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Cover: To manage the increasing support requirements of the Modular Force, Army logisticians need a robust communications network that can provide on-the-move access to critical information. The article beginning on page 2 summarizes developments in Army communications that affect the logistician and the warfighter alike, such as the Warfighter Information Network-Tactical (WIN–T) and the Joint Network Transport Capability-Spiral (JNTC–S). The cover photo shows a soldier with an important component of the communications network, the Combat Service Support Very Small Aperture Terminal (CSS VSAT), which connects logisticians to a global network of logistics information by satellite.

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

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ALOG NEWS

ARMY BUDGET PLAN ADVANCES MODULAR FORCE AND FCS

The President's budget proposals forwarded to Congress in February call for significant boosts in spending for two key Army Transformation efforts: the Modular Force and the Future Combat Systems (FCS).

The Army's budget request for fiscal year 2006 seeks to increase spending on the FCS program by $200 million, to a total of $3.405 billion. The higher spending reflects the Army's decision last July to restructure the program to introduce, or "spiral," individual FCS capabilities to the field in 2-year increments as they mature, while continuing to develop the overall "system of systems."

The supplemental budget for fiscal year 2005 asks for $5 billion for the Army's transition to the Modular Force. Under this program, the Army is creating new, more flexible, more self-sufficient brigades. These brigades will be the Army's basic combat units, shifting the Army from a division- to a brigade-centric organization. The requested funds will support the standup of three new brigades this year as part of the Army's plan to add 10 brigades to the existing 33 in the Active Army.

The fiscal year 2006 budget seeks to acquire 240 Stryker vehicles for $878 million to equip the sixth Stryker brigade combat team; 360 uparmored high-mobility, multipurpose, wheeled vehicles (HMMWVs) and 1,705 heavy-chassis HMMWVs for $224 million; 3,529 trucks in the family of medium tactical vehicles for $450 million; 2,002 trucks in the family of heavy tactical vehicles for $207 million; and 41 UH–60 Black Hawk utility helicopters for $585 million.

Total Army spending under the proposed fiscal year 2006 budget would be $98.6 billion, a slight decline (1.4 percent) from the $99.994 billion appropriated by Congress for fiscal year 2005. (These figures do not include supplemental appropriations, which brought total spending for fiscal year 2005 to $115.011 billion.) The Army budget request amounts to 23.5 percent of the President's overall Department of Defense budget request of $419.3 billion.

Fiscal year 2006 spending requests in the major appropriation categories compare to fiscal year 2005 appropriations, excluding supplemental appropriations, as follows—

- Military personnel: $41.413 billion, up $2.466 billion, or 6.3 percent.
- Operation and maintenance: $31.813 billion, down $45 million, or less than 1 percent.
- Procurement: $11.755 billion, down $1.330 billion, or 10.2 percent.
- Research, development, test, and evaluation: $9.734 billion, down $807 million, or 7.7 percent.
- Military construction: $1.913 billion, down $211 million, or 9.9 percent.
- Family housing: $1.363 billion, down $202 million, or 12.9 percent.

The funding proposed for fiscal year 2006 will support Active Army ground operating tempo training annually for each vehicle of 765 live miles and 85 virtual miles and 13.1 live flying hours monthly for each aircrew in the Active Army. It also will support 11 brigade rotations each through the National Training Center and the Joint Readiness Training Center, 4 brigade rotations through the Combat Maneuver Training Center in Germany, and 3 corps-level Warfighter exercises and 7 division-level command and staff groups through the Battle Command Training Program.

The fiscal year 2005 supplemental appropriations request includes $3.3 billion for force protection measures such as adding armor to convoy trucks and $5.4 billion for refurbishing and replacing worn-out or damaged equipment used in Operations Iraqi Freedom and Enduring Freedom. (These figures are mostly, but not exclusively, for the Army.) Overall Army spending in the supplemental request amounts to $41.216 billion.

The President also is seeking an Army budget of $110.081 billion in fiscal year 2007.

ARMY SETS NEW STRATEGIC PLANNING GUIDANCE

Improving joint logistics capabilities is one of the strategic imperatives announced in the new Army Strategic Planning Guidance (ASPG). The ASPG is a long-range planning guide that defines the Army's strategy for the next 10 to 20 years. Usually published every 2 years, this out-of-cycle revision of the 2004 guidance was necessary to meet requirements set forth in the Department of Defense Strategic Planning Guidance. Secretary of the Army Francis J. Harvey approved the new ASPG in January.

(ALOG NEWS continued on page 41)

A Communications Network for Today's Logisticians

BY LIEUTENANT COLONEL TONY C. MUNSON AND LIEUTENANT COLONEL FORREST BURKE

The Army is improving its tactical communications systems so that commanders and logisticians have the on-the-move access to critical information they need on today's battlefield.

The challenge for the Army logistics community is to support the speedy deployment of soldiers and equipment and to sustain them through mission accomplishment. A combat task force generates thousands of supply requests a day. To manage that workload and quickly and efficiently process requests from the battlefield in support of the warfighter, the logistician clearly needs a robust communications network.

Current tactical communications systems, from the Single Channel Ground and Airborne Radio System (SINCGARS) to Mobile Subscriber Equipment (MSE) and the Tri-Services Tactical Communications (TRI–TAC) system, served well to support yesterday's command, control, and support services, which relied heavily on voice and short text messaging at security levels of secret collateral and below. But today's commander needs a network that permits mounted and dismounted, on-the-move communications; disseminates information at all levels of security; extends reach and reach-back capabilities; and provides increased throughput to support warfighter operations.

The battlefield of the future, featuring the Army's units of employment and brigade combat teams functioning as part of joint task forces, will depend on the infusion of state-of-the-art, commercial off-the-shelf information technology to provide logistics support to the warfighter.

Because the Army tactical communications network of the 1990s does not support current needs, Army signalers and logisticians have been designing connectivity and bandwidth capabilities that will allow warfighters to get the supplies they need when they need them. The Army is rapidly infusing state-of-the-art, commercial off-the-shelf information technology into brigade combat team (BCT), unit of employment x (UEx, a division equivalent), and unit of employment y (UEy, a theater and corps equivalent) warfighting platforms, strategic reach-back sites, and signal formations. This information technology effort includes hardware, software, training, and elements of network management, information assurance, and information dissemination management.

The Army's Bridge to Future Networks (BFN) concepts are providing warfighters with the commercial off-the-shelf communications backbone that enables voice, data, and video information exchanges throughout

Prophet (left) and Trojan SPIRIT (right) are tactical intelligence systems.

the tactical UEy and into the sustaining base. The BFN is replacing the Area Common User System Modernization Plan and takes advantage of existing and directed capabilities. The BFN primarily enhances battle command technological capabilities.

Communications capabilities for specific combat service support (CSS) and intelligence programs continue to be developed and recapitalized to meet program-specific requirements. Examples include the AN/TSQ–190 Trojan SPIRIT (Special Purpose Integrated Remote Intelligence Terminal), the AN/MLQ–40 Prophet system, and CSS business communications initiatives like "Connect the Logistician." [Trojan SPIRIT is a satellite terminal that provides access to intelligence systems. Prophet is the principal signals intelligence and electronic warfare system for the division and armored cavalry regiment.]

Major Change for the Signal Corps

The Army's new division construct—the BCT and the UEx headquarters—is transforming the Army and the signal services. In practice, all division-level signal battalions in the Army are going away. To keep the network whole, the UEx will have a G–6 who also will be the "commander of the network" and will be responsible for integrating the BCTs into the overall UEx network, managing the network, and defending the network at the UEx level.

Signal services will reside inside the BCTs as well as inside the UEx. This arrangement will ensure that each BCT can provide its own signal support with minimal dependence on higher echelons. This decentralization promises to be a major change for the Signal Corps.

Each light BCT will consist of a brigade troop battalion that includes a signal company, an engineer company, and a military intelligence company. This BCT also will have two infantry battalions similar to the ones deployed in Iraq. This approach allows staff functions previously performed at the division level to be pushed down to the infantry BCT level. A UEx will replace division main headquarters.

Signal support organizations will drastically reduce the need for remote signal sites on hilltops, thereby minimizing the requirement for force protection of those remote sites, and reduce the wheeled-vehicle footprint of existing signal support units at the UEy (theater and corps), UEx (division), and BCT levels.

Tactical Warfighter Information

"The Army has accelerated the implementation schedule of the Warfighter Information Network-Tactical (WIN–T)," said Lieutenant General Steven Boutelle, the Army's Chief Information Officer/G–6, "and is providing interim networking capability, bandwidth, and connectivity through the Joint Network Transport Capability-Spiral (JNTC–S)." The JNTC–S fills a gap in bandwidth capability for command and control, CSS, and intelligence beyond-line-of-sight communications support down to the battalion level.

[WIN–T will replace MSE and TRI–TAC as the foundation system for routing tactical information.]

Currently, the JNTC–S is being fielded to the 3d Infantry Division (Mechanized) as it converts to lighter BCTs. JNTC–S will serve both the BCTs and the UEx and will replace MSE as the networking element of the battlefield infostructure.

The concept behind JNTC–S is that satellites play a key role in providing communications links. The 3d Infantry Division's JNTC–S capability provides a mixed satellite and line-of-sight architecture from the UEx level down to the battalion level. Voice over Internet Protocol (VoIP) will enable a commanding general to talk to individual battalion commanders. The VoIP telephones are slated to replace existing digital and most circuit-based telephone systems, providing greater bandwidth efficiency across the network.

The extended networking capability provided by the JNTC–S will affect the way in which the UEx allocates forces. In the past, a division would dispatch a BCT to carry out a mission 100 miles away. Now, with new satellite assets, a battalion may be sufficient to perform the same mission. Units not fielded with this capability will use gateway switches to interface with units possessing the new technology.

Custom Network for Supply and Maintenance

Warfighters around the globe are starting to benefit from the capabilities of new network systems. The CSS Very Small Aperture Terminal (CSS VSAT) system provides Non-Secure Internet Protocol Router Network (NIPRNET) access for logistics transactions to CSS users almost anywhere on the planet using a global network that connects remote users to one of several hub stations located around the world via satellite. Soldiers often use the CSS Automated Information Systems Interface (CAISI) as a wireless local area network to connect to the satellite. With the satellite connection, a soldier can check instantly on the status of supplies and replacement parts.

CSS VSAT, which was first used by several divisions in the 2003 Iraq campaign, makes a huge difference. This system enables individuals with minimal training in satellite communications to acquire NIPRNET access. Setup time for the user generally is less than 30 minutes, depending on the field environment. By using a wireless interface, such as CAISI, CSS VSAT can be connected either to a local area network via a hub, router, or switch or to a wide area network. CAISI, which allows the operator at the terminal to be positioned up to 4 miles away from the antenna, also allows supply troops to start checking immediately on the status of desperately needed supplies and to enter requests that combat units radio in while the logisticians themselves are on the move.

Bypassing "Sneaker Net" and Saving Lives

CAISI allowed much more flexibility in the positioning of units, both in tactical and garrison facilities, during Operation Iraqi Freedom. Extended NIPRNET connections allowed support personnel to exchange data over the network rather than travel and risk exposure to hostilities. Troops also were able to avoid exposure by reducing the number of trips needed to move data by "sneaker net" from one location to another. In Iraq, this reduction in travel and exposure to hostilities has become a lifesaver.

CAISI provides 11 megabytes of wireless line-of-sight transmission, encryption on all wireless local area network links, and a 2-megabyte Digital Subscriber Line backup capability for non-line-of-sight requirements within a 4-mile distance. It extends the tactical connectivity capability from the theater level to the brigade support area and provides a communications capability that traditionally has been lacking in such areas as supply chain management, maintenance, and CSS business systems.

New equipment training will serve as the basis for developing institutional training, for unit sustainment training, and for rapid train-up of replacement personnel in support of contingency operations. All training will exploit the right mix of hands-on training and classroom training needed to maximize the effectiveness of individual and collective training. The bridging strategy toward full WIN–T capabilities will reduce personnel, training, and equipment requirements resulting from the anticipated consolidation of capabilities into common facilities. **ALOG**

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RFID Vision in the DOD Supply Chain

BY ALAN F. ESTEVEZ

The Assistant Deputy Under Secretary of Defense for Supply Chain Integration believes that the real value of RFID lies not in what it can do today but in what it will do in the future.

Today's U.S. military is a dynamic, rapidly moving force that is designed to be effective in an asynchronous battlespace. The enhanced mobility and speed of today's combat forces, which can perform in austere theaters with limited infrastructure, create new challenges for military logisticians. Logistics problems experienced during the combat phase of Operation Iraqi Freedom presented a compelling case for change. Contemporary military logisticians must meet the challenge of supporting the transformed combat force with fast, accurate, flexible, and mobile sustainment.

Historically, military logisticians supporting combat forces have had limited information on assets, particularly in theater. This lack of information led to ineffective inventory management, waste, inefficiency, and delay across the supply chain. Ultimately, these shortfalls affected the warfighters' overall materiel readiness, their ability to close the force, and the operational availability of weapon systems. The lack of synthesized, end-to-end, real-time information on items at rest and in transit undercut the combatant commander's ability to exercise directive authority for logistics.

The "bumper sticker" term that frequently is used to refer to the availability of information on assets in transit is "visibility," but visibility is not an end in itself. Visibility is a tool that helps to—

- Reliably deliver the required item to the right location, in the correct quantity, when it is needed, and from the most appropriate source.
- Make tools and information available to the decisionmakers who exercise effects-based management of the logistics network.
- Manage end-to-end capacities and available assets across the supply chain to best support warfighter requirements.
- Enhance the ability of the supported combatant commander to exercise directive authority over logistics.

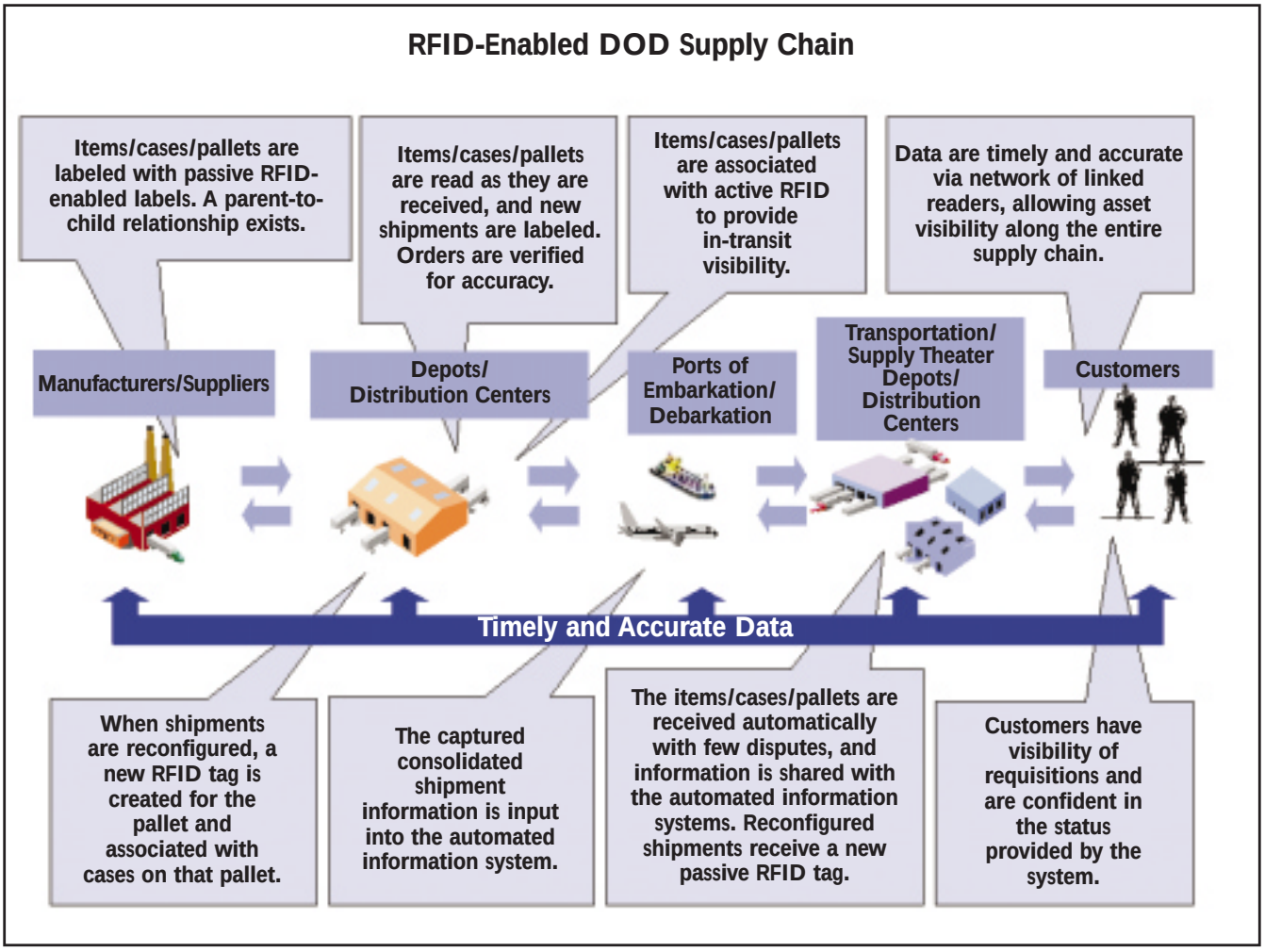
Radio frequency identification (RFID) is an enabling technology that allows military logisticians to synthesize and integrate end-to-end information about assets. The Department of Defense (DOD) is a globally sophisticated user of active RFID, with more than a decade of experience in this technology and the most extensive RFID network in the world. Now, DOD is attempting to standardize the use of active RFID and is moving ahead with the application of passive RFID technologies. (Active RFID uses a battery within the tag to power the tag and its RF communications circuitry. Passive RFID relies on radio frequency energy transferred from the reader to the tag to power the tag.)

