U.S. Army Forces Command acquisition command structure. His adept reorganization and empowerment of his acquisition workforce resulted in his command's ability to lead and support NTC's customers.

Charter Presentations

At the conclusion of the awards presentation, Kern presented a Deputy for Systems Acquisition (DSA) Charter to COL(P) Paul S. Izzo, DSA, U.S. Army Communications-Electronics Command.

HEATHER J. KOHLER, an employee of Science Applications International Corp. (SAIC), provides contract support to the Acquisition Career Management Office. She has a master's degree in public administration from George Mason University and a bachelor's degree in political science from the University of Connecticut, Storrs, CT.

MODERNIZING AIR AND MISSILE DEFENSE

COL Richard P. De Fatta

Introduction

Army transformation challenges all mission areas, and air defense artillery is no exception. In preparing for an ever-escalating and proliferating threat consisting of both “air-breathing” and missile (ballistic and cruise) carriers capable of transporting weapons of mass destruction (WMD), DOD is developing a comprehensive and integrated array of Defense systems designed to protect the United States, its deployed elements, and allied forces. These systems include land-, sea-, and air-based assets and counter-specific threat vulnerabilities in all phases. Traditional development programs produce complete systems for integration into the existing force. We must now consider an alternative acquisition approach for air and missile defense (AMD) modernization that is more responsive to the Army’s immediate needs than today’s system-centric process.

Background

The Army’s systematic, multitiered approach to all land-based AMD is in various stages of development, production, and fielding. The Army currently operates short range air defense (SHORAD) against air-breathing threats in the forward area, including Stinger-missile-based weapons platform, the Sentinel radar, and battle management via Forward Area Air Defense Command and Control (FAAD C2).

More stressing, longer-range targets are addressed by the Army’s “lower-tier” PATRIOT missile system. PATRIOT is self-contained and includes an acquisition/track-fixed azimuth radar, missiles on a mobile launcher, and organic command and control equipment. Designed in the 1980s, PATRIOT provides primary air defense against air-breathing threats for fixed assets. However, because of numerous equipment upgrades (most notably the fielding of the PATRIOT Advanced Capability-3 (PAC-3) missile), the system is now effective against all classes of the modern AMD threat. PAC-3 was designed specifically for hit-to-kill lethality against sophisticated threat missiles.

The most stressing and longest range ballistic missiles will be countered by Theater High Altitude Air Defense

(THAAD), the Army’s “upper-tier” system currently in engineering and manufacturing development. THAAD is also configured with a powerful fixed-azimuth acquisition and track radar, a hit-to-kill missile and mobile launcher, and a tactical operations center (TOC).

SHORAD and upper- and lower-tier systems share a common architecture. Each system requires sensors for acquisition and fire control, “shooters” (missile/launcher combinations) for lethal destruction of the target, and battle management assets such as TOCs to direct the engagement. A significant goal in developing the Army’s AMD involves seamlessly integrating all available sensors, shooters, and TOCs within a deployable architecture. The resulting engagements will integrate the best data available from any source and the most cost and operationally effective interceptor. Common AMD components are desirable. Why perpetuate separate TOCs (and military occupational specialties) when a common and configurable hardware and software approach could result in a single AMD TOC?

Missiles that can perform effectively against today’s sophisticated threat are inherently expensive. This expense is due to demanding performance envelopes and the advanced onboard sensor, guidance, and processor technologies required to overcome the limits of ground-based guidance systems. Expending a PAC-3 missile against an unsophisticated, inexpensive, but WMD-capable large caliber rocket is not cost-effective. For this reason, the Army requires a low-cost, lethal defense

against such short-range threats. Leap-ahead technology shooters such as directed energy or kinetic energy projectiles are an integral part of the future AMD architecture.

Lower-Tier Modernization

Modernizing the Army’s lower tier provides the framework for the “system-of-systems” integration of SHORAD, lower tier, and THAAD. The system functionality and capabilities necessary to achieve an integrated and cost-effective AMD are resident in the Army’s Medium Extended Air Defense System (MEADS) operational requirements document (ORD). MEADS will provide the required mobility and deployability, be tailorable to the mission, and provide 360-degree protection against all lower-tier ballistic and cruise missile threats and all air-breathing targets. The Army requires that MEADS be fully interoperable in the joint and combined AMD architecture. These capabilities are achieved with a “netted and distributed” system design that eliminates any site- or battery-centered dependencies. The system architecture is designed to be capable of what the Air Defense Artillery (ADA) School has dubbed “plug and fight” functionality. Similar to modern computer peripherals, the system is tailorable to the mission by “plugging in” the necessary mix of sensors, shooters, and TOCs. Once fully netted and distributed, the AMD task force can be flexible and reconfigurable such that no single point failures result from the loss of any single asset. If a sensor or TOC is dis-

abled, another similar asset replaces it seamlessly.

Current Approach

To achieve the objective, lower-tier modernization could follow various acquisition paths. The current approach involves a full-up, concurrent system development that replaces PATRIOT ground equipment upon fielding. This is the basic construct of the MEADS trinational cooperative development program involving the United States, Germany, and Italy. MEADS resulted from an unprecedented agreement on an international common operational requirement (ICOR) that combined three separate but similar national requirements. Concurrent, full-system development is most acceptable to all three nations. Germany intends to completely replace NATO Hawk while Italy is acquiring MEADS as a new capability. This approach is also highly desirable because all participating nations share development costs.

Because all three nations must agree to make changes, the ICOR is fixed and not subject to the typical programmatic turmoil that results from requirement changes. However, three separate national funding processes also result in little flexibility to make any changes in the acquisition strategy. A full-up system development is expected to result in MEADS fielding in 2010 or later. However, critical ADA system enhancements are required before 2010 to support Army transformation initiatives.

Full system MEADS development focuses (to varying degrees) on developing all components that are guided by system engineering priorities. All components and system engineering elements mature at the necessary rate to arrive simultaneously at a final system configuration. Given sufficient funding, this approach can result in achieving full performance as rapidly as possible. However, because resources must focus across development activities and address the most difficult areas first, there is little flexibility to “spin off” individual system capabilities at the earliest opportunity. In this traditional process, the materiel developer does not need to work or expend resources early on the technical no-brainers (that may result in enhancing capabilities immediately)

unless system developments are on the critical path to full performance.

Alternative Approach

An alternative approach is to block upgrade, in phases, the existing AMD systems by considering the most pressing operational needs and relative technology maturity first. This “spiral development” approach is described in the DOD 5000 guidance that governs major acquisitions. In the case of lower-tier upgrades, this approach is enabled by the success of the lower-tier missile. PAC-3 provides lethal, effective, hit-to-kill performance against medium-range ballistic and cruise missiles. The missile itself, typically the “long pole” in a missile system development program, requires only minor modification for system integration.

Phase 1 should address the rapid deployment vision of Army transformation and the overall need to relieve demand on strategic airlift. This first step results in fielding a lightweight missile launcher to accommodate the PAC-3 missile and replaces the current PATRIOT launcher with a MEADS-compliant common launcher. Phase 1 also produces a prototype MEADS X-band fire control radar (FCR) and matures ground-based laser technology for integration into a mobile platform. Phase 1 also marks the beginning of the common hardware and software development for the objective Army AMD TOC.

Phase 2 provides a MEADS FCR and a MEADS TOC replacing the PATRIOT radar and engagement control station. Minor missile modifications are incorporated to accommodate the revised system configuration. Laser technology is demonstrated on a mobile platform. A prototype long-range surveillance sensor is developed.

Phase 3 results in fielding a common Army AMD TOC hardware and software package to implement an AMD-wide netted and distributed system integrated into the Joint Single Integrated Air Picture architecture. A long-range surveillance sensor is fielded along with the laser platform. All components undergo final system integration.

This phased approach introduces increasing capabilities as they mature rather than waiting for an entirely new system to complete development. The

phased approach effectively evolves the various AMD elements into a tailorable, integrated configuration. The MEADS ORD is not changed; the acquisition strategy to satisfy that requirement is modified. This approach would also set the stage for a new way to acquire and organize future AMD developments. Now is the time to evolve the acquisition organizations as well. Instead of system project managers (PMs), system component PMs would develop product lines—sensors, shooters, TOCs—that would ensure interoperability across the product lines. New technology enhancements and systematic upgrades could be introduced without the parochialism of individual system proponents.

Conclusion

Critics will undoubtedly respond from a system engineering standpoint and would be right to express concern. Given current organizational structures and today's independent system design approaches, simply reorganizing developments immediately along product lines would be impossible. However, the ADA vision involves a fully netted and distributed, plug-and-fight capable, task-force approach to AMD. Accomplishing this requires common system architectures, technologies, and components to ensure vertical and horizontal interoperability. Future modernization is likely to occur selectively across the force rather than on an individual basis. System engineering is critical but must be focused at the system-of-systems level.

COL RICHARD P. DE FATTA is the Chief of Staff to the Assistant Secretary of the Army for Acquisition, Logistics and Technology (ASAALT). At the time he wrote this article, he was a U.S. Army War College fellow at the University of Texas in Austin. He also served previously as MEADS Product Manager. He has a B.S. in engineering from the U.S. Military Academy, an M.S. in systems management from the Florida Institute of Technology, and an M.S. in laser physics from the Air Force Institute of Technology.

The 2001 Army Small Business Innovation Research (SBIR) Phase II Quality Awards ceremony was held Aug. 21, 2001, at the Pentagon. Dr. Kenneth J. Oscar, Acting Assistant Secretary of the Army for Acquisition, Logistics and Technology, hosted the ceremony. Assisting Oscar with the presentations was Dr. Robert S. Rohde, Deputy Director for Laboratory Management, Office of the Deputy Assistant Secretary of the Army for Research and Technology.

Established in 1994, the Quality Awards Program recognizes SBIR Phase II (research and development (R&D)) efforts that exemplify the SBIR goal of bringing innovative technologies and products to the marketplace. Army SBIR Phase II companies whose projects conclude in a given fiscal year are eligible to compete for that year's quality awards. Award winners are selected based on originality and innovation of research; relevance of the research to the Army and its mission; and commercialization potential of the research, reflecting the primary goal of bringing technology and products to the marketplace.

Quality awards are presented to each winning SBIR company and to its sponsoring Army organization's technical director, technical monitor, SBIR coordinator, and contracting officer.

The dual-use SBIR Program taps into the creativity of the small business community to help meet government R&D objectives. Participating companies develop technologies, products, processes, and services that they can commercialize through sales to private industry or the government. "Our Nation's 25 million small businesses make indispensable contributions to America's economic strength and success. They account for 35 percent of federal contract dollars and provide 55 percent of innovations," stated Oscar. "The men and women of America's small businesses create a wellspring of new technology, new products, and more effective business processes," he added.

2001 ARMY SBIR PHASE II QUALITY AWARDS

Dr. Kenneth A. Bannister
and James R. Myers

The Army is transforming to a more responsive, deployable, and sustainable force while maintaining its high levels of lethality, survivability, and versatility. This new force, called the Objective Force (OF), is intended to meet the full spectrum of present and future Army missions. The cornerstone of the OF capability and the transformation is the Future Combat Systems (FCS) Program. This reconfigurable, adaptive "system-of-systems" will provide a common baseline capability that increases the Army's ability to conduct network- and collaboration-centric warfare. The Army is working to develop and demonstrate first-generation FCS and its enabling technologies within this decade. This transformation has had, and will continue to have, a major impact on the Army science and technology community, including the Army SBIR Program. During 2000, the Army SBIR Program was aligned with OF and FCS technology categories, a process that will be ongoing as OF and FCS needs evolve.

During 2001, there were 110 eligible Phase II projects. Through an online nomination system, technical monitors from the sponsoring Army laboratories and centers nominated their respective projects. The Army Research Office-Washington, DC, compiled the 25 top-ranked nominations and forwarded them to the Quality Awards Selection Committee, which is comprised of Army and

industry experts who used an online evaluation system to select the most exceptional Phase II projects. Dr. A. Michael Andrews II, Deputy Assistant Secretary of the Army for Research and Technology, approved five projects for the 2001 awards.

2001 Quality Award Winners

Recipients of the 2001 Army SBIR Phase II Quality Awards and their achievements are as follows:

Ormet Circuits Inc., Carlsbad, CA. As Army weapon and support systems have become increasingly dependent on electronics, susceptibility of electronics to electromagnetic interference (EMI) has become a major readiness issue. Electronic devices have become smaller and faster and are being forced closer and closer together. Consequently, Ormet developed a unique, cost-effective, and state-of-the-art shielding process. ORGANIC-METALlic materials can be screen-printed on bare boards to provide 80 decibels of EMI shielding, or they can be spray-coated over dielectrics on populated boards to provide 30 to 40 decibels of shielding. This enabling technology may be critical to ensuring the survivability of FCS command and control systems.

Accepting the award for Ormet Circuits Inc. was the company's President and Chief Operating Officer Pradeep Gandhi. Also receiving awards for this project were Dr.

Michael J. Lavan, Director of the Advanced Technology Directorate at the U.S. Army Space and Missile Defense Command; Mark D. Brown, Technical Monitor; Dr. Douglas M. Deason, SBIR Coordinator, and Larry G. Ridgeway, Contracting Officer.

TPL Inc., Albuquerque, NM. Newly developed propellants are extremely corrosive and consume gun components at an accelerated rate as ammunition is being developed with higher velocities and lethality. TPL Inc. developed a process to explosively clad thermochemical-resistant refractory metals to the bores of various caliber gun tubes and fabricated two tantalum-clad test barrels from 25mm Bushmaster barrels. Testing demonstrated an increase in barrel life of more than 400 percent. This technology not only dramatically increases barrel service life, but it allows development of new, higher-performance ammunition for greater range and accuracy, with far fewer sustainment requirements, and more lethal rapid-fire weapon systems.

Accepting the award for TPL Inc. was Robert F. Lowey, Senior Engineer and Barrel Armor Program Manager, and Thomas E. Kelly III, Vice President of Marketing. Also receiving awards for this technology were Dr. C.I. (Jim) Chang, Director of the U.S. Army Research Office; Dr. David M. Stepp, Technical Monitor; Dr. Ellen G. Segan, SBIR Coordinator; and Kathryn C. Terry, Contracting Officer.

Lynntech Inc., College Station, TX. Fuel cells offer lighter, more powerful energy sources than those currently available and will extend mission time, reduce weight, and dramatically decrease the logistics burden of present batteries. Monopolar fuel cells represent the simplest possible fuel-cell power supply. With methanol as the fuel, Lynntech Inc. developed cells that are capable of delivering a large amount of electrical energy from an easily handled, pourable liquid fuel. These fuel cells have great potential to serve as small primary energy sources for the Land Warrior Program

and can also power a diverse range of portable electronics for much longer than current battery technology.

