ARMY LOGISTICIAN

JANUARY–FEBRUARY 2003

Afghan Supply Pipeline

PB 700-03-1 Headquarters, Department of the Army

ARMY LOGISTICIAN

PROFESSIONAL BULLETIN OF UNITED STATES ARMY LOGISTICS

PB 700–03–1
VOLUME 35, ISSUE 1
JANUARY–FEBRUARY 2003

COVER

Resupply of Army forces in Afghanistan continues, even as media attention has shifted elsewhere. In the article beginning on page 4, the author presents some preliminary findings on how well this supply effort has gone over the last year. The cover photos show the end of the supply pipeline in Afghanistan: a C–130 Hercules transport is loaded with cargo for delivery to Kandahar, and soldiers of the 82d Airborne Division unload meals, ready to eat, destined for troops in the field at Narizah.

Army Logistician (ISSN 0004–2528) is a bimonthly professional bulletin published by the Army Logistics Management College, 2401 Quarters Road, Fort Lee, Virginia 23801–1705. Periodicals postage is paid at Petersburg, VA 23804–9998, and at additional mailing offices.
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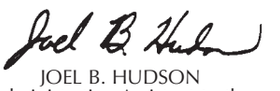

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Administrative Assistant to the
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- The Attack on Attu
- USTRANSCOM: A Case for Transformation
- Gun Trucks: American Ingenuity at Its Best
- Managing the Munitions Stockpile
- Training With a Tactical Focus
- Proprietary Packaged Petroleum
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- Another Look at Property Accountability
- Managing Hazardous Materials
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- Transforming Strategic Mobility
- Restructuring the Division Support Command

ISSN 0004–2528
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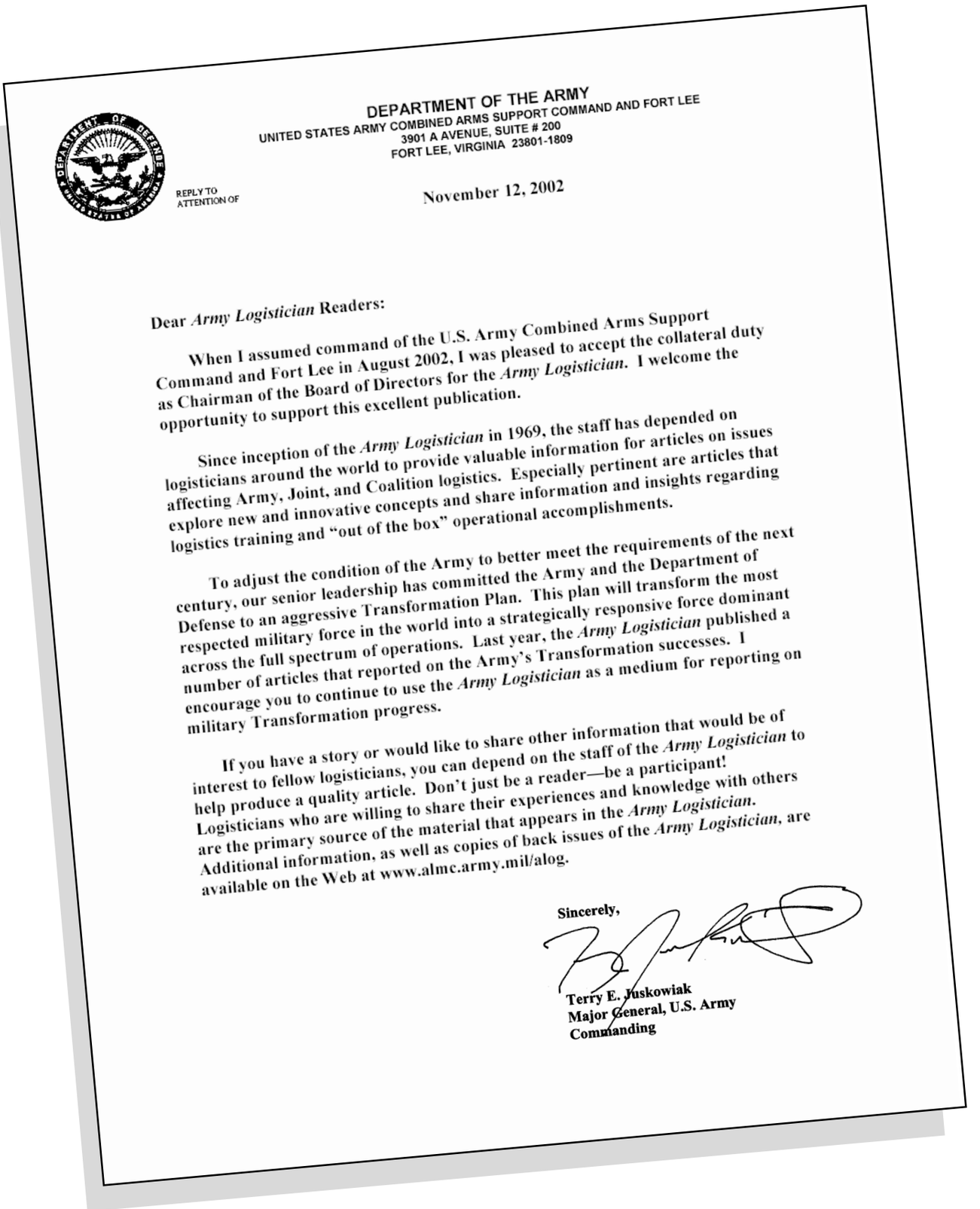

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REPLY TO
ATTENTION OF

November 12, 2002

Dear *Army Logistician* Readers:

When I assumed command of the U.S. Army Combined Arms Support Command and Fort Lee in August 2002, I was pleased to accept the collateral duty as Chairman of the Board of Directors for the *Army Logistician*. I welcome the opportunity to support this excellent publication.

Since inception of the *Army Logistician* in 1969, the staff has depended on logisticians around the world to provide valuable information for articles on issues affecting Army, Joint, and Coalition logistics. Especially pertinent are articles that explore new and innovative concepts and share information and insights regarding logistics training and "out of the box" operational accomplishments.

To adjust the condition of the Army to better meet the requirements of the next century, our senior leadership has committed the Army and the Department of Defense to an aggressive Transformation Plan. This plan will transform the most respected military force in the world into a strategically responsive force dominant across the full spectrum of operations. Last year, the *Army Logistician* published a number of articles that reported on the Army's Transformation successes. I encourage you to continue to use the *Army Logistician* as a medium for reporting on military Transformation progress.

If you have a story or would like to share other information that would be of interest to fellow logisticians, you can depend on the staff of the *Army Logistician* to help produce a quality article. Don't just be a reader—be a participant! Logisticians who are willing to share their experiences and knowledge with others are the primary source of the material that appears in the *Army Logistician*. Additional information, as well as copies of back issues of the *Army Logistician*, are available on the Web at www.almc.army.mil/alog.

Sincerely,

Terry E. Juskowiak
Major General, U.S. Army
Commanding

The Mobility Warrant Officer: Simplifying Deployment

by Lieutenant Colonel Peter B. Everitt, USA (Ret.)

> We will prioritize solutions which optimize smaller, lighter, more lethal, yet more reliable, fuel efficient, and more survivable options. . . . we intend to transform the Army, all components, into a standard design . . . that [will] allow us to put a combat capable brigade anywhere in the world in 96 hours once we have received execute liftoff, a division on the ground in 120 hours, and five divisions in 30 days.
>
> —General Eric K. Shinseki,
> Chief of Staff of the Army

The Army projects its combat power to locations throughout the world using a joint deployment process in a joint environment. This time-sensitive process requires immediate and rapid response, the simultaneous execution of multiple actions, and an in-depth knowledge of the Joint Operations Planning and Execution System.

As the combat commander prepares his unit for deployment, he also plans for employment, tailors his force, conducts rehearsals, and gathers intelligence; he is totally engaged. All the while, he must input movement requirements rapidly and accurately to the Defense Transportation System automated network.

In the past, commanders successfully deployed their forces through determination, hard work, and great leadership. The deployment challenge, however, will only get tougher as Army personnel move to achieve the Chief of Staff's deployment goals. Determination alone will not suffice.

But there is good news. For the first time, a deployment expert—the mobility warrant officer (MWO)—is readily available to the combat commander. Thirty-eight of these highly trained MWOs have graduated from the Army Transportation School at Fort Eustis, Virginia, and are now at their assigned units. They know the joint deployment process and are familiar with the latest deployment information systems and planning and implementation tools.

What is a Mobility Warrant Officer?

The MWO, military occupational specialty (MOS) 882A, is the commander's key staff officer for deployment planning, execution, advice, coordination, and training. The MWO is a competent and proven expert who can help the commander minimize the complexity of deployment in a joint environment. Specifically, an MWO is a skilled technician who—

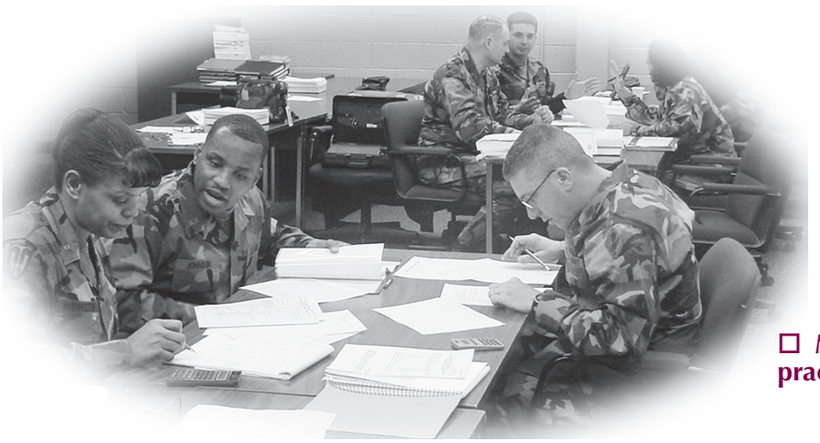
- Advises the warfighting commander on all facets of the joint deployment process.
- Executes the rapid transmission of movement requirements in the Defense Transportation System.
- Develops and conducts unit training on the tactics, techniques, and procedures associated with unit deployment operations.
- Identifies and remedies force projection and strategic deployment shortcomings.
- Plans and coordinates the deployment and redeployment process.
- Provides expert traffic management, throughput, and operational-lift advice in an OCONUS (outside the continental United States) environment.

The Road to Success

The Vice Chief of Staff of the Army approved the concept for the MWO in July 1997. Initially, the intent was to replace Transportation Corps lieutenants with MWOs in certain Transportation Corps units. The plan later was modified so that the first MWOs were assigned to the first 2 interim brigade combat teams (IBCTs), now known as Stryker brigade combat teams (SBCTs), forming at Fort Lewis, Washington, and the division transportation offices of the 10 active divisions. These MWO positions in the SBCTs and divisions are now filled, and more positions are being filled in corps movement control battalions, movement control teams, and other critical transportation organizations.

The Transportation Corps is actively seeking candidates for this program. Competition for selection to attend the MWO Course has been intense.

Initially, most MWO candidates came from MOS 88N, traffic management coordinator. However, the prerequisites have been changed to include candidates from any MOS or service. This change was made to attract a wider pool of highly qualified candidates who had performed in a variety of deployment positions. The minimum prerequisites are as follows: E4 (promotable), 2 years of documented deployment experience, a working knowledge of computer hardware and software applications, and an understanding of the complex de-



☐ **MWO Course students complete a practical exercise in small groups.**

ployment process. Graduation from the Unit Movement Officer Deployment Planning Course and an associate's degree are desirable additional qualifications.

Institutional Training—A Work in Progress

All candidates must successfully complete the Warrant Officer Candidate Course at Fort Rucker, Alabama. The new warrant officers then proceed to the Mobility Warrant Officer Basic Course at Fort Eustis for an 18-week program of instruction that includes detailed course work in the joint deployment process, the Defense Transportation System, unit movement operations, strategic mobility operations, and joint deployment information systems. Students are taught to use a wide variety of transportation and deployment information systems, including the—

- Joint Operations Planning and Execution System (JOPES).
- Joint Force Requirements Generator II (JFRG II).
- Transportation Coordinator's Automated Information for Movement System II (TC–AIMS II).
- Transportation Coordinator Automated Command and Control Information System (TC ACCIS).
- Global Transportation Network (GTN).
- Deployment and Sustainment Support Tool (DS2T).
- Automated Air Load Planning System (AALPS).
- Global Air Transportation Execution System (GATES).
- Joint Deployment Logistics Model (JDLM).
- Automated Movement Flow Tracking (AMFT).

The course culminates in an integrated deployment exercise, during which the MWOs role-play supporting the deployment of a brigade-sized unit from CONUS to an overseas theater. It leverages the work of the Transportation School, the Deployment Process Modernization Office, and the Joint Deployment Training Center at Fort Eustis. The intent is for MWOs to learn how to deploy Army forces under joint deployment conditions.

Program Success

The program already is proving successful. In the active force, MWOs currently are assigned to the 10 divisions and 2 SBCTs, 8 transportation movement control battalions, 6 transportation movement control teams, and 2 transportation groups. Three National Guard units and seven Reserve units also have MWOs. They are providing commanders and their staffs with deployment expertise, formulating prepackaged unit deployment lists, advising and training unit movement personnel, and serving as a ready resource on improving the deployment process. Currently, 68 MWO positions are authorized for active units, 12 for Army National Guard units, and 72 for Army Reserve units.

In a short time, the MWOs have made an impact in the field, developing movement plans, training, validating unit movement books, and coordinating with support elements. The next step will be to introduce the MWO into every brigade-sized combat and combat support unit in the Army.

As the number of MWOs increases, the momentum of changing how our Army prepares and trains for deployment will increase. The MWO is an essential component of making strategic responsiveness a reality. Ernest Hemingway said, "Never confuse movement with action." In future force projection, the MWO will be the key to ensuring that every movement produces the desired action. **ALOG**

Lieutenant Colonel Peter B. Everitt, USA (Ret.), is a doctrine writer with the Deployment Process Modernization Office at Fort Eustis, Virginia. He has a bachelor's degree from Pennsylvania Military College and a master's degree from Florida Institute of Technology.

Afghan Supply Pipeline Performance

by Major John Hall, USAR

Based on data flowing into AMC LOGSA, the author presents some preliminary findings on how well the supply effort for Operation Enduring Freedom is working.

While the media spotlight has shifted from Afghanistan following the fall of the Taliban regime and the dispersal of Al Qaeda forces, the need to supply U.S. Army forces deployed in support of Operation Enduring Freedom continues. Soldiers in the Afghan area of responsibility (AOR) are receiving materiel through multiple supply pipelines. How is this vital work going? How well are the pipelines performing?