Passive RFID

On 30 July 2004, the Acting Under Secretary of Defense for Acquisition, Technology, and Logistics issued a policy requiring the implementation of RFID across DOD. DOD is taking a leadership role in passive RFID, both as an early adopter of the technology and as the developer of the technology and standards for its use.

The RFID policy directs military services and Defense agencies to expand immediately the use of high-data-capacity active RFID that currently is used in the DOD operational environment. The policy also directs the phased application of passive RFID by suppliers, who will be required to put passive RFID tags on cases and pallets of materiel shipped to DOD and on the packaging of all items requiring unique identification (UID). Beginning in 2005, DOD suppliers will be required to put passive RFID tags on shipments of selected classes of supply going to Defense Distribution Depot San Joaquin, California (DDJC), and Defense Distribution Depot Susquehanna, Pennsylvania (DDSP). Additional classes of supply will be included and nodes will be added over the next several years, with full implementation expected by 2008.

The desired end state for the DOD supply chain is a fully integrated, adaptive entity that uses state-of-the-art enabling technologies and advanced management information systems to automate routine functions and achieve accurate and timely in-transit, in-storage, and in-repair asset visibility with the least amount of human intervention. RFID is a foundational technology on the path to achieving this vision. Ultimately, DOD will operate a single, seamless, responsive enterprise visibility network that will be accessible across the network backbone and usable by both people and systems throughout the supply chain.



DOD envisions using RFID as an integral part of a comprehensive suite of automatic identification technologies (AITs) to facilitate accurate, hands-free data capture in support of business processes in an integrated DOD supply chain enterprise. DOD will apply all of the AITs where appropriate in the supply chain to improve support to the warfighter.

RFID-Enabled Supply Chain

The chart above depicts an RFID-enabled DOD supply chain. This high-level process view provides a visual representation of how DOD foresees using RFID as materiel is moved from the manufacturers and suppliers to the warfighter.

Clearly not all operations within the DOD supply chain are captured on this chart. However, the primary actions performed by the physical nodes to move materiel through the supply chain are the shipping, receiving, and transportation processes. The chart depicts materiel movement that physically "touches" each node throughout the chain. Yet, materiel can start, move through, and end on different paths between logistics nodes.

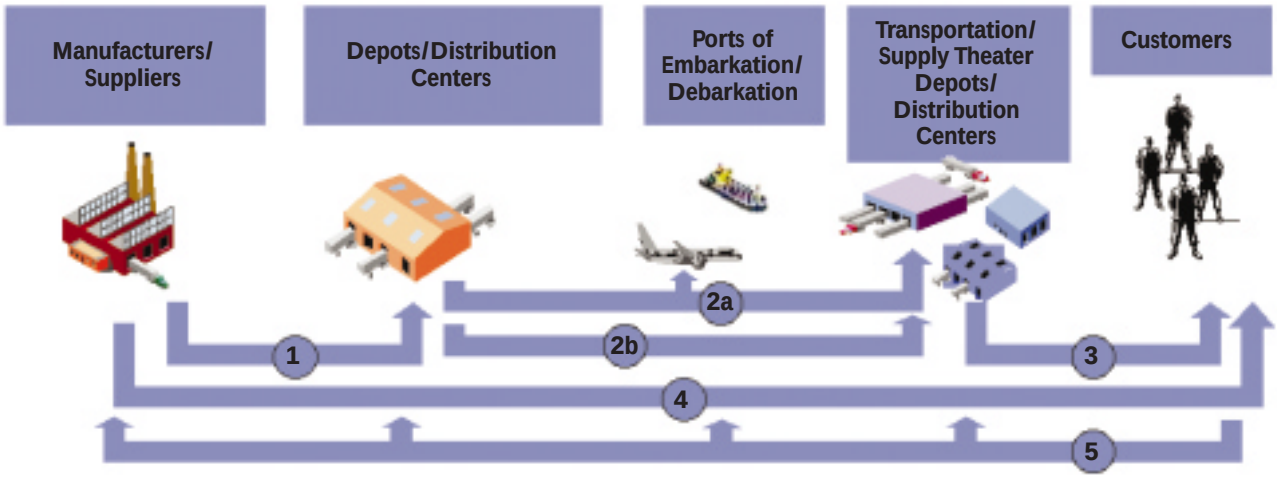
The chart at right shows how materiel can move, in various segments, through the supply chain. All of the segments depicted on the chart are affected by RFID. Materiel movement includes retrograding through the supply chain. Again, the direct impact of RFID on the retrograde and return process corresponds to the basic shipping, receiving, and transportation processes.

With passive RFID, DOD will capture more granular [detailed] data automatically, injecting advanced technology at the transactional level. This will streamline the movement of materiel through warehouses and depots, increase inventory accuracy, and generate productivity improvements.

Active RFID is a cargo-tracking capability that provides the ability to manage consolidated shipments. By adding passive RFID to the technology portfolio, the military services will be able to develop an end-to-end capability that relies on complementary active and passive technologies to deliver an RFID suite applicable to all assets that are in transit, in process, or on the shelf.

Historically, information across the supply chain has been captured only at the predefined nodal touchpoints.

Alternative Examples of DOD Supply Chain Segments



1. Manufacturers/suppliers to Defense Distribution Center for stock replenishment.
2a. Defense Distribution Center to supply depots/theater distribution centers for stock replenishment outside the continental United States.
2b. Defense Distribution Center to supply depots for stock replenishment in the continental United States.
3. Supply depots/theater distribution centers to customer.
4. Direct vendor delivery.
5. Return/retrograde. Active and passive RFID read-and-write capabilities will be required at the furthermost point in the supply chain delivery system to support retrograde. The return/retrograde process is the same as the shipping process.

This data capture generally has been used to update systems of record and, in some situations, generate status notifications. To speed the adoption and implementation of passive RFID technologies and accelerate the learning curve, the military services initially are using passive capabilities for transaction sets similar or identical to legacy transactions. However, once the foundational implementations are established, the true promise of passive RFID can be realized.

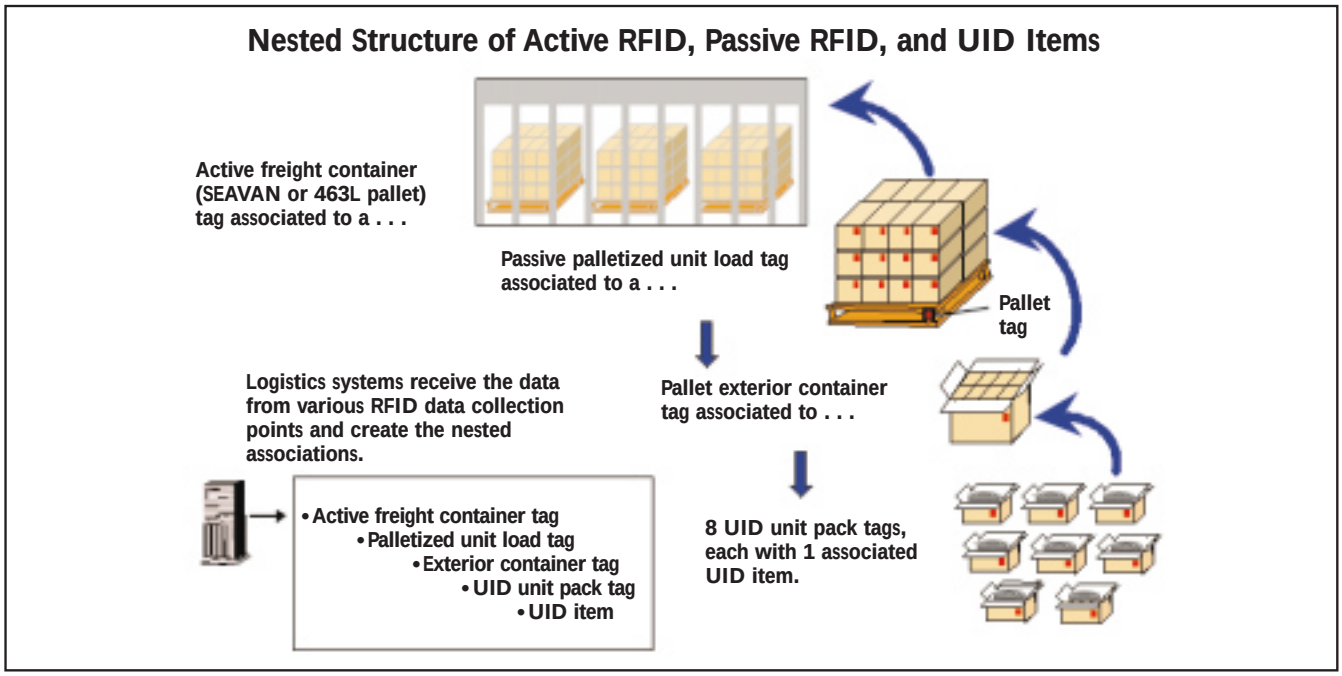
The Stovepipe Challenge

RFID delivers near-real-time status and improves inventory control, particularly in deployed or combat environments. It can make "track and trace" a reality around the world, across system and organizational stovepipes. No longer will DOD be limited to capturing information on at-rest and in-transit materiel at fixed locations. As RFID tagging becomes more and more ubiquitous and RFID technology becomes more portable, real-time information can be captured wherever needed to support the requirements of the combatant commander. Equally important, the adoption of passive RFID standards will circumvent the stovepipes and barriers to information flow throughout the services that historically have been a challenge for DOD. The military logistician will be able to deploy and move a logistics infrastructure and visibility capability as rapidly as the combatant commander can deploy and engage the combat force.

RFID is part of a larger suite of AITs that DOD will leverage in the supply chain where appropriate to improve support to the warfighter. As an enabling technology, RFID data must be available to automated information systems (AISs). Managers of major acquisition programs must update their programs to incorporate RFID capabilities where applicable.

RFID/UID Relationship

Active and passive RFID will continue to complement one another as passive RFID technology is



implemented throughout DOD. Many shipments moving through the Defense Transportation System currently are tracked using active RFID and a barcoded military shipping label. The implementation of passive RFID will complement the current successes in using active RFID for shipments outside the continental United States.

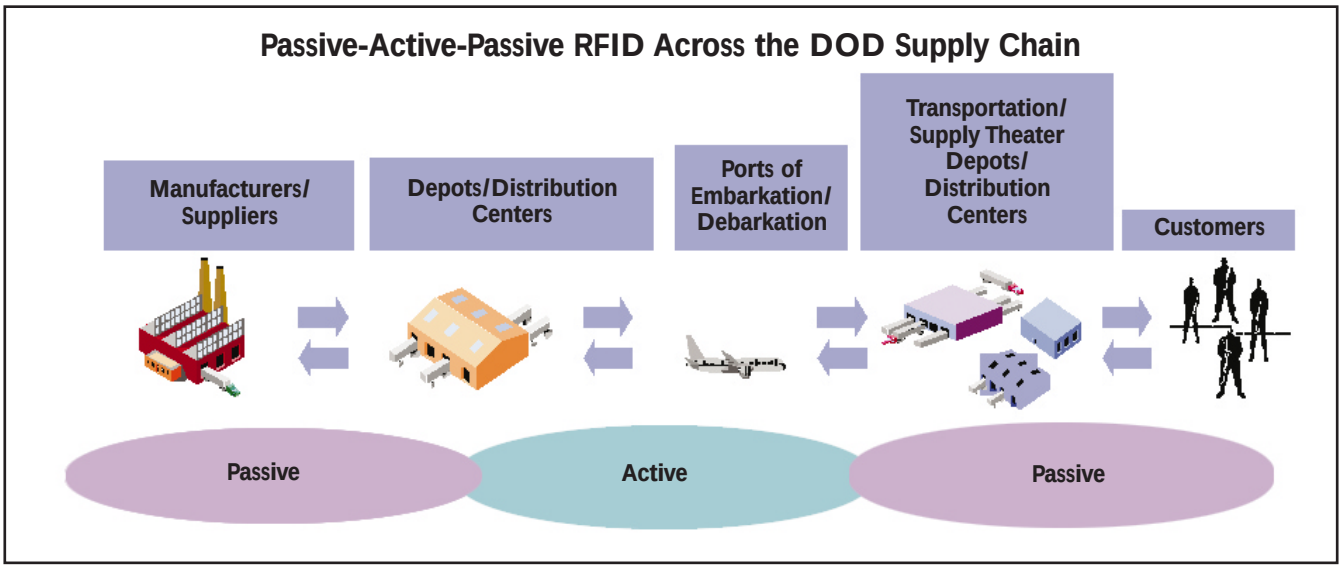
The association of a passive tag to an active tag will reduce container stuffing and unstuffing time and provide more accurate "inside the box" visibility. This passive and active association is created by building a "nested" structure of passive tags (UID item packaging and case and pallet tags) that are subordinate to the active tags (SEAVAN container and 463L pallet tags). Historically, active RFID has been excellent at providing nodal visibility. The use of passive tags will provide efficient and accurate item and content visibility. The marriage of active and passive RFID will result in more accurate and timely automatic capture and reporting of data within the multiple layers of information required in DOD's dynamic environment.

RFID deployment also complements the ongoing UID initiative. Although the UID and RFID initiatives are closely related, they have fundamental differences. UID is a permanent, unambiguous, and globally unique item identifier. RFID is a means of collecting data using radio frequency technology. RFID will be used as a hands-free data-collection method to identify UID items that are located within various levels of packaging.

To identify a UID item using RFID, the data on the RFID tags on unit packs, shipping containers, exterior containers, and palletized unit loads must be linked to the UID information in a logistics system. Using RFID tags to collect data and associating the tag data with UID information will help to maintain precise UID in-transit visibility and improve data quality, item management, and maintenance of UID materiel throughout the DOD supply chain.

Hands-free data collection will help extend and take advantage of the UID policy. However, the UID initiative requires that a data matrix be applied to each UID item. This data matrix is a two-dimensional barcode that is an alternative form of AIT. Incorporating two-dimensional barcode and RFID technologies into AIT equipment will facilitate the UID and RFID relationship.

The chart shown above depicts the "nested" structure of active RFID, passive RFID, and UID items. In this nested structural relationship, passive RFID will be used to verify the accuracy, track the physical movement of, and virtually build the contents of a 463L pallet or SEAVAN container. Passive RFID will verify the contents in real time and convey this information to the local AIS and the personnel physically loading the pallet or container. Once the pallet or container is configured properly, an active tag is attached to it to track and trace its movement. At the final destination, when the pallet or container is unloaded, passive RFID will again verify the contents and track the physical movement of the materiel within the destination node. These nested data also will be used to create a transaction record and close the transportation transaction once the items are received. The chart shown above right depicts



how the passive–active–passive relationship could look across the DOD supply chain.

RFID Versus Barcodes

RFID is part of a family of AIT devices that includes barcodes, optical memory cards, smart cards, microelectromechanical systems, and satellite tracking systems. RFID and barcodes will coexist for several years because both technologies have merit. However, RFID provides a number of positive benefits over barcodes. For example, RFID—

- Eliminates human error.
- Improves data accuracy and asset visibility.
- Performs in rugged, harsh environments.
- Provides a dynamic, multiblock read-and-write capability.
- Facilitates source data collection.
- Permits simultaneous reading and identification of multiple tags

Each military service and Defense agency should review its internal business processes to refine the most appropriate employment of RFID. The widespread integration of RFID into DOD business processes should be managed with the same level of attention given to a major system fielding.

Although RFID technology ensures accuracy and timeliness of data within current and future systems, implementing it will require significant planning, equipment fielding, AIS changes, and training. Such an approach will ensure a long-term, fully integrated solution.

RFID is being recognized as a valuable component of the suite of AITs because of the capabilities it provides. Active RFID has improved the ability to track, trace, and locate materiel on demand throughout the supply chain. Combining passive RFID technology with the active RFID technology already in place will create greater efficiencies and data accuracy in the DOD supply chain. Leveraging RFID to the fullest extent possible will improve the services' ability to get the right materiel to the warfighter at the right place, at the right time, and in the right condition.

The real value of RFID lies not in what it can do today but in what it will do in the future. DOD is in the midst of the most fundamental transformation of logistics capability ever attempted, and RFID is an integral element of that transformation. By employing RFID, DOD is laying a foundation that allows military logisticians to leverage new applications that enable them to see and manage the supply chain from end to end and not be limited by enterprise-centric, stovepipe systems. With RFID, it will be possible to control the supply chain from factory to foxhole and deliver the right item to the right place at the right time, even in the face of rapidly evolving conditions in the battlespace. **ALOG**

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Information Technology for Marine Corps Ammunition

BY STEVEN M. CRITTENDEN

The enterprise of managing Marine Corps ground ammunition requires new information systems to support forces in the field.

Imagine working for a company with a merchandise inventory valued at $4.2 billion and nearly 1,500 employees working at 22 different locations around the world. Your company's inventory consists of some 337 different major end items weighing a total of 210,510 tons and is stored at over 150 places worldwide, including stocks afloat on the oceans. Your company's budget for the next 6 years for replacing the items your customers are anticipated to use is $2.1 billion. Your company must train 450 new employees a year to keep up with personnel turnover, and those employees must be trained to understand and comply with numerous, strict safety regulations imposed by the Federal Government. Finally, there are the customers—over 200,000 of them—whom your company supplies with items from its inventory. They are extremely demanding and unforgiving, and they will not tolerate late delivery or insufficient quantities of items, or items that malfunction or do not work as intended, or shipments that do not contain the items they ordered. Oh, by the way, your customers' very lives depend on the received items working as advertised.