Accepting the award for Lynntech Inc. was the company's Electrochemical Energy Conversion Manager Alan Cisar. Also receiving awards for this project were Dr. Robert W. Whalin, Director of the U.S. Army Research Laboratory; Dr. Deryn D. Chu, Technical Monitor; Dean Hudson, SBIR Coordinator; and Lee A. Hess, Contracting Officer.

Remcom Inc., State College, PA. Realistic analyses of radio-wave channels are required to assess communication networks and systems envisioned for FCS. Remcom Inc. developed a software tool that combines site-specific, physics-based radio propagation models for predicting wave characteristics in indoor, urban, and rural environments with a powerful, easy-to-use graphical user interface. The site-specific models accurately predict the negative interactions of radio communication signals with the physical environment, particularly in dense urban areas where strong shadowing and multipath interference effects occur. Using this information, deployed tactical units can build ad hoc and effective wireless communication systems to optimize communications coverage.

Accepting the award for Remcom Inc. was Dr. Raymond J. Luebbbers, President, and Joseph W. Schuster, Director of Propagation Software Development. Also receiving awards for this project were Dr. C.I. (Jim) Chang, Director of the U.S. Army Research Office; Dr. James Harvey, Technical Monitor; Dr. Ellen G. Segan, SBIR Coordinator; and Kathryn C. Terry, Contracting Officer.

eMagin Corp., Hopewell Junction, NY. The Army needs dependable microdisplays to provide mounted and dismounted soldiers expanded situational awareness to maintain high levels of lethality, survivability, and versatility for the OF. eMagin developed a high-resolution, active matrix organic, light-emitting diode (OLED) microdisplay for incor-

poration into military helmet-mounted displays. These OLED microdisplays provide high brightness and resolution, a wide temperature operating range, shock resistance, and wide viewing angles, which allow ease of viewing for long periods of time. These microdisplays can be directly interfaced to unattended sensors or to computer videos, providing simple connectivity with low-power consumption.

Accepting the award for eMagin Corp. was Vice President of Microdisplay Product Development Olivier F. Prache. Also receiving awards for this project were Dr. Louis C. Marquet, Director, Research Development and Engineering Center, U.S. Army Communications-Electronics Command; David A. Fellowes, Technical Monitor; Suzanne J. Weeks, SBIR Coordinator; and Ronald W. Backes, Contracting Officer.

Conclusion

The small business community plays a vital role in the readiness and effectiveness of our Armed Forces. Its creativity and innovative spirit will allow tomorrow's warfighters to successfully overcome challenges they may encounter on the battlefield. The SBIR Program fosters innovative thinking and benefits the Army, the private sector, and our national economy.

DR. KENNETH A. BANNISTER is the Army SBIR Program Manager at the Army Research Office—Washington. He has 32 years of service with the Department of Defense.

JAMES R. MYERS is an Analyst with BRTRC Inc. and supports the Army Research Office in executing the Chemical and Biological Defense SBIR, SBIR, and Small Business Technology Transfer Programs.

Introduction

The tradition continues. Year Group (YG) 2002 became the latest participants to be inducted into the Competitive Development Group (CDG) Program during the annual CDG orientation hosted by the Acquisition Career Management Office (ACMO) and held Aug. 21-22, 2001, in Springfield, VA. In addition, a commencement ceremony was held honoring YG98 graduates.

As in years past, this orientation provided new members an opportunity to learn how participation in the CDG Program can help make them more competitive, broaden their perspectives, and increase their professionalism. In addition, it provided members of all year groups the opportunity to hear from colleagues firsthand about their individual experiences in the CDG Program.

The following 20 individuals in YG02 were inaugurated into the 3-year career development program: Janet Ballard, Sam Collier, Mark Cryderman, Barbara Falling, Daniel Featherston, Janet Fletcher, Eric Goodman, Kenneth Hiltunen, Janice Isbell, Thuan Khong, Abraham Kim, Jacquelyn Kowallik, Mark McCoy, Gary McPherson, Marvin Nichols, Ray Sellers, Millie Smith, John Traylor, Robert Voltz, and Roger Yocom. Highlights from the orientation follow.

Opening Remarks

CDG Manager Maria Holmes opened the orientation by congratulating YG02 members. Being a CDG member, she said, is not a right but a privilege. She introduced COL Frank C. Davis III, then ACMO Director and Deputy Director for Acquisition Career Management, for welcoming comments. (Davis is scheduled to retire Jan 31, 2002.) Davis shared some of his perceptions about the program. He said this is an excellent time to enter the CDG Program because during the next 4-5 years, the acquisition workforce will lose a tremendous number of senior managers to attrition. There will be

Developing Leaders For The 21st Century . . .

CDG ORIENTATION HELD FOR YG02

Sandra R. Marks

opportunities for eye-opening training experiences at sites such as the National Training Center, and CDG participants will be able to witness current initiatives such as the Army transformation.

Davis was followed by Larry Israel, Chief, Personnel Management Division at the Army Acquisition Executive Support Agency (AAESA); and LTC Thomas Hogan, Chief, U.S. Total Army Personnel Command's Acquisition Management Branch, for briefings about their agencies. Israel outlined AAESA's mission statement, strategic plan, and organizational structure, and gave insight on what functions the agency performs to assist CDG members. Hogan's focus

was on the kinds of support his agency provides CDG members. He highlighted areas such as career management counseling, board application review and scrub, and Individual Development Plan (IDP) assistance.

Other AAESA personnel gave a presentation on personnel actions, travel, and permanent change of station (PCS) status. Carolyn D. Creamer, Human Relations Specialist in AAESA's Personnel Management Division, addressed issues such as support provided by both the Civilian Personnel Advisory Center and the Civilian Personnel Operations Center, requests for personnel action, timekeeping, locator cards, and



YG02 CDG inductees are shown with COL Frank C. Davis III, who is on the far left, and LTG(P) Paul J. Kern (now with his fourth star), who is on the far right.

awards. Junius Wright, Budget Officer, and Mary Sutton, Budget Analyst, both from AAESA's Resource Management (RM) Division, highlighted the numerous functions that the RM Division performs as the ACMO's business office. They emphasized that the RM Division provides resource support for the CDG Program by advising the ACMO on funding issues and processing all fund certifications for travel orders and training.

Regional Directors' Briefing

New to this year's orientation was a briefing by each of the three regional directors: Sandra Long, Regional Director for the National Capital, Central, and OCONUS regions; Maxine H. Maples, Regional Director for the Southern and Western regions; and Kelly L. Terry, Regional Director for the Northeast and Central regions. Their purpose was to profile key points of contact and summarize ongoing regional programs and initiatives within their customer support offices. In addition, Long, Maples, and Terry emphasized their role and the importance of Acquisition Career Management Advocates to the CDG Program in providing advice and guidance and identifying and approving developmental assignments.

Sharing CDG Experiences

YG01 member David Duda and YG98 graduates Samuel Jones and Amelia Hatchett took the podium to



Larry Israel

share some of their CDG experiences. Duda discussed his Training With Industry assignment with the Aerospace Industries Association (AIA). He outlined AIA's organizational structure and the working relationships established between AIA and other federal agencies, and he discussed some of AIA's ongoing initiatives. Duda concluded with a summary of the assignments he piloted during the 1-year program.

Samuel Jones, Product Manager (PM), Combat Training Instrumentation Systems, highlighted what he views as necessary for selection to a PM position and what the key attributes are for success as a PM. Jones emphasized the need to be flexible when accepting developmental assignments and the need to obtain an advanced degree as key enablers to PM selection. In addition, he sug-



Luncheon speaker Pamela Creek

gested that one maintain a well-developed Acquisition Career Record Brief and not underestimate the value of a Senior Rater Potential Evaluation. Jones credits his success as a PM to being visible and being able to manage funding, connect to the warfighter, document activities, control e-mail, challenge the status quo, reward people, and think positively.

Amelia Hatchett, YG98, discussed her promotion experience and what aided her career advancement. She underscored the importance of staying focused on one's career path. That career path, she added, should include formal training, training to complete your IDP, career training in both your core area and related areas, long-term training opportunities, and developmental assignments. Career advancement, Hatchett said, is a combination of personal, technical, and social expertise, as well as one's skill set. Among the career essentials Hatchett advocates are having the proper attitude, maintaining networks, working well with others, having good work habits, holding high ethical standards, being aware of unwritten rules, having technical competence, involving management, and establishing a good management style and reputation. She urged newcomers to take on the challenge of new assignments and to step out and ask for work.



YG98 CDG graduates are shown with COL Frank C. Davis III, who is on the far left.

Panel Discussion

COL Davis led a group comprised of five YG98 graduates and a current YG01 member in a discussion of current issues relevant to the CDG Program. Panelists were YG01 member David Duda and YG98 graduates Doug Packard, Amelia Hatchett, Samuel Jones, and Kevin Maisel. YG98 graduate Maria Holmes served as moderator. The panel fielded questions from the audience. Topics included what options were available to those experiencing a less-than-fulfilling developmental assignment, sponsors and mentors, Contribution-based Compensation and Appraisal System (CCAS) forms and current guidance on pay pools and awards, and CDG demographic profiling and selection rates. In addition, the panel broached the subject of the newly mandated policy that will require all CDG members, starting with YG03, to apply to a PM Board.

Working Lunch

Pamela Creek, who served as Director of Human Resources for the Defense Logistics Agency before her retirement from federal government service in 2000, presented a briefing titled "The Leadership Journey—The Importance and Value of Leadership in the Public Service." Creek used information she gathered from a number of key individuals in the field of leadership development and interviews with current and retired Senior Executive Service (SES) members to assess leadership and management today. Creek focused on what author and leadership guru Warren Bennis has stated is "the crisis of leadership in our institutions and government today." Creek says we are not adequately developing people to take on leadership positions vacated predominantly by attrition. In these times of "choice, chaos, and change," Creek says we need people of character and capability who can lead change. She proposes several prerequisites to develop leaders: accepting challenging assignments, enduring

hardships, and learning from others. Creek views the CDG Program as a wonderful opportunity to have a full range of experiences that will prepare one for future leadership positions. What someone gains from the CDG Program, Creek says, depends on the individual. She urged CDG members to take full advantage of opportunities presented them.

AcqDemo Project Training

A training session on the DOD Civilian Acquisition Workforce Personnel Demonstration (AcqDemo) Project was conducted to help familiarize YG02 members with its various components. Jerry Lee, a Senior Analyst with Science Applications International Corp. (SAIC), who supports the ACMO relative to implementation of the AcqDemo project, was assisted by three fellow SAIC employees who also support the ACMO implementation of the demo project: Jael Latham, Analyst, also based in the ACMO; and Program Analyst Andy Bacon and Senior Analyst Darryl R. Burgan, both based in the DOD Civilian Acquisition Workforce Personnel Demonstration Project Office. They discussed topics such as transitioning into and converting out of the AcqDemo Project; understanding CCAS, the evaluation system used in the demo project; assessments; and pay pools. Ample time was allotted to answer questions from the YG02 members, many of whom were being exposed to the AcqDemo Project for the first time.

YG02 Induction

"You represent the future of our acquisition career force," guest speaker LTG(P) Paul J. Kern said as he congratulated YG02 members on their induction into the program during a dinner in their honor. (At the time of the orientation, Kern was the Military Deputy to the Assistant Secretary of the Army for Acquisition, Logistics and Technology and Army Acquisition Corps Director. He now has his fourth star and is Command-

ing General, Army Materiel Command.) Kern addressed the challenges that lie ahead in supporting the pace of technology as the Army moves forward in the 21st century. "We have a real need today for all of you," he added. The emergence of new concepts, the uncertainty of how we're going to use the equipment, and creating policies to support this equipment will test the future acquisition workforce, Kern said. Recruiting was another important topic Kern addressed. It will be imperative, Kern said, that we have a group of people capable and prepared for the challenges that lie ahead.

YG98 Graduation

The CDG orientation culminated with Mary Thomas, a former Deputy Director of the ACMO, addressing YG98 graduates at a ceremonious dinner honoring their completion of the 3-year program. The theme was "Facing The Future From Within," and Thomas spoke about having the courage to take risks and face possible failure in our constantly changing and competitive environment. We're not always going to meet expectations, Thomas reminds us, and it's through failure that we learn about our strengths and weaknesses. She added that it is important to take advantage of opportunities that will help us grow and strengthen our skills. Thomas talked about having passion for one's job. If you find something you care about and that makes you happy, Thomas says, it's so much more worthwhile. Even after the CDG Program, Thomas says, taking advantage of opportunities will help you find those things that really help you succeed.

SANDRA R. MARKS, an employee of SAIC, provides contract support to the staff of Army AL&T magazine. She has a B.S. in journalism from the University of Maryland, College Park.

NEW CHALLENGES AND LESSONS LEARNED FROM THE CDG PROGRAM

Beverly Wasniewski

“Congratulations and welcome to the FY01 Competitive Development Group!” Those were the first words I heard at the Competitive Development Group (CDG) Orientation just over 1 year ago as I began this prestigious program. Time flies when you’re having fun, doing so many new things, and learning so much.

I’ve been asked on several occasions what prompted me to apply. Having worked in the contracting field for nearly 18 years, I started catching myself repeatedly saying that although the program and contractor names changed, the problems were the same. During the last several years, the traveling Army roadshows were laying the foundation for a paradigm shift in acquisition, encouraging the pursuit of new and innovative acquisition approaches that leveraged commercial industrial practices from both the technical and business perspectives to get products into the field quicker and more economically. A computer on every desk changed the way we worked. Long-standing policies and procedures were being replaced at lightning speed by new guidelines that encouraged independent thinking and risk taking, and novel solutions were fast replacing the old ways. The time was now ripe, and I aspired to rekindle an

old flame of applying my commercial industry practices to government work; the only question was how to start. When the first Army Acquisition Corps CDG Program announcement came out in 1996, I saw a new opportunity to try different things, to reinvent and re-energize myself, just as the Army was starting its transformation, and so I applied.

My disappointment in not being selected was soon lost in work and I took solace that nearly 750 others suffered the same fate. That first CDG was indeed stellar; as of today nearly 76 percent of that class has been promoted into leadership positions, and it continues to leave its marks on the acquisition community.