Metrics generated by the Army Materiel Command's (AMC's) Logistics Support Activity (LOGSA) provide a way of monitoring the condition of these pipelines. Based on these metrics, I would like to present some preliminary findings on the performance of the supply pipelines supporting our forces deployed to the Afghan AOR for Operation Enduring Freedom (as observed through September 2002). My purpose is not to determine the root causes that drive the metrics but rather to highlight pipeline performance in support of this contingency mission. Pipeline performance is described in terms of overall mean requisition wait time and mean processing times for four major pipeline segments.

Measuring Logistics at LOGSA

Located at Redstone Arsenal, Alabama, LOGSA is the national data warehouse for tracking all Army maintenance, transportation, requisition, and supply activities. LOGSA's mission is to transform raw logistics data into useful information for Army customers throughout the world.

LOGSA currently performs several important tasks in support of Operation Enduring Freedom, including assigning Department of Defense activity address codes (DODAACs) and routing identifier codes (RICs) to all deploying units; clearing Army transportation requests for air movement of materiel; and performing ad hoc logistics analyses requested by Department of the Army and AMC staffs and deployed units. LOGSA also produces metrics that describe the condition of the supply pipelines supporting Enduring Freedom forces.

Information on all worldwide national-level supply transactions, including movement data, is received by LOGSA and maintained in the Logistics Integrated Data Base (LIDB). Operations research analysts at LOGSA query the LIDB to produce Enduring Freedom pipeline metrics. AMC and other customers use these metrics to monitor pipeline performance. (Customers can generate similar metrics using the Velocity Management [VM] module found in WebLIDB, which can be accessed from the LOGSA Web site at www.logsa.army.mil.)

Pipeline Overview

Units deployed to the Afghan AOR are serviced by supply support activities (SSAs). Each SSA performs retail-level supply operations by filling the demands of customer units from stocks maintained at the SSA. When the SSA cannot fill a customer demand or needs to replenish its stocks, it submits the requisition to the national-level supply system. Supply pipelines to the Afghan AOR include the processes to submit requisitions from the SSA to the national-level system and the subsequent processes at the national level to deliver the requested materiel to the SSA.

Requisitions from the SSA are routed to the national inventory control point (NICP) that manages the requested materiel. For Army-managed items, AMC major subordinate commands are the NICPs; these include the Army Aviation and Missile Command, Army Communications-Electronics Command, Army Soldier and Biological Chemical Command, and Army Tank-

automotive and Armaments Command. Items managed by the Defense Logistics Agency are processed by ICPs at Philadelphia, Pennsylvania; Richmond, Virginia; and Columbus, Ohio. Other items are managed by the General Services Administration or the other armed services.

The NICP identifies a depot or storage site that stocks the requested materiel and issues a materiel release order (MRO) to that site. These sites are usually Defense distribution centers and Army depots. However, a portion of Army-managed class IX (repair parts) requisitions from Enduring Freedom units is filled by Single Stock Fund sites.

After receiving the MRO, the depot-level activity picks and packages the materiel and makes it available for transportation. The majority of Enduring Freedom requisitions are transported from the depot to a consolidation and containerization point (CCP), where they are palletized for air transportation or containerized for surface movement. Pallets or containers holding the materiel are next moved to an appropriate air or sea port of embarkation (APOE or SPOE) to await transportation. Transportation assets move the materiel to the port of debarkation (POD) in the AOR.

SSAs in the Afghan AOR are collocated with, or are in close proximity to, an air POD (APOD). Materiel arriving at the APOD is delivered to the requesting SSA. Receipt of the materiel by the SSA completes the supply pipeline operations considered in this paper.

The supply pipeline is truly a system of component processes; therefore, a systems approach should be used to analyze and improve pipeline performance. Activities that focus on improving an individual segment without reference to the complete system may fail to improve overall materiel throughput or delivery time to an SSA in the AOR.

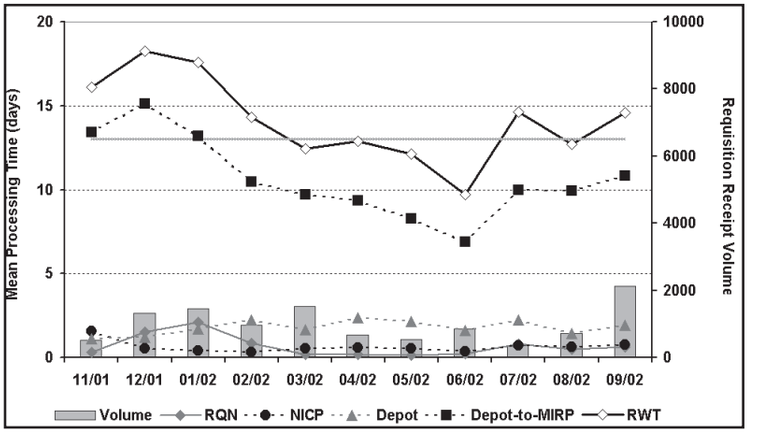
Pipeline Metrics

LOGSA analysts generate monthly pipeline metrics based on requisitions received by the SSAs in the AOR. The DODAAC assigned to each SSA is the key data field used to query the LIDB. A requisition submitted by an SSA contains the SSA's DODAAC as the *requisition address*. Requisitions from a customer unit passed on to the national-level system by the SSA will contain the SSA's DODAAC as the *requisition supplementary address*.

Pipeline metrics considered in this paper include mean processing times for four major pipeline segments as well as the overall mean time to complete national-level supply activities. In this article, I will discuss only non-backordered requisitions; however, similar metrics can be computed for backordered requisitions and for vendor-supplied requisitions. I will consider the following metrics in analyzing the Operation Enduring Freedom supply pipelines—

- ***Mean requisition processing time.*** For all requisitions received by an SSA in a given month, this is the mean time from the document number date to the requisition established date.
- ***Mean NICP processing time.*** For all requisitions received by an SSA in a given month, this is the mean time from the requisition established date to the MRO date.
- ***Mean depot processing time.*** For all requisitions received by an SSA in a given month, this is the mean time from the MRO date to the depot ship date.
- ***Mean depot-to-MIRP processing time.*** For all requisitions received by an SSA in a given month, this is the mean time from the depot ship date to receipt of the materiel by the SSA as designated by the materiel inventory receipt post (MIRP) date. This metric addresses the entire transportation segment of the pipeline and includes processing at CCPs and all delays incurred at intermediate nodes in the transportation channel.
- ***Mean requisition wait time (RWT).*** For all requisitions received by an SSA in a given month, this is the mean time from document number date to receipt of materiel by the SSA as designated by the MIRP date. This metric thus includes the four previous metrics. It is the Army metric that measures national-level response time and is equivalent to the formerly used order ship time (OST) metric. It does not include local source (or retail) fills for customers of the SSA.

AR 725–50, Requisition, Receipt, and Issue System, describes the Uniform Materiel Movement and Issue Priority System (UMMIPS). UMMIPS establishes time



☐ Pipeline metrics for class IX supplies received in Uzbekistan from November 2001 through September 2002, showing monthly values for mean RWT and mean processing times for four major component segments of the pipeline. Segment metrics are based on the requisition receipts for the given month.

standards for each segment of the supply pipeline. These standards are based on the mission of the requisitioning unit, its urgency of need, and its location. The Army has used VM tools successfully to improve the delivery time of materiel to continental United States (CONUS) and outside CONUS (OCONUS) units and has established VM goals for both CONUS and OCONUS deliveries. OCONUS VM goals that apply to the Enduring Freedom supply pipelines are 13 days for air-transported materiel and 40 days for surface-transported materiel.

Uzbekistan Pipeline Performance

The pipeline to Uzbekistan was the initial supply pipeline into the Afghan AOR. A Special Operations Forces (SOF) support unit established an SSA at Kharsi-Khanabad that began receiving materiel from the national-level system in November 2001. This SSA used a single DODAAC for requisitioning multiple classes of supply. A corps support element subsequently assumed SSA operations at Kharsi-Khanabad and continues to use the same DODAAC.

The chart on page 5 presents pipeline metrics for class IX materiel received by the SSA in Uzbekistan from November 2001 to September 2002. Mean RWT for class IX receipts peaked at 18.2 days in December 2001—the second month that the SSA received materiel—and then experienced a downward trend through June 2002, when it reached its minimum value of 9.7 days. Mean RWT trended upward after June and was 14.6 days during September. This increase in mean RWT could be due to unit rotations or other operational or environmental factors not addressed in this analysis. Mean RWT met the VM goal for OCONUS air deliveries of 13 days in March 2002—the fifth month of SSA receipts—but exceeded this goal beginning in July.

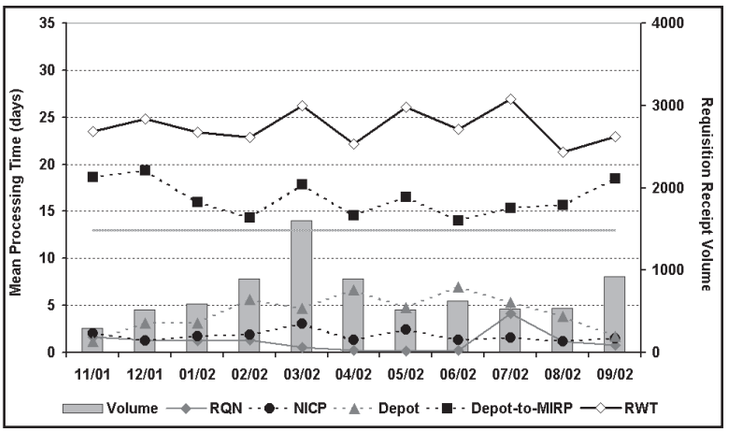
Mean requisition processing time for class IX receipts peaked in January 2002 at 2.1 days and held at a constant value of approximately 0.2 days from March until June. Since July, mean requisition processing time has experienced a slight increase to approximately 0.6 days. Mean NICP processing time for class IX receipts experienced its maximum value of 1.6 days in November 2001 and has held constant at approximately 0.6 days since March 2002. Mean depot processing time for class IX receipts ranged between 1.7 days and 2.2 days from January to September 2002. Mean depot-to-MIRP processing time for class IX receipts peaked at 15.1 days in December 2001—the second month that the SSA received materiel—and then declined through June 2002, when it reached its minimum value of 6.9 days. Mean depot-to-MIRP processing time trended upward after June and was 10.8 days during September.

The volume of non-backordered class IX requisitions received in Uzbekistan peaked at 1,512 receipts in March 2002 and then remained below 1,000 receipts per month until September, when the SSA received 2,118 class IX requisitions.

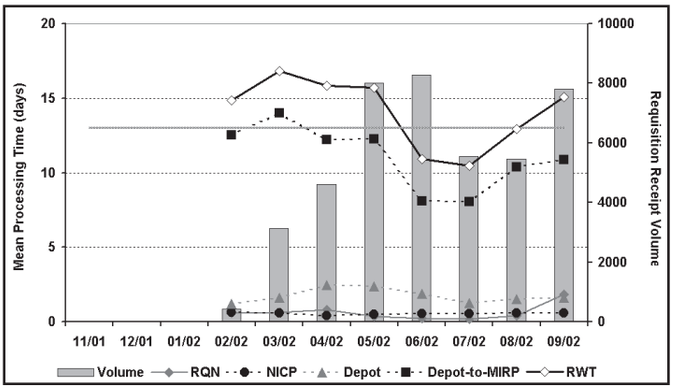
The chart below presents pipeline metrics for general supply materiel received by the SSA in Uzbekistan from November 2001 to September 2002. General supplies include class II (clothing and individual equipment), packaged class III (petroleum, oils, and lubricants), and class IV (construction and barrier materials). Mean RWT values for general supply receipts ranged between 21.2 days and 27.0 days from February to September. There appears to be no easily discernable trend in this metric; however, the month-to-month volatility of mean RWT has increased since March. These values consistently exceeded the VM goal of 13 days for OCONUS air deliveries but met the VM goal of 40 days for OCONUS surface deliveries.

Mean requisition processing time for general supply receipts trended downward through June 2002 (when it was 0.3 days), peaked at 4.1 days in July, and decreased to 0.8 days in September. Mean NICP processing time for general supply receipts peaked at 3.0 days in March 2002 and remained at a constant value of approximately 1.6 days after June. Mean depot processing time for general supply receipts trended upward through June 2002, when it reached its maximum value of 7.0 days. Mean depot processing time has since experienced a downward trend and was 1.7 days in September. Mean depot-to-MIRP processing time for general supply receipts ranged between 14.0 days and 18.5 days from January to September 2002.

The volume of general supply non-backordered requisitions received in Uzbekistan peaked at 1,599 in March 2002 and has remained below 1,000 requisition receipts per month through September.



☐ Pipeline metrics for general supplies received in Uzbekistan from November 2001 through September 2002.



☐ Pipeline metrics for class IX supplies received in Afghanistan from February through September 2002.

Afghanistan Pipeline Performance

The initial supply pipeline to Afghanistan provided materiel to an SSA located at Kandahar Air Base; it began receiving materiel from the national-level system in February 2002. This SSA uses two DODAACs, one for multiple classes of supply and one exclusively for class IX aviation materiel. A second supply pipeline to Afghanistan began providing materiel to an SSA located at Bagram in April. That SSA uses a single DODAAC for multiple classes of supply. The SSAs in Kandahar and Bagram continued to use the same DODAACs following the replacement of the 101st Airborne Division (Air Assault) by the 82d Airborne Division as the deployed force.

The chart above presents composite pipeline metrics for all class IX materiel received by the SSAs at both Kandahar Air Base and Bagram from February to September 2002. Mean RWT for class IX receipts peaked at 16.8 days in March—the second month of requisition receipts in Afghanistan—and then experienced a downward trend through July, when it reached its minimum value of 10.5 days. Mean RWT increased after July and was 15.1 days during September. Again, this increase in mean RWT could be due to operational or environmental factors not addressed in this analysis. Mean RWT met the VM goal for OCONUS air deliveries of 13 days in June—the fifth month of SSA receipts—but exceeded this goal in September.

Mean requisition processing time for class IX receipts peaked in April at 0.8 days, trended downward through July to 0.2 days, and then experienced a large increase during September to 1.9 days. Mean NICP processing time for class IX receipts ranged between 0.4 days and 0.6 days from February to September. Mean depot processing time for class IX receipts peaked in April at 2.5 days and now holds at approximately 1.5 days. Mean depot-to-MIRP processing time for class IX receipts peaked at 14.0 days in March—the second month of requisition receipts in Afghanistan—and then trended downward through July, when it reached its minimum value of 8.1 days. Mean depot-to-MIRP processing time increased after July to 10.9 days in September.

The volume of all non-backordered class IX requisitions received in Afghanistan increased through June, when it reached its maximum value of 8,285 receipts. July and August saw volumes of approximately 5,500 requisition receipts, followed by an increase to 7,813 receipts in September.