Welcome to the world of Marine Corps ground ammunition, referred to in the military supply vocabulary as "class V(W)." The management of the Corps' ground ammunition program, headed by the Program Manager for Ammunition (PM-Ammo) at the Marine Corps Systems Command, is big business. However, managing the Corps' ground ammunition is not simply a matter of keeping worldwide track of 337 major end items, each with its own Department of Defense Identification Code (DODIC). Many of these items include component items with separate national stock numbers (NSNs). There are literally thousands of NSNs to keep track

Better support of the customer in the field is the goal of Marine Corps ground ammunition information technology programs. Here, a forklift unloads a crate of ammunition from a CH–53E Super Stallion Helicopter at Camp Korea, Iraq. The customer being supported is the 31st Marine Expeditionary Unit.

of, not including the lot numbers assigned to batches of a specific NSN-designated item by its manufacturer. Items with the same lot number are assigned one of 15 condition codes by DOD, and those condition codes can change throughout the life cycle of those items. Items with the same lot number at the same storage location also can have different condition codes. For example, the portable Anti-Personnel Obstacle Breaching System (APOBS) is one of the 337 items managed by PM-Ammo. It incorporates components with different NSNs, including the motor, grenade, fuze, detonation cord, and packaging, and each of those components potentially can have different lot numbers and condition codes.

To improve the management of ground ammunitions and thus improve support to logisticians and operating forces in the field, the Marine Corps is developing several information systems that will increase the availability, timeliness, and accuracy of ammunition information.

Managing Ground Ammunition

The mission of PM-Ammo is to conduct limited research, development, and acquisition and execute lifecycle management support of all conventional ground ammunition Marine Forces require to train for, and successfully conduct, expeditionary maneuver warfare. PM-Ammo's corporate headquarters is located at Marine Corps Base Quantico, Virginia, and includes the PM, Deputy PM, and three divisions: Inventory Management and Systems, Ammunition Programs and Budget, and Logistics (see the chart on page 12). PM-Ammo is also the sponsor of occupational field 23, Ammunition and Explosive Ordnance Disposal, for the Corps' ammunition community, both officer (restricted only) and enlisted. ["Restricted" refers to warrant officers and limited-duty officers. "Unrestricted" refers to the rest of the officer community. All officers in the Marine Corps ammunition community are restricted.]

PM-Ammo is responsible for managing the following types of ground ammunition—

- Small arms.
- Medium caliber.
- Mortar.
- Artillery.
- Tank.
- Grenade and pyrotechnics.
- Demolition.
- Rockets and missiles.

It does not, however, manage Navy-owned aviation ordnance used by Marine Corps aviation units; the Deputy Commandant for Aviation is responsible for those requirements.

Ammunition Knowledge Management Portal

A significant information technology (IT) enabler used to provide meaningful and timely information in the conduct of the Corps' ammunition business is a comprehensive repository of ground ammunition data with its own Web site known as the Ammunition Knowledge Management Portal (KMP). Access to the KMP is controlled for security reasons.

The Program Manager for Ammunition supervises three divisions: Inventory Management and Systems, Ammunition Programs and Budget, and Logistics.

The KMP includes data on the following ammunition-related subjects—

- Class V(W) ground ammunition assets.
- Life-cycle management.
- Marine Corps stockpile by age.
- Malfunction histories.
- Notice of Ammunition Reclassification (NAR) histories.
- Engineering change proposals.
- Lot manufacture dates.
- Current NARs.
- Muzzle velocity adjustments.
- "Preferred for training lots" ammunition (a classification of ammunition that should be used for training).

The KMP is an evolving service provided to the Marine Corps ammunition enterprise that is updated systematically to provide "added value" to the viewer. Resource links are regularly added to the alphabetized directory located on the KMP home page.

e-Qual

Another IT enabler under development is the Electronic Ammunition and Explosives Qualification and Certification Program, known as e-Qual, that will allow Marines in the ground conventional ammunition, aviation ordnance, explosive ordnance disposal, and other explosives-handling communities to view their qualification and certification (Qual/Cert) training records on the KMP. Once it is fully implemented, the e-Qual tool will be updated regularly by Marine OnLine, thereby eliminating the current manual recordkeeping system. ["Marine OnLine" is a secure site linked to the Headquarters Marine Corps Web site that allows marines to log in with their name and password and then access personal records data (including pay matters), review their personal records for accuracy, and submit a request for corrections or updates.] Currently, e-Qual is scheduled to be delivered this spring.

Ammunition Budget Management

The IT primer of the Corps' ammunition enterprise is the Ammunition Budget Management System (ABMS). ABMS is used to formulate the Marine Corps' ammunition budget and support and defend the expenditure of Procurement Ammunition, Navy and Marine Corps, appropriations. It is a central information repository with a browser-based interface that is accessible to any authorized client through the KMP.

Ordnance Information System

As defined in paragraph 1007.1a of Marine Corps Order 4400.150E, Consumer-Level Supply Policy Manual, ammunition is classified as a nonexpendable item. Because of this classification and the sensitive nature of ammunition and explosives, accountability for these commodities is critical. The Corps currently uses as many as seven different end-user application systems to keep track of its ground ammunition. As a result of DOD's transformation initiatives, that multiplicity of systems is about to change. The Corps has partnered with the Navy to adopt a single system, called the Ordnance Information System (OIS), that will manage all ground conventional ammunition and aviation ordnance within the Department of the Navy.

OIS will allow authenticated users to interact with the database from their desktops using a Web browser, Web-enabled forms, and specialized applications. It also will be capable of interfacing with the Global Combat Support System (GCSS). GCSS-Marine Corps (GCSS–MC) will field a collaborative logistics IT suite that is built on a rich operational architecture, operates in a shared data environment, serves the entire business enterprise (garrison and deployed), and

is scalable, interoperable, and joint. GCSS–MC is currently one of only two programs to be designated as a Marine Corps Acquisition Category I program, the other being the Expeditionary Fighting Vehicle (formerly the Advanced Amphibious Assault Vehicle).

Common Logistics Command and Control System

The Marine Corps ground ammunition community is working on several other IT initiatives that will give the community, combat service support (CSS) units, and the "trigger pullers" in the operating forces (their primary customers) a better feel for ammunition visibility and logistics situational awareness, both on the battlefield and in garrison. One such initiative is ensuring integration of ammunition into the Corps' Common Logistics Command and Control System (CLC2S). CLC2S is designed to give the CSS decisionmakers better data and asset visibility.

Supported Unit Ammunition Module

During combat, the Marine Corps component commander must provide a daily Munitions Status Report (MUREP) to the combatant commander. The MUREP's influence extends beyond the theater of operations, reaching back to the service headquarters, the Joint Staff, and, for some types of ammunition, to the Commander in Chief (the President). Currently, no fully accredited IT solution is in place to provide visibility of ammunition assets once they have been issued to the operating forces from the retail supply points that maintain accountable records. PM-Ammo is considering designing a tool called the Supported Unit Ammunition Module (SUAM) to establish and maintain ammunition awareness and standardize the collection and reporting of relevant ammunition information. SUAM would provide supported units at all levels with the common automated tools they need to obtain enhanced asset visibility, improved and standardized expenditure reporting, enhanced planning capabilities, centralized data storage and management, and improved communications. SUAM could be built using the technologies and the lessons learned with the Unit Level Ammunition Status (ULAS) concept demonstration initiative. It is envisioned that SUAM could be a capability within OIS or CLC2S.

Training Ammunition Management

A garrison-level initiative known as the Training Ammunition Management Information System-Redesigned (TAMIS–R) is an Army-developed, Web-based application that allows supported units to forecast their ammunition training requirements to ammunition supply points worldwide in order to support the logistics functions of request management, order management, and capacity management. TAMIS–R also allows a supported unit to track its allowances and record its expenditures, which permits near-real-time expenditure tracking and makes end-of-year expenditure reporting less labor-intensive and more reliable.

Munitions Readiness Report

Another key IT enabler is the Munitions Readiness Report (MRR), another Army-led initiative that is being reengineered as a result of input from a working group. The Marine Corps' initial effort to provide a similar capability was known as the Ammunition Readiness System (ARS). ARS will continue to mature to produce a mirror-like application of the current Army MRR. Ultimately, MRR will be a joint, common readiness application for all services and will meet the munitions-related requirements of the Defense Readiness Reporting System.

The Marine Corps' ground ammunition community is "leaning forward" in many areas to improve and modernize its business enterprise practices. It is doing so in ways that complement and support many ongoing transformation and modernization efforts, including the U.S. Transportation Command's Distribution Process Owner, Naval Logistics Integration, and the Marine Corps' Logistics Operational Architecture initiatives. In the final analysis, it is all about supporting customers throughout the world with the timely delivery of the right amount, the right type, and the right condition of class V(W) products. **ALOG**

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MORE INFORMATION ON MARINE GROUND AMMUNITION

For more information on the various Marine Corps ground ammunition systems, go to the PM-Ammo Web site at http://www.marcorsyscom.usmc.mil/am/ammunition and click on "Ammo Quarterly." The following articles are recommended reading—

- **"The Winds of Change . . . Ammunition Logistics Focus Team (ALFT)," January 2003, page 4.**
- **"Inventory Management and Systems Division (IM&SD) Sets Sail," January 2004, page 10.**
- **"E Qual," January 2004, page 32.**
- **"Ammunition Knowledge Management Portal News," January 2004, page 33.**
- **"Ammunition Budget Management System (ABMS)," January 2004, page 35.**
- **"Marine Corps Ammunition Procurement Budget in Review—2005," July 2004, page 2.**

Chronic Medications in Iraq: A True Army Lesson Learned

BY MAJOR GRETA L. BENNETT

After medical logistics officers found that their plans for supplying soldiers in Iraq with chronic maintenance medications did not work, they developed a process that ensures soldiers will receive their medications without having to order them.

Nearly 2 years ago, our country was faced with a dilemma: Declare war on Iraq immediately, or allow United Nations inspectors to complete their inspections and proceed based on their findings. While this decision was being made, the military forces were busy with operational planning, which had to be conducted with high levels of secrecy. The U.S. military already was supporting combat operations in Afghanistan; however, establishing a logistics support concept—particularly medical logistics support—for Iraq was a completely different matter. Military medical materiel managers had to keep in mind that they might have to deal with the effects of biological or chemical weapons if the United States went to war with Iraq. The planning phase was extremely detailed and labor intensive. Many scenarios were discussed before logistics support concepts were developed.

The focus of medical materiel managers during operational and tactical planning for Operation Iraqi Freedom was combat healthcare operations. They had to ensure that soldiers stayed healthy and protected from diseases and biological weapons and that the combat healthcare system could respond to combat injuries quickly. However, they did not anticipate the duration of the deployment. What initially had been envisioned as a "quick" war similar to Operation Desert Storm in 1991 quickly turned into multiple deployments of 12 months or longer. The extended deployments significantly affected the maturing supply-chain management of medical materiel; specifically, the refilling of prescription medications that the Army identifies as chronic maintenance medications.

Chronic maintenance medications are those medications needed to treat or control chronic health conditions of individual soldiers. Maintenance medications normally are used on a regular, predictable schedule rather than sporadically as needed. Examples include medications used to treat high blood pressure, high cholesterol, thyroid disease, diabetes, ulcers, depression, and chronic pain.

Concept of Medical Logistics Support

The underlying concept for medical logistics support in Operation Iraqi Freedom was to make the maximum use of distribution in order to relieve the forward units of the burden of managing and moving large quantities of supplies. The goal was to have medical units deploy with their required materiel and equipment. However, this proved to be more difficult than expected because combat unit medical supplies, which are generally too expensive to keep on the shelf during peacetime, were not readily available. This placed a significant burden on the medical supply system and commercial partners to manage the surge in requirements.

Based on the assumption that Operation Iraqi Freedom would be similar to Operations Desert Shield and Desert Storm, guidance was issued that each soldier would deploy with a 90-day supply of chronic maintenance medications. However, most of the medications were consumed before the soldiers departed from home station because the medications were issued weeks in advance of deployment. Planners had assumed that soldiers would be able to use the Department of Defense Mail-Order Pharmacy System for refills, but no process was ever developed and put into place to make that a realistic alternative.

By late April 2003, the need to obtain prescription refills was becoming an overwhelming problem in the Southwest Asia theater of operations. Nearly 10 percent of all soldiers had prescription requirements, and it was almost impossible to predict each soldier's actual drug and dosage requirements because chronic medications were not identified before deployment. With 120,000 soldiers in theater, over 12,000 prescriptions had to be refilled.

As the problem escalated, it was discovered that units did not know what specific chronic medications their soldiers used. Once medications were consumed, the medical materiel system could not handle the volume of requirements and process requisitions in time to

Pharmacists at the 21st Combat Support Hospital in Balad, Iraq, are responsible for ensuring that soldiers have the medications they need.

get prescription refills to soldiers. As a result, units initially bypassed the system and reached back to home station hospitals to have refills shipped into the theater.

To correct the problem, combat support hospital pharmacies began collecting prescription requirements and stocking chronic medications for soldiers in their area. Units were instructed to provide detailed listings of the chronic maintenance medications their soldiers needed. This requirement led to a major reengineering of the deployment process to ensure that prescription requirements are compiled in a clinical database during predeployment processing. Soldiers now are required to deploy with 8-month supplies of medications, and female soldiers using oral contraceptives must take 14-month supplies.

Data Collection

Data on chronic maintenance medications for deploying soldiers are now captured and managed by a Web-based system called the Predeployment Medication Analysis and Reporting Tool (P–MART). The Department of Defense Pharmacoeconomic Center in San Antonio, Texas, issues a P–MART report to help commanders and medical officers accurately identify the chronic medications being used by their soldiers.

Once a unit has been identified for deployment, its soldiers must pass through medical readiness checks. One such check, called the Soldier Readiness Program, offers soldiers the opportunity to create wills, establish powers of attorney, make financial allotments, get medical assessments that identify immunizations they need, and verify their medical histories. After this process is complete, each unit commander or unit medical officer provides the Pharmacoeconomic Center a by-name roster of all personnel within the unit designated for deployment. The center generates a P–MART report that lists soldiers' chronic medications and the approximate dates they will need to be refilled.

The P–MART report goes a step further. Once information is captured in the system, refills are automatically filled and shipped to the medical logistics battalion in Iraq and then distributed to the deployed unit. Using P–MART, the battalion receives bulk shipments of chronic medications and immediately forwards the medications to the appropriate unit for distribution to soldiers. Refills normally are shipped at the 4-month mark for the deployed unit. This ensures that medications are received in a timely manner and neither the soldier nor his unit has to initiate the request.

Deployments to combat operations present soldiers and their units with many challenges. Fortunately, providing chronic medications is no longer one of them. Drawing from lessons learned, the Army now has a system in place that ensures that soldiers have the chronic medications they need and combat hospitals stock the pharmaceuticals required by the soldiers they serve. **ALOG**

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Patriot and Avenger Reset

BY KIM C. RUSSELL AND MARK L. SHEFFIELD

Applying Lean Manufacturing techniques during the restoration of the Patriot and Avenger air defense systems reaped significant savings for the Government.

At the beginning of Operation Iraqi Freedom, coalition forces repeatedly relied on the Patriot air defense missile system to knock out Scud missiles launched toward coalition command posts, base camps, and advancing troops. On 20 March 2003, Patriot batteries successfully intercepted and destroyed two Iraqi tactical ballistic missiles fired at Kuwait. In the days that followed, other missiles were successfully destroyed. Air defense artillery units performed brilliantly in Operation Iraqi Freedom, intercepting every Iraqi missile fired toward Kuwait or coalition forces except those whose trajectories indicated that they would fall harmlessly into the empty desert or the ocean.

Patriot Missile System

The Patriot is the Army's most advanced air defense system. Since it was fielded in 1982, it has proven itself to be a combat multiplier for combatant commanders. Capable of defeating both high-performance aircraft and tactical ballistic missiles, it is the only operational air defense system that can shoot down attacking missiles. A Patriot battery (the basic firing unit) consists of a phased-array radar set, an engagement-control station, computers, power-generating equipment, and up to eight launchers, each holding four ready-to-fire missiles. Approximately 90 soldiers are assigned to a battery, but only 3 are needed to operate the battery in combat.

A Patriot launching battery typically has eight launching stations. This launching station is mounted on an M860 semitrailer towed by a 10-ton M983 heavy, expanded-mobility tactical truck.

During the early stages of Operations Enduring Freedom and Iraqi Freedom, the Patriot batteries were exposed to extremely harsh environments. Sand significantly degraded their condition during both transport and operation. The exposure to the environment, coupled with exposure to hostile fire, resulted in severely damaged batteries. The impact of the damaged Patriots on the deployed air defense artillery fleet was severe and had to be addressed to maintain acceptable long-term levels of readiness.

Patriot experts from the Lower Tier Project Office of the Army Aviation and Missile

Command's Integrated Materiel Management Center (AMCOM IMMC), at Redstone Arsenal, Alabama, along with personnel from Letterkenny Army Depot, Pennsylvania, developed a detailed plan to restore the Patriot systems to their predeployment condition. The plan was called Patriot Reset, and its stated objective was to increase readiness by making the equipment fully mission capable. Letterkenny's mission was to reset three Patriot battalions in a year.

The Patriot Reset program showcased Letterkenny's capabilities and commitment. The depot is the Army's center of technical excellence for air defense and tactical missile ground support equipment. Letterkenny had saved the Patriot Lower Tier Project Office $1.2 million in fiscal year 2003 using the Lean Manufacturing process. Lean Manufacturing is a set of principles and practices directed toward revamping the production process in a way that includes eliminating waste, removing inventory buffers, and focusing on quality. Using the earlier success as a model, Letterkenny's Lean Manufacturing Core Team designed the reset program using Lean Manufacturing techniques, a system of cross-training, and flexible management that focused on customer needs.