I continued to take the Defense Acquisition Workforce Improvement Act (DAWIA)-mandated 80 hours of training to maintain currency in the contracting and acquisition fields, but DAWIA and something inside of me wanted more. The train of acquisition reform was now racing by and I needed to do all I could to grab the caboose and hang on for dear life or be left stranded on the tracks, knapsack on my back, being a “hobo” until retirement. So grab on I did and I applied a second time for the CDG Program. Anyone who has applied recognizes the onerous application

process, but don’t let a little paperwork hold you back. The application process is being simplified, and the program is more user-friendly than ever before.

What was the difference between my first application and my second? In the 4 years between applications, I accepted new contracting assignments with difficult problems. Eventually, some very challenging work with short suspenses and high visibility came my way and I successfully executed them. While office management was “powering down” and “empowering” employees, natural working groups, integrated product and process teams, focus groups, and quality circles started to emerge, with topics often outside the contracting arena. I volunteered for and actively participated in many of these groups as they tackled issues such as personnel evaluation revamping and job descriptions, office environments, acquisition streamlining initiatives, base closures, and major command restructuring. Still desiring to maintain a balance between work and play, I continued my more pleasurable volunteer work with the Civilian Welfare Fund, organizing health fairs, travel programs both in the United States and abroad, and working with our Post Restaurant Committee. I captured all of this on my CDG application. The next big step was to understand the selection process.

Fortunately, the Acquisition Career Management Office (ACMO) offered group and individual review sessions on the CDG application process. I took advantage of these opportunities. The ACMO reviewed my Acquisition Career Record Brief and Individual Development Plan (IDP) and offered career counseling and constructive criticism on presentation style. The CDG application process is similar to the military’s Officer Evaluation Report process. If you have the opportunity, talk to some of your military co-workers to see how their Senior Rater Potential Evaluations are written and how they are evaluated for promotion. You’ll get lots of good pointers on what is

and isn't important and, at the same time, gain more insight on the CDG process. Also talk to other CDG members; they are always ready to share their own experiences and offer some good advice.

"Does the program really meet your goals and expectations?" is another frequently asked question. The CDG Program helped me to define and focus on my goals and then provided the work environments and opportunities to achieve them. I now know what track my locomotive is on, where my transfer stations are, and which station is my final destination. I'm no longer hanging off the caboose; I'm on a career path that puts me in charge of this train.

My developmental rotational assignments were designed to meet my specific goals. I'm fortunate to work at Picatinny Arsenal, NJ, home to the Army Armament Research, Development and Engineering Center (ARDEC) base operations; the Program Executive Office for Ground Combat and Support Systems (PEO, GCSS); Army Tank-automotive and Armaments Command tenet activities; PEO, GCSS and ARDEC program management offices; and many project offices. These offices offer the full spectrum of acquisition and life-cycle experiences. For those concerned about mobility agreements, look for installations with a broad spectrum of offices and develop your IDP around the variety of office locations. You'll thereby gain the experiences while minimizing the chance of family disruption caused by physical relocation. Consider too the advantages of the IDP and the mobility agreement. The CDG Program offers the opportunity to have the government fund moves and training, and to work in locations you've been longing to visit, thought you might want to transfer to, or even considered for eventual retirement. There's lots of work to be done out there, and you may be just the one who can do it!

I'm learning acquisition from the end to the beginning; no, I don't mean beginning to end. I started government service working as an Industrial Specialist for the Defense Logistics Agency in the Defense Contract Administration Services Management Area, Springfield, NJ. I traveled throughout northern New Jersey visiting contractor facilities to ensure that the products they were manufacturing for our servicemen and servicewomen would be delivered on time, in the right quantities, and within the stated price.

Transferring into the contracting arena, I became a Contract Administrator in the same office handling post-award contract issues such as equitable adjustments, delivery schedule revisions, and Defense priority and allocation system issues. When I transferred to Picatinny Arsenal as a Contract Specialist and then Contracting Officer, I wrote the contracts that I previously administered. But pieces of my acquisition puzzle were still missing: requirements generation, funding, logistics, and organizational management. My current developmental rotational assignments were tailored to fill in these missing pieces. I completed my first rotation working with PEO,GCSS in the program management office with assignments dealing with horizontal technology integration, transition policy for ammunition, the industrial base, and recapitalization.

Now in my second rotation, I'm learning the multidisciplinary skills, political sensitivities, international diplomacy, and jack-of-all-trade responsibilities of the Deputy for the Joint Program Manager for the LW155mm Howitzer. One of my newly acquired skills is as publicist, preparing and disseminating the newsletter and daily and weekly reports. I'll shortly rotate into a new assignment within this office, concentrating on my alternate career program in logistics. Once I've completed the CDG Program, I'll have worked in almost all aspects of the acquisition process and will have a

better appreciation for the difficulties each organization encounters along the way to a fielded system.

What are my suggestions for those of you considering the CDG Program as a way to enhance your acquisition career? Seek out new activities and continuously improve yourself. Even new languages and belly dancing can help you gain a better understanding of yourself and stimulate new ideas that can be applied to other daily activities! Embrace the computer environment, and become skillful in a variety of software programs (a challenge still facing me). Take on tasks you've never done before; you may find them enjoyable and they may lead you in different and unexpected directions.

I decided long ago never to be afraid of trying something new or setting my sights on more lofty goals. As I was told by a local travel guide in Maui, HI, when traveling along the famed Road to Hana, "Most people miss the boat," he said. "It's not arriving in Hana that's exciting; it's the journey on the road itself that's the thrill." So too is the CDG Program; graduation is not the ultimate destination but the new experiences and the journey of discovery that is the thrill. This program is molding the future leaders and managers for the transformed Army and you can be a part of it!

BEVERLY WASNIEWSKI, a member of CDG YG01, was an Acquisition Management Specialist working in the Joint Program Management Office for the LW155mm Howitzer when she wrote this article. She has a master's degree in contracts and acquisition management from the Florida Institute of Technology.

NEXT-GENERATION MATERIALS FOR BIOLOGICAL WEAPON DETECTION

Roy Thompson, Dr. Cheng J. Cao, Dr. Kevin P. O'Connell,
Dr. Akbar S. Khan, and Dr. James J. Valdes

Introduction

As evidenced in the Gulf War, U.S. soldiers confronting an adversary owning chemical and biological weapons could face an attack by these weapons. Biological warfare (BW) has a long history, dating back to attempts by the Romans to foul their enemies' water supplies, and represents an important asymmetrical strategic threat to U.S. military forces and civilian populations. Unlike other weapons of mass effect, pathogenic viruses and bacteria and infectious proteins such as prions (the presumed causative factor in mad cow disease) are self-replicating; hence, the effects of many BW agents are amplified by secondary infection. Rapid, sensitive, and accurate detection and identification is therefore a priority in developing sensor technology that will meet the operational requirements of the future Army.

This article describes the Army's application of advanced biotechnology to devise new molecules that recognize BW agents, with an emphasis on how these molecules will provide the means to develop more specific and sensitive sensors to detect BW agents. It also addresses logistics issues such as cost-efficient manufacturing processes and improvements in total process quality assurance/quality control (QA/QC) in the life-cycle management of critical reagents. As used in this article, the term reagent refers to the engineered antibodies that specifically bind with each target BW agent.

Lessons From Nature

The tremendous complexity of most living things, including BW agents, provides a rich supply of unique molecules that can be used as distinctive signatures for an organ-

ism or class of organisms. Some sensors under development use sequences in the genetic code of an organism (the "genome") as the source of these unique signatures. Other sensors, including many that are now fielded, use a kind of recognition between two molecules that is like a lock and key. The most commonly used of these interactions is the attachment of an antibody to its target molecule.

Given the diversity of living things on Earth and the enormous variety of unique molecules that comprise them, scientists have looked to nature for examples of effective biological recognition molecules (BRMs) derived from natural processes. The immune system of mammals is one such example; they can produce between 100 million and 1 billion different antibodies. Antibodies are BRMs, each of which binds to a small molecular shape different from any other. Animals exposed to a foreign microbe (immunized) produce an abundance of antibodies specific for the invading organism.

Antibodies from immunized animals have been isolated and bound to fiber optics, silicon chips, and other nonbiological surfaces to create "biosensors," hybrid devices that detect target molecules by com-

Given the diversity of living things on Earth and the enormous variety of unique molecules that comprise them, scientists have looked to nature for examples of effective biological recognition molecules derived from natural processes.

binding biological molecules such as BRMs with electronic or optical microsensors. The binding of the target molecule to the sensor-bound BRM creates a measurable physical change that registers as a signal in the sensor device, but only if the presence of the target molecule is recognized by its specific binding to the immobilized BRM. Our work focuses on next-generation BRMs—molecules beyond conventional antibodies—and includes both molecules derived from biotic (natural biological) and biomimetic (synthetic that mimic biological molecules) approaches.

Current Solutions

It is important to stress that BRMs (in this case, antibodies) are at the heart of all currently fielded BW agent detection systems; without the antibodies, there is no BW agent detection. Two technologies are used to produce antibodies for biological defense. The “polyclonal” method produces a mixture of antibodies that is harvested from the blood serum of animals repeatedly injected (immunized) with a “disarmed” BW agent. The “monoclonal” method produces individual antibodies, each produced by cells in culture flasks.

The Joint Program Office for Biological Defense (JPO-BD), through its Critical Reagent Program, is the agency responsible for acquiring antibodies that recognize BW agents, ensuring their quality, and providing them to the vendors that produce biosensors. In this way, the JPO-BD supports several sensor platforms that incorporate antibody-based biosensors, including the Joint Biological Integrated Detection System, the Joint Biological Point Detection System, and Portal Shield. This work also ensures that the required quantity and quality of antibodies are available to meet fielding requirements and support continued research, development, test, and evaluation efforts.

The U.S. Army Soldier and Biological Chemical Command’s Edgewood Chemical Biological Center (ECBC), Aberdeen Proving Ground, MD, is the home of JPO-BD’s Critical Reagent Repository (CRR) for antibodies. The CRR includes sophisticated storage facilities and validation labs and maintains a highly detailed tracking database of all antibodies being used in DOD biological defense efforts. ECBC staff scientists, in addition to maintaining the repository, are developing new BRMs and new applications to supplement and possibly replace currently fielded reagents.

Recombinant Antibodies

There is considerable lot-to-lot variability in the current production of antibodies. This is especially true for polyclonal antibodies because the individual response of each animal to an agent can vary dramatically. The process of producing antibodies in animals or in a mammalian cell culture is also time-consuming, which limits the capacity for “just-in-time” or surge production in time of conflict.

A recent advance in antibody production technology is the cloning of antibody genes from mammalian cells in large quantities, or “libraries” of genes. These genes have been introduced into bacteria, and the resulting population of bacteria can be rapidly sorted to obtain those making antibodies that have the desired qualities of specificity for a BW target and sensitivity for its detection. This technology has been proven capable of producing antibodies for BW agent detection that are of excellent quality and greater uniformity from lot to lot; therefore, their inclusion in fielded bioassays will result in greater reliability. Recombinant antibodies are also faster and less expensive to produce and acquire in quantity; therefore, establishing a process for their production can improve the maintain-

ability and supportability of fielded biodetection systems. A number of these valuable reagents are currently under development at ECBC, and we have begun to explore this technology for eventual sourcing of several defense-critical antibodies for biodetection.

Recombinant Peptides

Whole antibodies are relatively large, as molecules go. However, that portion of the antibody that actually interacts with the target is relatively small—perhaps 1 percent of the antibody actually contacts the target molecule. Most of the rest interacts with the animal’s immune system, a function that is not required for use in detecting a BW agent. Portions of the antibody that specifically bind the target are at the ends of the two “arms” of the molecule, and their smallness has prompted scientists to ask, “Can only those short pieces of antibody protein, or *peptides*, substitute as BRMs for the whole antibody?”

Just as libraries of antibody genes have been cloned and sorted, recombinant genetic technologies have enabled scientists to create and sort collections of genes that encode short proteins, or peptides, finding those that bind to a molecule of interest. A library composed of tens of millions of random peptide sequences can be rapidly screened against a specific threat agent to identify a peptide that mimics the activity of a whole antibody. Also, like the recombinant antibodies, peptides can be made in bacterial cells and be harvested from fermentations, or they can be produced in large quantities entirely by chemical synthesis. These peptide libraries are called “combinatorial” because of the randomness of the peptide-encoding genes.

An additional advantage of screening for peptide mimics is that the search is not limited to immunogenic binding sites. Recombinant

antibodies are often made using genes cloned from animals. Animals will not make antibodies effectively against some molecules, partly as a protection against attacking their own bodies. Peptides, however, can be selected for binding to other molecular features of the threat agent that do not elicit an immunogenic response, thus allowing for a potentially greater diversity of BRMs to be discovered.

Improved Logistics

The search for recombinant antibodies and peptides that mimic whole antibodies offers several technical and logistic advantages in production and QA/QC issues compared to conventional methods of production in animals and mammalian cell culture. First, the combinatorial libraries, once formed, can be rapidly screened and candidate molecules selected for further test and development within 1 to 2 weeks of the start. Conventional antibody development, as noted previously, is much more time-consuming. Second, the libraries present an efficient means for rapidly identifying reagents that recognize emerging threat agents for which no current antibody exists, or for live pathogens that are too lethal to effectively use animal inoculations. Third, recombinant antibodies and peptides are smaller than whole antibodies and therefore more stable outside controlled environments. Smaller molecules afford greater control in orienting and immobilizing the molecules on a sensor platform (e.g., microchips) with greater assurance that the active binding site is fully exposed to sample media. Fourth, once an antibody fragment or peptide has been identified with strong binding properties, the molecule can be further engineered by directed mutation or specific amino acid substitution to "fine tune" its specificity or affinity for the target agents. Finally, recombinant antibod-

ies and peptides can be produced in large quantities within rigidly controlled manufacturing processes that yield cost savings from economies of scale while achieving higher levels of QA/QC between different production lots.

The Army's Role

ECBC's Process Engineering Facility (PEF) is DOD's sole scale-up PEF dedicated to the research, development, and validation of manufacturing processes for producing biological materials. The PEF staff emphasizes cooperation between basic molecular biology research scientists and the bioprocess engineers responsible for production and purification of antibodies and other products. The molecular biology laboratory in which recombinant antibodies and peptides are cloned is the same building in which they are produced, tested to meet QA/QC requirements, and stored in the CRR, thus ensuring a continuous transition of basic research and development (R&D) into advanced development and final production. Thus, DOD benefits by having the logistic advantage of housing a repository of BW detection materials within a facility with strong R&D and end-stage production capabilities.