The chart on page 8 presents composite pipeline metrics for all general supply (classes II, packaged III, and IV) materiel received by the SSAs at both Kandahar Air Base and Bagram from February to September 2002. Mean RWT values for general supply receipts initially peaked at 28.9 days in March, trended downward through June to 23.5 days, and peaked again in July at 31.0 days. Mean RWT for general supplies was 27.2 days in September. Mean RWT for general supply receipts consistently exceeded the VM goal of 13 days for OCONUS air deliveries but met the VM goal of 40 days for OCONUS surface deliveries.

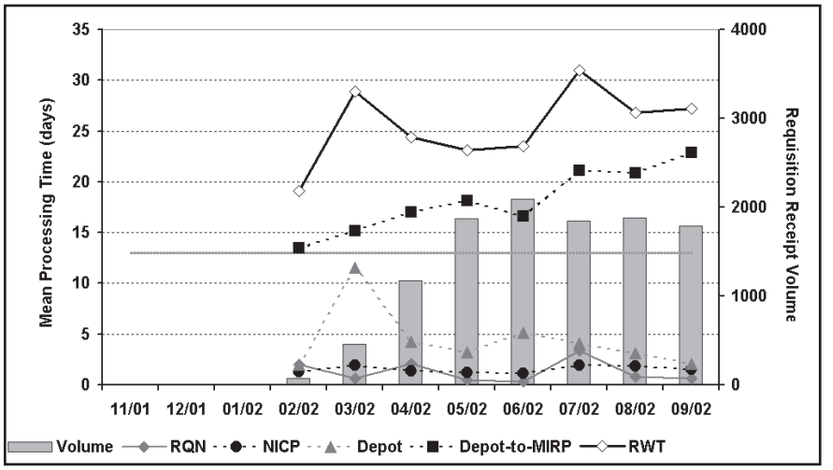
Mean requisition processing time for general supply receipts has been volatile since February 2002, with values ranging from 0.4 days to 3.4 days. Mean NICP processing time for general supply receipts ranged from 1.1 days to 1.9 days from February to September. Mean depot processing time for general supply receipts peaked at 11.6 days in March and subsequently trended downward after June to a value of 2.1 days in September. Mean depot-to-MIRP processing time for general supply receipts experienced an upward trend through September, when it reached its maximum value of 22.9 days.

The volume of all non-backordered general supply requisitions received in Afghanistan has remained steady since May 2002 at approximately 1,800 receipts per month.

Preliminary Findings

So what do all of these figures mean? Given the condition of the supply pipelines supporting the Afghan AOR observed through September 2002, the following preliminary findings can be provided—

- Mean RWT for class IX receipts in both Uzbekistan and Afghanistan peaked in the second month of requisition receipts in each country. The second month was the first full month of class IX receipts reported by the SSAs at Kharsi-Khanabad, Uzbekistan, and Kandahar, Afghanistan. After this peak, mean RWT trended downward in each country. This suggests that, as the logistics infrastructure supporting an AOR matures, class IX mean RWT will decrease. However, logistics planners should be aware of operational and environmental conditions in the AOR or reallocation of strategic resources that can affect the performance of the supply pipeline. These



☐ Pipeline metrics for general supplies received in Afghanistan from February through September 2002.

factors could explain the recent upward trends in class IX mean RWT observed in Uzbekistan and Afghanistan.

- Mean RWT for class IX receipts in both Uzbekistan and Afghanistan met the VM goal of 13 days for OCONUS air deliveries in the fifth month of requisition receipts in each country.
- Mean RWT for general supply receipts in both Uzbekistan and Afghanistan failed to meet the VM goal for OCONUS air deliveries of 13 days but did meet the VM goal for OCONUS surface deliveries of 40 days. LOGSA transportation specialists report that a large proportion of general supply requisitions move to the Afghan AOR by air transportation. Trends in mean RWT for general supply receipts do not demonstrate the initial downward trends experienced with class IX receipts. The range of values for mean RWT for general supply receipts in Uzbekistan has remained somewhat constant; however, the month-to-month variability for this metric has increased over time.
- Mean depot-to-MIRP processing time has the greatest influence on overall mean RWT. Inspection of pipeline metrics suggests that monthly increases or decreases in mean depot-to-MIRP processing time produce similar changes in the resulting mean RWT. This can be clearly seen in the class IX charts on pages 5 and 7, where changes in curves for mean depot-to-MIRP processing times are matched closely by similar changes in the curves for mean RWT.
- Analysis of all class IX receipts to the AOR reveals that depot-to-MIRP processing time constituted the largest component of mean RWT (77.8 percent), followed by depot processing time (13.5 percent), requisition processing time (4.6 percent), and NICP processing time (4.1 percent). This suggests that process improvement efforts to reduce mean RWT should focus first on the transportation segments of the Afghan supply pipelines. Process improvement efforts to reduce mean depot-level processing times also would be beneficial, as would the synchronization of the depot (supply) and transportation segments of the pipeline.

Remember that these are preliminary observations and findings about the performance of the supply pipelines supporting forces deployed to the Afghan AOR for Operation Enduring Freedom. They reveal early operational characteristics of supply pipelines established in an immature theater to support a contingency mission.

Supply pipelines supporting future contingency missions will be affected by several factors, including the composition of the force structure, the rotation of units to and from the AOR, the operational tempo, the logistics resources assigned to pipeline operations, and the environmental conditions. A cause-and-effect analysis that considers how these factors have affected pipeline performance in the Afghan AOR would provide information needed to improve logistics simulations and other predictive tools that logisticians will use in planning support operations for future contingency missions. This information could result in better response time of the national-level supply system in support of the warfighter deployed to an immature theater. **ALOG**

Major John Hall, USAR, was ordered to active duty in support of Operation Noble Eagle and was serving as an operations research analyst in the Army Materiel Command's Logistics Support Activity at Redstone Arsenal, Alabama, when he wrote this article. In civilian life, he is the technical director for APT Research, Inc., in Huntsville, Alabama. He holds a Ph.D. in industrial engineering from Mississippi State University.

Flexibility: The Key to Success in Weapon System Recapitalization

by Major Craig L. Rettie

Sustainment and recapitalization of the Legacy Force are fundamental components of the Army's Transformation strategy. The M1A1 Abrams main battle tank remains the dominant ground combat platform in the Legacy Force. Today there are more than 1,000 M1A1s in Active Armor and Cavalry units and many more in the Reserve components and pre-positioned at locations around the globe. Because the average age of these tanks is more than 12 years, sustainment is a formidable challenge.

Recapitalization means rebuilding and selectively upgrading currently fielded systems to a zero-time, zero-mile standard to ensure their operational readiness. Weapon system recapitalization provides a single method for addressing two critical sustainment factors: system supportability and operations and support costs.

Abrams Integrated Management

Abrams Integrated Management (AIM) is a partnership formed between Anniston Army Depot in Alabama and General Dynamics Land Systems of Sterling Heights, Michigan, to recapitalize M1A1 Abrams tanks. The joint venture exploits the depot's expertise in repairing and refurbishing components and the manufacturer's skill in assembling ground combat systems to prescribed specifications. M1A1s are inducted into AIM at Anniston and completely disassembled. The depot also repairs and refurbishes most of the tanks' components. Some components, such as suspension parts, are sent to the General Dynamics Land Systems' Scranton, Pennsylvania, and Muskegon, Michigan, plants to be refurbished.

After the parts and assemblies are refurbished, they are shipped to the Government-owned, General Dynamics-operated Lima Army Tank Plant in Ohio, where the tanks are reassembled on the original tank production line. Following reassembly, the tanks are fielded to designated units in an order of precedence based on the units' operational tempos. The rebuilt tanks are subjected to the same acceptance procedures as new vehicles.

Now in its fourth year of production, AIM has increased from its initial production rate of 45 tanks per year to 135 per year. The program is fully funded at this rate through fiscal year 2007. The most significant lessons that have been learned so far from the program are—

- A configuration baseline is essential to sustained program success.
- Fielding of vehicles must follow a total package fielding concept, which includes funding and requisitioning for nearly all items needed for the fielding.
- Where depot capacity or capability constraints occur, components should be repaired by vendors.
- Selective upgrades should be promoted to prevent obsolescence of electronic components.
- Component dropout factors will fluctuate from year to year, adding a level of uncertainty to program execution.

Configuration Baseline

The success of a recapitalization program may depend on how effective the execution plan is in establishing the system's configuration baseline. In the case of M1A1 tanks, many configuration updates have occurred over time. As many as four different versions of some primary tank components have been produced, some of which have not been compatible with earlier upgrades. AIM reestablishes a baseline system by incorporating all outstanding engineering change proposals (ECPs) and ensuring that all line-replaceable units have the most recent configuration. Standardization is ensured across the fleet by fielding the AIM M1A1s to divisions in battalion sets (44 tanks each).

Each year, during the development of an AIM proposal, General Dynamics is given the serial numbers of 135 tanks that are to be inducted into the AIM process during the next 2 program years. For the first year, General Dynamics proposes a cost for labor to assemble the 135 tanks. For the second program year, they screen the tank serial numbers for ECP applicability. All outstanding no-cost or low-cost ECPs are applied automatically. ECPs with additional costs are included in the General Dynamics proposal. The Product Manager (PM) Abrams decides whether to include those ECPs in the contract award.

Total Package Fielding

Department of the Army Pamphlet 700–142, Instructions for Materiel Release, Fielding, and Transfer, defines total package fielding (TPF) as the standard method by which the Army fields a system. TPF ensures that, when a system is handed off to a gaining unit, the equipment is supportable and maintainable.

AIM uses the TPF concept to field recapitalized M1A1 tanks. Included in the fielding are a refurbished set of tank basic issue items, a new set of technical manuals, a small quantity of repair parts, and any diagnostic tools required. The repair parts are limited to those parts that are new or modified because of a change in tank configuration. Diagnostic tools include any software changes required for the direct support electronic test set to support a different tank configuration.

New equipment training is conducted in conjunction with TPF, although, technically, training is not part of TPF. Soldiers in the gaining unit receive limited operation and maintenance training that is focused on tank configuration changes. Both TPF and new equipment training require a commitment of time, effort, and funding by the PM. The cost of TPF of tanks in the AIM program in Europe has posed a challenge. However, the PM remains committed to using the TPF concept.

Vendor-Refurbished Items

Most tank components are reparable throughout the entire maintenance chain. Depot repair programs have been in place for years to fix some components according to a depot maintenance work requirement. This ensures that the parts perform as they originally were designed to perform even though they are not new. However, because of their age, some components are beyond the level of repair specified in the depot maintenance work requirement and must be repaired by a vendor.

Some items are refurbished by a vendor because of their technical nature. The thermal imaging unit used in the M1A1's primary sight is a good example. Anniston sends the thermal receiver unit to Raytheon to be repaired or refurbished. The overhauled component is returned to the depot to be installed in the tank's primary sight with other components.

Obsolescence Prevention

Although the M1A1 is considered to be an analog system rather than a digital system, its architectures are fairly sophisticated and have many major electronic components, each of which has a number of circuit boards and other electronic parts. In some cases, the original manufacturer of the electronic components may have switched to a more modern technology or practice, may no longer be in the defense business, or may have gone out of business altogether. This happens more frequently now than in the past, when the defense business often drove technological change. System technical support ends when a weapon system goes out of production, so electronic components for the weapon system become obsolete over time.

The AIM recapitalization program has launched an aggressive campaign to combat obsolescence by identifying high-risk areas and developing strategies to reduce those risks. For example, every M1A1 tank has hull and turret network boxes. These boxes are the prime routers of all control, interface, and power-distribution electrical signals on the hull and the turret sides of the tank. The two boxes, considered the "heart" of the tank, were facing obsolescence in the late 1990s. In an effort to ensure that network boxes would be available to sustain the M1A1s in the field, PM Abrams embarked on a plan to redesign the two network boxes and incorporate them in the AIM recapitalization process. The redesigned boxes replicate the functionality of the originals while incorporating such improvements as Versa Module Europa (VME) for plug-and-play applications. [VME is a flexible, open-ended bus system, or channel,

☐ **The first M1A1 Abrams tanks produced in the AIM program were fielded to C Company, 1–66th Armor Battalion, 1st Brigade, 4th Infantry Division (Mechanized), at Fort Hood, Texas. In the photo at left, one of those tanks is offloaded at Fort Polk, Louisiana, for subsequent participation in a Joint Contingency Force Advanced Warfighting Experiment (below).**

that supports a variety of computing-intensive tasks. It is being used to incorporate an embedded diagnostics architecture into the M1A1.] The new network boxes are being sent to units in the field, which helps to reduce the strain on the depots to provide overhauled boxes.

Dropout Factors

At the component level, most of the parts used in AIM are reclaimed through a refurbishment process at the depot or vendor. It is difficult to predict with any certainty how many of a specific item will be recovered in the reclamation process. Items may drop out for several reasons.

A good example is the M256 cannon, which is the main gun on the M1A1. The M256 has an effective full charge (EFC) round life of 1,500 rounds. To be reclaimed, the gun tube must meet two AIM criteria: It must have at least 500 EFC rounds of life remaining, and it must be fully serviceable according to Technical Manual 9–1000–202–14, Evaluation of Cannon Tubes. AIM originally was structured to accommodate a 15-percent dropout of gun tubes. Since program inception, the dropout has increased steadily each year, well beyond the original prediction of 15 percent. Absorbing the cost of items as expensive as gun tubes in the approved program budget has been difficult. Here's why.

Currently, tanks inducted into the AIM program have been turned in by Active component units. The units turn in the tanks in "as-is, clean and complete" condition. Under such turn-in standards, it is difficult to determine the condition of all the tank components, which makes it hard to forecast which repair parts will be required when the tank eventually is inducted into the AIM program. In the case of gun tubes, the integrated product team that manages the program has taken measures to forecast the gun tube requirement more accurately so program funding and gun tube demands can be managed more effectively. Yet without conducting a complete serviceability inspection on all of the components, there always will be a degree of uncertainty in the parts forecasts. The key is to plan for the uncertainty and mitigate the risk with sound backup plans.

Each recapitalization program has its own unique challenges. This is true for all systems, not just weapon systems. The successful outcome of each program depends on how well the team managing it adapts to unforeseen circumstances. Configuration baselines, overhaul factors, and other challenges are certain to arise in any program involving the management of an aging system. The key to success is structuring the program to be flexible enough to limit uncertainty and to accommodate it where necessary. This is particularly critical in a recapitalization environment such as AIM. **ALOG**

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Transforming Strategic Distribution

by Captain Timothy J. Ross, USN

Strategic Distribution, formerly known as the Strategic Distribution Management Initiative, is a program designed to transform the Department of Defense (DOD) worldwide distribution system. This transformation will be accomplished by integrating the key elements of stock positioning, synchronization, and transportation to drive down customer wait time and costs while improving the quality and reliability of service.