From the initial planning stages, Letterkenny representatives used "out-of-the-box" thinking to create an efficient plan. This plan eventually allowed the depot to complete the project 2½ months ahead of schedule and $1.5 million under budget. The plan called for the Patriot systems to be overhauled in two locations by three organizations. Using the ongoing Patriot recapitalization program as a model, equipment was divided between the assets that could be reset at Fort Bliss, Texas, and those that had to be returned to Letterkenny for repair.

Letterkenny technicians developed a reset schedule and synchronized it with the three air defense battalions at Fort Bliss to ensure that reset operations would not interfere with the units' deployments, redeployments, or training missions. Then, more than 100 technicians at the depot worked two shifts 7 days a week to ensure the success of the reset mission. They disassembled and cleaned all major items, repaired or replaced their components, and reassembled them. The technicians successfully reset 16 Patriot radar sets, 15 engagement-control stations, 3 information and coordination centrals (command and control elements), 15 electric power plants, and 30 generator sets. During the system integration and checkout conducted at the Tobin Wells Training Area at Fort Bliss, the Patriot equipment was determined to be fully mission capable and was accepted by the fire units. The final product was a revitalized Patriot air defense system that soldiers could trust to accomplish their missions.

A missile fired from a Patriot launcher heads toward a target detected by the system's engagement-control station.

Letterkenny's Logistics Center of Excellence (LCOE) at Fort Bliss was the second location used for the reset program. One of the first employees to arrive at the LCOE was a member of Letterkenny's Lean Manufacturing Core Team. The Patriot Lean Value Stream Analysis (a process that helps identify a system's values and pinpoints areas needing improvement) identified opportunities to save money and time by reducing travel distances and turnaround time. For example, a major bottleneck in the cleaning, plating, and painting operations was identified and mitigated. The Lean Manufacturing process reduced a 3- to 4-week backlog of material to a less than 1 day backlog and sped up component parts processing by 87 percent.

Avenger Air Defense System

Patriot was not the only weapon system used to cover the coalition forces advancing from the Kuwait border to Baghdad International Airport. Avenger air defense systems also were deployed and used by some Army units, usually in extremely adverse conditions. The Avenger is the Army's premier line-of-sight, mobile, shoot-on-the-move air defense system. It is a key element of the air defense architecture. The Avenger system carries eight Stinger missiles in two four-missile launch pods ready for rapid firing from a gyro-stabilized turret mounted on a high-mobility, multipurpose wheeled vehicle.

A soldier with the Oklahoma Army National Guard maintains site security at a remote Patriot missile battery tactical site in Southwest Asia.

The Avengers used by the coalition forces were sandblasted by windstorms, and many suffered battle or transportation damage. Letterkenny crews examined the Avengers front to back, top to tires, and discovered that nearly everything needed to be "redone."

"We've had to adapt to significant changes in maintenance requirements as a result of how Avengers are being used in the AOR [area of responsibility]," said Michael McGee, director of IMMC's Short-Range Missile Directorate. "Although designed as an air defense system, Avengers have assumed an expanded battlefield role of extensive force protection. [This has] . . . changed our thinking on how to reset Avengers. For example, the 3d Armored Cavalry Regiment drove their individual Avengers over 70,000 miles in a single year. . . . You can imagine the degree of stress that places on the . . . system since it wasn't specifically designed for that type of combat role."

"During the reset of our first Avenger battalion—from the 3rd Infantry Division at Fort Stewart, Georgia—we decided that we would ask the unit to relinquish control of the vehicles and ship the fire units to Letterkenny [for] more detailed maintenance," said Chief Warrant Officer 4 Tom LaFontaine of the Short-Range Air Defense Project Office. "To maintain unit confidence in our ability to reset and return fire units consistent with their internal training schedules, we invited the units to send their maintenance technicians to Letterkenny to assist in hands-on repair of the Avengers. . . . Soldier involvement is especially critical considering the maintenance challenges facing Avengers returning from the area of responsibility."

All Avenger vehicles were returned to Letterkenny for reset. Together, Letterkenny personnel and Team Redstone developed a reset plan for the Avengers that would meet redeployment schedules and, at the same time, save IMMC $1 million. In the assembly and disassembly areas, technicians made many recommendations that eliminated unnecessary steps in the refurbishment process. Some improvements to the process included the use of portable light fixtures to aid in disassembly and reassembly and the creation of a "parts supermarket" close to the work cells. At times, as many as 40 Letterkenny maintenance personnel and 4 to 6 soldiers were involved in reset activities.

In an August 2004 ceremony, the commander of Letterkenny Army Depot presented IMMC with a ceremonial check representing the combined $2.5 million in savings realized through the center's application of Lean Manufacturing techniques to the Patriot and Avenger missile systems reset programs. The check was "endorsed" and returned to the depot's coffers by John Chapman, IMMC Executive Director. "Every dollar we can save by improving our processing . . . [is] a good thing for the taxpayer and a good thing for the budget," Chapman said.

In addition to having Patriot and Avenger missile systems back in the field faster than expected, soldiers also benefit from the refurbishment because the money saved can be used to support other unfunded projects.

As the Army transforms, the Avenger and Patriot air defense systems must remain lethal, survivable, and sustainable with reduced operating costs. Maintaining the highest level of unit and system readiness is the Army's dominant objective, and the Letterkenny Army Depot Avenger and Patriot reset programs are the Army's proven solution. **ALOG**

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Installation Management—
From Camp Swampy to the *Starship Enterprise*

BY JOHN DI GENIO

On "Star Trek," a groundbreaking television series in the 1960s, humans and aliens served together on the *Starship Enterprise.* A sequel, "Star Trek: The Next Generation," was even more visionary, making the *Enterprise* home to both the crew and their families. While the crew deployed on missions, family members enjoyed the amenities on the *Enterprise*. Today's Army installations are moving toward the environment portrayed in "Star Trek: The Next Generation."

The traditional image of the young, unattached GI is a thing of the past. The typical American soldier today has a high school diploma and may be college educated. Over half of the members of our military forces are married. Many have children attending Department of Defense Dependents Schools.

Unfortunately, because their infrastructures have not kept pace with the changes in Army demographics, many military installations continue to be much like Camp Swampy, the post portrayed in the "Beetle Bailey" comic strip. In these places, existing facilities are inadequate for today's soldiers. Housing suitable for a single soldier is unacceptable for a service member with a family. Recreational facilities and activities that once were appropriate for the unaccompanied draftee are unappealing to professional soldiers and their families. The Army can no longer consider only the soldier; it now must address the broader concerns of the soldier and his family. When a soldier has to serve in a dependent-restricted area, he must be confident that his family is well cared for back home.

Professional installation management personnel—military and civilian alike—play a pivotal role in meeting soldier needs. Installation management personnel must provide enough funding for Army facilities to accomplish missions during both peacetime and mobilization. They also must recruit and retain people with the skills necessary to make Army installations viable power-projection "flagships"—installations capable of sustaining and supporting forces anywhere in the world at any time.

Installations as Flagships

In 2003, Army Chief of Staff General Peter J. Schoomaker designated "Installations as Flagships" as one of the Army's 16 focus areas. Installation management personnel at Headquarters, Department of the Army (HQDA); Headquarters, Installation Management Agency (IMA); the seven IMA regional offices; and individual Army garrisons are key to realizing the Chief of Staff's vision and making installations more efficient and effective.

Providing resources for realistic standard levels of services at each Army installation ensures that support and services are equitable and consistent. Realizing economies at the facility level gives leaders flexibility to resource key initiatives that will make installations both excellent communities and power-projection flagships.

Flagships are places where military personnel live, work, and train and from which they deploy and are supported during contingency operations. A flagship installation needs a standard installation infrastructure that is aligned to the needs of the professional soldier and his family. For example, Quonset huts and gang latrines are no longer acceptable. Recreational activities should be more family oriented. Training ranges should be modernized to support interservice, simultaneous collective training. Professional warriors should have the electronic capabilities needed to reach back to the home station for support when they are deployed. Essentially, the Army is striving for excellent communities that provide quality-driven installation support within the framework of essential common levels of services.

Visionary leaders at HQDA, IMA, the IMA regions, and the individual installations are creating a corporate culture that is receptive to emerging, challenging roles and responsibilities. Although the flagships are Army installations, the key stakeholders at the installations could very well be from other services. Installation management personnel therefore should think "purple," or "joint."

Joint Mindset

With the Department of Defense's increasing promotion of joint expeditionary forces, other military services share the Army's flagships and could deploy from an Army installation. Consequently, they are key stakeholders in the operations at that installation. Installation management personnel should become better acquainted with joint doctrine because, as flagships, Army installations need to focus on joint expeditionary forces.

The life expectancy of the Korean War-era Quonset hut was 20 years. Although they do not meet the Army's minimum standards of acceptability for dwellings, many are still used in Korea to house soldiers.

Installation management personnel can cultivate an environment that is receptive to joint operations by pursuing initiatives that benefit the different service components. Installation management professionals could promote "jointness" through initiatives that maximize savings for all of the services supported by the Army installation. For example, one way to foster a joint atmosphere is to allow the other services on an installation to share in the accrued savings or cost avoidances of an activity-based cost management project that crosses service lines.

Having a vision and fostering the right state of mind at the installation are only part of the challenge. Flagship personnel must be ethical and competent to achieve the IMA vision.

Installation Quality

A disparity exists in the quality of facilities and services available at Army installations. Some installations (the "haves") provide adequate support for soldiers and their families and civilian employees. "Have" installations provide decent housing; office space; dining, recreational, and athletic facilities; and training ranges. At the other end of the spectrum are the "have not" installations, which are unable to provide the needed level of support services. Quonset hut buildings and gang latrines are often still found at these installations.

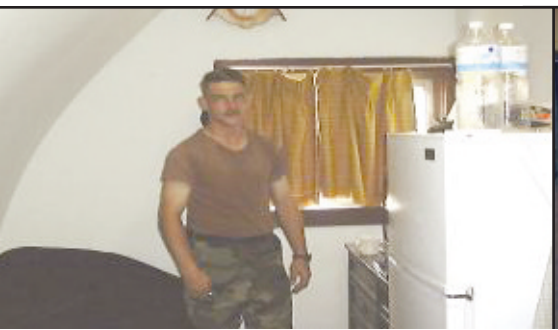
"Have" and "have not" installations need to be replaced by excellent communities that provide equitable support and services. Training ranges, deployment facilities, equipment, and state-of-the-art technologies should be readily adaptable for use by members of other service components. Providing common levels of support is a way to reduce, if not eliminate, the gap between "have" and "have not" installations. Under the common levels of support concept, installations are being funded to provide equitable services throughout the Army. With this funding, an installation in Korea will be able to provide the same level of support services as an installation in Texas. Housing and office space deficiencies also are being addressed. For example, Quonset huts are being replaced with modern buildings in Korea. Essentially, the Army's goal is to provide equal services at all installations. In the next stage of this reform effort, IMA will focus on applying the Army Performance Improvement Criteria to installations to make them "communities of excellence."

Personnel

To restructure successfully the way the Army conducts its installation support mission, it must train personnel to meet future challenges. Managers play a crucial role in ensuring that soldiers and civilian employees are ready to assume responsibilities on the flagship. Forward-thinking managers at HQDA, the IMA regions, and the individual installations should concentrate on funding required training to equip personnel with the skills they need to support the flagship during peacetime and contingency operations.

For example, the traditional roles of installation comptrollers are expanding rapidly. Historically, installations were staffed to execute a budget given to them by a major command. However, under the flagship concept of installation management, resources flow directly from the IMA to the installations without passing through a major command. Installations now have to plan and program for their resources to accomplish an evolving base-operations mission—one that supports excellent communities designed to standards, realistic training, reach-back capabilities, and power reception and projection.

Modularity ties in nicely with the flagship concept. Military and civilian personnel will be required to perform diverse duties and responsibilities. New skills will have to be learned and rehearsed during training exercises. The flagship will need installation personnel who are familiar with operations during mobilization. Hence, positions at the IMA regions and the installations may be staffed with emergency-essential civilians and contractors with wartime provisions in their contracts. Civilian personnel may be required to train on common battlefield skills and tasks to support the installation's wartime mission. Emergency-essential civilian personnel and contractors will expedite a seamless transition from a peacetime or armistice environment to a wartime posture, thereby facilitating deployment and supporting the expeditionary force without interruption or costly delays. [Emergency-essential civilians are Department of Defense civilian employees who perform specific battle tasks during mobilization.]



This inside view of a Quonset hut shows what each of the three soldiers who share this domicile gets for his $614 a month basic allowance for quarters.

Trained personnel work to execute the IMA leadership's plans for the future. However, nothing derails future plans better than archaic processes that add no value to installation management and support services. To avoid this problem, action officers at HQDA, the IMA regions, and the installations are reviewing processes and improving methods to ensure efficiencies and effectiveness.

Robust Processes

All installation management action officers should be the standard bearers for creative ideas that conserve public resources, eliminate redundant operations and processes, reengineer staffing and positions to make administrative procedures less bureaucratic, and promote an expeditious transition to a wartime posture.

Flagships should enhance the Army's capability to transition rapidly from peace to war. Redundant procedures could hinder this transition and increase the likelihood of the loss of lives and assets. Therefore, costly, outmoded, labor-intensive processes should be streamlined to help ensure mission success and realize efficiencies.

Taking advantage of regional contracts is an effective way to generate efficiencies. For example, installation management personnel within the IMA Korea Region Office noticed that the region was spending too much for utilities. To improve efficiency, the Korea Region Office is creating region-wide contracts to provide utilities and construction materials at the enduring installations on the peninsula. [As part of the Land Partnership Program and Future of the Alliance Talks, the United States will be returning installations to the Korean Government. Enduring installations are the facilities that the United States will continue to use.] Another excess cost is caused by warehouse managers at the installations' Directorates of Public Works using an outdated pencil-and-paper method of accounting for stocks in the warehouses, which results in higher ordering and storage costs. The Korea Region has contractors developing integrated processes that will address warehousing, logistics, and an in- and out-processing system.

Another cost-saving effort from the Korea Region Office is the use of the traditional Korean real estate "key-money," or "chunsae," system to obtain housing for civilians and military personnel living off post. With the key-money system, the renter gives the landlord a percentage of the value of the property up front. This lowers the amount that must be paid monthly. Currently in Seoul, the cost of off-post housing is astronomical. A typical four-bedroom apartment in a high rise can cost the U.S. Government $35,000 to $40,000 per year. The Government pays between $90 million and $100 million a year to house personnel off post in Seoul. The chunsae initiative potentially could save $25 million a year that could be redirected to finance higher priority requirements.

Family housing, such as the newly constructed Burke Towers in Yongsan, is replacing antiquated housing throughout Korea.

The Korea Region Office participates in major exercises to rehearse its critical role in supporting warfighters during a contingency. The Korea Region Office receives personnel and materiel at the installations and pushes them forward to sustain mobilization efforts. The warfighters are the "tooth." IMA regions, like the Korea Region Office, that have a wartime mission represent the logistics tail that sustains operations.

Installation management personnel play a crucial role in transforming Army garrisons into viable flagships where military personnel live and train and from which they deploy to protect U.S. interests. Installation management personnel must find creative ways to support initiatives that provide quality services to military members and their families. This includes providing deployed service members with reach-back capabilities.

Installation management personnel must eliminate wasteful practices and reallocate installation assets to resource standard levels of services equitably. They must be familiar with modularity in order to provide support and services to deployed personnel and their families. Installation management personnel must provide training that prepares military and civilian employees to meet the challenges of operating a flagship within a joint environment. Essentially, dedicated installation management personnel make the difference between Camp Swampy and the *Starship Enterprise*. **ALOG**

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Equipping the Iraqi Security Forces

BY CHIEF WARRANT OFFICER (W–3) BRIAN EDWARDS

One of the 1st Infantry Division's tasks during Operation Iraqi Freedom II was to oversee the establishment of Iraqi Security Forces (ISF) within Task Force Danger's area of responsibility. This was a very important mission because the ISF is essential to the successful transfer of authority to the Iraqi people. Equipping the ISF and maintaining asset visibility for all the equipment issued to it was, and continues to be, a large project for the 1st Infantry Division Property Book Office.

The ISF consists of four organizations: the Iraqi National Guard, the Iraqi Security Police, the Department of Border Patrol, and the Facilities Protection Services. The members of all four organizations were recruited from the Iraqi population, and most of their equipment consists of weapons the recruits furnished and vehicles they confiscated.

This eclectic collection of equipment presented several challenges to the ISF leaders. First, they had no way to determine combat power. The commanders had difficulty determining which units were prepared for security operations and which were not. Because its members brought varying amounts of equipment to the ISF, some units were well equipped and others had very little equipment on hand. This created an extremely difficult environment for commanders at all levels. Second, the United States was in the process of purchasing large quantities of equipment for the ISF. Without a good understanding of individual unit equipment levels, it would be very difficult to field equipment to the units that had the most pressing requirements. Finally, in order to build a professional force, the ISF needed to develop supply discipline, which is an important component of unit discipline. The Division Property Book Office was tasked to develop a property management system that would address all of these shortcomings.

Gaining Control of the Equipment

The division's first step was to gain visibility and control of the equipment already possessed by the ISF units in the Task Force Danger area. Each unit, in coordination with its U.S. partner unit, conducted an inventory of its equipment and reported the information to the ISF cell located in the Division G–3. The ISF cell, in turn, relayed the information to the Division Materiel Management Center (DMMC) and the Division Property Book Office. After this information was gathered and consolidated, the Property Book Office began building a property book for the ISF forces using the Standard Property Book System–Redesign. Once accountability was established, copies of the 60 primary hand receipts were sent to the U.S. partner units for distribution to, and validation with, the ISF units.