Conclusion

Molecular engineering of recombinant antibodies and peptides provides unique opportunities for improving the production of current reagents, developing new reagents, and reducing the life-cycle costs associated with reagent production and continuous process improvements. Life-cycle management of critical reagents used to detect and identify biological agents extends from the support of basic R&D of new or better reagents; to the scale-up production, testing, and validation of the reagents in field trials; to sustained production of quality

reagents to the tri-Service user community.

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Introduction

Since 1975, the Assistant Secretary of the Army for Acquisition, Logistics and Technology (ASAALT) (formerly the ASA for Research, Development and Acquisition) has presented annual Research and Development Organization (RDO) of the Year Awards to Army organizations in recognition of outstanding technical and managerial programs implemented during the preceding fiscal year. Specifically, RDO awards recognize the best research and development (R&D) programs and best-managed organizations that enhance the capability and readiness of Army operational forces and the national defense and welfare of the United States.

RDO laboratories play a key role in executing the Army vision and the Army Transformation Campaign Plan (TCP). The Army TCP will result in an Objective Force that is strategically responsive and capable of dominating at every point on the spectrum of operations. The objective of the TCP is an Army that is responsive, deployable, agile, versatile, lethal, survivable, and sustainable. The Army labs have stepped forward to meet the Army transformation objectives and operational challenges.

The Objective Force will capitalize on advances in science and technology (S&T) that will enable the operational force to be equipped with significantly advanced systems such as the Future Combat Systems (FCS), thus allowing greater responsiveness with overmatching combat power. The labs' technical programs are obviously very important to the readiness of the Army and to the safety and capabilities of the soldier. Army labs are challenged to remain on the cutting edge of S&T and to innovate in both the management and technical arenas to support the Army transformation. The Army's R&D organizations will continue to provide the Army the technical advantage in support of our non-negotiable contract with the American people—fighting and winning our Nation's wars, when called.

Awards Ceremony

At an awards ceremony at the Pentagon Oct. 4, 2001, LTG Paul J. Kern,

ARMY CITES OUTSTANDING R&D ORGANIZATIONS

Joseph E. Flesch

then Military Deputy to the ASAALT (now with his fourth star and Commanding General, U.S. Army Materiel Command), on behalf of then Acting ASAALT Dr. Kenneth J. Oscar, presented the annual awards to selected R&D organizations for FY00 achievements. The labs that were honored demonstrated a commitment to excellence both in their technical programs and in the management of their organizations.

The 2001 RDO Award recipients were selected by an evaluation committee chaired by Dr. Walter F. Morrison, Director for Research and Laboratory Management, Office of the ASAALT, and composed of highly qualified members from the Army and DOD S&T communities. The committee evaluated both written nominations from each organization's major command and verbal presentations from each organization's director. Organization rankings were based on accomplishments and impacts; organizational vision, strategy, and plans; resource management; and continuous improvement.

Based on the review of accomplishments, the evaluation committee selected two 2001 RDO of the Year Award recipients, one in the Large Laboratory Category (600 employees or more) and one in the Small Laboratory Category (less than 600 employees).

Additionally, the evaluation committee selected two organizations (one large and one small) for Army 2001 RDO Excellence Awards in recognition of FY00 research accomplishments.

Large Lab RDO Of The Year

The winner of the 2001 RDO of the Year Award in the Large Laboratory Category was the U.S. Army Aviation and Missile Research, Development and Engineering Center (AMRDEC), Redstone Arsenal, AL.

AMRDEC's mission is to provide technical services to a variety of customers and to conduct scientific R&D in the disciplines that support their customers. AMRDEC's personnel are among the world's premier aviation and missile technologists. AMRDEC has repeatedly proven its abilities by demonstrating affordable solutions to overcome critical technical barriers in customer programs.

During FY00, AMRDEC focused on enhancing the capabilities of the U.S. Army to make the pre-eminent warfighting force in the world even more lethal, survivable, flexible, deployable, and affordable while reducing its logistical footprint. AMRDEC had many outstanding accomplishments during the year. Most noteworthy was development of the Counter Active Protection System (CAPS), which defeats threat armor equipped with active protection systems. The application of CAPS technology restores the lethality of the U.S. antiarmor inventory and saves billions of dollars.

AMRDEC was also recognized for its outstanding milestone in achieving the Carnegie Mellon University Software Engineering Institute "Capability Maturity Level 4" certification for software engineering processes. AMRDEC is the only Army organization to achieve a Capability Maturity Level 4 certification and is one of only five government organizations to reach this level. This achievement will help ensure reliable and robust software for the soldier, produced in less time and at lower cost.

Also noteworthy was AMRDEC's S&T Personnel Demonstration, which has proven successful in recruiting, retention, and career development of the workforce. In addition, the S&T Personnel Demo resulted in reduced grievances and accelerated action approvals and decisions.

Small Lab RDO Of The Year

The recipient of the 2001 RDO of the Year Award in the Small Laboratory Category was the U.S. Army Natick Soldier Systems Center, Natick, MA.

The center's mission is to conduct research, development, testing, and evaluation to maximize the soldier's

survivability, sustainability, mobility, combat effectiveness, and quality of life by treating the soldier as a system. By applying cutting-edge technology, state-of-the-art equipment and facilities, partnerships with the private sector (industry and academia), and a disciplined and inclusive customer focus, the center made significant advances in developing individual-warrior-related technologies and warrior systems. The center's 28 patents and invention disclosures in FY00 indicate that center personnel are innovative and focused on technology that is both revolutionary and relevant to the military.

Among the center's notable FY00 accomplishments was the Military Operations on Urbanized Terrain (MOUT) Advanced Concept Technology Demonstration (ACTD). This project evaluates advanced technologies to provide operational dominance in MOUT to Army and U.S. Marine Corps forces. It also integrates technology; training; and tactics, techniques, and procedures, and has produced operational capabilities used by Army and Marine Corps units.

The center was judged outstanding for the implementation of its 5-year human resources (HR) strategic plan dealing with manpower assessment, hiring, training and skills, retention, and improved HR processes. The center aggressively pursues outreach programs as part of its overall workforce recruitment strategy. This includes partnerships with Historically Black Colleges and Universities (HBCUs), recruiting promising candidates under the DA Career Related Experience in Science and Technology Program scholarship, and advertising scientific and engineering opportunities at the center.

During FY00, the center also transitioned an impressive number of high-payoff technologies and products to multiple customers. These include the MOUT ACTD, Interceptor Body Armor and Small Arms Protective Insert, Near-Infrared Modifier Technology, and the Interagency Emergency Communications System.



Army RDO Award ceremony attendees shown left to right are Dr. James Houston, Director, ERDC; Dr. Walter F. Morrison, Director for Research and Laboratory Management, Office of the ASAALT; Philip Brandler, Director, Natick Soldier Systems Center; Dr. William C. McCorkle, Director, AMRDEC; LTG Paul J. Kern, then Military Deputy to the ASAALT (now with his fourth star and Commanding General, U.S. Army Materiel Command); and Dr. Edgar Johnson, Director, ARI.

Large Lab Excellence

The recipient of the 2001 RDO Award for Excellence in the Large Laboratory Category was the U.S. Army Corps of Engineers Engineer R&D Center (ERDC), Waterways Experiment Station, Vicksburg, MS.

ERDC is one of the most diverse engineering and scientific research organizations in the world, combining all Corps of Engineers R&D operations into one organization. ERDC provides quality R&D solutions to the Army and to the Nation. Research at ERDC results in products related to mapping and terrain analysis; infrastructure design, construction, operations, and maintenance; structural engineering; cold regions and ice engineering; and coastal and hydraulics engineering.

ERDC's major FY00 accomplishments included excellence in modeling vehicle-specific seismic signatures. This project resulted in development of state-of-the-art physics models for vehicle/ground interaction and 3-D seismic propagation that enable ground sensors to identify and target vehicles. This breakthrough technology directly supports futuristic tactical sensor systems including the Raptor Intelligent Combat Outpost, antipersonnel landmine alternatives, and advanced sensor networks envisioned for the FCS and Objective Force. ERDC was also recognized for technical excellence for its tele-engineering concept that provides deployed engineers rapid access to subject matter experts, knowledge databases, and private-sector and academic

expertise. ERDC was also cited for its excellent outreach programs, especially with HBCUs.

Small Lab Excellence

The recipient of the 2001 RDO Award for Excellence in the Small Laboratory Category was the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI), Alexandria, VA.

ARI's mission is to maximize individual and unit performance and readiness to meet the full range of worldwide Army requirements through advances in the behavioral and social sciences. ARI is the primary

human laboratory that investigates the human dimension of warfighting.

ARI's technical accomplishments included development and implementation of the innovative Think Like a Commander training. Think Like a Commander is a Command and General Staff College (CGSC) effort designed to improve battlefield thinking skills through deliberate practice of expert patterns of thought in a variety of conflict situations. This training was a coordinated development effort with the U.S. Army Training and Doctrine Command (TRADOC) and CGSC. This represents a shift from procedural training to cognitive skill development. ARI adapted the learning theory of Think Like a Commander for use in other TRADOC schools and developed a leader's guide on how to implement this type of training. These activities directly support the Army's transformation to the FCS and Objective Force.

ARI was also recognized for its excellent exploitation of information-age technology and the World Wide Web to enhance access to ARI's products and ongoing research, and for providing quick and innovative methods for interactive data collection.

JOSEPH E. FLESCH is a Principal Project Analyst with GRC International, an AT&T company. He wrote this article while on a contract assignment in the Office of the Deputy Assistant Secretary of the Army for Research and Technology, Office of the ASAALT.

Introduction

As the Army enters the 21st century, life-cycle management becomes increasingly valuable in guiding the materiel acquisition process. In a memorandum signed by the Army Acquisition Executive (AAE) on March 20, 2000, senior Army leaders were reminded that, "The focus of life cycle management is to develop, field and sustain high quality warfighting systems at the lowest total cost." Many factors contribute to this daunting task, particularly because most of the decisions involve multiple variables simultaneously.

Fortunately, the logistics analysis community has many tools and techniques that help acquisition managers address the task of lowering total cost. By using the tools described below early in the development cycle, acquisition managers can decide—based on the impact on total cost—whether a system component should be repaired or replaced and whether organic or contractor support should be employed for maintenance or supply.

Acquisition managers can field systems with spares packages that achieve a required readiness rate at the lowest possible cost. They can identify the true cost drivers of fielded systems to determine which ones provide the highest expected total cost reduction if they are reduced or eliminated. The tools and techniques to address the AAE's goals are not new; most have been available for years. However, they need to be applied, and the following four situations are examples of where these logistical tools can be used.

Situation No. 1

A system with 175 line replaceable units (LRUs) and 400 shop replaceable units (SRUs) is being developed. A total of 900 end items that will operate 2,000 hours per year and have a reliability of 1,200 hours mean-time-between-failure will be fielded. To respond to the AAE's

LOGISTICS ANALYSIS: A KEY TO LIFE-CYCLE MANAGEMENT

Dick McGauley

goals, which LRUs and SRUs should be repaired and which should be discarded upon failure? Which should be repaired by the contractor? These issues have significant impact on total cost.

A decision to minimize total cost must be made, but that decision depends on the cost of each LRU and SRU. In addition, managers must consider the cost of developing, procuring, and maintaining test equipment for any LRU or SRU that will be repaired. Other cost-related factors include the time required to return a failed component to the repair site as well as the time necessary to make the repair.

The task of minimizing total cost can be impossible unless a model such as the Computerized Optimization Model for Predicting and Analyzing Support Structures (COMPASS) is used. This model can provide the maintenance concept that minimizes total cost by considering in combination the cost of the LRUs/SRUs, the number of maintainers and their location, the spares required at each location, the customer wait time, the cost of test equipment, the cost of alternative repair options such as contractor repair, and many other factors. This

model also allows for conducting sensitivities in these areas, providing more insight to the developer. Gathering good data to run this model can be a time-consuming effort, but the result can meet the AAE's goals and create significant cost savings.

Situation No. 2

The same system will be fielded using the maintenance concept developed from COMPASS. Assuming a 90-percent Operational Availability (Ao) goal for the system, which LRUs and SRUs should be stocked to minimize total cost? How many of each should be stocked? Managers must consider how often LRUs or SRUs will fail and how long it will take to repair and return them to stock.

Other options include direct vendor delivery or premium service delivery of repaired components. One factor that may have an impact here involves the good components that are removed and sent on for unnecessary repair, usually referred to as the No-Evidence-of-Failure (NEOF) rate. But the Selected Essential-Item Stock for Availability Method (SESAME) model can be used to identify the mix of spares that provide the required readiness at

the least total cost. This model considers these and other factors in combination to minimize the total cost. SESAME is also useful in identifying the incremental cost of achieving a particular Ao goal.

A graph of cost versus Ao was generated for an Army program as provisioning was being determined, using SESAME. That graph showed that the cost of achieving a 93-percent Ao was less than \$50,000, whereas the cost of achieving the required 97-percent Ao escalated to more than \$200,000. That was an excellent example of where cost as an independent variable (CAIV) analysis could be conducted by both the combat and materiel developers to determine how much, in an effort to balance minimizing total cost with the performance required by the warfighter, a 4-point increase in Ao is worth to the Army.

Is SESAME being used by acquisition managers to help minimize total cost? Although SESAME is required by AR 700-18, *Provisioning of U.S. Army Equipment*, to be used for initial provisioning, a 1998 Army Audit Agency Report showed only 7 of the 35 systems studied used SESAME to compute the initial spares packages. The project managers for the remaining 28 systems may have expended more funds than necessary to provision their systems.

Situation No. 3

Several LRUs of a fielded system have high NEOF rates. Which LRUs should be targeted for reduction or elimination of that rate? Should the most expensive LRU or the one with the highest rate be targeted? In addition to cost and frequency, the following factors should be considered: the number of fielded systems and their yearly usage, the customer wait time, transportation costs, remaining years of useful life, the cost of developing and maintaining a screening capability, and the number of maintenance locations where screening can take place.

These data are available in various Army databases. Only when factors are accounted for in combination can acquisition managers decide which LRU is the best candidate for NEOF rate reduction or elimination. The candidate may be the one with the lower rate or one with the lowest unit cost. A spreadsheet analysis can help focus the decision on the correct LRU. This analysis identifies the costs of eliminating the NEOF and the savings achieved. A wrong decision can actually result in a higher total cost.