Since the program's inception in 2000, the efforts of the Defense Logistics Agency (DLA), in partnership with the U.S. Transportation Command, have resulted in dramatic improvements in the performance of the DOD supply chain. Customer wait time (the total elapsed time between issue of an order to delivery of the ordered item to the customer) has been reduced from a pre-Strategic Distribution (SD) average of 15 days to 11 days for U.S. European Command units. At the same time, improved positioning of stocks to support forward-deployed customers has reduced transportation costs by shifting cargo to scheduled transportation services and away from more expensive, premium transportation modes.

This improvement in response time has been sustained even in the face of surge requirements resulting from Operation Enduring Freedom. The flexibility of processes introduced by SD has enabled the system to respond rapidly to support contingency operations.

The Office of the Deputy Chief for Logistics, Fleet Supply, and Ordnance, U.S. Navy Pacific Fleet, has been involved with SD since June 2001. "SD has [provided] an opportunity to review the supply chain's response to the warfighter from a holistic perspective," said Commander Randall Moore of the Deputy Chief's Office. "It is providing an opportunity to optimize transportation and stock positioning to achieve the required response to warfighter requirements."

The Pacific Fleet has seen quantifiable improvements in both surface and air transportation service as a result of SD, Moore said. As a result of Phase 1 of SD, the Pacific Fleet recently received the first end-to-end channel sparing-analysis tool for the Pearl Harbor Naval Shipyard and will be using it to determine optimal stock positioning tradeoffs with available transportation. This analytical tool follows a requisition from its origination through each potential source of supply until it is filled or backordered. Data collected can show whether the requisition is filled at the local or regional retail level, through procurement, or by DLA. DLA data are broken down further, such as by the number of items issued from stock and the number backordered.

Participants in SD-Europe created a theater distribution management cell to reduce the backlog of cargo transported by air. This SD innovation reduced customer wait time, transportation costs, and overall requirements for frequency channels for communication between Germany and the Balkans.

By measuring inbound intertheater air-transported cargo against scheduled intratheater air transport, potential backlogs can be diverted to ground transportation. This innovation has worked so well that it has been extended to Aviano, Italy, and Mildenhall, England.

Forward stocking—positioning applicable materiel closer to the customers in Europe and the Pacific—is a central component of DLA's management of the supply chain as a whole. Forward stocking has reduced customer wait time and transportation costs substantially. For example, air shipments to Korea and Japan now arrive 3 to 5 days earlier, and surface shipment time has been reduced by 17 percent since October 1999.

Global Synchronization

Improving a massive logistics system requires a great degree of coordination and synchronization. The biggest challenge is getting the various command and service computer systems "talking" to one another in a common language. Creative solutions and "out-of-the-box" thinking are required to meet this challenge. Part of the problem is that stock delivery and positioning are not assessed by DOD on a global basis. DLA, through the SD process, is working to change all that.

DLA, working very closely with the European Command and the Transportation Command, the 21st Theater Support Command Distribution Management Center, and the 200th Materiel Management Center Velocity Management team, has been able to assist with other SD improvements.

Two years ago, 90 percent of the materiel transported to Bosnia and Kosovo was flown in by U.S. military airlift. Now, less than 30 percent is moved by air, and customer wait time for Bosnia alone has been reduced 27 percent—from 15 days to 11 days. This is a dramatic reduction of $1.5 million in transportation costs annually to the Army.

☐The highly automated SD platforms centralize freight from multiple sources for rapid consolidation and shipment.

Perhaps not as critical as air transport, sea transport also is making great strides in reducing customer wait time. In sea deliveries to military customers in Europe, customer wait time has been reduced, on the average, from over 55 days to less than 40 days—a 27-percent reduction. A customer wait time reduction of 1 day equates to about a $4 million savings to U.S. taxpayers.

DOD leaders have been pleased with the results of SD. Air Force Major General William Welser III, Director of Operations and Logistics, U.S. Transportation Command (USTRANSCOM), believes the program is having a big impact on DOD's ability to support the war on terrorism. "Rapid movement of sustainment supplies in support of Operation Enduring Freedom clearly demonstrates that SD efforts are on target. The enhanced velocity is a direct result of the SD partnership among the services, DLA, and USTRANSCOM," said Welser.

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Ongoing SD Initiatives

Since 11 September 2001, customer wait time for door-to-door military air service has remained steady at 11 days compared to the pre-SD average peacetime wait time of 16 days. DLA now is moving forward to realize the full potential of the SD partnership through several initiatives—

- ***Positioning stock in the continental United States.*** By continuously and aggressively reviewing opportunities for moving stock to Strategic Distribution platforms in Susquehanna, Pennsylvania, and San Joaquin, California, DLA supply centers are providing optimal support to customers while minimizing costs. The key measurement of this effort, the facing fill rate, is now 73 percent, an improvement of 13 percent from the pre-SD baseline. (Facing fill rate is the percentage of requisitions filled through the distribution center or Strategic Distribution platform located closest to the customer demand. For example, facing fill at Anniston Army Depot is the percent of requisitions filled by Defense Distribution Depot Anniston, Alabama, or Defense Distribution Depot Susquehanna, Pennsylvania.)
- ***Forward stock positioning.*** Building on the success of U.S. European Command efforts, DLA is expanding to support U.S. Pacific Command customers in Hawaii, Guam, and Japan. The current focus is on determining the optimal mix of in-theater stock positioning and the appropriate transportation channels to enhance support and reduce cost.
- ***Expansion of scheduled truck program.*** Scheduled truck deliveries are a key component of the SD effort to minimize costs while reducing customer wait time. This innovation is now institutionalized as a DLA business practice. As a result, surface customer wait time is down by 20 percent. The program is expanding to include 3 new truck routes and 41 additions to existing routes.
- ***Partnering with the General Services Administration (GSA)***. Discussions continue between the DLA Defense Distribution Center and GSA about establishing an integrated distribution system. Such a system would offer significant opportunities for improved performance and efficiency through the integration of GSA items into DLA stock positioning and scheduled truck programs.

We know that SD is working well, but we must be vigilant in seeking further improvements to the system. Additional modifications of distribution processes will be required. Initial efforts are underway with the Army to configure shipments to meet the needs of deployed or deploying units. For example, preconfiguring loads would reduce the personnel and equipment needed to establish operations in forward bases.

So the SD work continues. Everyone involved with SD needs to use his imagination, flexibility, and commitment continually to create "business success" in peace, in war, and in times of unanticipated customer requests. DLA personnel are ready for that challenge.

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Civilian Augmentation of Joint Operations

by Peter J. Higgins

The primary logistics consideration for each combatant commander is to ensure adequate support for his operational plans in war and contingencies. The challenge is to get enough of everything required but not too much of anything. Transportation limitations (time and lift assets) preclude shipping everything needed to support the force from the continental United States, so making use of locally or regionally available labor, supplies, and services offers at least a partial solution. However, the solution to one problem can create problems in other areas. A major challenge is to solve problems before they occur.

One important limiting factor for any combatant commander is the ceiling placed on the number of uniformed personnel a host nation may allow in its country. The combatant commander needs fighters to support his operational plans and logisticians to support the force from the buildup phase through demobilization and redeployment. Arriving at an optimal force with a minimal logistics footprint on the ground is difficult.

One way to circumvent limitations on military personnel is to use civilian contractors. Each of the armed services needs contractor support, but their requirements and solutions are different. As the end strength of military and Department of Defense civilians has decreased over the last decade, outsourcing for common skills and low-density, high-tech skills has increased.

Planning for the use of civilian contractors on the battlefield must begin in peacetime, when it becomes known that prospective host nations cannot provide adequate support. Each service must plan to provide both logistics and mobility support to its component commanders and forces. Civilian augmentation is the name given to this overall concept, but each service has its own program.

The Army's LOGCAP

The Army's Logistics Civil Augmentation Program (LOGCAP) is managed and administered by the Army Materiel Command (AMC). It is a special contingency program to maintain a worldwide contract on a multiple-region basis. It enables the Army to contract quickly for combat support and combat service support needed in a contingency.

LOGCAP was established in December 1985 but was not used until 1988, when the Army Corps of Engineers was tasked to contract for a management plan to construct and maintain two petroleum pipeline systems to support contingency operations in Southwest Asia. The Corps of Engineers awarded the first LOGCAP umbrella contract to Brown & Root Services (now Halliburton KBR) in August 1992 and activated it the following December to support all U.S. and United Nations forces in Somalia. Since that time, LOGCAP has been implemented in no less than a dozen foreign countries around the world.

LOGCAP contractors are chosen in peacetime through a competitive selection process to plan for and, when tasked, provide needed construction and services worldwide. The contract is in effect for an initial time period and has option clauses for additional years. It must be generic and worldwide in scope for both developed and underdeveloped countries and must align with operational and country-specific plans. The contractor also must develop and maintain a database of available equipment, supplies, and services to carry out those plans. The contractor's database must support five broad categories of support: facilities, supplies, services, maintenance, and transportation. Support is tailored to each concept of operations, and the scope of work is provided by the supported commander.

DynCorp International began performing as the LOGCAP contractor in January 1997. With their contract expiring in February 2002, the Project Manager-LOGCAP, in coordination with AMC's Operations Support Command, began the process of awarding a new contract. Halliburton KBR won the LOGCAP III cost-plus-award-fee contract for 1 base year with 9 option years. This means that the Government will reimburse the contractor for allowable expenses and award an additional fee based on performance.

The contract specifies the services that Halliburton KBR

LOGCAP Capabilities

- Supply operations
- Clothing exchange and bath
- Clothing repair
- Mortuary affairs
- Billeting
- Facilities management
- Information management
- Other operations and services
- Transportation
- Engineering and construction
- Support of Army personnel and equipment retrograde
- Field services
- Laundry
- Food service
- Hazardous materials/waste disposal
- Morale, welfare, and recreation
- Personnel support
- Maintenance
- Medical services
- Signal support services
- Power generation and distribution
- Standard Army Management Information Systems operations

CONCAP Capabilities

Horizontal/Vertical Construction

- Runways
- Roads
- Bridges
- Causeways
- Piers
- Berthing/messing facilities
- Depots/warehouses
- Clinics and field hospitals
- Operation/maintenance facilities
- Communication facilities
- Ammunition dumps

Specialty Construction/Engineering

- Dredging
- Aerial photography
- Soils engineering and surveys
- Operation of power generation, concrete, and asphalt plants
- Petroleum, oils, and lubricants facilities
- Environmental restoration

must be able to provide (see chart at left) in support of two simultaneous contingencies in widely separated geographical areas. The local commander must determine the type of services required in each instance and the scope or level of support needed.

The Navy's CONCAP

The Navy's civilian augmentation program is called Construction Capabilities (CONCAP). This program was started to enhance the Naval Facilities Engineering Command's ability to respond to global contingencies. The immediate need was to supplement the capabilities of local commanders and regional resources.

CONCAP provides for indefinite deliveries and quantities using a cost-plus-award-fee contract for design, construction, and services to support the Navy in war, disaster recovery, and military operations other than war. CONCAP is suitable for those situations in which the mission parameters exceed normal acquisition timing, there is an austere contingency environment, and facility requirements are not well-defined.

The current CONCAP contract for 1 base year with 4 option years of worldwide coverage was awarded to Brown & Root Services (now Halliburton KBR) in June 2000. The contract calls for a broad range of capabilities in both vertical and horizontal construction scenarios. (See chart above.)

CONCAP helps the Navy stay within its force ceilings and frees uniformed Navy personnel for contingency operations. The contract specifies what may be required and includes time parameters for setting up quick, behind-the-lines facility support for troops. It also frees up Seabees to support the fight.

The Air Force's AFCAP

The first Air Force Contract Augmentation Program (AFCAP) contract was awarded to Readiness Management Support, LC (RMS) in February 1997 and was for 1 base year plus 4 option years. RMS also won the rebid of the contract in February 2002, which calls for 1 base year and 7 option years. Like the Army and Navy contracts, it is a cost-plus-award-fee contract. The chart below shows what the AFCAP contractor is required to provide.

RMS is supported by its parent company, Johnson Controls, Inc., and eight other subcontractors on the AFCAP team. Each team member specializes in one or more portions of the contract. As with the LOGCAP and CONCAP contracts, the AFCAP contract requires that the AFCAP team plan for and provide specific services when called on to support a combatant commander in a contingency or war. RMS has provided this support at several locations around the world.

All three of these civilian augmentation programs support joint U.S. operations worldwide. They prevent the dilution of military forces that would occur if the military had to provide the required services and support. However, these contracts are expensive. They should be used only when it is not appropriate for military personnel to provide needed services and functions. Commanders must be vigilant in the use of civilian augmentation because contract costs can get out of control easily, particularly when changes or additions are made late in the execution phase. However, these civilian augmentation contracts often are the only means of getting skilled people and services needed to construct and repair buildings and equipment quickly.

AFCAP Capabilities

- Deployed management/services
- Infrastructure support
- Emergency support services
- Reconstitution
- Services (morale, welfare, and recreation)
- General
- Airfield support
- Environmental
- Ancillary capabilities
- Restoration
- Materiel support

Several courses offered by the Army Logistics Management College (ALMC) at Fort Lee, Virginia, include information on civilian augmentation programs. They are the Logistics in Support of Joint Operations Course (formerly the Joint Course on Logistics), the Logistics Executive Development Course, and the Multinational Logistics Course. For information on these courses, visit the ALMC Web site at www.almc.army.mil or send an email to higginsp@lee.army.mil. **ALOG**

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Developing Logistics Systems for the Finnish Defence Forces

by Major Timo K. Saarinen, Finnish Defence Forces

Benchmarking is a viable method of developing effective and competitive companies in the business world. The same technique can be used to improve military operations. The question is: Is it relevant to use the logistics characteristics and principles of the U.S. Army as a benchmark for comparison with the Finnish Defence Forces (FDF)? Can the FDF use U.S. Army combat service support (CSS) transformation tenets to meet its logistics needs?

Demographics

Finland is a republic located in northern Europe. A quarter of its total area lies north of the Arctic Circle. Finland's neighboring countries are Sweden, Norway, and Russia. Its eastern border with Russia, which is the easternmost border of the European Union, is about 800 miles long. Finland has a population of 5.2 million. It has an advanced industrial economy, with the metal, engineering, and electronics industries accounting for 50 percent of the country's export revenue. The forest products industry provides 30 percent of the export revenue.

Finland's Defense System

Finland's security policy is based on nonparticipation in military alliances and on a credible national defense. While not a member of any military alliances, Finland participates in the North Atlantic Treaty Organization (NATO) Partnership for Peace program. Finland has a long history of participating in United Nations peacekeeping activities and currently participates in the NATO-led Stabilization Force (SFOR) and Kosovo Peacekeeping Force (KFOR) in the Balkans.

Finland's military doctrine is based on a territorial defense that will be adjusted to meet future threats. The President of the Republic is the supreme commander; the Chief of Defence directs the defense of the nation and assigns tasks and resources to lower echelons.