At the same time, sub-hand receipts and individual clothing and equipment documents were prepared and distributed in both Arabic and English. This allowed the Iraqis to begin establishing accountability and supply discipline at the unit level.

Equipping the Force

The most difficult and dangerous part of building the ISF was receiving their equipment and fielding it to them. The ISF lacked most of the equipment needed to maintain a credible force. The Multinational

Soldiers from the 1st Infantry Division's 701st Main Support Battalion pull security as an explosive ordnance disposal team destroys a roadside improvised explosive device (IED) during a combat logistics patrol transporting ISF equipment.

Coalition-Iraq established a central distribution center for all ISF equipment at Forward Operating Base Cooke in Taji, which is just north of Baghdad and approximately 130 kilometers south of Forward Operating Base Speicher in Tikrit. Because the 1st Infantry DMMC and Property Book Office were located at Forward Operating Base Speicher, that base was chosen as the distribution center for all ISF units in Task Force Danger's area of responsibility.

The Division Property Book Office, along with the division's ammunition and general supply offices, conducted several combat logistics patrols from Tikrit to Taji in an effort to fill the ISF's equipment needs. As equipment was received, it was prepared for issue and provided to the ISF units when needed.

Receiving and issuing equipment is an ongoing process. After each receipt of equipment, the DMMC develops a distribution plan and coordinates issue of the equipment to the ISF units through the U.S. partner units. Before the equipment is issued, the partner unit and ISF representative conduct a joint inventory. The equipment then is issued to the ISF representative, who then sub-hand receipts it to the individual units.

Two soldiers from the 1st Infantry Division Property Book Office issue weapons to ISF soldiers.

At first, the Iraqis had little concept of maintaining accountability and responsibility for equipment in their possession. They wanted the equipment; they just didn't want to sign for it. However, over time they made significant progress and now have a much better understanding of the requirements and benefits of equipment accountability.

Maintaining the Force

At first, the ISF property records were maintained in one Standard Property Book System–Redesign system at the Division Property Book Office. Once the ISF units were established and the influx of new equipment slowed, the Division Property Book Officer decided to use a team method similar to the one used by the 1st Infantry Division to manage its property. The division places a property book team inside each brigade combat team (BCT), collocating each property book team with the forward support battalion supporting that brigade. This has worked very well for the geographically dispersed BCTs. The team chiefs have better knowledge of the commands they support, and, because of the collocation, units travel less for support.

Accounting for ISF equipment is an additional duty for the 1st Infantry Division property book teams. Each team is responsible for a BCT and all ISF units collocated with it. They maintain the Standard Property Book System–Redesign records with input from ISF soldiers and the U.S. partner units. The original plan was to have ISF soldiers stationed with each team. However, because of the difficulty of finding an ISF soldier who could use a computer and read and write English, the idea was abandoned.

Overseeing the establishment of the ISF units has been a unique and challenging mission. Soldiers rarely have the opportunity to help establish a military organization from scratch. Each day brings new improvements in both the capabilities of the ISF units and the supply discipline they practice. In 3 months, the ISF transitioned from an underequipped, nascent organization to a better equipped, more disciplined force. They still have a long journey ahead, but the foundations have been laid.

By January 2005, the ISF in the Task Force Danger area had received over 70,000 major end items, including 25,000 weapons, nearly 4,500 radios, and over 1,800 vehicles. They also had developed a better understanding and appreciation for property accountability and asset visibility practices. **ALOG**

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LOGCAP 101:
An Operational Planner's Guide

BY COLONEL KAREN E. LEDOUX

In the first of two articles on the Logistics Civil Augmentation Program, the author discusses the commander's role in planning and executing the program successfully.

During my deployment to Iraq to provide support to Operation Iraqi Freedom, commanders sometimes expressed frustration that the Logistics Civil Augmentation Program (LOGCAP) did not meet their expectations. I believe the commanders' perceptions stemmed, in part, from the fact that they did not fully understand their roles and responsibilities in planning and executing the program and did not always have realistic expectations of the program's capabilities. LOGCAP's strengths lie in preplanned support and economies of scale and effort. These strengths have not been exploited fully because of incremental, bottom-up planning rather than top-down, integrated staff planning; underdeveloped theater contracting management processes; and a lack of knowledge at all levels of what the program can do and how to access it.

Two major findings of a 2004 Government Accountability Office audit of LOGCAP operations in Operations Enduring Freedom and Iraqi Freedom were that the Department of Defense did not comply fully with guidance on identification of contracting requirements early in the planning process and that the LOGCAP contractor was not adequately involved in the planning process. I believe that Army Materiel Command (AMC) Pamphlet 700–30, LOGCAP, does not detail the tactical- and operational-level mechanics of LOGCAP or provide "how to" information the combatant commanders (COCOMs) and Army service component commanders (ASCCs) need to properly implement the contract during contingency operations. In this article, the first of two on proper planning and employment of LOGCAP, I will attempt to help fill some of the voids in that doctrine.

LOGCAP Doctrine

Army Regulation (AR) 700–137, Logistics Civil Augmentation Program (LOGCAP), establishes Department of the Army (DA) policies, responsibilities, and procedures for implementing LOGCAP to augment Army forces during wartime. AMC Pamphlet 700–30 outlines procedures for commanders at both the DA and regional COCOM levels to follow when requesting and implementing LOGCAP services.

However, the pamphlet does not discuss operational and tactical execution or program mechanics. Nor does it explain fully how to maximize the program's capabilities or establish who is responsible for identifying or validating LOGCAP requirements, writing statements of work (SOWs), preparing independent cost estimates, tracking funds obligated against the SOWs, or reviewing the technical execution program at the operational and tactical levels. Likewise, the responsibilities of the requiring and using activities are not addressed in the pamphlet.

> . . . it is imperative that logisticians fully integrate, in logistics plans and orders, the functions performed by contractors together with those performed by military personnel and government civilians.
>
> —Joint Publication 4–0, Doctrine for Logistics Support of Joint Operations

LOGCAP Objectives

According to AR 700–137, the four main objectives of LOGCAP are to—

- Resolve the combat support (CS) and combat service support (CSS) unit shortfalls represented in operation plans (OPLANs) and in the Army program.

This article expresses views of the author, not those of the Department of Defense or any of its agencies.

A KBR employee demonstrates proper sawing techniques to two Iraqi laborers as they construct a new military camp near Baghdad.

• Consider conversion of existing support units based on availability of contract support in wartime.

• Provide rapid contracting capability for contingencies not covered by global OPLANs.

• Provide for contract augmentation in the continental United States during mobilization.

LOGCAP provides for preplanned use of global corporate resources to support worldwide contingency operations. The program is designed to provide support primarily in areas of operations where no bilateral or multilateral agreements or treaties exist, but it may be used to provide additional support in areas where formal host nation support agreements are in place. This support is provided by augmenting CS and CSS forces with contractors. Civilian contractors provide the Army with additional means to support current and programmed military forces by performing selected services such as humanitarian assistance, disaster relief, peace enforcement, and peacekeeping.

Civilian contractor support in a theater of operations frees soldiers and other military personnel to perform combat arms and CS missions. During the military drawdown of the 1990s, some Army CS and CSS functions were reduced and personnel transferred from Components (Compos) 1, 2, and 3 (Active Army, Army National Guard, and Army Reserve, respectively) to Compo 9 (LOGCAP).

Although LOGCAP is an Army program, it can, with proper preplanning, coordination, and training, support other services in joint operations, Federal agencies through memorandums of agreement, and coalition partners through acquisition and cross-servicing agreements.

The need for LOGCAP has increased as a result of reductions in the military force structure and reallocation of CS and CSS manpower to sustain the Army's combat arms capabilities. Mandated force structure caps also have increased the need for contractors. The escalated U.S. involvement in military operations other than war, such as those in Somalia, Bosnia, Kosovo, Haiti, and East Timor, have strained the military operating tempo (OPTEMPO). LOGCAP provided support in those operations to reduce the "green-suit footprint," decrease individual soldier OPTEMPO, and improve the deployed soldiers' quality of life.

LOGCAP Contract

The LOGCAP base contract operates under an indefinite-delivery, indefinite-quantity umbrella contract (one that covers many functional areas in one or more locations). The base contract provides for the winning contractor to develop a worldwide

Direct and General Support Operations[1]	Field Services	Other Operations and Services
Class I (subsistence)	Billeting	Airfield operations
Class II (clothing and individual equipment)	Sanitation	Retrograde operations
Class III (bulk and packaged petroleum)	Facilities	Engineering and construction
Class IV (construction materials)	Food service	Signal operations
Class V (ammunition)	Facilities operation and maintenance	Power generation and distribution
Class VI (personal demand items)	Information operations	Transportation operations
Class VII (major end items)	Personnel and administrative support	Maintenance and motor pool operations
Class VIII (medical supplies)	Laundry and bath	Standard Army Management Information Systems operations
Class IX (repair parts)	Morale, welfare, and recreation	Medical services
	Clothing exchange and repair	Physical security[2]
	Mortuary affairs	Convoy support centers
	Legal services	Force Provider operations

1. Supported unit must provide accountable officer(s).
2. Guard services cannot be provided in a hostile environment. LOGCAP contract prohibits arming the contractor.

management plan; participate in exercises as directed; when requested by DA or funded by a COCOM, prepare LOGCAP annexes to joint OPLANs; and execute plans or provide logistics support to operations when directed by the contracting officer.

The LOGCAP contract was awarded competitively; it has a 1-year base period and nine 1-year renewal options. The current contract was awarded to Kellogg Brown & Root (KBR) in December 2001. The contract does not stipulate a monetary ceiling; however, the number of events or contingencies KBR can support is limited.

The chart above shows some of the services LOGCAP can provide. This is not a complete list; in fact, there are few restrictions on the services that can be provided as part of the LOGCAP contract.

Legal Limitations

One of the most frequent misperceptions about LOGCAP is the fact that it is a *service* contract, not a *supply* contract. Therefore, it cannot be used to *buy* items or products. For example, the LOGCAP contractor can operate a motor pool and provide maintenance services for nontactical vehicles, but the Government cannot use the LOGCAP contract as a means to purchase the vehicles. The LOGCAP contractor can provide billeting services with environmentally controlled housing, but the contractor should not be used simply to purchase the housing. However, the contractor may purchase the items necessary to perform the services required under the contract.

All LOGCAP SOWs must be legally reviewed by the requesting command and the Army Field Support Command (AFSC) to determine if the requested work is permissible under current U.S. law, if the work is within the scope of the underlying LOGCAP contract, and if the requirements are properly funded.

LOGCAP is not a personal services contract. Therefore, it cannot be used to hire personnel who take day-to-day direction from military personnel or DOD civilians.

Planners must factor legal reviews into their planning timelines and work with their Judge Advocates General and LOGCAP advisors to ensure compliance with Department of Defense and Army Federal Acquisition Regulations.

Support Network

The Department of the Army (DA) Deputy Chief of Staff, G–4, is the Army's proponent for the LOGCAP program, and he approves its use in all operations. AMC is the Army's executive agent for LOGCAP and has task-organized LOGCAP operations under AFSC. AFSC has three organic elements dedicated to LOGCAP operations—

- The Directorate of LOGCAP Operations (DLO) (formerly PM LOGCAP) manages LOGCAP. The DLO

prioritizes planning requirements based on funding, workload, and DA guidance and advises the COCOMs on LOGCAP capabilities. DLO operations personnel are stationed forward with AMC logistics support elements (LSEs) in Southwest Asia, Europe, and the Far East.

• The LOGCAP Support Unit (LSU) provides the soldier, or "green-suit," interface between the COCOM or ASCC and the contractor; it deploys worldwide in support of LOGCAP operations. The LSU is responsible for advising the COCOM, ASCC, or joint task force commander on how to access, use, and integrate LOGCAP properly in contingency operations. In small, single-site operations, such as the 1999 humanitarian mission in East Timor, an LSU soldier also may serve as the contracting officer's representative. The LSU has three detachments of logistics and engineer officers with teams aligned to support each of the COCOMs. Four Active Guard/Reserve officers are included in the structure.

• The Procurement Contracting Officer (PCO) manages the LOGCAP contract and subordinate task orders and statements of work during peacetime and contingency operations.

During contingency operations, these three elements deploy into the theater of operations and serve under the operational control of the theater AMC LSE Forward. Additional Department of Defense and DA assets from the Defense Contracting Management Agency (DCMA) and the Army Corps of Engineers may be task-organized with the LSU, DLO, and PCO to form "Team LOGCAP."

DCMA administers the contract in theater as delegated by the PCO and provides quality oversight through its quality assurance representatives. The agency develops, trains, and manages the contracting officer's technical representatives in the supported units. DCMA also evaluates contractor performance and issues letters of technical direction when needed. When required, the Army Corps of Engineers provides engineering and construction contracting officer's technical representatives to evaluate LOGCAP operations.

Although Team LOGCAP facilitates implementation of the LOGCAP contract, the supported unit is the most critical "member" of the team when executing the contract. Supported units include the COCOM, the ASCC, the joint force land component command, joint task force, and their subordinate units. LOGCAP is not a "fire-and-forget contract" (a reference to a type of missile that does not require further guidance after launch). To maximize LOGCAP capabilities, the contractor must be fully integrated into staff planning and

KBR Support of Operation Iraqi Freedom

In November 2002, KBR deployed to Kuwait to prepare Camp Arifjan in Kuwait for the anticipated influx of U.S. troops. Since that time, KBR has—

- Prepared more than 160 million meals.
- Washed more than 6.2 million bundles of laundry.
- Produced more than 1 billion gallons of potable water.
- Transported more than 300 million gallons of fuel.
- Hosted more than 18 million patrons at morale, welfare, and recreation facilities.
- Delivered more than 560,000 bags of mail.
- Logged more than 50 million miles transporting supplies and equipment for the military (with more than 900 trucks on the road each day).

KBR now has 48,000 employees and subcontractors deployed to Kuwait and Iraq to support the U.S. military. Although KBR and its subcontractors have lost a number of their personnel to hostile actions, they continue to honor their commitment to ensure that the troops serving in Iraq have the best food, shelter, and quality of life possible.

On average, KBR produces 74 million gallons of water per month for LOGCAP.

execution processes, then monitored closely by DCMA and the supported unit. Without the full engagement of the supported unit, contractor capabilities and performance will be reduced.

LOGCAP Enablers

The keys to maximizing LOGCAP's capabilities are integrated military and contractor preoperation planning and standard support criteria for using the program in a theater. An LSU support officer must be included in the staff planning process before and throughout the operation to advise the commander on LOGCAP's capabilities.

DLO and LSU personnel are trained to advise commanders on the entire menu of LOGCAP services, inform them of program capabilities and limitations, and advise them on how to establish processes that will ensure effective operation of the program. These LOGCAP liaisons are not trained strategic planners; they are logistics and engineer officers or DA civilians. In past operations, DLO and LSU personnel have often been called "planners," which misled the supported units to assume they were qualified planners (perhaps with functional area 59, Strategic Plans and Policy, or skill identifier 6Z, Strategist, designations) and expect them to conduct LOGCAP planning for their units. On the contrary, the supported command is responsible for planning and integrating LOGCAP into its OPLAN.

LOGCAP personnel can be accessed through the DA G–4 or through AMC LSE elements in Southwest Asia, Europe, the Far East, and the Army Forces Command in the United States. These elements have organic DA civilian LOGCAP operations personnel. The AFSC's DLO also has DA civilian and contracted operations personnel.

The LSU has the most experience in executing LOGCAP operations on the ground in combat operations. During peacetime, ASCCs and personnel in theater support and corps support commands can learn much by tapping into the LSU's collective experience, knowledge, and capabilities during theater and joint exercises. Participation in an exercise requires coordination

through overseas coordination conferences and the ASCC G–3 in order to document future overseas deployment training requirements.

LOGCAP Mobilization

Because LOGCAP is not automatically approved for use in COCOM OPLANs or contingency plans (CONPLANs) and must be approved by the DA G–4, the LSU is not included in the time-phased force and deployment data (TPFDD) on any existing OPLANs. In Operations Enduring Freedom and Iraqi Freedom, this disconnect resulted in an "ad hoc" mobilization and deployment process, which impeded LOGCAP capabilities. To prevent a recurrence in future operations, the DA G–3 should be notified in a general-officer-level requirement letter from either the DA G–4 or AMC to mobilize LSU personnel as soon as theater planning begins and a requirement for LOGCAP has been identified, validated, and approved. LSU personnel then can be called forward into theater by the AMC LSE Forward commander as needed.

It is absolutely critical that the LOGCAP contractor be involved in the planning process as soon as possible to ensure that he has enough time to formulate the plan, hire and train the required personnel, and procure the proper type and quantity of equipment and move it into the theater to support the mission. Without a comprehensive, upfront SOW, additional costs are sure to result from unknown requirements. A good initial SOW that is designed to augment organic military capabilities will help ensure proactive planning and performance.

To enhance the integrated planning process, COCOMs and ASCCs must ask that a LOGCAP contractor planning cell be incorporated into their theater planning cell. Since the LOGCAP contract is preawarded, contractor input during the planning process does not present a conflict of interest. An underused provision of the LOGCAP base contract calls for the contractor to provide a planning cell to analyze existing theater OPLANs and CONPLANs and write the LOGCAP annexes during periodic reviews of those plans. It is critical that the COCOM specify that personnel in the LOGCAP contractor planning cell must have CS or CSS theater-level planners' backgrounds and top-secret security clearances. Quality, upfront integrated planning, sufficient time, and adequate funding of the SOW will help ensure success in providing support during the operation. The northern theater-opening option through Turkey that was developed by U.S. European Command and U.S. Army Europe at the beginning of Operation Iraqi Freedom is a good model for a theater-funded contractor planning cell. It is unfortunate that diplomatic barriers forced the 4th Infantry Division to deploy through Kuwait and those plans were not carried out.