Situation No. 4

For developmental systems that replace fielded systems, acquisition managers must focus on those components that drive total cost for the replaced system. This evaluation cannot be performed by merely identifying the components with the highest replacement costs and then eliminating or improving those components. All factors driving operations and support component costs must be evaluated, including associated costs to repair, store, and ship. For fielded systems, this type of analysis can provide significant opportunities for reducing total costs.

Acquisition managers can use a variety of Army databases to get a history of supply and maintenance activities for all the components of the fielded system. The components can be separated according to whether they are unique or common, and repairable or consumable. Data on credits given to the field for both serviceable and unserviceable returns can be factored into the component's total cost. This information can then be used to generate an initial list of ranked cost drivers.

For each component on the list, an assessment can be made as to how reliability can be improved, the cost of that improvement, and the savings from reductions in maintenance, spares, supply pipeline, and other costs. Acquisition managers

can then determine the net cost savings for a reliability improvement, re-rank the original list according to this net savings, and optimize the total cost reduction program.

Logistics analysis can also reduce total cost by helping to determine whether components already in "long supply" are being repaired or whether consumable components are being repaired instead of being discarded. Logistical analysis can also be used to determine whether components are being repaired for a higher cost than if they were simply requisitioned.

Conclusion

These four examples show that logistical analysis can help acquisition managers reduce total costs. In some cases, the analysis requires models such as COMPASS or SESAME. In other cases, spreadsheet analyses and data obtained from various Army databases can help acquisition managers identify courses of action to efficiently reduce total cost.

Logistics analysis is a crucial capability that all acquisition managers must take advantage of to meet the AAE's stated goals. The good news is that tools and techniques are available now.

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HQDA REORGANIZATION IMPACTS OASAALT OPERATIONS

COL Richard P. De Fatta

*"Change is the law of life
and those who look
only to the past or present
are certain to miss the future."*

—John F. Kennedy

Introduction

Ongoing comprehensive organizational and process changes in the Department of the Army (DA) have significantly affected operations in the Office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology (OASAALT). Secretary of the Army Thomas E. White's realignment initiatives seek to streamline HQDA by increasing efficiency without sacrificing operational effectiveness. The realignment affects the OASAALT in three areas: through closer integration with other DA staff elements; through changes in OASAALT's composition, functions, and staff; and through the reorganization of direct-reporting program executive offices (PEOs) and their subordinate program, project, and product managers (PMs).

DA Staff Realignment

A more unified approach to staff operations results from the Army Secretariat and Army Staff realignment within functional areas. The assistant secretaries of the Army are aligned with deputy chiefs of staff to provide advice and assistance within their functional areas, and realign-

ment effectively integrates the critical functions of both staff elements and eliminates redundancies.

The ASAALT retains a military deputy for acquisition. Of special significance under the HQDA realignment is that integrated logistics support (ILS), or "acquisition logistics" functions, transfer from the Office of the Deputy Chief of Staff for Logistics (ODCSLOG) (G-4) to the ASAALT staff. The DCSLOG provides ILS and sustainment advice and assistance to the ASAALT. Much of the ASAALT staff, functional, and physical reorganization reflects and enhances the integration of logistics and sustainment into the weapon system development process.

OASAALT Staff Changes

The ASAALT gains a Principal Deputy Assistant Secretary of the Army (PDASA) for enhanced staff oversight and functional continuity, and the Army Science Board continues under ASAALT's purview. In addition to duties as senior military assistant to the ASAALT, the ASAALT Chief of Staff oversees consolidated administrative functions of both the current ASAALT and the DCSLOG.

The staff is further being realigned along more direct functional lines. The only staff element that remains intact is the Office of the Deputy Assistant Secretary of the Army (ODASA) for Research and Technology. Newly realigned elements are the ODASA for Plans, Programs, and Resources (ODASAPP&R) and the ODASA for Policy and Procurement (ODASAP&P). Another new staff element, the ODASA for Defense Exports and Cooperation (ODASADE&C), was transferred intact from an abolished DA staff element, the Office of the Deputy Under Secretary of the Army for International Affairs (Security Cooperation). The Office of the Deputy for Systems Management and Horizontal Technology Integration (HTI) (henceforth in this article referred to as Deputy for Systems) is reorganized to reflect alignment with the Office of the Deputy Chief of Staff for Programs (ODCSPRO) (G8) and the Office of the Deputy Chief of Staff for Operations (G3), and is joined on the staff by the newly established Office of the Deputy for ILS with a similar functional alignment.

Plans, Programs, And Resources

The new ODASAPP&R streamlines oversight and control of the directorate that supports the ASAALT by working closely with the Army DCSPRO-Force Development and the Assistant Secretary of the Army (Financial Management and Comptroller) to plan, program, budget, and execute Army research, development, and acquisition efforts. The ODASAPP&R also leads the planning, programming, and execution of the Army's research, development, test and evaluation (RDT&E) and procurement appropriations totaling more than \$17 billion annually. The DASAPP&R retains responsibility to co-chair the Equipping Program Evaluation Group that directs the Army's long-term RDT&E and acquisition strategy. The ODASAPP&R also retains the Army Cost Reduction Programs Directorate to coordinate Cost Reduction Program initiatives Armywide.

The office for acquisition reporting will also fall under the purview of the ODASAPP&R. This office provides synergistic management oversight and technical advice relative to the execution, review, analysis, and reporting of the Army's major acquisition programs. It also serves as the lead for the quarterly Defense Acquisition Executive Summary review process for Acquisition Category I programs and the Consolidated Acquisition Reporting System, and it provides the Executive Secretary for the Acquisition Review Council.

Policy And Procurement

The new ODASAP&P will be the key ASAALT organization element for total life-cycle acquisition and procurement policy and initiatives. It will also support all activities interfacing with Congress and the Office of the Secretary of Defense on contracting and acquisition policy issues

and represent the Army on various Defense integrated product teams.

The DASAP&P develops and coordinates Army input into DoD 5000-series regulations, directives, and implementation instructions. The DASAP&P also oversees the Army's investment strategy (Supply Management Army-Operational Support Cost Reduction and Total Ownership Cost Reduction) and is the focal point for the Investment Cycle Model for Planning, Integrating, Acquiring, and Resourcing Investment Strategies. Consolidation of Army acquisition and acquisition reform policy efforts greatly enhances support of the goal to reduce overhead costs and accelerate weapon systems acquisition cycles. In addition, this consolidation more closely ties together acquisition policy, contracting policy, and acquisition reforms to unify and accelerate the decisionmaking process and streamline the flow of information. It also provides a single focal point for addressing the broad policy and innovations of the life-cycle objectives of Army systems.

The ODASAP&P develops and promulgates contracting policy and procedures. As such, it is the office primarily responsible for all matters related to the Federal Acquisition Regulation and its implementation. The DASAP&P also chairs the Army Contract Adjustment Board and is the focal point for industrial base issues such as production and base support investments, underused plant capacity, and arsenal and ammunition plant issues.

Defense Exports And Coordination

The ODASADE&C has policy oversight for the Army's worldwide foreign military sales, armaments cooperation, foreign disclosure, technology transfer, and direct commercial sales activity, including munitions case processing. This realign-

ment enhances both the Army's international defense sales and international cooperative research and development processes by more effectively harmonizing the activities of the acquisition PEOs, the Science and Technology Executive, and the Army's international engagement and cooperation efforts.

Deputy For Systems

The Deputy for Systems reorganization streamlines internal operations and improves functional alignment with the DCSPRO (G8) and a newly reorganized PEO/PM structure. The new organization minimizes the amount of cross-directorate coordination frequently necessary today. The Deputy for Systems reorganization includes six hardware divisions (Maneuver Systems; Aviation and Intelligence, Electronic Warfare and Sensors Systems; Munition Systems; Combat Support Systems; Force Protection Systems; and Command, Control, Communications, and Computers (C4) Systems) and an Integration Division. Each of the hardware divisions has DA systems coordinators (DASCs) responsible for all acquisition-related actions for their respective systems. The Integration Division coordinates across divisions and performs HTI functions. The Deputy for Systems absorbs systems acquisition functions from the Director of Information Systems for Command, Control, Communications, and Computers (DISC4)/Chief Information Officer (CIO) (C4 Division) and from the Army Materiel Command (AMC) Combat Support Systems Division. The directorate also assumes management oversight for the Army's chemical and biological defense acquisition programs.

C4 Staff Integration

Other new developments include the transfer of DISC4/CIO oversight responsibilities for their PEOs/PMs

to the ASAALT, and establishment of a new C4 Division under the Deputy for Systems and a CIO support cell. The C4 Division consists of two subordinate branches providing DASC functions for the oversight and program tracking for PEO, Command, Control and Communications-Tactical and Enterprise Infostructure, respectively.

Although direct oversight of DISC4/CIO PEOs/PMs is transferred from the DISC4/CIO, the Army CIO retains oversight for all C4/information technology (IT) systems (as defined by the Clinger-Cohen Act of 1996) and serves as the principal advisor to the Secretary of the Army and the ASAALT on all information systems. The Army CIO develops, maintains, and facilitates the implementation of sound and integrated C4/IT systems architectures, and monitors and evaluates the performance of information system programs. The Deputy for Systems is augmented with a CIO support cell to accomplish these CIO responsibilities across all information systems and also provides the coordinating staff between the Army CIO and the ASAALT. The cell's mission includes conducting CIO assessments; preparing CIO certification packages; preparing command, control, communications, computers and intelligence support plans; and coordinating with the Assistant Secretary Of Defense for Command, Control, Communications and Intelligence on matters related to the acquisition of national security systems and IT systems.

Army Contracting Agency

A field operating agency has been established to consolidate and provide oversight for Army contracting activities. The U.S. Army Contracting Agency will assume central control of regional installation, contingency contracting, and standardization and oversight for specialty

contracting offices. Development of the final construct continues, but the current concept calls for two contracting regions in CONUS—an Eastern Region and a Western Region. These regions will focus on regional utilities, A-76 contracting, and services contracting. There will also be a commercial contracting center and an IT contracting activity. Each installation will have a contracting office. The size of this office will depend on the installation's unique requirements for items such as one-of-a-kind buys, safety, and emergency procurement. This concept accelerates the Army toward efficiencies by eliminating redundancy, and it focuses scarce resources on core competencies and standardized processes.

Acquisition Support Center

The former Acquisition Career Management Office (ACMO) and Army Acquisition Executive Support Agency (AAESA) are being consolidated to form the Acquisition Support Center (ASC). This reorganization combines related functions under a single management structure. The ASC will be the acquisition, contracting, and logistics personnel proponent. In addition, the ASC will manage military and civilian professional development programs. The ASC will also perform the myriad of tasks previously assigned to the Director for Acquisition Career Management in addition to personnel policy, acquisition force structure and position management, and matrix management support for the PEOs.

PEO/PM Reorganization

The ASAALT realigned the PEO/PM structure along commodity lines to effectively provide a single life-cycle manager for all Army systems. AMC deputies for systems acquisition were abolished, and all of their assigned acquisition program

offices now report, either directly or through a PEO, to the ASAALT/Army Acquisition Executive. Further, the PEOs that formerly reported directly to the DISC4 no longer do so. In addition to numerous PEO/PM realignments, two new PEOs (PEO, Soldier as a System and PEO, Ammunition) were chartered to align and consolidate programs and management functions for critical Army commodities. Each PEO will establish a GS-16 level deputy for science and technology (S&T). This position is specifically aimed at assisting in the management of S&T initiatives and improving the transition of basic technology into Army systems.

Timeline

No organization makes sweeping changes in haste, and ASAALT is no exception. For example, the PEO/PM reorganization was effective on an operational control basis Oct. 26, 2001. This change and the remainder of the realignment entails meticulous planning, and transition details are numerous. All changes require allocation of sufficient execution time without negatively impacting the OASAALT's most important resource, its professional and dedicated workforce. The OASAALT is dedicated to executing the reorganization in the most expeditious manner and with the least impact to mission and personnel.

COL RICHARD P. DE FATTA is the Chief of Staff to the Assistant Secretary of the Army for Acquisition, Logistics and Technology. He has a B.S. in engineering from the U.S. Military Academy, an M.S. in systems management from the Florida Institute of Technology, and an M.S. in laser physics from the Air Force Institute of Technology.

OPERATION EXTENDED VISION

LTC Camille M. Nichols, MAJ Dana Goulette, and MAJ Mac Haszard

Introduction

Most acquisition programs undergo two design iterations: Engineering Manufacturing and Development (EMD) and Low-Rate Initial Production (LRIP). EMD addresses difficult technical issues and the manufacturing approach prior to the production phase. LRIP is often used to test the final design in developmental and operational tests and construct the manufacturing facilities and procedures prior to committing to full-rate production. Prototypes developed during EMD are often only used during EMD because they rarely become the final design and are not usually fielded.

Prototypes are usually rough, limited reliability models and are often of little value as the program progresses. However, innovation and acquisition streamlining sometimes create an opportunity to have a single program design phase; hence, EMD design is the final design and the EMD prototypes may become highly useful. This is the case with the Long Range Advanced Scout Surveillance System (LRAS3).

The LRAS3 Program resulted in 13 EMD assets for system and software development, developmental and environmental testing, and initial operational test and evaluation. Because the acquisition strategy did not include an LRIP phase and was fiscally constrained, eight of the EMD prototypes were refurbished and fielded as training base assets at the U.S. Army Armor Center (USAARMC). This was necessary to meet the Army's procurement objective of 638 systems. However, one of those magical acquisition rarities occurred: the program's production phase came in under budget because of commercial and military off-the-shelf practices, a

competitive multiyear contract, and an aggressive risk-management plan. This allowed the product office to fund all 638 systems without having to refurbish and field the EMD systems. These eight EMD assets became program office assets used for demonstrations, follow-on testing, and design and testing of preplanned product improvements.

Events in June 2000, however, caused the LRAS3 team to embark on a different development path. An incredible opportunity for these systems arose when the Commanding General of the 1st Armored Division requested assistance in filling a critical shortfall in Task Force (TF) Falcon's Brigade Reconnaissance Troop's (BRT's) long-range night-vision capability in Kosovo. The shortfall arose when a Canadian Army sensor system was redeployed to Canada. In September 2000, the Office of the Deputy Chief of Staff for Operations approved the urgent need to field three EMD LRAS3s prototypes to Kosovo in support of TF Falcon. The following paragraphs describe how these leftover models became critical operational "diamonds in the rough" and details the process to loan prototypes in Operation Extended Vision.