Finland's peacetime command structure includes the Army, the Air Force, and the Navy. The Army has 3 regional military commands—Eastern, Western, and Northern—that are divided into 12 military provinces. Each military command is an echelon capable of independent warfare and must coordinate the operations of the Air Force, the Navy, and other relevant authorities. The strength of the wartime FDF is 470,000 men; this will be reduced to 350,000 men by the year 2008. The Army consists of 22 brigades (2 armor brigades, 9 jaeger [mechanized] brigades, and 11 infantry brigades), troops from different branches of the Army and from other services, and local defense units [somewhat like U.S. Army National Guard].

The FDF's main wartime ground forces are the three highly mobile readiness brigades (Brigade 2005) that are based on a concept similar to that of the U.S. interim brigade combat team (IBCT). In 2 years, these brigades will be the most capable and best-equipped units in the Finnish Army.

The Changing Environment

Significant changes have occurred within the military doctrines and structures of many countries during the past decade because of changes in the political, strategic, and security environments and because of new threats. The new, asymmetric battlefield creates new requirements for logistics systems. Business logistics also has changed over the same period. Many countries and their armed forces face the same challenges: reorganizing the armed forces and reducing defense budgets. The dilemma all nations face is whether to change their military logistics systems or to depend on old principles and doctrines.

How can Finland estimate future military requirements? Many nations look to the United States for guidance. As U.S. Army logistics is being transformed as a part of the Revolution in Military Affairs, a number of logistics factors have been identified for change. Finland may find that many of the ideas the U.S. Army has implemented and the principles it uses also would be useful within the FDF. Of course, changes in the Finnish strategic environment, and thus in the FDF, would be smaller.

Comparison of Tasks and Doctrines

Comparing the FDF to the U.S. Army is quite complicated because of the major differences in organ-

izational structures, tasks, and duties. As stated in the U.S. National Security Strategy and National Military Strategy, the U.S. Armed Forces must respond to the full spectrum of crises all over the world. The distinction between U.S. strategy and the Finnish territorial defense strategy is notable. However, the armed forces of both countries have a homeland security mission.

Although there are many differences, the basic functions of both the U.S Army and the FDF have a number of similarities. Both systems must be able to sustain forces in all situations and during different types of crises. Both logistics systems must be able to provide support operations at home, overseas, and during international crises.

After the incidents of 11 September 2001, both countries are closely examining homeland defense and their logistics systems, although the tenets of ongoing transformation seem to respond well to a new kind of asymmetric battlefield. However, the FDF focuses mainly on logistics operations on its own soil and the U.S. Army concentrates on operations abroad.

Characteristics of Logistics

As stated in Field Manual (FM) 3–0, Operations, successful logistics operations should be both effective and efficient. The tools to achieve this goal are the characteristics of logistics shown in the table below. These characteristics guide logistics planning at every level and help logisticians develop plans based on the requirements of the mission, enemy, terrain, troops, time available, and civilian considerations (METT–TC) and the commander's guidance.

But are these characteristics universal, and do the FDF and U.S. Army have equivalent guidelines? The comparison of U.S., Finnish, and business logistics characteristics in the table below shows that the basic meanings behind different terms are almost the same. The U.S. Army's logistics functions are clearer. A comparison of the U.S. and FDF military logistics characteristics with business logistics characteristics reveals that they are very much alike. The comparison shows no contradictions, so the direction of development appears to be the same among them all. It also shows that the characteristics of the FDF are comparable, although they are expressed in different, less concise terms.

An analysis of the comparison reveals that the FDF needs to update two characteristics. The first is survivability—the ability of CSS elements to prevail in the face of potential destruction and the ability to protect support functions. One way to reinforce the FDF's logistics survivability is to increase the combat capabilities of its CSS units when reviewing their organization and equipment. The second characteristic that the FDF needs to update is integration. CSS operations must be synchronized with all aspects of operations. The national logistics system must be able to support international operations without special arrangements. Although the

Comparison of Logistics Charactaristics

Joint Logistics	Combat Service Support	Business Logistics	FDF Logistics	Analysis
Responsiveness	Responsiveness	Responsiveness Quality	Long-term planning and foresight	+
Simplicity	Anticipation Integration	Automation Minimum materials handling	Simplicity	+
Flexibility	Improvisation	Flexibility	Flexibility	+
Attainability	Anticipation Integration	Mininum use of storage	Concentration and prioritization of resources	+
Sustainability	Continuity Anticipation	Quality	Sustainability	+/-
Survivability	Continuity	Resistance	Security Force protection	+
Economy	Integration	Economy Minimized cost and time	Concentration and prioritization of resources	+
Integration	Integration	Automation Information	Synchronization in multinational and joint operations	-

Comparison of Logistics Functions

CSS Tactical Logistics Functions	New Logistics Functions (FM 4–0)	FDF Logistics Functions	How FDF Logistics Functions Differ From U.S. Logistics Functions Identified in FM 4–0
Sustaining	Supply Financial management Religious services Legal Band	Supply (includes all classes except VIII and IX)	Financial management falls under the operations branch. Religious, legal, and band functions fall under the personnel branch.
	Combat health	Combat health	Combat health falls under logistics, not the personnel branch as it does in the U.S. Army.
	Field services	Field services	Mortuary affairs falls under logistics, but chaplains fall under the personnel branch.
Arming	Explosive ordnance disposal		Explosive ordnance disposal is part of ammunition supply (part of the life cycle system).
Fueling			
Fixing	Maintenance	Maintenance	
Moving	Transportation	Transportation	Movement control belongs to the operations branch.
Manning	Human resources		Human resources falls under the personnel branch.

FDF has a long history of sending units to peacekeeping missions around the world, the support system does not respond fully to today's requirements for rapid reaction and force deployment.

Principles and Functions of Logistics

A revolution in the Finnish logistics system is underway. A new FDF Logistics Handbook was published in 2001 that provides principles and basic structures and acts as a guideline for other handbooks that were released in 2002. The major change in the handbook was a move from traditional logistics functions, which have been maintained for about 85 years, to support functions. The old system was based on independent branches of logistics, such as ordnance. The new logistics functions are supply, combat health, field services, maintenance, and transportation. The effects of this change are widespread and create the need to streamline many things. Areas needing improvement include not only manuals but also CSS unit organizations, the ideology of older logisticians who are used to doing things the old way, and CSS personnel training systems.

The CSS functions of the FDF are similar to U.S. Army logistics functions. (See the table above.) The main difference is that combat health is a logistics function for the FDF and a personnel function for the U.S. Army. In the FDF, the personnel section is responsible for human resources, religious support, legal services, and the band; however, mortuary affairs is a logistics function that is led by the chaplain, and financial management is an operations function. A flaw in the FDF is a slight fragmentation of responsibilities because too many functions are logistics by nature but are not considered logistics functions. These differences are the result of tradition and history.

Overall, the FDF's new logistics functions provide a solid foundation for developing the FDF's future logistics systems. However, the FDF supply classification system correlates with the U.S. Army classification only in principle, because the FDF uses neither the U.S. Army supply class system nor the NATO classification system. The supply classification system is an integral part of the supply system. Making the FDF supply system compatible with U.S. or NATO systems undoubtedly would increase its usefulness. Movement control responsibilities also need review. Logisticians should play greater roles in movement control functions in corps and brigade rear areas, where traffic is related to logistics.

A fundamental difference between FDF and U.S. Army ideology is the method the FDF uses to support its combat forces. The main principle of U.S. Army logistics doctrine is to release operational commanders from worrying about logistics arrangements by giving the responsibility to logisticians. The chain of command and logistics doctrine enable this principle to work. The U.S. Army's organizational modularity makes it possible to provide interchangeable and tailorable units to meet changing needs. The flexible use of units allows better response to asymmetric warfare and the shattered battlefield. This also fits well into various tasks of the U.S. Army's CSS units, such as domestic support op-

☐ Finnish Defence Forces participate in the Kosovo peacekeeping mission.

erations and peacekeeping operations.

In the FDF, the commander has total responsibility at all levels, which is why organizations at brigade and below are fixed. They are also more logistically independent, because forward support battalion-level capability is built into the brigade organization. This has proved to be a foresighted strategy since it is the direction the U.S. Army is taking in developing new concepts to respond to future challenges. U.S. CSS units above brigade level are not fully modular and therefore are not fully able to respond to tomorrow's requirements.

U.S. Army CSS Transformation Tenets

Focused Logistics is a significant cornerstone in providing all the necessary CSS assets and sustainment to customers at all levels of operations. Focused Logistics enablers are integrated maneuver and CSS systems command and control, Total Asset Visibility, modular organization, the Movement Tracking System, and a wireless management information system. Focused Logistics will ensure delivery of the right equipment, supplies, and personnel in the right quantities, to the right place, at the right time.

The U.S. Army has developed six CSS Transformation tenets to help attain Focused Logistics—

- Seamless logistics system.
- Distribution-based logistics.
- Agile infrastructure.
- Total asset visibility.
- Rapid force projection.
- Adequate logistics footprint.

A remarkable point is that both the Joint Vision and the Army Vision emphasize the importance of logistics as a key factor in developing a more capable military force. Unfortunately, the role of logistics in the FDF appears to be growing dimmer because it is more fashionable to concentrate on developing maneuver units. Perhaps one reason for this unfavorable trend is the last 56 years of peace in Finland. Logistics development has been guided more by peacetime economics than by wartime readiness issues.

FDF Logistics System Structure

The more resources are limited, the more effective and economical a system must be, which is why the FDF has selected its way of conducting logistics. As outlined in the FDF's FM VI, Logistics, the FDF's peacetime logistics system consists of two elements: the FDF's own logistics system, which expands to encompass field logistics when the readiness level is raised, and business logistics systems, which are used as an extension of the FDF logistics. This logistics system is divided into field CSS and local CSS, based on the types of CSS units and what services the units provide.

The FDF's logistics doctrine states that, in peacetime, the headquarters, garrisons, depots, military institutions, and storage areas form a logistics system on which the wartime logistics system is based. The FDF continuously adapts its logistics system to meet wartime needs. At the same time, logistics command and materiel management connections are established and maintained with business information networks. The FDF uses business logistics systems for purchasing goods, transportation assets, and repair services.

The system created for basic readiness is fully functional during heightened readiness. When the FDF raises its readiness level, the logistics system, based on the threat scenario, makes part or all of field logistics operational to expand the logistics system to the needed level. Troops that will be mobilized are equipped and

combat ready. Domestic businesses raise economic readiness to wartime levels and cooperation with international trade partners are secured. The business systems also are used to provide supplies for the troops. Above all, the logistics system must be based not only on military logistics organizations and garrisons but also on the business structures and contractors in the area. The military command logistics regiments enter service at the same time as the first rapid reaction units in order to receive materiel dispersed from the garrisons, regional stores, and depots.

During wartime, the FDF logistics system goes on full readiness and the domestic production of materiel and equipment increases to its full capacity. In addition to the field CSS, the FDF uses local and international businesses and a civilian hospital system that can be expanded to meet wartime needs. The U.S. Army might find some of these ideas useful in developing their system.

Applying the Transformation Tenets to the FDF

A comparison of the tenets of U.S. Army Transformation with the characteristics of FDF logistics shows that they are closely related. Therefore, the concepts are not new because the same kinds of principles already existed. Nevertheless, the ideology behind the tenets is revolutionary because the tenets of Army Transformation include actions to be completed and metrics to measure progress toward the desired outcome. Although some of the tenets are already included in the FDF's logistics system, others should be incorporated.

Seamless logistics should tie all parts of the logistics community together into one network of unified actions. However, the FDF's logistics system is not completely seamless because not all parts of the system are coordinated and some logistics functions are separated from the logistics system. The seamless network must include not only the FDF's branches and services but also commercial businesses. The FDF needs to focus more on developing wartime logistics systems than on maintaining the effectiveness and economy of peacetime logistics systems. Making the system more seamless would improve the integrity of both peacetime and wartime CSS organizations. All levels of the logistics chain should be improved at the same time.

Distribution-based logistics represents a completely new way of doing business. Velocity offsets mass as echelons of inventory are replaced by managed flows of materiel. The FDF had a distribution-based system during the Winter War against the U.S.S.R. in 1939. However, because of growing inventories in some areas and the lack of materiel in other areas, the system soon was changed to a supply-point system. With today's system, the idea is to try to distribute when possible, but not lower than the brigade support area level, because the units do not have enough transportation assets. Guidelines for developing a system that is more distribution capable would include—

- A more centralized use of streamlined transportation units.
- The purchase of the Movement Tracking System, at least for military command-level transportation units.
- The development of the movement control system at military command levels.

Agile infrastructure can be addressed from a structural, physical, or mental point of view. However, taking into account the need to reduce the logistics footprint, the common factor might be better flexibility. A modular force structure would help improve FDF agility because modularity allows CSS systems to be more flexible and responsive in every situation.

Total Asset Visibility (TAV) should be developed while the distribution program is being improved. However, the FDF system would be different from the U.S. Army's because the FDF's needs and resources are different. The TAV of the FDF should be based on electronic situation reports and materiel requests. The FDF's logistics unit (LOGYKS), which is a link between business and military command CSS units, plays an important role in TAV, just as the U.S. Army's materiel management center does in the corps support command. Computerized requirements and ordering systems are the basis for developing TAV in the FDF. Therefore, LOGYKS' tasks should be extended to cover all materiel classes in an effort to achieve better visibility and a single-point supply system.

Rapid force projection is a demanding challenge to logistics because, as Mark J. O'Konski said in the January-February 1999 issue of *Army Logistician,* "projection of combat forces is of little value if those forces cannot be sustained." This means that logistics force projection must be adequate in all situations. In the FDF, the approach is different because it focuses mainly on projecting the force within the country. Therefore, the time requirements to deploy rapid reaction units are even more demanding than for the U.S. Army.

Adequate logistics footprint is linked strongly to agile infrastructure**.** Reducing the logistics footprint requires not only modularity but also increased use of businesses and contractors to meet materiel needs. The footprint should always be the "right size," yet big enough to respond to contingency plans and unforeseen situations.

Reducing the total cost of logistics without jeopardizing readiness or combat capability is a challenging task. The FDF should consider increasing its use of contractors. It would need to concentrate on core functions and outsource functions not essential for wartime logistics,

☐ **Since a quarter of their country is above the Arctic circle, Finnish Defence Forces must be able to function in arctic conditions.**

such as commercial vehicle maintenance and garrison dining facility operations. This would result in better integration with business logistics systems.

The comparison of the tasks and doctrines shows that the same needs can be found in domestic operations and abroad. This means that logistics systems must be able to sustain forces in all situations and in different types of crises, including on an asymmetric battlefield. Although the scale of operations and the emphasis on homeland and international operations are remarkably different in Finland and the United States, the justification exists for the FDF to conduct further benchmarking of U.S. Army logistics principles.

The U.S. Army, the FDF, and business have no disturbing contradictions among their logistics characteristics. The direction of developing logistics seems to be equivalent and comparable. Increasing the integration of business logistics and military logistics will be essential in the future.