In the July–August issue of *Army Logistician*, I will discuss planning considerations and identify critical tasks and management processes that will assist the U.S. military in maximizing LOGCAP's capabilities in future operations. **ALOG**

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Airlift Operations During the Lebanon Crisis

BY LIEUTENANT COLONEL MARK A. OLINGER

Airlift of a Marine Corps battalion to Lebanon demonstrated that deploying contingency forces from the continental United States to an overseas operation was feasible and expeditious.

During the Cold War, the United States deployed its Armed Forces to support the national objectives of various countries around the globe. The majority of those operations were short in duration and occurred in underdeveloped areas of the world. Most were joint operations, and some were conducted with forces from allied nations. Nearly all of them were contingency operations in which the goals, the time available, and the operational area were limited. One such mission was Operation Bluebat, the code name for the U.S. military intervention in Lebanon in 1958. That country, which is situated between Israel and Syria, was threatened by a rebellion aimed at toppling its pro-Western government. Because the resources needed to deploy an airborne brigade were limited, Operation Bluebat was one of the most complex operations of the Cold War.

A Continental U.S. Strike Capability

The XVIII Airborne Corps at Fort Bragg, North Carolina, was designated as the Strategic Army Corps (STRAC) in 1958. The designation was, in reality, the assignment of an additional mission rather than a true designation. The additional mission was to provide a flexible strike capability that could deploy worldwide on short notice without declaration of an emergency. The 4th Infantry Division at Fort Lewis, Washington, and the 101st Airborne Division at Fort Campbell, Kentucky, were designated as STRAC's first-line divisions, while the 1st Infantry Division at Fort Riley, Kansas, and the 82d Airborne Division at Fort Bragg were to provide backup in the event of general war. The 5th Logistical Command (later inactivated), also at Fort Bragg, would provide the corps with logistics support, while Fort Bragg's XVIII Airborne Corps Artillery would control artillery units.

Airlift assets were made available to U.S. forces based on the possible outbreak of a general war in Europe. In his paper, "Not War But Like War: The American Intervention in Lebanon," prepared for the Army Command and General Staff College's Combat Studies Institute, Roger J. Spiller notes—

> The Military Air Transport Service could deliver up to 188 million ton-miles of mobility under the general war scenario, and it was calculated that the Army's part would come to 80 million ton-miles of the total. From these figures, the Army's Deputy Chief of Staff for Operations, Major General Earle Wheeler, made the assumption that "if the general war requirement could be met, it would seem likely that the limited war requirement of the Army could be met in most circumstances."

Although the STRAC mission was to provide an easily deployable force for use in a limited war or other emergency, its ability to deploy overseas was limited by airlift constraints. Without the declaration of a national emergency, the required lift assets would not be released to support a STRAC deployment.

Overseas Operations

In March 1957, a year after its deployment to Germany, the 11th Airborne Division was organized under the "Pentomic" structure. A poorly conceived organization, the Pentomic division was cellular in structure and designed to fight on nuclear and conventional battlefields. Five infantry battle groups replaced three infantry regiments and became the basic fighting units of the division. Each battle group contained a headquarters company; five rifle companies; an organic mortar battery; and the reconnaissance, antitank, and logistics units needed to make it an independent, self-sustaining fighting force. The division's supporting units (artillery, signal, engineer, support, and command and control) were organized similarly in cellular multiples of five.

Based at Augsburg, the 11th Airborne Division was forward deployed, which limited its use as an airborne counterattack force. The division planned for numerous contingency missions requiring an airborne assault capability, not only in Europe but also in other parts of the world. However, the 11th Airborne Division was inactivated 1 July 1958, and its assets were transferred to the 24th Infantry Division, also in Germany.

Two-thirds of the 24th Infantry Division was organized as airborne, which made the division the first infantry division to have organic airborne assault units. Airborne elements of the division consisted of two battle groups; an artillery battery; a cavalry troop; two engineer companies; a parachute supply and maintenance company; and signal, ordnance, supply, and medical detachments provisionally formed into an airborne brigade known as the 24th Airborne Brigade.

Unrest in the Middle East

In the spring of 1958, U.S. interests in the Middle East were compromised when nationalist uprisings threatened pro-Western governments. In May, troubles sprang up in Jordan, Iraq, Lebanon, and Syria. On 14 July, King Faisal and Crown Prince Abdul Illah of Iraq were assassinated in a coup d'état led by Brigadier General Abdul Karim al'Kassim, a nationalist. At the same time, it was rumored that another coup was in the making against King Hussein of Jordan.

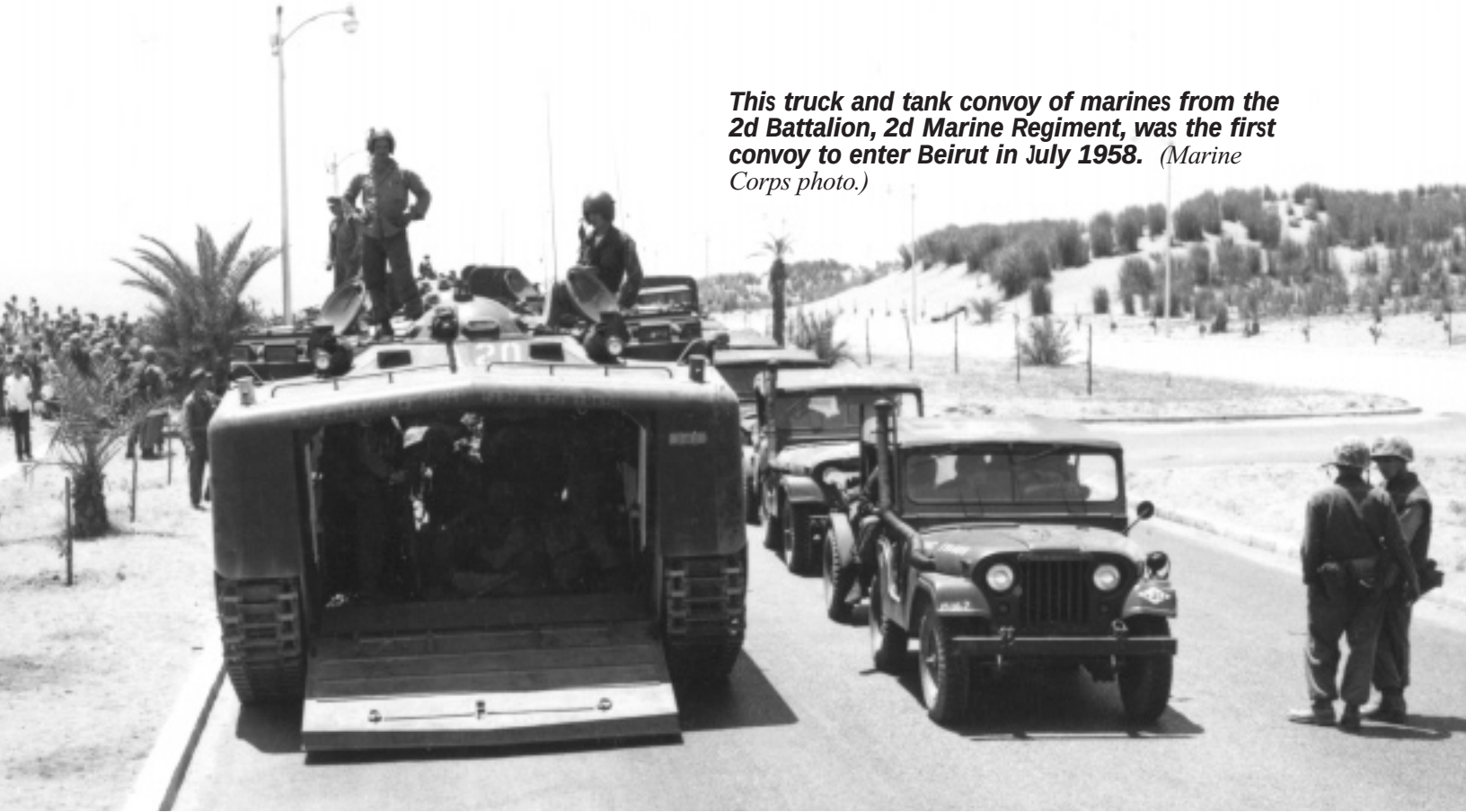
President Dwight D. Eisenhower, reacting to the overthrow of King Faisal's government in Iraq, alerted U.S. forces and deployed to Europe a tactical strike force from the Ninth Air Force at Shaw Air Force Base, South Carolina, and transport planes from Donaldson Air Force Base, South Carolina. A naval task force of 75 ships, including three aircraft carriers and two cruisers, and 45,000 men, 5,000 of whom were marines, was deployed to the Middle East from the Sixth Fleet in Italy.

The Government of Lebanon, faced with political turmoil, requested United States military intervention to prevent a collapse. With the situation deteriorating, President Eisenhower ordered U.S. forces to begin deploying on 14 July. The purpose of Operation Bluebat was to bolster the pro-Western government of President Camille Chamoun against internal opposition and threats from Syria and Egypt. The plan was to occupy and secure Beirut International Airport, a few miles south of the city, then secure the port of Beirut and the approaches to the city.

Because it was difficult to obtain sufficient airlift assets, the decision was made to employ forces that were closer to the region rather than STRAC elements. Contingency plans that had been formulated in 1956 for such an eventuality gave the 11th Airborne Division responsibility for the mission. The 24th Infantry Division assumed the mission after the 11th Airborne Division was inactivated.

Force Package Deployment

Although both Army and Marine Corps troops were ordered to Lebanon, only Marine Corps units made assault landings. On 15 July, within 30 hours of the President's order, a battalion landing team from the 2d Battalion, 2d Marine Regiment, from Camp Lejeune, North Carolina, arrived at Red Beach—only 700 yards from Beirut International Airport—and went ashore on



This truck and tank convoy of marines from the 2d Battalion, 2d Marine Regiment, was the first convoy to enter Beirut in July 1958. *(Marine Corps photo.)*

Marines arrive at the port area in Beirut to establish security around the congested facility. In the photo at right, marines man machinegun positions atop buildings near the dock*. (Marine Corps photos.)*

landing craft or amphibious tractors. In cooperation with the Lebanese Army, marines kept the airport open for commercial air traffic. The following day, a second battalion landing team from the 1st Battalion, 8th Marine Regiment, also from Camp Lejeune, landed at Yellow Beach 4 miles north of Beirut.

U.S. Army Europe (USAREUR) was to provide forces as stipulated in the February 1958 revision of Emergency Plan 201. This plan directed the formation of Army Task Force (ATF) 201 to handle emergencies in the Middle East. The task force would consist of two airborne battle groups that were reinforced with minimal combat support and combat service support elements. The task force would comprise five echelons, four of which were committed to the operation in Lebanon.

Force Alpha, which was composed of the task force command group and the 1st Airborne Battle Group, 187th Infantry Regiment, received orders to move from Germany to Adana, Turkey. On 16 July, the unit departed an air base near Munich, Germany, for a staging area in Adana and then moved to Beirut International Airport on 19 July.

On 18 July, the 2d Battalion, 8th Marine Regiment, arrived in Beirut by airlift through Port Lyautey, Morocco. It took 34 hours in the air on board 26 C–124C Globemaster II aircraft and 54 hours overall for approximately 800 marines and their equipment to reach their destination. In less than a week, 7,200 combat troops were in Beirut, including three battalions of marines.

The troops established Camp Zeitune in an olive grove near the airport and manned a perimeter defense around the airport. All three marine battalions assumed positions northeast of the city. U.S. soldiers

and marines made a show of force in and around the area. By the end of July, they encircled Beirut with an armed perimeter. Since combat did not develop in Lebanon, a second airborne battle group, Force Bravo, and the advance headquarters of ATF 201 never deployed from Germany.

Force Charlie, made up of combat, combat support, and combat service support units, deployed from Germany by sea and air beginning 19 July and closed on Beirut by 25 July. By the time the airlift phase was completed, over 1,600 soldiers and 1,718 tons of equipment had been flown into Beirut in 166 C–124C Globemaster II and C–130 Hercules transports from four separate airfields in Europe.

According to Emergency Plan 201, Force Echo, a medium tank battalion, was to move by sea. Leaving Germany on 22 and 23 July, the battalion arrived at Beirut on 3 August. Force Delta, which was the sea echelon of the second airborne battle group, left Germany on 26 July and closed on Beirut between 3 and 5 August. By 5 August, all major ATF 201 forces had reached Beirut and the bulk of their equipment and initial resupply had arrived or was en route. A total of 3,234 personnel and more than 2,310 tons of equipment were airlifted for the Army in 242 aircraft. All operations had gone according to plan, and conditions remained stable until a new government was installed in Lebanon.

Political Situation

Plans to end the intervention were underway as soon as it began, and President Eisenhower called on the United Nations to safeguard Lebanese independence. However, a Japanese resolution in the Security Council calling on the United Nations to protect Lebanon was vetoed by the Soviet Union.

Robert D. Murphy, Under Secretary of State for Political Affairs, arrived in Beirut on 17 July as President Eisenhower's personal representative. His task was to speed a political solution to the internal Lebanese problems that had led to the intervention. He and U.S. military leaders believed that the causes of Lebanon's internal conflict were domestic and bore little relationship to international issues.

As the political situation cleared, U.S. forces trained Lebanese forces to use American weapons and conducted a combined land-sea-air training exercise on the shore adjacent to the historic ruins of Byblos. U.S. Army and Marine Corps units continued to man checkpoints and conduct patrols, and the 1st Airborne Battle Group jumped occasionally.

In October, after 3½ months in Lebanon, the United States began to withdraw its forces and the confrontation subsided. On 23 October, the Lebanese formed a balanced government with representatives from each of the major parties. Two days later, the remaining U.S. Army forces left the country. During Operation Bluebat, one U.S. soldier was killed by sniper fire and four others died in accidents during what a Pentagon spokesman told the New York Times on 16 July was "not war, but like war."

The absence of opposition during Operation Bluebat and the underlying dilemma of whether contingency forces should be supplied by USAREUR or STRAC in the United States were significant factors in the Lebanon operation. Airlift of a Marine Corps battalion from the continental United States to the objective area demonstrated that such a movement was feasible and could be done quickly. The airlift increased the difficulty of justifying the need for a USAREUR contingency force for the Middle East when STRAC was being maintained for that purpose.

Although the intervention did not solve Lebanon's chronic political chaos, it helped maintain peace and demonstrated that the United States would support a small country that wanted to maintain its independence. The United States did not use its military power to sustain one faction against the other, but its presence made it possible for the Lebanese to devise a temporary political solution. Importantly, U.S. forces pulled out voluntarily as soon as possible.

Operation Bluebat was a nominal test of power. Because its amphibious and air landings were unopposed, the operation has been recorded in history only as a brief note. That it might have been the beginning of a conflict of Korean War proportions is overshadowed by the fact that it was not. **ALOG**

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Slaying the Manpower Dragon

BY JAMES T. DELISI

The success of a manpower assessment and review is directly related to the length of time spent on meaningful preparation.

Suppose you are the commander or chief of a table of distribution and allowances (TDA) logistics activity. You receive a letter from your major Army command stating that a manpower assessment and review team is scheduled to visit your organization and validate its manpower requirements during the next fiscal year.

Your reaction may be one of sheer panic. You envision a massive reduction in personnel or perhaps abolishment of your entire organization. You and your subordinates resign yourselves to the probability that the "manpower dragon" will cut a preset percentage of spaces and that personnel losses are inevitable. As a result, you do not devote much time and effort to preparing for the assessment.

Contrary to what you may have heard, a manpower assessment and review team does not arrive at an organization with predetermined cuts in mind. Instead, its mission is to determine the minimum number of personnel required by the organization to perform all missions and tasks directed by regulation or higher headquarters. Therefore, the success of the assessment is directly related to the length of time you spend on meaningful preparation for the team's visit. By providing detailed information that accurately portrays your organization's workload, you can slay the "manpower dragon."

Baseline Submission

Manpower assessment and review teams ask work centers for a baseline submission before the assessment. Elements such as teams, branches, divisions, and directorates that are set apart as separate paragraphs on an organization's TDA usually are considered to be work centers. The TDA indicates if the spaces in the work centers are overhead, supervision, or worker positions.

Each work center involved in the manpower assessment must prepare a baseline submission. This is a comprehensive document that provides information on the work center's mission, functions, organizational structure, workload, and manpower resources. The mission is why an organization exists and originates from regulation, public law, or other delegation of authority. A short description of the mission is usually found in the activity's organization and functions manual.

The directive that assigns an organization's mission, along with directives for any new missions, should be included in the baseline submission. For example, a recently received memorandum from the Army Deputy Chief of Staff, G–4, tasking the Army Forces Command (FORSCOM) to provide equipment to support several Army marksmanship matches yearly obviously would increase the FORSCOM workload. Therefore, a copy of the memorandum should be included in the baseline submission.

> Properly portraying your mission, type of work, output, and time spent producing that output will greatly aid the manpower assessment and review team in determining the proper staffing level for your organization.

Functions are the actual work performed. For example, functions derived from the marksmanship mission would include identifying FORSCOM sources of equipment to support the matches and providing shipping instructions. An organization chart, which shows organizational, command, and supervisory chains, should be included in the submission because it addresses command and control and operating relationships.

Workload is the major output, product, or service provided by a work center. Determining the workload is probably the most time-consuming part of developing a baseline submission. However, this element of the submission is the most critical because the

To ensure that the workload is defined accurately within a work center, each employee should complete an individual task sheet.

manpower assessment and review team will validate workload data during an on-site audit to determine staffing requirements.