LRAS3

The LRAS3 consists of a second generation forward looking infrared (FLIR) with long-range optics, an eye-safe laser rangefinder, a day video camera, and a Global Positioning System (GPS) with attitude determination. The LRAS3 allows scouts to detect long-range targets and determine the 10-digit grid coordinate of any target within range. The LRAS3 will be fielded to all mechanized infantry and armor battalion scout platoons, BRTs, and Interim Brigade

Combat Team (IBCT) reconnaissance squadrons. The system can operate in the dismounted configuration or can be mounted on the M1025 Scout High Mobility Multipurpose Wheeled Vehicle (HMMWV) or Interim Armored Vehicle. The LRAS3 Program is currently in its first production year with a goal of 60 systems.

Challenges

The biggest challenge was time. In 4 weeks, the team had to obtain an urgent-need materiel release, design and manufacture a new vehicle integration kit, update the training support package, and ship the LRAS3s overseas.

TF Falcon's BRT is equipped with the M1114 (Up-Armor) HMMWV. The current vehicle integration kit is designed for the M1025 HMMWV and is incompatible with the M1114. The prime contractor and the U.S. Army Communications-Electronics Command's (CECOM's) Night Vision and Electronic Sensors Directorate designed, developed, and hand-built three new integration kits over a 3-week period. This work was monitored by the Product Manager (PM), FLIR and the Project Manager, Light Tactical Vehicles to ensure that the installation of the integration kit provided a safe operational environment for the scout and did not degrade the ballistic characteristics of the M1114.

Because the LRAS3 contains trace amounts of compressed helium and compressed methane, the system is considered hazardous material (HAZMAT). Although HAZMAT has clearly defined standards, proper paperwork procedures could not be agreed upon. Bureaucracy was at its finest as the paperwork was routinely rejected based on who happened to be reviewing it. Frustration was high

and time was running out on being able to ship the assets before the Kosovo elections.

Training

Upon arrival in Kosovo, three noncommissioned officers from USAARMC conducted the 5-day new equipment training (NET). Instruction involved hands-on small group instruction with a 5-to-1 student to teacher ratio. Training topics included preventive maintenance checks and services, sight operation, mounting/dismounting the sight for vehicular operations, dismounted LRAS3 operations, far target location, and video recording. Training was conducted both during daylight hours and during periods of limited visibility. The team trained nine soldiers from the BRT and six soldiers from two battalion scout platoons. A follow-on visit to Kosovo was conducted in early December 2000 to oversee the unit rotation and the system's transition to a replacement BRT.

Supporting LRAS3

Supporting the deployed LRAS3s in Kosovo was a major concern as we handed-off the unit. The LRAS3 Program is logistically on track, but because the system is scheduled to be supported through interim contractor support (ICS) until FY03, the direct support level maintenance procedures have not yet been fully finalized. Additionally, test equipment is unavailable, and the Army has no trained LRAS3 maintainers.

Because of the system's low density and the LRAS3's solid maintenance record, it was not economically sound to require that a field service representative (FSR) be stationed full time in Kosovo. The systems are being maintained by a part-time FSR who works for the prime contractor in Germany. With U.S. Army, Europe assistance, we were able to emplace a system that allows the FSR to deploy, on short notice, into a hazardous duty zone to fix broken systems. Program offices need to be sensitive to TF Falcon's particular requirements concerning who is allowed to enter Kosovo, what military equipment and training they must have, and the person's conduct.

Additional Deployments

The feedback from the troops in Kosovo was encouraging. The troops were impressed with the system's capabilities and performance. This success further fueled the product office's commitment to pursue two additional LRAS3 deployments, one to Fort Hood, TX, and one to Fort Lewis, WA. Additionally, two systems were sent to the 4th Infantry Division in January 2001 for use in the Division Capstone Exercise and two systems were sent to the IBCT in March 2001.

These additional deployments were conducted like the Kosovo deployment. USAARMC personnel conducted the NET, and the systems are supported by an FSR from the prime contractor's facility in McKinney, TX. The additional deployments also served as valuable rehearsals for the LRAS3 initial fielding in October 2001. The team was able to incorporate lessons learned from the Kosovo deployment, had the benefit of additional technical manual reviews, and was able to incorporate members from the CECOM NET team that conducted initial field training.

Conclusion

Every system fielding is complicated and often requires months or even years of in-depth planning. Therefore, any deployment of EMD assets prior to establishing the sustainment and maintenance structure, coupled with a high-tempo, real-world operation, is an extremely risky endeavor. In Kosovo, two LRAS3s have rolled over and one LRAS3 sustained depot-level damage when it was knocked from its vehicle mount. The support system put in place was able to address the depot repair in Kosovo, but the LRAS3s involved in rollovers had to be evacuated to the prime contractor facility for repair. These unpredictable and unfortunate events put a significant strain on available EMD spares, but have not diminished the team's commitment to support the Kosovo mission to the fullest.

PM, 2nd GEN FLIR was directed for Kosovo deployment, but voluntarily took on the burden of two addi-

tional deployments. The feedback from all three deployments has vastly improved the LRAS3 Program. It has allowed us to improve training quality, the NET trainers, and the technical manuals. We are gaining valuable reliability and maintainability data that assist us in developing the ICS plan. USAARMC is using tactical feedback to develop new scout tactics, techniques, and procedures (TTPs).

The most important program management benefit is the ability to give soldiers a thermal imaging capability second to none. The selection of the First Digitized Division and the IBCT as recipients for the remaining EMD systems was deliberate. These are the first units to receive the LRAS3 and are the units that are transforming the Army into the objective force. Affording them this early opportunity to use these sights and develop their TTPs will contribute to a smoother transformation.

LTC CAMILLE M. NICHOLS was the PM, 2nd GEN FLIR at Fort Belvoir, VA, at the time this article was written. She has a Ph.D. in engineering management from The George Washington University and is attending the Industrial College of the Armed Forces.

MAJ DANA GOULETTE, an infantryman, is the Assistant Product Manager for the LRAS3 in the 2nd GEN FLIR Product Office at Fort Belvoir, VA. He has a B.S. in mechanical engineering from the U.S. Military Academy and an M.S. in operations research from the Naval Postgraduate School.

MAJ MAC HASZARD is System Manager, Scout in the Directorate of Force Development at the U.S. Army Armor Center, Fort Knox, KY. He has a B.S. in agriculture science from Western Kentucky University and is Level III certified in program management.



Participants at the Northeast Regional JSS competition in Turners Falls, MA.

America's Science Challenge . . .

The Junior Solar Sprint Program

Paul J. Hoepfer, former Assistant Secretary of the Army for Acquisition, Logistics and Technology, says that one of the greatest threats to our Nation's security is that "we are failing to create enough scientists, engineers, and mathematicians to maintain super-power status in the information age." A recently released government report, *The Nation's Report Card: Science 2000*, supports him. According to the report, more than 80 percent of America's high-school seniors are not performing at the prescribed proficiency level in science, and that science poses the same challenge to every demographic group.

Hoepfer believes that young people must cement their interest in science in the sixth, seventh, and eighth grades. "We must interest them at the beginning of the pipeline, at a crucial stage in their educational development," he said. That is why he is a strong proponent of the Army's involvement in the Northeast Junior Solar Sprint (JSS) Program. JSS is an exemplary program for middle-school students to design, build, and race small model cars that are powered entirely by solar energy. The program, started by the Department of Energy, is presided over in the Northeastern United States by the Northeast Sustainable Energy Association (NESEA), with Army sponsorship.

Working in teams, participating students are provided with a standard motor and solar panel. The chassis, wheels, and transmission are made from any other materials. With guidance from teachers, parents, and mentors, these young people are encouraged to use math, science, and technology principles along with their creativity to design cars that can win competitions. Awards are given for speed, innovation, craftsmanship, and technical merit.

Because the Army's transformation and continued land combat pre-eminence is largely dependent on advancements in science and technology, Hoepfer hopes that some of the



Washington, DC, JSS race participants (shown in truck) left to right are Patrick Hoyer, Victor Zhu, and Dashiell Kirk. Standing in front, left to right, are Paul J. Hoyer, former Assistant Secretary of the Army for Acquisition, Logistics and Technology; Charlie Garlow, Washington, DC, Regional JSS Program Coordinator and an official with the U.S. Environmental Protection Agency; and Dr. Tom Killion, a representative from the Office of the Deputy Assistant Secretary of the Army for Research and Technology.



Army SGM Jerry Asher shown with one of the Washington, DC, JSS race participants .



Army SGM Jerry Asher shown with two Washington, DC, JSS race participants.



Washington, DC, JSS race participants (left to right) Dashiell Kirk, Patrick Hoyer, and Victor Zhu display one of their solar-powered cars.

young people he mentors will grow up to be Army scientists. He said, "The Army helps to sponsor JSS because it is an exciting program that builds enthusiasm for science at a time when many of these children are forming their impressions of what they want to be." While acknowledging that America needs scientists, Hoyer also said that many occupations—chemists, astronomers, doctors, engineers, and

botanists—need a strong foundation in science.

GEN Eric K. Shinseki, the Army's Chief of Staff, wants personnel to be involved in the community. One excellent way to accomplish this goal is for Army personnel to act as science and technology mentors in the classroom.

The photos on this page were taken at the Washington, DC, race in June 2001. The winners were among 73

teams that competed in the seventh annual Northeast Regional JSS Competition in Turners Falls, MA.

For more information on the Junior Solar Sprint Program or to start a race in your area, please contact Chris Mason, Director Northeast JSS at cmason@nesea.org or (413) 774-6051 (ext 21).

FROM THE DIRECTOR ACQUISITION CAREER MANAGEMENT OFFICE

By the time you read this letter, COL Mary Fuller will have taken over as the new Director of the Acquisition Career Management Office (ACMO). I would like to take this opportunity to formally welcome her.

COL Fuller served formerly as Project Manager for the Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System in Huntsville, AL. She comes to the ACMO with more than 24 years of Active military service. An article about COL Fuller appears on Page 52.

I am very fortunate and very proud to have served as the Director of the Acquisition Career Management Office. It was a great and challenging year. This is an exciting time to be in the acquisition workforce—a time of change and refocus. Acquisition is a multifaceted process that requires the skills of many to ensure the best possible systems are developed and fielded to our soldiers. The combined talents and dedication of all participants are necessary if we are to achieve the goals and objectives set forth in the Army Transformation Campaign Plan and the Objective Force concept.

I am pleased to congratulate the Acquisition Education, Training and Experience Board selectees. (See article on Page 53 of this magazine.) I would also like to direct your attention to the “Ask The ACMO” article, which includes responses to some of the most frequently asked questions submitted to the ACMO. Finally, I want to mention the article on the Acquisition Career Experience Program on Page 51. This is an excellent opportunity for college students with multidisciplinary backgrounds to seek summer employment in Army acquisition organizations.

Again, it was a pleasure serving you. I wish each and every one of you the best in this new year.

COL Frank C. Davis III
Director
Acquisition Career
Management Office

Ask The ACMO

Many of us have worked hard to become certified in two or more acquisition career fields, but this information is never conveyed to Program Manager (PM) Selection Board members. I was told 3 years ago that this oversight was going to be fixed “next year,” but the board checklist letter I just received indicates that, again, Army Acquisition Corps (AAC) certification is not included on board Officer Record Briefs (ORBs). How can a board select “best-qualified” individuals without this important piece of information? If we are not going to use this information, we should do away with the entire certification process because it is a waste of time and money. Why are AAC certification levels not included on LTC/GS-14 PM board ORBs?

The certification information does not appear on board ORBs because the Total Officer Personnel Management Information System II (TOPMIS II) was not designed to put it there. Because AAC officers compete against other officers (Army Pre-Officer Personnel Management System for the 21st Century (OPMS XXI) and Functional Area 48 in OPMS XXI), we do not display a data field. There is only one type of board ORB—there is no difference between promotion- and command-board ORBs. Those of us in the Acquisition Career Management Office (ACMO) are not sure who told you certification data would appear on board ORBs, but research data indicate that there was never a plan to do so. However, a change was made to include AAC certification on nonboard ORBs.

The certification policy was not designed, nor implemented, to be a discriminator for promotion or selection for command. The Defense Acquisition Workforce Improvement Act requires that the Secretary of Defense establish education, training, and experience requirements for all acquisition positions based on the complexity level of the duties carried out in the position. The certification program, under the direction of the ACMO, is designed to provide the AAC with a common level of knowledge to meet the requirements and mission of the AAC, depending on position and grade.

Certification alone does not determine an AAC member's education, training, and experience. The elements that determine the education, training, and experience of an officer or civilian are formal/informal schooling, formal/informal training, and job experience as documented via the Officer Evaluation Report (OER) and civilian evaluation system. Certification is a formal documentation of education, training, and experience—all of which are seen through the normal board process.

In particular, for lieutenant colonel command positions, if a selected officer is not currently certified for a specific position, that officer can meet certification requirements via one of two methods. First, because selections are typically made 18 months prior to the officer assuming the command position, the officer can receive the required schooling and/or training during that 18-month period. Second, an officer has up to 18 months (in most cases) to meet the certification requirements (if they exist) once in the position. Both options provide sufficient time to meet certification requirements.

The bottom line is that ORBs and OERs communicate to the board an officer's manner of performance, level of experience, and key education and training. These are the selection discriminators, not one's certification level.

In January 2000, I was approved for the School of Choice Long-Term Training Program and attended graduate courses from May 2000 through April 2001. The information on the Army Acquisition Corps Web site at that time, which is very different now, stated that funds for books were not allowed; therefore, I bought my own books. I know that was in the past, and I am grateful to have had my tuition paid. However, I am curious why I had to pay for my books, and now the Acquisition Education, Training and Experience Board provides an allowance of \$100 per course for books.

Simply put, the ACMO had the resources following your participation so we provided the book allowance. However, the FY02 budget may not allow us to pay for books when the next board meets. This may seem unfair, but the allowance is one of those things that ebbs and flows because it is based on the budget. Some people have argued that the allowance potentially takes away resources to fund someone else's tuition, but we try to avoid that by running the budget, funding to the cut line, and doing the math. Then, if we have only partial resources to fund the next person in line, we defer them until the next budget cycle and use the money to fund other requests.

Note: All Ask The ACMO questions must be submitted via the Army Acquisition Corps home page at <http://dacm.rdaisa.army.mil>. Point to **Comments/Feedback** at the top right of the page and send your submission to the ACMO Director or to one of the three listed Regional Directors. Please do not send your questions to *Army AL&T* magazine.