The CSS functions of the FDF are comparable with U.S. logistics functions. Overall, the FDF's current logistics system provides a solid foundation on which to develop the future FDF logistics system using the U.S. Army principles.

U.S. Army CSS transformation is designed to reshape the way combat forces are deployed and sustained. This requires rethinking logistics functions and processes. The same kind of open-minded streamlining is needed in the FDF because most of the tenets of U.S. Army logistics also are adaptable to FDF needs.

The U.S. Army's logistics characteristics and principles can be used as a guide in further developing the FDF logistics system, and the CSS Transformation tenets will be useful. The similarities between the U.S. Army and FDF systems outweigh the differences. One fact remains: All of the developing ideas must be in proportion to circumstances, needs, and resources. Nothing should be copied without careful examination and consideration.

The process of studying and comparing the principles of logistics is very important when developing logistics systems. This is true not only when comparing different armed forces but also when benchmarking with business because military logistics will be even more integrated with commercial logistics and contractors in the future. **ALOG**

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Helicopters Make Final Flight in South Korea

by Master Sergeant Christopher S. Allbright

Seawater swirled beneath the powerful rotating blades of an approaching AH–64 Apache helicopter. The aircraft descended slowly onto the deck of Pier 8 at the Pusan harbor, making its final landing in the Republic of Korea.

The helicopter was the last of 27 Apaches and 13 UH–60 Black Hawks that were flown last May by pilots from the 2d Infantry Division and the 6th Cavalry Brigade to Pusan, where they were to be packed for shipment to Beaumont, Texas. Most of the 40 helicopters, no longer needed at Camps Long and Humphreys, were to be transferred to Army National Guard units in the United States. This would make room for the newer AH–64D Longbows scheduled to arrive in Korea next spring.

A task force of about 215 soldiers, under the direction of the 19th Theater Support Command (TSC) at Camp Red Cloud, took part in the Army's aviation retrograde operation. Twelve separate units combined to carry out the operation at Pusan.

'Bird' Roundup

Months before the touchdown of the Apaches and Black Hawks at Pier 8, Eighth U.S. Army tasked the 19th TSC, the Korean theater logistics experts, with the mission. The 19th TSC planned the operation and asked the aviation mechanics of the 194th Maintenance Battalion to prepare the aircraft for the journey to the United States.

The first step of the operation was getting the helicopters to the pier. The 17th Aviation Brigade tracked the "birds" from the time they left their home stations until they landed on Pusan's Pier 8. The 837th Transportation Battalion, which is responsible for pier operations, provided not only the physical location for the retrograde but also expert advice on staging and loading the aircraft at the pier. An adjacent pier owned by the Republic of Korea also was used during the operation.

The 194th Maintenance Battalion was the "big dog" of the operation. The battalion provided 120 aviation mechanics and support personnel. Other supporting units included the 18th Medical Command, which provided a preventive medicine team; the 20th Area Support Group, which provided logistics support for the task force; and the 23d Chemical Battalion. A continental United States-based Army National Guard aviation depot maintenance roundout unit brought soldiers whose depth of experience dates back to Vietnam. Their expertise in all phases of the operation ensured that it was performed safely, to standard, and as directed by the mission's leaders.

Port Operations

Stations were set up at the port to receive, rinse, disassemble, shrink-wrap, stage, and ship the helicopters. The helicopters began to arrive at the pier on 3 May. The scheduled arrival times for the 40 aircraft were

☐A soldier from C Company, 52d Aviation Regiment, guides an Apache in for a landing at Pier 8 in Pusan.

☐ Chemical specialists from the 61st Chemical Company, 23d Chemical Battalion, spray a helicopter with freshwater to wash away salt deposits. Below, crowning straps are removed from the rotor blades of an Apache by soldiers from G Company, 52d Aviation Regiment.

spread out over several days to allow for a manageable flow through the assembly-line process. About eight helicopters arrived at the port each day.

When an aircraft touched down at the receiving station, its pilot was escorted to an area where he could rest and eat. Movement control teams pulled each helicopter through the various stages of the process.

At the rinse station, the 23d Chemical Battalion sprayed the aircraft with freshwater to remove salt deposits. Saltwater mist created by the draft of the rotor blades clings to an aircraft's body and must be removed to prevent corrosion. Freshwater was used instead of chemicals for environmental safety, because the rinse water ran back into the bay.

After the aircraft was rinsed, it was moved to the disassembly station. One of the four 10-man teams of mechanics climbed over each helicopter like pit crews at the Indianapolis Motor Speedway. The rotor blades were removed from the Apaches; the Black Hawks' rotor blades were folded back.

Along with personal safety, safeguarding the equipment was stressed during each step of the procedure. For example, Apache rotor blades, worth thousands of dollars each, were removed gingerly and placed in long, protective shipping containers.

"We stressed safety throughout the operation," said Chief Warrant Officer (W–3) Bruce Irwin, of the 52d Aviation Regiment at Camp Eagle, who was the lead safety officer for the operation. His dedicated safety team, which included aviation and hazardous materials personnel, checked and rechecked to ensure that equipment was handled properly and that the leaders and soldiers actually doing the work were wearing the proper protective gear.

After the aircraft were broken down into components, they were moved to the staging area to be shrink-wrapped in plastic to prevent corrosion during shipping. This was the most time-consuming and critical step of the

☐ **Above, an Apache helicopter is covered with plastic wrap to protect it from the salt spray. At right, a G Company soldier applies heat to the plastic wrap to shrink it tightly over the aircraft.**

operation. Shrink-wrapping is just what the name implies. Padding is placed over sharp edges, and the entire aircraft is covered with plastic. Heat guns are used to shrink the plastic around the aircraft. During the first couple of days of the Pusan operation, shrink-wrapping a helicopter took 7 or 8 hours. By the end of the operation, the time per aircraft was reduced to 2 hours and 15 minutes. Despite the cut in time, each shrink-wrapping job was performed safely and to standard.

☐ **A shrink-wrapped helicopter is towed to the *MS Green Dale* for loading.**

Once the shrink-wrapping was completed, the 837th Transportation Battalion, with the help of the shipping team, loaded the aircraft onto the *MS Green Dale* for shipment to Beaumont. They also loaded boxes and crates of parts, Hellfire missiles, and military storage units. The *MS Green Dale* left Pier 8 in Pusan on 14 May and arrived in Beaumont on 11 June, more than a week ahead of schedule.

The soldiers who participated in the retrograde operation had an opportunity to develop new skills they will need if they are required to work under similar conditions at a pier during a contingency.

"This [operation] has Army-wide value," said Master Sergeant Eddie Barber, the noncommissioned officer in charge of the pier operations for the 194th Maintenance Battalion. "When these soldiers leave here and go to another unit, . . . they are going to be subject-matter experts on shrink-wrapping and shipping aircraft."

Next spring, when U.S. Forces Korea receives upgraded AH–64D Apache helicopters equipped with Longbow weapon systems, the process at Pier 8 will be reversed. It is possible that many of the same soldiers who helped pack this group of helicopters will be unpacking the new aircraft for their first flights out of Pusan. **ALOG**

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Innovative Container 'Building' Speeds Helicopter Upload

Heavy rain threatened to delay the scheduled move of 27 AH–64 Apache and 13 UH–60 Black Hawk helicopters from Pusan, Korea, by the Military Traffic Management Command's 837th Transportation Battalion. The aircraft were to be shrink-wrapped to protect them from corrosive saltwater mist during shipment to the United States. As the term implies, shrink-wrapping involves using a heat gun to shrink plastic to fit tightly over the entire aircraft. But there was a problem: how to shrink-wrap 40 helicopters in the rain.

Working closely with support troops from the 19th Theater Support Command, contractors, and the Republic of Korea Port Operations Group, the battalion came up with a solution. Between 30 and 40 shipping containers were used to build a temporary covered work area. Army-owned 20-foot containers were used for the walls of the structure, and 40-foot containers belonging to the Republic of Korea were placed overhead to form a roof. The structure was completed in approximately 8 hours.

Thanks to the temporary structure that port workers dubbed "The Castle," all 40 helicopters were shrink-wrapped and ready to be loaded on board the *MS Green Dale* when it arrived at Pusan's Pier 8 on the evening of 13 May.

☐ Forty-foot shipping containers form the roof of the temporary structure erected to protect shrink-wrapping operations from the weather.

Modeling an Ammunition Corps Storage Area

by Alan Santucci and Dr. Tayfur Altiok

Army researchers are continuing to analyze the performance of the ammunition distribution system.

To achieve its warfighting vision, the Army needs to gain a complete understanding of the ammunition supply chain and of available distribution alternatives. To meet this challenge, the Logistics Research and Development Activity at the Army Tank-automotive and Armaments Command's Armament Research, Development, and Engineering Center (TACOM–ARDEC) at Picatinny Arsenal, New Jersey, has been using simulation modeling to analyze the ammunition distribution system. (For background, see the article, "Modeling Ammunition Logistics," in the January-February 2002 issue of *Army Logistician*.)

The Logistics Research and Development Activity, in partnership with the Department of Industrial and Systems Engineering at Rutgers, The State University of New Jersey, has completed the second iteration of this modeling effort. The approach emphasizes trading off alternative solutions based on clearer information about both the efficiency and the effectiveness of the choices. The completed family of models will assess the impact of system-wide changes on the performance of the ammunition distribution system and assist decision makers in their choices about improving the system.

Corps Storage Area Modeling

In conjunction with other organizations, TACOM–ARDEC has developed baseline estimates for each node in the logistics chain. TACOM–ARDEC is in the process of transforming these estimates into workflow diagrams and process descriptions that will be used as starting points for subsequent models. The ammunition corps storage area (CSA) was chosen as the first node to model because of the many types of materials handling carried out there.

The CSA was modeled using Arena 5.0 simulation software, which is a modeling environment developed by Rockwell Automation. The model included shipments of ammunition into and out of the CSA using convoys of trucks; the shipments were based on the consumption rates in different combat areas. The CSA's soldier, equipment, and materiel interactions were defined and measured. The model also included all other operations, such as inspection, parking, unstuffing containers, storage, assembly, and retrograde; these operations involve the use of trucks, pallets, boxes, container roll-in-roll-out platforms, forklifts, rough-terrain container handlers, and palletized load systems.

The objective of this modeling effort was to answer the following questions for various levels of engagement intensity—

- How much ammunition of each type will have to be moved, when, and by whom?
- What is the current resource capability of the distribution system?
- What changes are expected to affect the system's performance?
- How does the system respond under a surge of heavy demand?
- What is the system's resource availability under various surge scenarios?
- What are the alternative courses of action for alleviating shortfalls?
- What does each alternative cost?

The simulation model was able to answer these questions by producing average values for a number of related performance measures calculated over a period of time (the replication length).

The Approach

TACOM–ARDEC used a system-level perspective

because an action taken in one part of the ammunition distribution system will affect other parts. Imbalances can cause some nodes of the system to be swamped and others to be idle. Underutilization and overutilization inefficiencies can occur at lateral, upstream, and downstream nodes within the system. The challenge of the analysis was to reveal, evaluate, and quantify system performance and capacity needs under demand surge scenarios and then determine alternative actions for ensuring a seamless flow of ammunition.

The model accommodated the four workflows of receipt, issue, ship, and turn-in using various engagement scenarios of infantry, armor, field artillery, air defense artillery, engineer, and aviation units as driving functions. The model generated random intensities and durations for each type of engagement, thus simulating the expected ebb and flow of battlefield demand for munitions. Baseline consumptions were calculated as a function of force structure, battle posture, and region of deployment using the Operations Logistics Planner software.

These consumption figures were folded into other user-defined initial conditions, such as personnel and equipment levels, that are read into the model. Depending on the random intensity generated by the model, the equivalent daily consumption in rounds of ammunition was easily calculated and the CSA responded accordingly. Intensity ranges, from a value of zero (indicating a "no conflict" situation) to a maximum of 100 (a "high-intensity conflict"), and random engagement durations also were defined by the user.

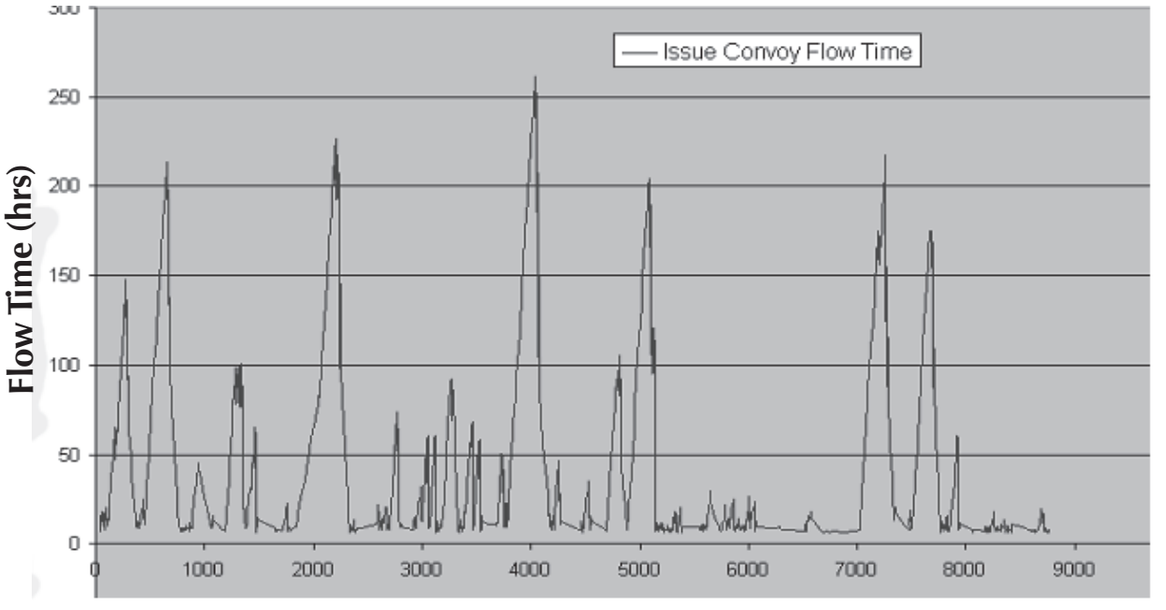
Metrics

The model was built to look into the resource capacity requirements and transportation capabilities of the CSA at various intensities of conflict, including peak demand. Other measures that were calculated included tonnage handled per day, the average time each convoy spent within the CSA, and the average inventory level of each Department of Defense Identification Code (DODIC) at the end of the simulation run. The average intensities and duration of each engagement type also were reported. The Arena software provided maximum levels as well as 95-percent confidence intervals for all the measures reported.