Most work centers have several different workloads. Each should be identified and data on it collected for a historical period—normally 1 year. However, this data-collection period should represent the normal period of work. For example, a resource management activity may use a 2-year timeframe because that collection period most accurately portrays the Program Objective Memorandum process.

Individual Task Sheets

To ensure that the workload is defined accurately within a work center, each employee should complete an individual task sheet. This sheet should contain —

- Office name.
- Employee name, grade, and rank.
- Position title, TDA line number, and paragraph number.
- Date assigned and date reassigned (if incumbent has departed the work center).
- Documented overtime and compensatory time hours.
- Number of hours of annual leave taken.
- Number of hours of other types of leave taken (sick leave, annual training, etc.).
- Description of duties.

The description of duties should portray the main outputs, services, or products generated by the employee. The number of tasks performed may vary by position. The employee also must indicate the frequency of outputs, number of times services and products were provided, and actual man-hours spent on each task during the data-collection period. For example, over a collection period of 1 year, an individual may process 15 credit card transactions per week, handle 10 equipment turn-ins per month, and maintain 4 hand receipts, spending 400 actual man-hours on credit card transactions, 800 man-hours on equipment turn-ins, and 540 man-hours on maintaining hand receipts. This information will provide the survey team a starting point for validating the center's workload. Any contractor workload also must be captured and presented in a summary of the work performed and total hours devoted to each task.

Individual task sheets should be completed for positions that were vacant during the data-collection period. These sheets should describe the backlog resulting from each vacancy. Backlog is defined as those tasks required to be completed in order to accomplish the work center's mission but are not being completed because of personnel shortfalls. The work center supervisor must explain how failure to complete these tasks adversely impacts its mission. Finally, the work center must provide the number of officers, warrant officers, enlisted personnel, civilians, and contractor personnel required, authorized, and assigned.

The work center supervisor may want to add comments about the backlog, staffing and overtime patterns, and projected future mission changes. This information will facilitate manpower and data analysis and serve as justification for additional manpower requirements in the work center.

Properly portraying your mission, type of work, output, and time spent producing that output will greatly aid the manpower assessment and review team in determining the proper staffing level for your organization. Developing this information also will help you to better understand your workload and be prepared to respond to questions the team may ask. If you do your homework, you can "slay the manpower dragon."

James T. Delisi works part-time for a nonprofit organization. He retired from Federal Civil Service as a management analyst with the Army Forces Command. He also retired as a lieutenant colonel in the Army Reserve. He has a B.A. degree in political science from Duquesne University in Pennsylvania and an M.A. degree in business management from Central Michigan University.

Confused or Absolved? Our COMMZ 'Megaproblem'

BY COLONEL CHRISTOPHER R. PAPARONE

In his book, *Managing the Dream: Reflections on Leadership and Change*, Warren Bennis quotes a high-level executive in a large organization as saying, "If you're not confused, you don't know what's going on." Our military leadership culture seems to be oriented toward a different philosophy: "Only if you are clear and have identified the problem will you know what's going on."

Rather than trying to remove confusion about "megaproblems," I believe we should attempt to appreciate the level of our confusion about complex joint mission areas. By "megaproblem," I mean a "mess," or conglomeration, of problems—a network of problems that are interconnected and interactive, creating complexity on a grand scale. We are accustomed to using the "scientific" method of breaking down problems into smaller pieces and attacking each one. This results in functional (isolatable) problems, such as "joint theater logistics" and its subproblems. As we attempt to define and manage smaller parts of a megaproblem, we often are surprised to find that the problem we have focused on has "morphed" from its original state and is now a "moving target" for resolution. We execute solutions that we hope will solve the problem; however, because we did not address the larger network of problems, we sometimes create even more confusion. This is why, if you take a look at the logistics problems experienced during Operations Enduring Freedom and Iraqi Freedom, you will find repeats of some of the documented "lessons learned" in Operations Desert Shield and Desert Storm and even as far back as World War II.

In a contingency operation, the communications zone (COMMZ) is a complex joint mission area. The Department of Defense Dictionary of Military and Associated Terms defines "communications zone" as "the rear part of a theater of war or theater of operations (behind but contiguous to the combat zone) which contains the lines of communications, establishments for supply and evacuation, and other agencies required for the immediate support and maintenance of the field forces." Problems repeatedly experienced in the COMMZ include a lack of centralized control, insufficient ground transportation and movement control, inadequate distribution and asset visibility, and unsatisfactory reporting of logistics status.

In his seminal book, *The Sinews of War: Army Logistics, 1775–1953,* James A. Huston writes of the World War II (WWII) logistics experience—

> Ill-defined lines of authority and responsibility bred chronic problems of coordination throughout the war in Europe. Appointment of Lieutenant General John C. H. Lee to be Deputy Theater Commander for Administration and Commanding General, Communications Zone, appeared for a time to give a certain integration to the structure; but this was deceptive, for field commanders resisted the arrangement and General [Dwight D.] Eisenhower [the Supreme Allied Commander in Europe] finally rescinded it. The result was an anomalous situation in which theater and COMMZ staffs overlapped (where the chiefs of technical services had theater-wide responsibilities) but the COMMZ commander had no theater-wide responsibility as such. It was confusion between theater and COMMZ organization—indeed confusion in conception—which would not end with WW II.

A more holistic "system of systems" perspective better reveals our COMMZ megaproblem and the fact that we have framed "joint logistics" problems by trying to isolate them from other problems, such as joint command and control and battlespace awareness. After a functional analysis, we attempt to reintegrate solutions across other problems; for example, through the Joint Capabilities Integration and Development System, or JCIDS. The inherent problem with this operations research/systems analysis methodology is that we are constrained by the functional areas we have chosen. These choices are based on existing functional expertise in stovepiped organizations, so we restate subproblems in what we think are simplified cause-and-effect relationships. However, when we, as functional problem-solvers, attempt to reintegrate subproblems and the

identified solutions, which often are really solutions that were looking for problems, we discover we cannot put "Humpty Dumpty" back together again.

Take, for example, the current efforts toward institutionalizing new theater logistics "organizational solutions" such as the deployment and distribution operations center (DDOC). As valiant and progressive as they are, these efforts do not holistically address a higher systems-level view. The DDOC is a "solution" that places national-level organizational representatives forward or adjacent to the joint operations area to manage distribution. One of the most confusing aspects of prosecuting the full range of military operations is that of prosecuting COMMZ capabilities efficiently and effectively. The DDOC does seem to address a critical subproblem of the joint operator—enabling the national support structure to establish liaison and a "management reachback" capability with regional combatant commander organizations. However, it does not provide a holistic solution of the megaproblem of integrating the differentiated, interdependent missions of theater infrastructure development; general engineering; communications; intelligence; security or force protection; enemy prisoners of war and detainee processing; rear combat operations; survivability; area (land) management; host nation support; coalition support; embassy liaison; integration of interagency and nongovernmental organizations; or traditional logistics sustainment and joint reception, staging, onward movement, and integration. The DDOC solution does not address these rear area concerns that together constitute the COMMZ megaproblem.

How can we renew some mental models that might help us appreciate this COMMZ megaproblem? Global operations now and in the foreseeable future will require a base or bases of operations and corresponding national and regional lines of operation (LOOs) and lines of communication (LOCs). These positional concepts remain the fundamentals of strategic and operational art. Even in nonlinear or noncontiguous operations, imaginary lines will exist between the base, the objective, and the forces (internal and external LOOs and LOCs). I have heard more than one senior officer say that there are no rear areas in noncontiguous operations. However, the insightful Marine Corps Warfighting Publication 3–41.1, Rear Area Operations, demonstrates how "rear" areas are likely to be with us always.

Managing all of the supporting activities required to sustain the LOOs and LOCs effectively and efficiently is a critical megaproblem for the U.S. military, at both the department and combatant commander levels. When expressed in operational art terms, the problem seems manageable. Nevertheless, we have not taken an integrated system of systems view of this megaproblem. It is time to appreciate the magnitude of this COMMZ megaproblem and at least share confusion about its complexity across functional stovepipes.

In trying to solve the problem, our initial impulse might be to assign it to a matrixed team for solution. Unfortunately, the complexity of megaproblems exceeds the problem-solving capability and authorities of lower level officers and civilians who often are assigned to capabilities-based analysis teams, working groups, task forces, and other ad hoc assemblies.

Russell Ackoff, a noted management and organization scholar and author, would criticize this method for three reasons. First, assigning a team to study a small portion of the megaproblem and eventually recommend a solution assumes that, while the team is working on the problem, the problem is not changing. Second, these sorts of teams typically come up with a recommended solution that ultimately is not implemented. Finally, Ackoff would suggest that the main reason for failure is that such teams do not take into account the whole—the complete set of interdependent relationships within a mission area.

Megaproblem management requires the supervision of a high-level general or flag officer who is charged with handling these interdependencies as a normal course of his work. Unfortunately, the COMMZ megaproblem has no such executive assigned to it. Perhaps this is something we need to consider if we intend to solve it.

In *Ackoff's Best: His Classic Writings on Management,* the author suggests four ways to treat a problem—

- Absolve it (by ignoring it and hoping it solves itself).
- Resolve it (by applying a clinical approach of diagnosis and treatment that results in a satisfactory outcome).
- Solve it (by doing something that yields the best possible outcome).
- Dissolve it (by redesigning the system that has the problem in order to reach an ideal state).

Have we inadvertently chosen to absolve the COMMZ megaproblem? Go ahead—admit that you are confused about the complex interdependencies associated with the COMMZ megaproblem. In admitting your confusion, you actually are revealing that you know what is going on.

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A New Tool for Simulation Modeling of Logistics Support

BY ALAN SANTUCCI AND DR. TAYFUR ALTIOK

A new computer simulation tool combines Microsoft Visio's flowcharting capability and Rockwell Software's Arena simulation tool to help Army planners ensure that embedded combat service support units remain agile enough to support the Modular Force effectively.

The Modular Force concept attempts to build brigade unit organizations supported by a distribution management system with nodes that are positioned based on mission, enemy, terrain, troops, time available, and civilian considerations (METT–TC). As a result, support functions previously accomplished at a single level have been redistributed and embedded with combat units to make those units more self-reliant. Although the workload of these combat service support assets remains the same, personnel and their equipment have been realigned to allow for greater autonomy of brigade combat teams (BCTs). Effective combat power is directly related to the amount of sustainment available to the maneuver BCTs. This embedded combat service support must be agile enough that it will not limit the maneuver commander's flexibility.

Operational performance and capacity planning decisions are often evaluated using computer simulation techniques such as discrete event simulation modeling, which is commonly used for analyzing complex systems. This technique creates a simplified representation of the system under study. It uses Monte Carlo random number and random variate generation methods to create sample paths of the system's behavior. It then experiments with the simulated system, guided by a prescribed set of goals such as improved system design, cost and benefit analysis, and sensitivity to design parameters. Experiments are conducted by generating system histories, observing system behavior over time, and examining system statistics. The representation created describes system structure, while the histories describe system behavior.

Typical deployment and sustainment questions include—

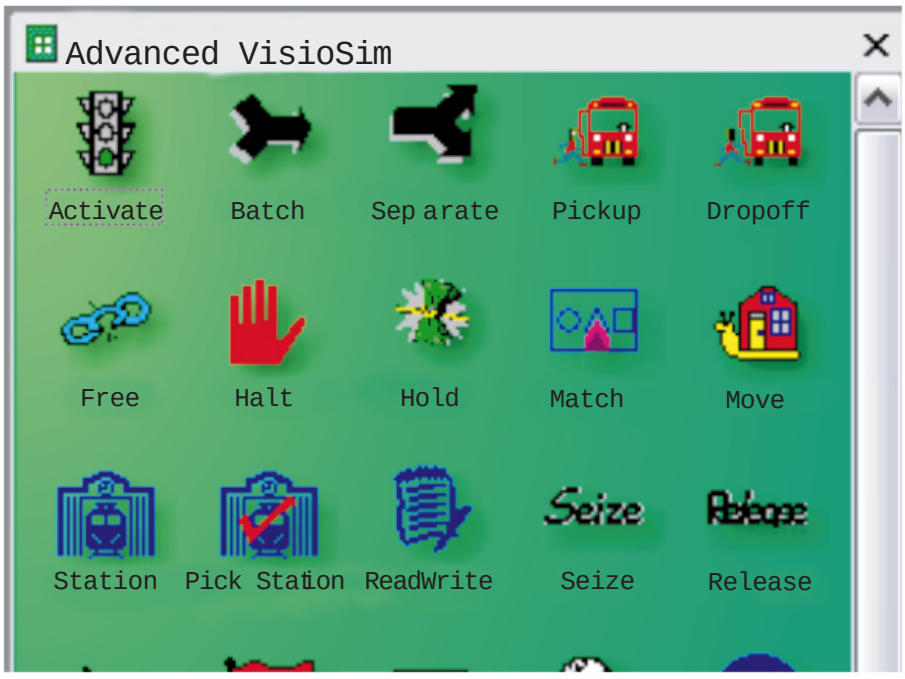
- How much of each supply class will have to be moved? When? By whom?
- What is the capability of the current distribution system?
- What changes are expected to affect the system's performance?
- How does the distribution system respond under a surge of heavy demand?
- What is the system's resource availability under various surge scenarios?
- What alternative courses of action will alleviate shortfalls? What does each cost?

VisioSim

The Logistics Research and Development Branch of the Armament Research, Development, and Engineering Center at Picatinny Arsenal, New Jersey, in partnership with the Department of Industrial and Systems Engineering at Rutgers, the State University of New Jersey, developed a means of expanding the simulation modeling capability by increasing its ease of use and practicality. The project, known as "VisioSim," aims at combining the simple flowcharting capability of Microsoft Visio with the simulation capability of Arena, a simulation tool developed by Rockwell Software. The user can place procedural and auxiliary information into the model without having to understand the technicalities of a sophisticated modeling environment. The flow-charting concept of VisioSim can be used to describe or demonstrate any operational procedure that may later become part of a bigger simulation model. VisioSim has been tested successfully by the Center for Army Analysis and has been used to model pierside ship ammunition loading operations at Naval Weapons Station Earle, New Jersey.

Overview of VisioSim

VisioSim uses the Active X Automation technology and the Visual Basic Applications programming environment to allow Arena and Visio to communicate with each other. Data transfer is achieved by using Microsoft Access database constructs to pass information from one application to another.



Basic and Advanced stencils in VisioSim.

VisioSim is intended primarily for use by subject-matter experts to document "as is" process flows using basic and advanced flowcharting objects and to assist modelers in transferring this knowledge into Arena models to carry out detailed analysis. VisioSim's objective is to provide an effective method of transferring credible workflows between user groups with different functions, thereby reducing process validation time considerably.

The VisioSim interface is similar in layout to a standard Microsoft Visio template. Objects with associated dialog boxes are dragged into the model window area to progressively build workflows. The VisioSim template contains two customized Visio stencils: Basic VisioSim and Advanced VisioSim (above).

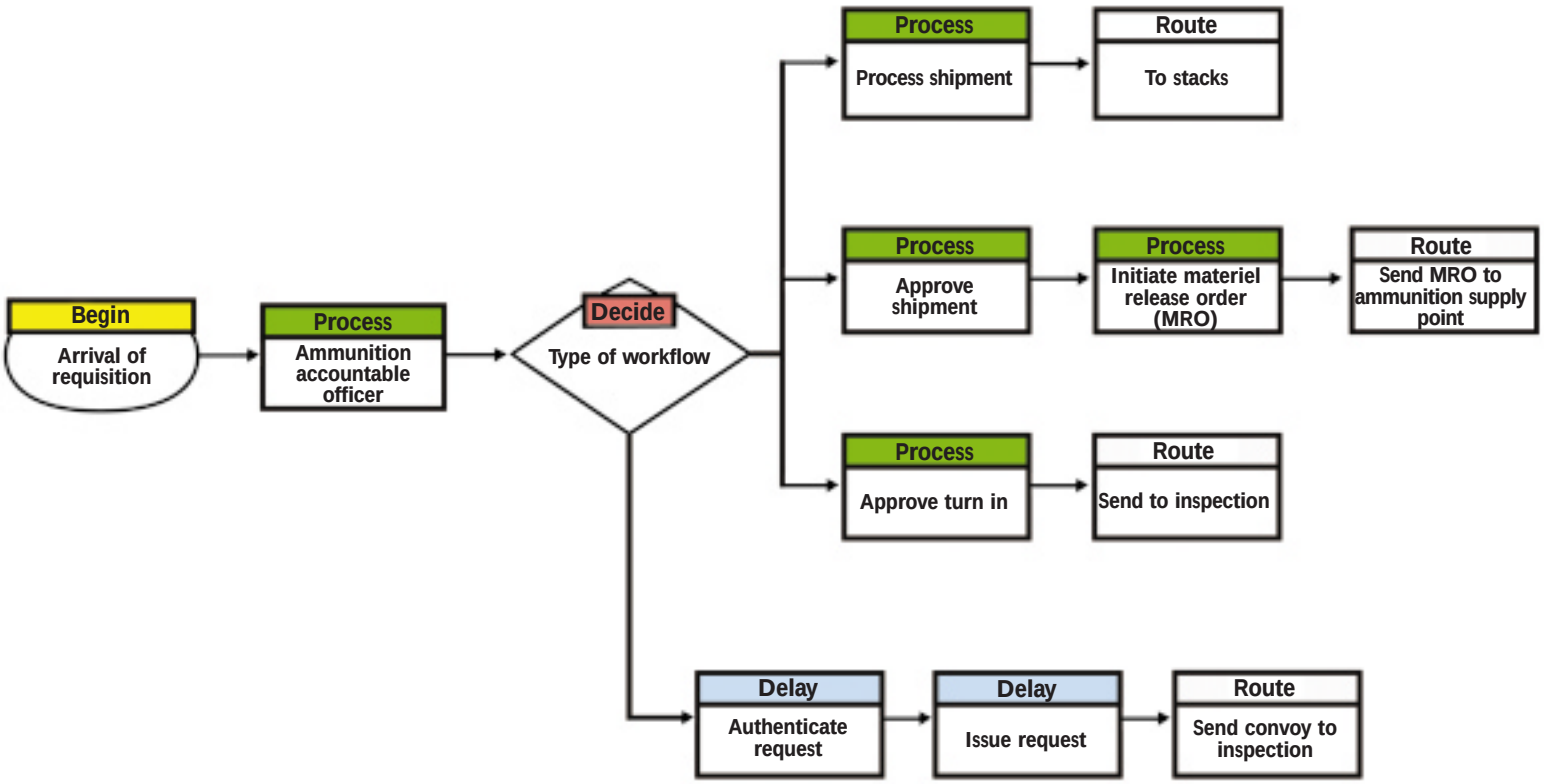
Although the Basic VisioSim stencil incorporates basic Arena modules, such as Begin, Terminate, Delay, and Process, the Advanced VisioSim stencil includes the more involved and capable Arena modules, such as Activate, Batch, Separate, and Match. Both of these stencils are integral parts of VisioSim. Most high-level processes can be modeled accurately using the Basic stencil; however, the Advanced stencil is needed to achieve more complex procedures.