Participants Sought For 2002 ACE Program

The intent of the Acquisition Career Experience (ACE) Program, a paid 2-year joint academic and government summer employment opportunity, is to recruit college students with multidisciplinary backgrounds for Army acquisition positions. The Acquisition Career Management Office (ACMO) sponsored the first ACE pilot program in March 2000 as a partnership between the U.S. Army Materiel Command and James Madison University in Harrisonburg, VA. Because of the success of the initial pilot effort, the program has been expanded to all acquisition regions and now includes students enrolled in colleges and universities throughout the United States.

The ACE Program is a win-win strategy for everyone involved. Students are placed in various Army acquisition organizations and teamed with a mentor to collaborate on challenging projects. Students work with their mentors to learn about specific acquisition issues and challenges. The program provides a valuable learning and work experience for the students and helps to cultivate the next generation of Army acquisition professionals.

If you know of a college student who would like to apply, please refer them to the ACE Web site at <http://dacm.rdaisa.army.mil/acepage/index.htm> for information on eligibility requirements, how to apply, and points of contact for specific geographical locations. Applications for the Year Group 2002 ACE Program must be received no later than Feb. 22, 2002.

The ACMO encourages each acquisition organization to participate in the ACE Program by sponsoring positions for students in addition to those funded by the ACMO. If you are interested in participating in this valuable program, please contact one of the Regional Directors below:

National Capital and Central Regions
(Washington, DC; Aberdeen Proving Ground, MD; Rock Island, IL)

Sandy Long
Telephone: (703) 805-1064/DSN 655-1064
e-mail: Sandy.Long@aaesa.belvoir.army.mil

Northeast and Central Regions
(Fort Monmouth and Picatinny Arsenal, NJ; Natick, MA; Detroit, MI)

Kelly L. Terry
Telephone: (732) 532-1406/DSN 992-1406
e-mail: kelly.terry@mail1.monmouth.army.mil

Southern and Western Regions
(Huntsville, AL; White Sands Missile Range, NM)

Maxine Maples
Telephone: (256) 955-2764/DSN 645-2764
e-mail: Maxine.Maples@md.redstone.army.mil

Fuller Takes Over As ACMO Director

COL Mary Fuller, former Project Manager for the Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System, Huntsville, AL, recently assumed new duties as the Director of the Acquisition Career Management Office (ACMO).

Fuller has more than 24 years of Active military service and has served in a number of key positions, including assignments as Product Manager, Army Small Computer Program, Fort Monmouth, NJ; and Chief of the Operations Division, Experimentation Center, Test and Experimentation Command, Fort Hunter Liggett, CA.

She holds a B.S. degree from Miami University, Oxford, OH, and an M.A. degree from Webster University, St. Louis, MO. Her military schooling includes the Women Officer Orientation Course, Airborne School, Signal Officer Basic and Advanced Courses, Army Command and General Staff College, the Joint and Combined Staff Officer School, the Materiel Acquisition Management Course, the Advanced Program Management Course, and the Senior Service College Fellowship Program at the University of Texas, Austin.

Listed among her awards and decorations are the Legion of Merit, Defense Meritorious Service Medal, Army Meritorious Service Medal, Army Commendation Medal, Army Achievement Medal, Joint Meritorious Unit Award, National Defense Service Medal, Armed Forces Reservist Medal, Army Service Ribbon, two Overseas Service Ribbons, and the Army Parachutist Badge.

DAU Policy Change

During FY01, the Defense Acquisition University (DAU) created a new type of course—a “hybrid” course. DAU hybrid courses are made up of two parts, Part A and Part B. With the exception of correspondence course LOG 201, Intermediate Acquisition Logistics, Part A is presented via the DAU Virtual Campus (<https://dau.fedworld.gov>) and Part B is presented onsite in an actual classroom. Each student must successfully complete Part A before attending Part B. Both parts must be successfully completed before the student will receive credit for completion of the course. Certificates are not issued upon completion of Part A only.

Previous DAU policy required students to complete Part B within 45 days following completion of Part A. If the student did not complete Part B within 45 days, the student had to retake Part A. This 45-day rule caused some difficulties for students who completed Part A and then had to cancel Part B. As such, this policy has been changed. Students can now complete Part B within 62 days after completing Part A. This will hopefully decrease the number of students having to retake Part A. Students are still encouraged to complete Parts A and B in a relatively short period of time. Students should still make every attempt to complete both parts as scheduled.

For additional information on DAU hybrid courses, contact Randy Williams in the Acquisition Career Management Office at (703) 604-7107, DSN 664-7107, or randall.williams@saalt.army.mil.

Acquisition Education, Training And Experience (AETE) Board

In keeping with the Army Acquisition Corps (AAC) philosophy that a balance of training, education, and experience is required for career development, the AETE Board meets biannually to consider eligible Acquisition and Technology Workforce (A&TWF) members for various education, training, and career-broadening opportunities. The AETE Board is comprised of AAC members and is conducted by the U.S. Total Army Personnel Command's Acquisition Management Branch. AETE Board members review applications from those military and civilian members of the A&TWF seeking opportunities announced in the AETE Catalog. Application instructions for the AETE Board are provided in the announcement or may be obtained by viewing the AETE Catalog at <http://dacm.rdaisa.army.mil> (click on the catalog's icon on the right side of the screen). Selections are made based on the applicant's package.

Because requirements for opportunities may differ between civilian and military A&TWF members, careful attention must be given to any special requirements listed for certain training opportunities in the catalog. For example, the AETE Board reviews and approves civilian applications for the Naval Postgraduate School and School of Choice Program; however, military officers pursuing full-time educational programs are governed by AR 621-1, *Training of Military Personnel at Civilian Institutions*. Application and selection procedures for AAC officers are available at <http://www.perscom.army.mil/Opfam51/ambmain.htm> (click on ACS on the left side of the screen).

Similarly, civilians must apply to the AETE Board to be considered for the Senior Service College (SSC) Fellowship Program at the University of Texas. In contrast, a Department of the Army board automatically considers military officers for SSC based on their individual year group.

With two exceptions, both military and civilian members of the A&TWF may apply for opportunities listed in the AAC-sponsored Leadership Training section of the AETE Catalog. Civilian AAC members grade GS-14 and above (or equivalent personnel demonstration broadband level) may apply through the AETE Board for the Program for Management Development. Military officers (lieutenant colonel and colonel) may also apply to the AETE Board; however, they must meet the additional requirement of being selected from among those officers on the Command Select List. The Advanced Management Program is available only to civilian AAC members grade GS-15 and above (or equivalent personnel demonstration broadband level). Both of these programs are offered through the Harvard Business School.

To qualify for AAC funding, applicants must currently serve in an acquisition position and meet the position requirements.

CAREER DEVELOPMENT UPDATE

AETE Board Results

The Acquisition Career Management Office is pleased to announce results from the Acquisition Education, Training and Experience (AETE) Board, which met in August 2001 to review applications for training and educational opportunities. Listed below are the personnel selected and their AETE opportunity. Unless otherwise indicated, all are civilian employees.

Name	Requested Opportunity
Aidala, Sally	St. Ambrose University
Allen, Carey	Florida Institute of Technology
Ambrose, Joyce	Florida Institute of Technology
Baroni, Brian	Naval Postgraduate School—Distance Learning
Battle-Blue, Detra	Florida Institute of Technology
Borgardts, Allen (LTC)	Harvard—Program for Senior Executive Fellows
Boyd, Gary	University of Texas Fellowship
Brooks, Gene	Radford University
Dahm, Bruce	Webster University
Downs, Karen	University of Alabama-Huntsville
Dukes, Beatrice (LTC)	UVA/Darden—Leadership for Extraordinary Performance
Flanagan, Robert	Keller Graduate School of Management
Gabbert, Jeffry (MAJ)	Harvard—Program for Management Development
Grasso, Robert	Florida Institute of Technology
Grubb, Susan (LTC)	Harvard—Program for Senior Executive Fellows
Harris, Thomas	Naval Postgraduate School—Distance Learning
Hurst, Peggy	Eller Graduate School
LaBar, Bruce	UVA/Darden—Leadership for Extraordinary Performance
Matheny, Linda	UVA/Darden—Leadership for Extraordinary Performance
McLaurin, Glenda	Florida Institute of Technology
Peterman, Cindy	St. Ambrose University
Pride, Shirley	Florida Institute of Technology
Prouhet, Meleta	University of Alabama-Huntsville
Ramsey, Andrew (LTC)	OPM—Management Development Seminar, Leading Organizations
Sanchez, Joan	Troy State
Simpson, James (MAJ)	Harvard—Program for Senior Executive Fellows
Sutton, James	Harvard—Advanced Management Program
Tellez, Hortensia	Troy State
Thomas, Darlene	Florida Institute of Technology
Thurgood, Leon (MAJ)	Harvard—Program for Management Development
Walker, Virginia	Florida Institute of Technology
Williams, Yancy (LTC)	Dartmouth—Gateway to Business Management
Young, Lester	Naval Postgraduate School—Distance Learning

The above AETE opportunities are funded entirely by the Army Acquisition Corps. To learn when the next AETE Board convenes as well as the suspense date for applications, go to <http://dacm.rdaisa.army.mil>.

Being Digital

By Nicholas Negroponte

Alfred A. Knopf, New York, 1995

Reviewed by LTC John Lesko (U.S. Army Reserve), a Decision Coach and Group Facilitator for Anteon Corp. Lesko is a member of the Army Acquisition Corps and a frequent contributor to Army AL&T. He can be contacted at John.Lesko@saftas.com.

“Computing is not about computers any more. It is about living. The giant central computer, the so-called mainframe, has been almost universally replaced by personal computers. We have seen computers move out of giant air-conditioned rooms into closets, then onto desktops, and now into our laps and pockets. But this is not the end.” With this introduction, Nicholas Negroponte (Founding Director of MIT’s Media Lab) begins to explain the wonders of today’s multimedia, bit-based technologies. To which this reviewer adds, “No, computing is not about computers anymore. Rather, it is increasingly about working effectively, efficiently, and collaboratively to deliver new, or to sustain current, capabilities for use along the spectrum of security missions, ranging from multinational peacekeeping to joint warfighting.”

Being Digital may appear to the pedestrian reader as nothing more than a compilation of Negroponte’s 18 favorite essays from *Wired* magazine; however, it is this and more. The author and editors have done a good job of structuring the book into three main parts. The book’s table of contents follows:

Part One—Bits Are Bits:

- The DNA of Information ...
- Debunking Bandwidth
- Bitcasting
- The Bit Police
- Commingled Bits
- The Bit Business

Part Two—Interface:

- Where People and Bits Meet
- Graphical Persona
- 20/20 VR [virtual reality]
- Looking and Feeling
- Can We Talk About This?
- Less Is More

Part Three—Digital Life:

- The Post-Information Age
- Prime Time Is My Time
- Good Connections
- Hard Fun
- Digital Fables and Foibles
- The New E-xpressionists

In these three parts, Negroponte describes the evolution of CD-ROMs, multimedia, hypermedia, high-definition television (HDTV), and more. The section on interfaces offers a history on visual interfaces, graphics, VR, holograms, teleconferencing hardware, the mouse and touch-sensitive interfaces, and speech recognition. Finally, Negroponte provides an epilogue entitled *An Age of Optimism*, in which he shares his vision of the future and how one might live in it.

Although this book often delves into the intricacies of binary code, data compression techniques, and the advantages of asynchronous meetings, readers are well served by numerous examples, illustrations, and metaphors that make the book an easy read. This is particularly helpful because the rate of change that occurs with these complex technologies can quickly overwhelm the average cybercitizen/soldier.

Being Digital serves as a guidebook for anyone who wants to understand technological forces that are shaping our bit-based world. Where it falls short, however, is in discussing the impact these technologies will have on transforming data to information, information to knowledge, and knowledge to wisdom. *Being Digital* is heavy on data management and information-based insights and light on integrating these concepts into a larger comprehensible whole.

As the military embraces new technologies that fundamentally change the way it wages war, perhaps the best defense will be a networked offense. Members of the Defense community will continue to wrestle with decisions and trade-offs surrounding today’s revolution in military affairs. Missions are likely to be created, re-examined, realigned, and/or eliminated. Bureaucratic battles will inevitably be won, lost, or fought to a draw. National strategy will evolve because it must change with the times. Decisionmakers must be both wired and adept at working with vast amounts of information in today’s knowledge-based world. This aggressive, offensive strategy will most likely be shaped by acquisition professionals *being digital*.

First, Break All the Rules

By Marcus Buckingham and Curt Coffman
Simon & Schuster, New York, 1999

Reviewed by LTC John Lesko (U.S. Army Reserve), a Decision Coach and Group Facilitator with Anteon Corp. Lesko is a member of the Army Acquisition Corps and a frequent contributor to Army AL&T. He can be contacted at John.Lesko@saftas.com.

What do the world's greatest managers do differently than your average manager? According to Marcus Buckingham and Curt Coffman, both from the Gallup Organization's Workplace Management Practice Office, "Before they do anything else, they first break all the rules of conventional [management] wisdom." For example, world-class managers:

- Do not believe that people can achieve anything they set their minds to,
- Do not try to help people overcome their weaknesses,
- Disregard the Golden Rule—playing favorites when it suits the organization's needs,
- And most of all, they have the ability to find, focus, and keep talented employees.

Most folks know of the Gallup Organization for its public opinion polls and surveys. Within the Gallup Organization is a research and consulting arm that has collected and analyzed data from more than 80,000 managers in more than 400 organizations (including for-profit and nonprofit companies and governmental agencies). The authors suggest that this is the largest such study undertaken in the field of management science. *First, Break All the Rules* summarizes this multiyear study and is rich with both data and anecdotal evidence that illustrate best-business practices.

So how might a program manager and/or acquisition executive apply what's in this book? The authors suggest that, "Measuring the strength of a workplace can be simplified to twelve questions. The twelve questions don't capture everything you may want to know about your workplace, but they do capture the most information and the most important information. They measure the core elements needed to attract, focus, and keep the most talented employees."

Questions were scored on a one to five scale with a "1" equaling strongly disagree and a "5" equaling strongly agree. Organizations that scored highest on these questions experienced higher levels of perform-

ance as measured in sales, profitability, and employee retention.

The following are the 12 strength-measuring questions:

1. Do I know what is expected of me at work?
2. Do I have the materials and equipment I need to do my work right?
3. At work, do I have the opportunity to do what I do best every day?
4. In the last seven days, have I received recognition or praise for doing good work?
5. Does my supervisor, or someone at work, seem to care about me as a person?
6. Is there someone at work who encourages my development?
7. At work, do my opinions seem to count?
8. Does the mission/purpose of my company make me feel my job is important?
9. Are my co-workers committed to doing quality work?
10. Do I have a best friend at work?
11. In the last six months, has someone at work talked to me about my progress?
12. This last year, have I had opportunities at work to learn and grow?