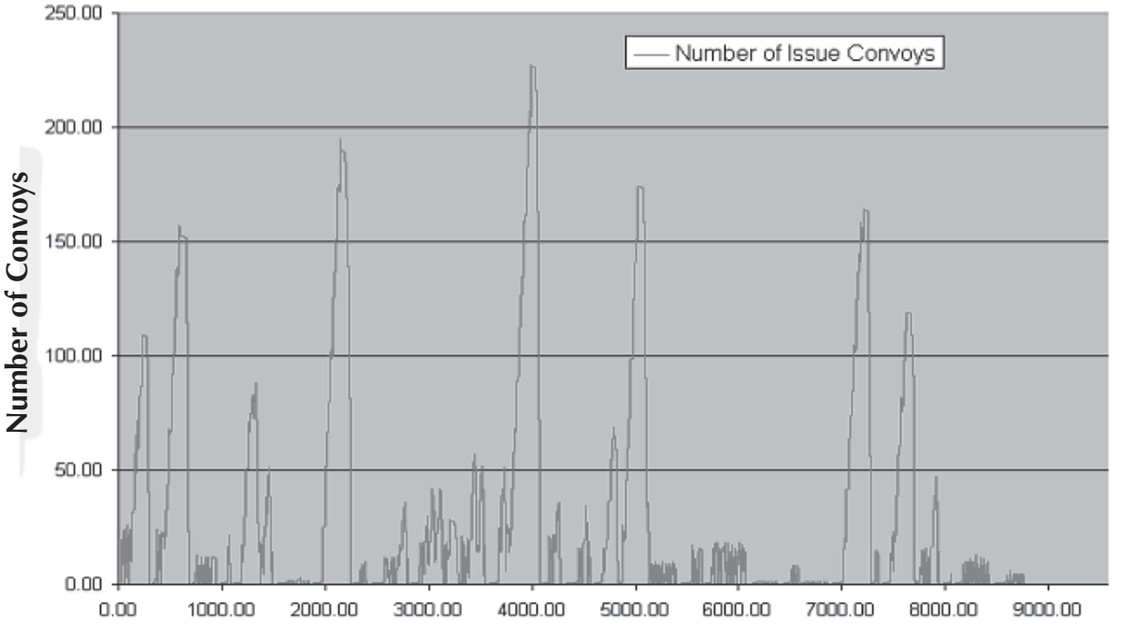
Surge Analysis

A crucial area of interest was monitoring of system capability in handling workloads under surge scenarios, which were identified using a critical set of parameters. The system was said to have moved into a surge state whenever the number of convoys being handled by the CSA rose above a threshold value.

Surge analysis was carried out in scenarios with varying engagement intensities to understand the system's readiness capability for handling extreme loads (surge) and the period of time needed to clear the surge and return to normal conditions. The tonnage handled was tracked separately during the surge period, along with the resources available at the start of each surge period and the average time needed for a convoy to depart from the CSA. Surge states are critically important since signifi-



☐ **Flow time for issue convoys over a 1-year period (in hours) at maximum intensity of 50.**



☐ **Number of issue convoys in the CSA over a 1-year period (in hours) at maximum intensity of 50.**

cant degradation in system performance occurs during those states.

Results

Results were obtained after running the CSA model for durations of 1 to 10 years. Graphs were plotted in Microsoft Excel using the data generated by the model, which provided a visual overview of how specific measures behaved over the simulation run.

The chart on page 27 shows the flow time for issue convoys over a 1-year period at maximum intensity of 50. ("Maximum intensity of 50" is an arbitrary measure of conflict intensity. The higher the number, the greater the volume of munitions that must be shipped or issued.) The chart above shows the number of issue convoys in the CSA over a 1-year period at maximum intensity of 50. ("Issue convoys" are the convoys of tactical combat service support vehicles that are assembled to transport the munitions that are to be issued to the warfighter. The X axis in the chart plots hours. For example, the "1000.00" on the chart means 1,000 hours into the simulation; a full year is 8,760 hours.)

It is clear from both charts that significant surge periods do occur and do affect system capacity in responding to demand; as a result, major delays are experienced in the process of getting munitions out of the CSA.

The number of soldiers and available equipment items were defined by the latest table of organization and equipment for the modular ammunition for medium and heavy lift platoons. The model was tailored to permit the evaluation of expected capabilities provided by materials-handling equipment enhancements now under development against the current baseline level.

As the new Objective Force doctrine is developed, alternate force structures and equipment allocations will be incorporated into the expanding family of models. The CSA model can be cloned easily and scaled to represent any of the proposed in theater storage nodes, such as a forward operating base or a mission staging site. As the throughput capabilities of these nodes are defined, a process of feeding these results into a global theater model must be created. This new integrated capability will be able to measure performance for all classes of supplies, not just ammunition. **ALOG**

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How Is the Theater Support Command Doing?

by Brigadier General George William Wells, Jr., USAR

The theater support command brings together soldiers from the Active and Reserve components. The author offers his views on the progress made in creating and improving these multicomponent organizations and the challenges that remain.

It has been over 3 years since the Army transitioned from the theater army area command (TAACOM) structure to the theater support command (TSC). In a series of articles published in *Army Logistician* in 2000, I offered my view, as a Reserve officer with a TSC, of where the TSC had come from, where it was going, and what we needed to do to make the organization work. [See the May-June, July-August, and September-October 2000 issues of *Army Logistician*.] Those articles looked at the history of the reorganization, the planning for it, and the leadership needed to accomplish the change. In this follow-on article, I would like to report to the field and to my fellow logisticians on just where we are today with the TSC initiative. Many areas of the TSC organization—force structure, personnel, command and control, rating schemes, regulations, funding, education and training, deployments, technology, the role of senior Reserve officers—still are evolving or are under some degree of active redesign in an attempt to make the TSC more capable and ready.

The Army now is faced with a world fragmented into several volatile, unstable environments. The Army's roles and responsibilities are ever changing, as defined by nations, groups, and independent operatives that are challenging the freedoms enjoyed by most people in the world. The business of logistics no longer is confined to a given scenario. Unexpected, short-notice contingencies can emerge from virtually any hotspot around the globe. At the same time, the Army is transforming itself. Today, logistics doctrine is at the forefront of change. As logisticians grapple with change, they are challenged simultaneously to reduce the logistics footprint on the battlefield. The TSC is a crucial part of the Army's response to these developments.

Assimilating more than one component into a single MTOE unit becomes a true challenge when elements of that unit are separated by large distances and even located in separate time zones.

Force Structure

The initial baseline for the TSC structure was derived from a standard formula used in designing Army organizations. The TSC was built deliberately with personnel from more than one Army component. Each position in the TSC was assessed carefully and designated as either an Active component or a Reserve component fill.

Assimilating more than one component into a single modification table of organization and equipment (MTOE) unit becomes a true challenge when elements of that unit are separated by large distances and even located in separate time zones. The challenge grows when the sections in the TSC structural design are integrated with personnel from both the Active and Reserve components. And these challenges are complicated by the Army's rightsizing efforts, since the majority of personnel cuts are targeted at units other than combat divisions.

The generic Army structure was designed to support predictable wartime requirements. The Army plans and organizes using a wartime, not a peacetime, force structure. For the most part, this model works for single-

component organizations (either all Active or all Reserve component). However, it does not work so well when separate component parts are added to an organization. The Army must remember that the TSC consists of both Active and Reserve component personnel. Depending on the designations for filling positions, those positions coded for the Reserve components are filled only 15 days a year on average, or less then 12 percent. A majority of these Reserve logistics positions are vital to daily operations. This creates a dilemma for the integrated TSC in today's ever-changing, volatile world.

As the TSC has been given numerous logistics operational missions, TSC leaders have begun to identify shortfalls in its capabilities. Theater constraints limit the number of Active component personnel available. The TSC commander then is faced with the reality of having less than 50 percent of his Active component staff available daily. This problem is hard to overcome. TSC staffing agreements were negotiated between component leaders after the Gulf War. The environment was sterile and predictable in the early 1990s as the military was downsized. Yet today the TSCs are supporting ever-increasing operational needs with less than a full complement of logisticians.

If TSC Active-component personnel requirements are not supported, adjustments in the TSC's internal component staffing become necessary and low-priority logistics needs can languish. Yet current laws and regulatory guidelines restrict the liberal use of Reserve component forces. These policies reflect the limits of the Reserve commitment to the Active force as defined by Congress. In short, when the TSC commander must acquire more than 50 percent of his personnel through the Reserve components, he is denied full, consistent access to a vital part of his assigned resources. Only under a Presidential callup is the commander able to call forward all of his Reserve component soldier fills.

Given these circumstances, the TSC commander is faced with some daunting challenges. Today's operational environment is incompatible with the TSC structural decisions that were agreed to a few years ago. Based on current mission loads, there is a definite need to look at realigning the TSC internal structure. The MTOE document is designed for authorized fill by component and, in essence, defines the commander's limits. Personnel adjustments and section restructuring cannot be accomplished readily. The exchange of Active and Reserve component personnel must of necessity follow a logical, systematic Army process.

The procedures for requesting an MTOE change must follow an extensive, protracted implementation timetable. However, a logistics commander cannot sit by idly until these formal actions are completed. So, even as they pursue the normal channels for structural change, proactive commanders are beginning to realign their soldiers to meet mission needs.

Personnel

Personnel management is the most challenging activity currently faced by the integrated TSC. With the downsizing of the military structure, the Army has begun to recognize that the resulting balance of personnel resources is strained to meet the demand. As transformation has progressed, strength figures have continued to fall. Major Army commands have reduced the number of supported positions at major subordinate commands. TSCs were not exempt from this process, leaving TSC commanders short of personnel with critical skill sets. Many of these skill sets now are aligned within the Reserve element of the TSC. At the same time, the TSC organization's roles and responsibilities have increased in complexity and frequency of demand.

Even though the Army's recruiting efforts have prospered in the last few years, some military occupational specialty (MOS) slots remain hard to fill. These positions are rare, low-density skills and are not likely to be found readily in any component. Some positions originally placed in the Army's generic structure currently are being reexamined to see if they are absolutely necessary. An organization may not need certain skills that typically are required only in a specific contingency scenario. These skills could be moved into a table of distribution and allowances (TDA) document. It might be prudent to exchange these positions for more critical, high-demand personnel.

The hard-to-fill MOS slots remain a challenge regardless of component. The Active component cannot find qualified personnel, and the Reserve components cannot get them trained. In most cases, Reserve component personnel cannot spend 3 months away from their civilian jobs to train for a Reserve position. Most schoolhouse courses are not designed to meet the special needs of citizen-soldiers. This training challenge is virtually unfixable in the current training environment. The best solution might be to place these positions in the Individual Ready Reserve. Another possibility is to convert these hard-to-fill positions to individual mobilization augmentees. Some have thought it prudent to align many of these individuals in the Individual Ready Reserve so they can be called forward in times of crisis. They thus would serve as a functional augmentation to a specific TSC. In contingency operations, these skilled individuals would become critical to command mission requirements, while local nationals or others could fill the void in peacetime.

The combat service support environment is more than soldiers; it includes Department of the Army (DA) civilians, contractors, military personnel from the other armed

services, and multinational representatives. Today, the TSC commander and his staff are learning to be more flexible in their thinking. They have access to additional personnel who have the capabilities to perform more roles.

The use of DA civilians for daily planning and administrative support in the TSC's Reserve element can provide stability. This daily contact through civilians leverages information and creates a link to senior Reserve leaders and to local Reserve personnel, who then can access the system better from their distant locations. Contractor personnel also can be hired to link the Reserve and Active elements together in a similar fashion. This can be done on a full- or part-time basis, depending on actual need.

The Active Guard/Reserve (AGR) member is another valued asset. The use of the AGR must be expanded. We must position AGR soldiers to work in both Active and Reserve environments. One approach would be to lengthen AGR tours, with the soldier spending time in each component headquarters element. This process would allow maximum use of soldier talent and foster team building. It would force the individual to make a concentrated effort, regardless of his location within the TSC structure, and create an atmosphere in which the soldier would be involved in the total organization rather than a single component. More soldiers then would be influenced, informed, and committed to the total concept of the organization.

There are a number of other personnel issues to consider. One is the need for qualified personnel to fill critical skill positions on the staff. The advisors to the commander need to have insight into the capabilities required to perform a mission. For example, the mortuary affairs officer has vital skills that are not readily acquired and maintained. This position is frequently placed in the Reserve element of the TSC. To fill it, a qualified mortician naturally is required. In the Reserve components, this is a very difficult fill unless the organization happens to be lucky.

Command and Control

The command and control of any organization requires that the organization have all the elements essential for conducting normal activities. Each TSC has determined its own mix of command and control elements. Some have chosen to keep their command and control elements intact rather than integrate them. On deployment of the early-entry module, command and control elements are needed to deploy personnel. They may be required to accompany the early-entry module forward.

Because of structural constraints, the TSC's Reserve element may lack designated command and control assets. For example, the TSC has a headquarters and headquarters company (HHC) and a special troops battalion (STB); if the Active element has the TSC's assigned HHC and STB personnel, that would leave the Reserve element without any assigned command and control personnel. While it is true that there are skilled personnel with the right MOSs to perform command and control functions scattered throughout the Reserve element, these personnel are assigned to the various G sections (G1, G2, and so forth). Removing them to perform command and control functions would create other voids in the TSC structure. The Reserve element lacking command and control may have to rely on outside organizational support to assist its soldiers. Another option would be to build a nondeployable TDA element within the Reserve structure.

Logisticians continue to sort out how to balance their daily missions and operational activities. Leaders find themselves shortchanged in manpower to support daily operations. Many daily missions demand a personnel presence that cannot be filled with the current integrated force. Changes to the laws governing Reserve personnel in support of these needed fixes remain a priority.

Rating Schemes

The complexity of the requirements for evaluating soldiers has created many problems in an integrated TSC. How realistic is it for a soldier to be evaluated by a rating chain thousands of miles removed from his duty location? How fair is it to view the performance of a Reserve component soldier only on a very limited basis—one drill plus annual training? Must there be an integrated (Active and Reserve components) rating scheme? The desire to achieve a participative, integrated evaluation process is admirable, but many times it is unrealistic.

In most cases, the Reserve and Active component soldiers of the TSC are segregated within their own component structures for purposes of evaluation. This is necessary to provide the soldier the fairest evaluation opportunity. Unfortunately, it also creates separate environments for soldier evaluation in what is supposed to be an integrated, multicomponent organization.

Regulatory Guidance

As an institution, the Army has not caught up with the reality of its multicomponent organizations. To its credit, the Army has recognized the challenges posed by this new structural concept. Steering committees are looking at a variety of issues that are being worked hard against biased cultural and bureaucratic thinking.

To support the mission, soldiers may have to take on additional responsibilities. Concerns about property accountability, operational requirements, and daily administrative activities such as reports can affect tenuous relations among TSC components unless such activities are planned and orchestrated carefully by senior leaders.