Six Sigma

VisioSim allows subject-matter experts to document every step of the industrial, administrative, engineering, and business processes used for design, analysis, and training purposes in support of Six Sigma lean enterprise analysis. [Six Sigma is a structured approach to solving complex problems by implementing data-driven improvement projects. Lean enterprise analysis looks at a business process and seeks ways to optimize elements of it to make it more productive.]

VisioSim allows subject-matter experts to document every step of the industrial, administrative, engineering, and business processes used for design, analysis, and training purposes in support of Six Sigma lean enterprise analysis.

The resulting value map, the VisioSim chart, is automatically exported to Arena to create a working Arena model that has a one-to-one relationship with the VisioSim chart. A simulation modeler gathers various VisioSim charts and exports them into Arena to merge them into a unified model that simulates the entire system. The resulting model then can be tailored with specific resource costs, capacities, and purposes to make the "to be" representation ready for any "what if" analysis.



VisioSim model of the workflows handled by an ammunition accountable officer.

A Simple VisioSim Model

For demonstration purposes, we will show how the tasks handled by an ammunition accountable officer at an ammunition storage area can be modeled using VisioSim. Typically, an ammunition accountable officer handles five segments of the ammunition flow: receipt, shipment to other facilities, issue to a unit, turn-in of unused ammunition, and maintenance of ammunition. The ammunition accountable officer processes the necessary paperwork and sends ammunition and documentation to other nodes. The chart above shows a VisioSim model of the procedure the officer follows in directing ammunition flow. Most of the objects used in the VisioSim model are Delay and Process objects that represent processing times, Route objects to send either ammunition or documents, and a Decide object to direct the traffic. Each object has a dialog box that contains details about the particular process it represents.

A typical VisioSim study includes descriptions of all the business processes involved at either the operational level or a higher level. It may be completed using operational details that VisioSim provides to produce an operational flow chart or using VisioSim's conversion function to produce an Arena model for a detailed study of the logistics and sustainment issues.

VisioSim provides a structured, well-defined process for capturing the knowledge of various subject-matter experts. It provides them with the capability to develop a high-fidelity model suitable for in-depth analysis of the tasks by capturing this knowledge and mapping it. For more information on VisioSim and how to obtain it, send an email to alan.santucci@us.army.mil. **ALOG**

Alan Santucci is the Chief of the Logistics Research and Development Branch in the Logistics Research and Engineering Directorate of the Army Research, Development, and Engineering Command-Armament Research, Development, and Engineering Center at Picatinny Arsenal, New Jersey. He has an M.S. degree in computer science from Polytechnic University in Brooklyn, New York, and an M.B.A. degree from the University of Phoenix.

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ALOG NEWS

(continued from page 1)

The new guidance has 10 strategic imperatives. The other nine are—

- Implement transformation initiatives.
- Improve capabilities for homeland defense.
- Improve proficiencies against irregular challenges.
- Improve capabilities for stability operations.
- Achieve Army force capabilities to dominate in complex terrain.
- Improve Army capabilities for strategic responsiveness.
- Improve global force posture.
- Improve capabilities for battle command.
- Improve joint fires capability.

Three of the imperatives—improve capabilities for homeland defense, improve capabilities for stability operations, and improve proficiencies against irregular challenges—are new Army focus areas.

The ASPG addresses the requirement for logisticians to provide a supply chain that reaches across a joint, interagency, and multinational theater. The means of accomplishing this include developing combat service support concepts, policy, and doctrine that support both theater-opening and distribution-based logistics and establishing end-to-end asset visibility.

The format of the new ASPG makes it easier for the reader to understand the Army's strategic objectives and how the Army plans to achieve them. The 2005 ASPG can be found on line at www.army.mil/references.

NEW LAB TO TEST FUTURE COMBAT SYSTEMS

Army and Boeing Company officials cut the ribbon on 28 January for the 140,000-square-foot System of Systems Integration Laboratory (SoSIL) in Huntington Beach, California. The SoSIL is a testing and simulation lab in which soldiers and civilian experts together will develop, test, and evaluate the Future Combat Systems (FCS) network that will connect vehicles and warfighters on the battlefield. The $35-million laboratory is a part of the Army's $21.4-billion FCS program that is scheduled to be fielded by 2014.

Colonel Charles Jorgenson, chief of staff in the Office of the Program Manager, FCS Unit of Action, said the facility "will allow us to test all 18 platforms in the network-centric warfare we're trying to move to. We'll move some of those capabilities to a test unit beginning in 2008. And we're already using some of the technology."

Boeing's Frank DeMattia said the new high-tech laboratory also will link suppliers and subcontractors nationwide in real time. DeMattia said that FCS will network the new manned and unmanned ground vehicles and unmanned aerial vehicles and integrate all the communications nodes in a brigade-sized unit of action. SoSIL will enable those vehicles, the soldiers' individual equipment, and stationary sensors throughout the battlefield to work together, he added.

Soldiers will be involved with the system's development early in the process in an effort to reduce the number of difficulties encountered in the field. "We want to get the warfighter involved in the developmental process, so if he's looking at a display, for example, and it doesn't look right to him, we can make changes before we're fully committed to a design," DeMattia said.

The first integration test is set to begin in October and end in the spring of 2006 with a mission test in which soldiers will use the equipment in a simulated battle.

According to DeMattia, the SoSIL will allow the Army to bring both hardware and software into the field gradually, with various components of FCS being fielded in 2008, 2010, and 2012 before the full system is in use in 2014.

EUROPE-BASED AMC BRIGADE DEPLOYS TO IRAQ

The Army Materiel Command Field Support Brigade-Europe (AMC FSB–E) deployed to Iraq from Germany just 2 months after it was established to provide expeditionary logistics support to forces in the field.

"This deployment is exactly why the unit was formed [on 18 November]," said Colonel Max Lobeto, the brigade commander. "Ours is the first such brigade in [the] Army Materiel Command, and [it] is designed to match up with the expeditionary Army."

The deploying contingent includes the commander and the brigade operations command post, which is made up of both soldiers and civilian employees. "Although many members of our command have deployed individually, this is the first time we are going as a unit," said Tommy Lane,

A loadmaster conducts a preflight inspection of his C–130 Hercules aircraft before takeoff from an air base in Iraq. The C–130s are used to transport supplies over areas where truck drivers face the greatest threat.

the brigade's civilian deputy. "It makes good sense: we are experienced professionals and have all the tools to organize the effort on the ground and reach back into AMC's arsenal of expertise and equipment."

Plans call for the brigade to exercise command and control over all AMC activities and personnel until later this year, when it will hand over authority to another brigade. "We're setting the standard for providing a modular solution to the logistics challenges raised by an enduring and global battle against terrorism," said Steve Lockridge, brigade chief of plans and operations. "What we do and what we learn will contribute to Army Materiel Command's continuing transformation. We've always operated in support of fighting forces, but now we are doing so in a formation that looks and acts just like the combatant commands. They're deploying as brigade units, organized and equipped for the mission [and] so are we."

While the brigade command is in Iraq, more than 1,000 members of the brigade will continue to provide logistics assistance and combat-ready equipment from operating locations across Europe and beyond. "This new mission is an additional task. The essential logistics support provided to U.S. Army Europe and U.S. European Command will continue at full speed," said Lobeto.

CDDOC INITIATIVES REDUCE CONVOY RISKS

An initiative of the U.S. Central Command's Distribution and Deployment Operations Center (CDDOC) reduces the number of U.S. truck drivers who have to transit some of Iraq's most dangerous roads each week. CDDOC is charged with synchronizing strategic and intratheater airlift for the U.S. military.

In the past, large cargo aircraft flew into airfields that were located in some of the most dangerous areas of Iraq, and truck convoys then delivered supplies to forward-deployed military forces.

CDDOC's improved distribution plan calls for strategic transports to deliver cargo directly from the United States to several airfields that can accommodate large aircraft. Then the cargo is flown from those airfields on smaller C–130 Hercules transport aircraft to airstrips that are located near large numbers of military forces.

This initiative has not totally eliminated the need for convoys to travel in high-risk areas, but, so far, it has removed approximately 1,280 convoy drivers per week from Iraqi roads.

CHEMICAL DEMILITARIZATION PROGRESSES

The Army is scheduled to begin disposing of chemical agents at a sixth site this spring. The facility, at Pine Bluff Arsenal, Arkansas, will destroy approximately 3,850 tons of the nerve agents GB and VX and the blister agents HT and HD. That amounts to 12 percent of the U.S. stockpile of chemical agents.

As of 2 February, the Army had destroyed 11,076 tons of chemical agents, or about 35.1 percent of the total U.S. stockpile of chemical agents, and about 42 percent of all U.S. chemical munitions (mainly rockets and landmines).

The Army's first chemical agent disposal facility opened at Johnston Atoll in the Pacific in 1990 and

completed its work in 2000, destroying approximately 6 percent of the Army's chemical agents. Other disposal facilities (with the percentages of the Army's chemical agent stockpile they store) began operating at Deseret Chemical Depot, Utah, in 1996 (44 percent); Anniston Army Depot, Alabama, in 2003 (7 percent); Aberdeen Proving Ground, Maryland, in 2003 (5 percent); and Umatilla Chemical Depot, Oregon, in 2004 (12 percent). The disposal facility at Newport Chemical Depot, Indiana (4 percent), is scheduled to begin operations later this year. Other facilities are planned for Blue Grass Army Depot, Kentucky (2 percent), and Pueblo Chemical Depot, Colorado (8 percent).

The Deseret, Anniston, Umatilla, and Pine Bluff facilities use incineration to destroy chemical agents, as did Johnston Atoll. Aberdeen uses a neutralization technology, as will Newport, Blue Grass, and Pueblo.

A forklift operator loads a pallet of VX rockets into an on-site container for movement from storage to the Tooele Chemical Agent Disposal Facility at Deseret Chemical Depot, Utah.

ARMY SAFETY CENTER SHIFTS FOCUS TO RISK MANAGEMENT

The Army is changing its safety program to incorporate safety into the fabric of daily operations. As a part of this change, the Army Safety Center at Fort Rucker, Alabama, became the Army Combat Readiness Center (USACRC) in February. The organizational change is designed to advance the concept of composite risk management, which seeks to develop a fuller evaluation of potential dangers and thus create more effective risk mitigation. Composite risk management will focus on sustaining readiness and managing all risks—those posed by the enemy, the environment, materiel and systems, and human error—by shifting from an accident-centric approach to a soldier-centric approach.

According to Brigadier General Joseph A. Smith, USACRC Commander, "The change is intended to move beyond the old concept of 'safety,' which had become viewed by many soldiers as an occasional action rather than a constant foundation for all other activities. In some cases, soldiers do not grasp the outcome of being unsafe until 'one of their own' is involved—recognizing, too late, the consequences of the accidental loss in making the unit less prepared, lowering its readiness, and potentially putting the unit mission at risk."

The Army Safety Office in Washington, D.C., will focus on the compliance aspects of safety and reinforce the use of composite risk management as a tool to help prevent all loss. USACRC will function as a field operating agency under the Office of the Chief of Staff of the Army. Safety remains a foundational component of the new organization. The USARC mission includes—

- Investigating Army accidents.
- Initiating the necessary cultural changes and developing the processes, structure, and training needed to implement composite risk management Army wide.
- Developing predictive trend analysis using digital technology and data mining in order to identify loss trends and preventive measures.

TRADOC IMPLEMENTS LEARNING MANAGEMENT SYSTEM

The Army Training and Doctrine Command (TRADOC) is implementing the new, Web-based Army Learning Management System (ALMS), which will help students, trainers, and training managers to conduct and manage training throughout students' Army careers. The system is an integral component of the Army Distributed Learning Program that provides professional military and self-development training and education.

The ALMS provides automated individual training management and distributed learning capabilities. It will be used to register and enroll students; monitor testing and student progress; distribute, store, and present education and training products;

maintain training and education records; collect and store feedback and evaluations; and provide a database of education and training products and resources. It will enable soldiers to take distributed learning courses and manage their training records and allow civilians to take Department of the Army-directed training.

The ALMS is accessible from the Army Knowledge Online Web site, providing one central location for soldier and civilian employee training needs. Implementation of the ALMS began with Fort Leonard Wood, Missouri, and is scheduled to be complete throughout TRADOC early in 2006. Fielding to the remaining major Army commands will begin shortly thereafter, with full fielding completed by 2008.

PHOTOVOLTAIC TECHNOLOGY PROMISES MULTIPLE BENEFITS TO MILITARY

Researchers at the Army Soldier Systems Center at Natick, Massachusetts, believe the potential benefits to the military of a new generation of photovoltaic (PV) technologies are unlimited.

PV solar cells convert light energy into electricity without noise, moving parts, fuel consumption, or pollutant emissions. In the last 5 years, PV technology has evolved from the use of large, heavy, rigid, reflective, and expensive glass panels to the use of lightweight and inexpensive devices that can be integrated directly into textiles and warfighter systems.

When used in combination with rechargeable batteries to power such items as night-vision goggles, PV cells could cut warfighters' battery-load weight in half. "On 72-hour and longer missions, it makes a lot more sense to carry rechargeable batteries," said Steven Tucker, an electrical engineer in the center's Collective Protection Directorate. "You get rid of that logistics tail by minimizing resupply with disposable batteries. The weight payback for a photovoltaic charger and rechargeable battery combination is incredibly quick, and out past 72 hours it just keeps getting better."

Less weight means better mobility, and the ability to recharge batteries on the move can increase sustainability, extend mission time and distance from tactical operations centers, and reduce logistics support requirements. Replacing or decreasing the number of liquid-fuel-powered generators reduces logistics requirements further and lowers the heat and sound signature in the field for improved stealth operations.

A "power shade" that fits over two kinds of Army tents has PV material laminated into a mesh fabric that reduces the cumulative solar irradiance by 80 to 90 percent while generating up to 1 kilowatt of power for shelter electronics or battery recharging. On a larger scale, PV cells on shelters for aircraft or field hospitals that cover thousands of square feet could generate 40 to 60 kilowatts of energy in peak sunlight.

Eventually, direct integration of PV technology into soldier-borne systems may create electronically active textiles that minimize the need for cables and connections and provide a more streamlined and multifunctional warfighter system. A new Science and Technology Objective that will continue through 2008 is looking at achieving PV power generation from virtually any surface.

Armored personnel carriers are staged for loading at Port Beaumont, Texas, in preparation for deployment to Southwest Asia. Nearly 2,900 tanks, trucks, and support vehicles, or approximately 85 percent of the assets of the 116th Brigade Combat Team, were loaded onto* MVs Cape Knox, Race, *and* Rise *and* USNS Yano *in October by the Military Surface Deployment and Distribution Command's 842d Transportation Battalion and deployed to Southwest Asia to support the 116th in Operation Iraqi Freedom III. The 116th includes Army National Guard soldiers from Idaho, Montana, New Jersey, North Dakota, Oregon, Pennsylvania, and Utah.

Writing for *Army Logistician*

If you are interested in submitting an article to *Army Logistician*, here are a few suggestions that may be helpful. Before you begin writing, review a past issue of *Army Logistician*; it will be your best guide. Keep your writing simple and straightforward (try reading it back to yourself); attribute all quotes; avoid footnotes (*Army Logistician* is not an academic journal); and identify all acronyms and technical terms. *Army Logistician's* readership is broad; do not assume that those reading your article are necessarily soldiers or that they have background knowledge of your subject.

Do not worry too much about length; just tell your story, and we will work with you if length is a problem. However, if your article is more than 4,000 words, you can expect some cutting.

Do not submit your article in a layout format. A simple Word document is best. Do not embed photos, charts, or other graphics in your text. Any graphics you think will work well in illustrating your article should be submitted as separate files. Make sure that all graphics can be opened for editing by the *Army Logistician* staff.

Photos are a great asset for most articles, so we strongly encourage them. Photos may be in color or black and white. Photos submitted electronically must have a resolution of at least 300 dpi (.jpg or .tif). Prints of photos may be submitted by mail. Please try to minimize use of PowerPoint charts; they usually do not reproduce well, and we seldom have the space to make them as large as they should be.

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Submit your article by email to alog@lee.army.mil or by mail to EDITOR ARMY LOGISTICIAN/ALMC/2401 QUARTERS RD/FT LEE VA 23801–1705. If you send your article by mail, please include a copy on floppy disk if possible. We look forward to hearing from you.

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