At first glance, this reviewer thought, "This is too easy. These questions are common sense and too simple." But the more I read and thought about the research findings, the more I began to understand the significance of these questions and how one's answers serve as a litmus test for managerial excellence.

Buckingham and Coffman propose that world-class performers must master these managerial issues in a sequential fashion. There is a Maslow-type hierarchy within these 12 questions. That is, first an organizational leader must successfully score high marks on questions 1 and 2. To start, work expectations must be clearly understood and resources made available to all. Then, the answers to questions 3 to 6 reveal an individual employee's self-esteem and sense of worth to an organization. Next come issues associated with establishing a sense of belonging (questions 7-10). And finally, questions 11 and 12 explore the opportunities for individual and organizational growth and learning.

Generally speaking, high-performing groups had the best employee morale and company loyalty. It is interesting to note that high scorers many times were located at the business unit or subdivision level of an organization. In other words, excellence was most likely to be found within a specific profit center, within a small team,

within a single store, and/or within a specific geographic segment of a larger organization.

So what can the Army's acquisition professionals learn from *First, Break All the Rules*? In this reviewer's opinion, there are two key lessons to learn and apply to our day-to-day work. First, we would be well-served to periodically ask our colleagues the 12 questions listed above. This will keep individuals focused on their tasks and on building a cooperative work environment. And second, we should benchmark government practices against internal models of excellence as well as external business organizations. There's plenty to learn from so-called "best-of-breed" or "best-of-class" competitions.

First, Break All the Rules presents a useful measuring stick that links employee opinion and performance to managerial practice. Program managers, acquisition executives, and others should read and apply the fundamentals of this book as they develop, purchase, and/or sustain our warfighting and peacekeeping systems.

The New Dynamic Project Management: Winning Through the Competitive Advantage

By Deborah S. Kezsbom, Ph.D.,
and Katherine A. Edward
John Wiley & Sons Inc., 2001

Reviewed by LTC Kenneth H. Rose (USA, Ret.), PMP, ASQ Certified Quality Manager, a Project Management Instructor for ESI International residing in Hampton, VA, and former member of the Army Acquisition Corps.

Throw away your project management handbooks. Throw away your so-called "bibles" of project management. *The New Dynamic Project Management: Winning Through the Competitive Advantage* by Deborah S. Kezsbom and Katherine A. Edward is the only project management book you'll ever need.

Now, the opinion just expressed is a bit overstated. But in these times of promotional hype, a little excess is warranted. The bottom line is that Kezsbom and Edward's book is a unique contribution in its completeness and clarity, and offers a stand-alone resource of considerable value to project management professionals.

The current volume is an update of a 1989 edition made better by new content and new organization. It includes a new chapter dedicated to quality management. This is appropriate because the authors describe in their first pages the *quadruple* constraint of project management, which adds quality to the traditional three

elements of time, cost, and technical performance. The authors describe an integrated program of quality planning, assurance, and control. They discuss the philosophy and approach of quality gurus Crosby, Deming, and Juran, adding more current views from David Garvin of the Harvard Business School.

A new chapter on procurement and contracting addresses an area that has gained new importance to project managers. The chapter on project management information systems has been redesigned to recognize the prevalence of Web-based technologies in today's tools.

The book begins with a view of the contemporary project management environment. The authors point out that the project manager's role has evolved to include more boundary spanning. The project manager has become "... a common focal point [who] brings the critical elements of a project together and *facilitates* all that needs to be done, *by those who are experts at doing it*, to offset the likelihood of failure" (italics in original). They reinforce the long-standing axiom that projects fail on people matters, not technical matters, with a list of 25 potential sources of project failure collected during 40 years of experience. Communication, priorities, teamwork, and conflict are all included; technical acumen is not.

The authors then march the reader down a progressive path of enlightenment, beginning with project organization. The thoroughness of the chapter on quality is duplicated throughout the journey. That feature is the standout difference between this and other texts that lecture on a superficial level or point to other sources for complete information. Although the book is heavily documented with citations and references for further study, everything the reader needs to get to work may be found between the covers of this singular book.

Planning, scheduling, and controlling all get the full treatment, as expected. The discussion on earned value management is exceptional, even though it uses the traditional acronyms—BCWS (budgeted cost of work scheduled), BCWP (budgeted cost of work performed), etc.—that only recently have been simplified to more user-friendly terms. The authors also give appropriate attention to the precedence diagramming method (where linked boxes show the sequence in which tasks are to be performed) as the successor to PERT [program evaluation and review technique] and CPM [critical path method]. A discussion of methods for controlling project costs, changes, and risks rounds out the presentation of these traditional nuts and bolts of project management.

Leadership, conflict resolution, communication, and teamwork are all covered in an integrated manner that links them together and to the other material in the

book. As always, the authors prescribe very practical approaches that can make a reader better able to execute project management responsibilities, not just be better informed. The sections on negotiation and listening may be especially valuable in today's rich mixture of internal and external stakeholders who can influence project success.

Throughout, Kezsbom and Edward augment their presentation with case studies, exercises, and appendices that demonstrate, clarify, and otherwise add food for thought.

In truth, *The New Dynamic Project Management* may not be the *only* book you need on project management. But it is certainly a one-of-a-kind resource, one that you—apprentice, journeyman, or master—should not be without.

The following poem was written by a recently retired Army civilian employee at the U.S. Army Developmental Test Command, Aberdeen Proving Ground, MD. His farewell e-mail to his many friends and associates indicated that service to soldiers through developmental testing was a big part of his life during his 33-year federal career.

Remembering The Ranges

The guard at the gate with his M16
The 105 firing and the rifling ring's scream
Knocked about by the big mortar's blast

Razor wire around "bugs and gas"
Carry your mask, wear your pass

In steel bombproof we huddle
Awaiting bang of grenade
Against bar-armor bustle

Stay inside until we hear
The whistle blow all-clear

Serving the 155 with broken ram
Crew sweating in summer sun
Loading big rounds by hand
'til the test is done

Cordite and nitro's acrid smell
Nasty stuff, headaches from Hell

Abrams tank and strong young backs
Swinging hammers and changing tracks

Servicing the Abrams always a dread
When trying to park in an M60 shed

Spine taking a beating
Cross-country by jeep
Or on the Huey's
Hard bench seat

Airdrop test load floating down
From high above we hear the sound
The singing of the snapping shroud
Then crashing load in dusty cloud

Firing 25 millimeter on the run
And the deadly 120—a smoothbore gun

PATRIOT missile's soldier crew
Big, rawboned boys, tried and true

Dothan "International" Airport
Red clay roads to Rucker's Fort
On TDY when Mamma died
Next, Fort Huachuca and C4I

Alaskan winter and biting cold
In the lower 48 far below
Sultry swamp and mighty mosquito
Desert heat and dust storms blow
Wasatch Range and high-mountain snow

Block and tackle, crane and cradle
Tanks and towbars, boom-sling and cable
Brothers and sisters, ready and able

Civilian and soldier, side-by-side
Serving our nation, testing with pride.

Richard J. Coski

PERSONNEL

Caldwell Takes Over As ASAALT MILDEP And Army Acquisition Corps Director

LTG John S. Caldwell Jr., former Commanding General (CG) of the U.S. Army Tank-automotive and Armaments Command, has assumed new duties as Military Deputy (MILDEP) to the Assistant Secretary of the Army for Acquisition, Logistics and Technology (ASAALT) and Director, Army Acquisition Corps. He succeeds LTG Paul J. Kern, who has received his fourth star and taken over as CG, Army Materiel Command (AMC).

With more than 30 years of Active military service, Caldwell has served previous tours as AMC's Deputy Chief of Staff for Research, Development and Acquisition (RD&A); Director, Army Digitization Office, Office of the Chief of Staff of the Army; Assistant Deputy for Systems Management, Office of the Assistant Secretary of the Army for RD&A; and Military Assistant, Major Weapons

Systems Acquisition, Office of the Under Secretary of Defense (Acquisition Reform).

Caldwell has an M.S. degree in mechanical engineering from Georgia Institute of Technology and a B.S. degree from West Point. In addition, he has attended the Industrial College of the Armed Forces and the U.S. Army Command and General Staff College, and has completed the Armor Officer Basic and Advanced Courses.

Listed among Caldwell's military honors are the Silver Star, the Defense Superior Service Medal, the Legion of Merit with Oak Leaf Cluster (OLC), the Bronze Star Medal, the Meritorious Service Medal with OLC, the Air Medal, the Army Commendation Medal with OLC, the Army Achievement Medal, and the Ranger Tab.

ACQUISITION EXCELLENCE

Service Acquisitions

The Army spends almost as much on the acquisition of services as it does on equipment. In fact, the *FY 2000 Army Contracting Summary* data indicate that services account for 36 percent of total contract actions and 30 percent of contract dollars. As a result, increased emphasis has been placed on the acquisition of services. To excel in service acquisition, the Army is focusing on performance-based service acquisition and better training for the acquisition workforce.

The importance of the Army's performance-based service acquisition (PBSA) strategy was emphasized in June 2000. At that time, the Deputy Assistant Secretary of the Army for Procurement (DASA(P)) directed the major commands (MACOMs) and the Principal Assistants Responsible for Contracting (PARCs) to accomplish 50 percent PBSA service acquisitions by 2005 and ensure that the core contracting workforce complete PBSA training by the end of 2001. In November 2000, the Acting DASA(P) directed that the MACOMs develop one or more Centers of Excellence in Service Contracting to act as a clearinghouse by soliciting, identifying, consolidating, organizing, and disseminating best practices in service contracting.

Effective Oct. 1, 2001, the Army Federal Acquisition Regulation was changed to require that all solicitations

for services be performance-based and price-fixed.

One-time deviations with adequate written justification may be granted by the PARCs up to \$1 million, by the Head of Contracting Activity up to \$10 million, and by the DASA(P) for more than \$10 million. In addition, DD Form 350, *Individual Contract Action Report*, was revised to collect PBSA information. DD 350 instructions indicate that for a contract action to be classified as PBSA, the contract value must exceed \$100,000. For consistency, the Army's stated PBSA goal of a minimum 50 percent of dollars and actions by 2005 is based on a \$100,000 threshold, and the PBSA usage metrics are based on DD Form 350 criteria.

In summary, the increasing significance of service contracting has prompted increased emphasis on performance-based service contracts which, if properly implemented, should result in reduced prices and improved Army performance. However, moving to these types of contracts will not be easy. The success of using performance-based contracts will depend on the extent to which the Army provides the necessary training, guidance, and tools to the acquisition workforce and establishes metrics to monitor the results of the use of these contracts.

ARMY AL&T WRITER'S GUIDELINES

<http://dacm.rdaisa.army.mil/>

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Purpose

To instruct members of the AL&T community about relevant processes, procedures, techniques, and management philosophy and to disseminate other information pertinent to the professional development of the Army Acquisition and Technology Workforce (A&TWF).

Subject Matter

Subjects may include, but are not restricted to, professional development of the Army's A&TWF, 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. **Articles submitted to *Army AL&T* will not be accepted if they have been scheduled for publication in other magazines.**

Length of Articles

Articles should be approximately 8 double-spaced typed pages, using a 20-line page, and must not exceed 1,600 words. **Articles exceeding 1,600 words will not be accepted.** Do not submit articles in a layout format or articles containing footnotes, endnotes, or acknowledgement lists of individuals.

Photos and Illustrations

A maximum of 3 photos or illustrations, or a combination of both, may accompany each article in a separate file from the manuscript. Photos may be black and white or color. **Illustrations must be black and white and must not contain any shading, screens, or tints. All electronic files of photos must have a resolution of at least 300 dpi (JPEG or TIFF). If they do not meet this requirement, glossy prints of all photos must be submitted via U.S. mail, Fedex, etc.** Photos and illustrations will not be returned unless requested.

Biographical Sketch

Include a short biographical sketch of the author/s that includes 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 by the Army Acquisition Career Management Office.

Submission Dates

<i>Issue</i>	<i>Author's Deadline</i>
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) and illustrations/photos (300 dpi JPEG or TIFF) may be submitted via e-mail to **bleicheh@aaesa.belvoir.army.mil**, or via U.S. mail to the address in the first paragraph at the top of this page. All submissions must include the author's mailing address; office phone number (DSN and commercial); and a typed, self-adhesive return address label.

2001 INDEX OF ARTICLES

This index is a headline listing of major articles published in *Army AL&T* during 2001.

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- Recapitalization And Unit Set Fielding
- The Paladin Enterprise Model Of Recapitalization
- Abrams Modernization: Keeping The Best Ahead Of The Rest
- Partnering With Private Enterprise On Army Posts
- Army Recognizes Outstanding R&D Organizations
- A Way To Train Digitally Proficient Soldiers
- Additional NPS Graduate Programs Offered In Huntsville
- Contingency Contracting In Kosovo: Starting From Scratch
- YPG Spotlights Virtual Proving Ground Technology
- Breaking The Acquisition Paradigm: CECOM Acquisition Center Pilots Army's E-Auctions
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- Transitioning From Fielding To Steady-State Sustainment

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- Implementing SMART Within PEO, Tactical Missiles
- A SMART Implementation For Ground-To-Ground Combat Identification
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- Using Advanced Collaborative Environments In Developing Army Materiel
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- Acquisition Systems Management Curriculum Development
- Floyd And Wally's Operational Test And Evaluation Top 10 Lessons Learned
- Army Acquisition Career Management Workshop 2001
- 22nd Army Science Conference Features R&D Achievement Awards And Best Papers Awards

- Field Pack-Up Units Provide Increased Mobility
- The Alternative Technologies And Approaches

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- The Army's Personnel Transformation
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- Warfighting Doctrine Development

- C4ISR Architectures

- Combat Support And Combat Service Support

Transformation

- The Virtual Proving Ground

- The AAC Annual Training With Industry Orientation

Workshop

- Threat Materiel Solutions For Army Acquisition

- The FY02 Army Posture Statement

- Improving Digital Terrain With Artificial Intelligence

- Intelligent Agents: Tools For The Command Post

And Commander

- The Developmental Firing Range At Wallops Island

- Lessons Learned From The GMLRS IPT Process

- The Airdrop Certification Process

- Assessing Effects Of Live Fire On The Enhanced

M1A2 Tank

- New Medical Technology For The Injured Soldier

- Rapid Detection Of Infectious Disease Outbreaks

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