Funding

Funding remains a critical ingredient in the success of a multicomponent organization like the TSC. However, current funding processes remain unchanged. Funding sources remain segregated by component, and transfer of funds from one component to another is nonexistent. Units must go through a series of headquarters to receive their allotted funds. There is no mechanism for a TSC to pass funds from its Active element to its Reserve element for the use of Reserve soldiers. The commander's hands are tied by an antiquated system. When it comes to supporting a mission, the TSCs are ready to ante up, but many times the funding restrictions thwart such positive initiative. The Special Operations Forces and the intelligence community have managed to overcome funding barriers between the Active and Reserve components. Why shouldn't the logistics field do the same?

The current funding situation restricts the TSC commander's ability to call forward his personnel to the fight. The commander does not have effective control over his assigned personnel. The organization flying an Active component flag cannot determine objectively the support it requires from its Reserve members and cannot proactively call them forward to support a pending or ongoing operation.

Force Education

In general terms, the Army is learning to be one culture while still retaining the identities of its components. What must we do to continue to change the culture? Obviously, we need to push to educate our soldiers on the common culture shared by Active and Reserve soldiers. We need to provide an environment in which soldiers can demonstrate their skills and leadership and management capabilities to one another.

However, regardless of how many times we have interaction between Active and Reserve soldiers, much remains to be learned. Multicomponent integrated structural change has created new hurdles. Many Active soldiers have little experience working with Reserve soldiers. When they are assigned to work with Reserve soldiers, Active soldiers can bring along negative stereotypes. Their perception of the Reserves may be an office environment of many empty desks and turned-off computers; slower Reserve reaction times and limited accessibility can add to the negative connotations among Active soldiers. Consequently, a cloud of mistrust and a reluctance to rely on one another remain until they are brought together on an extended exercise or deployment.

The integrated TSC staff must construct training events that bring together the professional talents of the entire staff, both Active and Reserve. Within the TSC, Active and Reserve soldiers must grasp the issues faced by their fellow soldiers within their specific Active and Reserve environments. This process forces the Active and Reserve components to challenge their members to engage, exchange, and communicate with each other and establish effective working processes.

Training

Conducting effective training in a multicomponent environment is doubly challenging. Time to complete the training is limited, so leaders must determine which training requirements are critical to the mission. In a deployment, they must determine what training can be moved from the schedule to the post-mobilization activities; what critical training should replace the training that is moved; and how staff training can be integrated despite time and distance separations. The training time needed to forge staff integration is critical when one considers the time and distance that separate headquarters elements of most integrated organizations.

Congressional guidelines place limits on Reserve soldiers engaged in overseas deployment training (ODT). (These guidelines protect the rights and roles of Reserve component soldiers while they are serving on active duty in a training role, preventing them from having to do anything other than what their orders say. This protection normally prevents a Reserve soldier who is on ODT from being placed in an area deemed to be hostile. For example a soldier on annual training in Germany could not be shipped to Afghanistan because it is a hostile-fire zone.)

Because of these limits on their participation, Reserve soldiers miss out on valuable learning experiences and their valued contributions to the unit mission are limited. That, in turn, places pressure on the command structure to recognize and manage around the limitations. ODT limitations on Reserve soldiers also could create a negative impression on Active component soldiers. However, before the Army solicits congressional changes to expand ODT participation by Reserve soldiers, it must ensure that full benefits are available to the Reserve soldiers in the event of accidents.

Deployment

One of the biggest challenges for the multicomponent commander has been the ability to activate and deploy his unit. The TSC components must be able to deploy as a unit. Under either flag (Active or Reserve), the TSC commander must be able to call forward his soldiers when he needs them. The requirement to report to a forward mobilization site when deployed should be exercised at the commander's discretion. The capabilities are in place at the forward locations to complete mobilization tasks. The rear elements are aware of the potential for mobili-

zation and have prepared their soldiers accordingly. The Army must provide commanders with clear authorization to call forward Reserve personnel on an as-needed basis.

Technology

The Army's latest technology often is not accessible to members of its Reserve elements. The differences in what is available to the TSC's Active and Reserve elements are critical. Historically, Reserve members are not connected in a secure mode to their Active counterparts on a daily basis. As a result, conducting seamless operations is a true challenge for the Reserve element. Individual Reserve connections to the Active side must be supplemented by laptop connectivity in order for Reserve soldiers to remain in a prime readiness state. Fortunately, the Active component in the TSC understands this technological gap and has supported the Reserve elements vigorously in most cases. Without appropriate component funds, Reserve personnel will not be able to stay in touch with their Active counterparts.

Senior Reserve Leaders

Defining the role of the TSC's senior Reserve leaders when the TSC falls under an Active component flag is challenging. The Reserve chain of command must be responsive to the needs of the Army through two component voices. On the surface, this appears to be rather simple. Senior Reserve leaders are able to link effectively and resolve issues before they become a problem. However, within the elements of the TSC structure, the process and methods can become very convoluted. It therefore is essential that the Reserve element not only have a memorandum of agreement with senior headquarters but also have detailed base operations and command and control mechanisms in place at the soldier level. Policy makers at these senior headquarters are aware and supportive of this multicomponent initiative.

It might be a good idea to align the TSC Reserve element under the Active component for operational purposes. This would not remove the Reserve spaces from the Army Reserve. Rather, it would allow for a unique administrative environment in which the assorted issues of the multicomponent organization could be handled under one flag and one component. This would add further value, worth, and understanding to the concept of One Army.

Direction and Focus

The TSC's direction and focus must remain clear. Leadership is key in this ongoing transition. The transition itself may never reach a conclusion; the Army's history over the past 10 years or so indicates that may be the case. Those blazing the trail with multicomponent organizations have the responsibility to identify issues and concerns.

Where are we headed? Leaders are beginning to recognize the constraints and limitations of the current TSC configuration. The challenge remains to define both internal and external operations. In sorting through these issues, how does the Army posture itself to meet the logistics needs of the warfighter? How can the TSC be integrated fully as one organization that still retains component identities?

Some have suggested that the Reserve element should be relocated closer to the Active component headquarters. This step certainly would yield closer and easier communication among Active and Reserve personnel, but time and distance still would remain a barrier to a seamless operational structure.

TSC leaders must define the roads to TSC integration further. One method is a corporate roadmap that a commander can employ to focus the organization on where it should be 18 months out. This roadmapping is especially critical to the complex linkage with the TSC's Reserve element and its citizen-soldiers. Forward thinking must follow an orderly scheme that engages all levels and components within the TSC organizational framework.

As transformation moves forward, the Army may not visualize a TSC as we know it today. Whatever the formation, logisticians will continue to provide the necessary support. But without regulatory guidance and appropriate policy exceptions, the TSC will remain limited in its flexibility and maneuverability.

The TSC organization indeed has been a unique experience to the soldiers and civilians serving within it. The integrated structure has raised many interesting questions that have called for out-of-the-box thinking to achieve administrative and operational solutions. Those of us involved in TSCs have learned much and experienced many challenges over the last few years. The TSCs will continue to blaze the integrated multicomponent trail for the Army. We will remain focused on addressing a number of issues. We will tweak the organization to make it work. The future success of the Army's TSC organization depends on leaders who can forge change and make adjustments when and where necessary. **ALOG**

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Logistics Lessons Learned by Lieutenant Grant in Mexico

by Lieutenant Colonel Kevin J. Dougherty

Ulysses S. Grant's daring Vicksburg campaign in the Civil War was inspired by what he observed as a junior officer in the Mexican War.

Like many of his fellow generals in the Civil War, Ulysses S. Grant gained valuable battlefield experience and learned lessons that would benefit him in the future while serving as a junior officer in the Mexican War of 1846 to 1848. As William McFeely writes, in *Grant: A Biography*, "Virtually unnoticed himself in the Mexican War, Grant watched his fellow warriors carefully." During the war, Grant served as the quartermaster and commissary of the Fourth Infantry Regiment. Thus, many of his observations were of logistics. One such operation Grant was able to consider at first hand was General Winfield Scott's campaign to capture Mexico City, which centered around Scott's decision to operate independently of a base of supplies. It was a maneuver that Grant himself would use during the Vicksburg campaign in the Civil War.

Scott in Mexico

After landing his army on Mexico's Atlantic coast at Vera Cruz, marching inland toward Mexico City, and winning a series of victories such as Cerro Gordo, Scott arrived in Puebla on 28 May 1847. As John S. D. Eisenhower observed, in *So Far from God: The U.S. War with Mexico, 1846-1848*, at this juncture Scott's "greatest practical problem was the maintenance of his communications with the coast." Scott's supply line back to Vera Cruz was becoming increasingly costly to maintain. The problem was protecting his rear from Mexican guerrillas. In order to do this, Scott had been forced to leave garrisons behind at Vera Cruz, Jalapa, and Perote. This requirement, as well as other factors, had reduced Scott's active army at Puebla by 5,820 men. To regain strength, Scott ordered that all stations between Vera Cruz and Puebla be abandoned. He was effectively cutting his army off from the coast. He would have no supply line, so he would have to live off the land.

Scott's move was bold and audacious. It also was not without its critics. Upon learning of Scott's decision, the Duke of Wellington—the great victor over Napoleon at Waterloo in 1815, who had been following the campaign closely—declared, "Scott is lost! He has been carried away by success! He can't take the city [Mexico City], and he can't fall back on his base."

Scott, however, would prove the skeptics wrong. He developed an effective system of local supply that included a prohibition against forced requisitions and an insistence on purchasing supplies from the locals. By ridding himself of the requirement to secure his lines of communication with garrisons in his rear, Scott was able to increase his force to some 14,000 men. This greater strength and his freedom from a fixed line of supply allowed Scott to fight the war of maneuver that he desired.

Scott's lead elements departed Puebla on 7 August. By 18 August, it appeared that the Duke of Wellington might be right after all. Scott's situation had become serious, if not desperate. Colonel Ethan Hitchcock wrote, "We have no forage for our horses; our hard bread is getting musty; we have four days' rations for the army and some beef on hoof." Edmund Kirby Smith had similar concerns: "Mexico must fall or we must all find a grave between this and the city." Scott's bold move of cutting loose from his line of supply would require a quick victory to eliminate the increasing danger to his army.

☐ Major General Winfield Scott, in a daguerreotype from about 1849.

Scott got his victory at Contreras on 19 August and Churubusco on 20 August. With these two successes, Scott had crossed the entire Valley of Mexico. Russell F. Weigley concludes, in *The American Way of War*, "Scott was a bold strategist. His march from Vera Cruz into the interior was one of the most daring movements of American military history." Even the Duke of Wellington reversed himself, declaring Scott to be "the greatest living soldier" and urging young English officers to study the campaign as one "unsurpassed in military annals."

Grant at Vicksburg

As a young lieutenant, Ulysses Grant was a participant in Scott's great Mexican campaign. Serving as a quartermaster and commissary attached to Brigadier General William Worth's division, Grant describes in his *Memoirs* at least one instance in which he marched with a large wagon train to procure forage. The Mexican War taught Grant that an army could cut loose from its line of supply and survive.

It was a lesson that Grant, as a major general in the Union Army, remembered in his Vicksburg campaign. Grant's line of supply for his advance into Mississippi was the Mississippi Central Railroad, originating in Grand Junction, Tennessee. Maintaining the railroad cost the Union Army troops, who were needed both to guard and repair it. It was the same problem Scott had faced in Mexico.

On 12 December 1862, Lieutenant General John Pemberton, the Confederate commander opposing Grant, ordered Major General Earl Van Dorn to take command of all the cavalry in the vicinity of Grenada, Mississippi, launch a sweep around Grant's left flank, destroy the Union depot at Holly Springs, Mississippi, and wreck as much of the Mississippi Central and the parallel Memphis and Charleston Railroad as he could. On 18 December, Van Dorn and 3,500 cavalrymen left Grenada, and on 20 December they surprised the weaker Union force at Holly Springs and destroyed an estimated $500,000 worth of supplies there. Van Dorn then proceeded north, destroying as much of the railroad as he could before returning to Grenada on 28 December.

Simultaneously, a twin raid was conducted by Lieutenant General Nathan Bedford Forrest against the important rail junction at Jackson, Tennessee, on 20 December. The two raids left Grant in serious danger. As Timothy Donovan writes in *The American Civil War*—

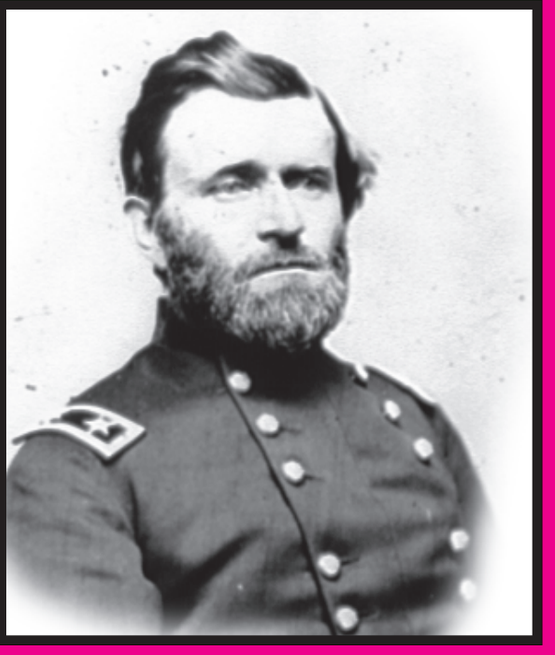
> To attempt to measure the amount of influence of the two cavalry raids on the subsequent decision by Grant to abandon his overland approach can only lead to a subjective estimate at best . . . [Nonetheless], the raids of Van Dorn and Forrest displayed cavalry in a classic example of the excellent use of a small, highly mobile unit in an economy of force role.

Indeed, Pemberton's superior, General Joseph E. Johnston, came to place his main reliance in defeating Grant on cavalry raids against the vulnerable rail communications in western Tennessee. The Confederate raiders presented Grant with the same threat to a vulnerable line of supply that Mexican guerrillas had presented to Scott.

On 3 May 1863, Grant learned that Major General Nathaniel P. Banks would be delayed in joining him. In his *Memoirs*, Grant writes, "Up to this time my intention had been to secure Grand Gulf, as a base of supplies, detach [Major General John] McClernand's corps to Banks and cooperate with him in the reduction of Port Hudson." With the delay of Banks, Grant instead "determined to move independently of Banks, cut loose from my base, destroy the rebel force in rear of Vicksburg or invest or capture the city."

Points in Common

Grant's decision at Vicksburg shared several things in common with Scott's decision in Mexico. First of all, it was daring and subject to criticism. Recognizing this, Grant purposely delayed notifying the Union Army



☐ Major General Ulysses S. Grant.

General in Chief, Major General Henry W. Halleck, until it was too late to stop it because he "knew well that Halleck's caution would lead him to disprove of this course." Even Grant's friend, Brigadier General William T. Sherman, wrote Grant to advise him "of the impossibility of supplying our army over a single road."

Grant's and Scott's operations both involved use of forage. To Sherman's protestations, Grant replied—

> I do not calculate upon the possibility of supplying the army with full rations from Grand Gulf. I know it will be impossible without constructing additional roads. What I do expect is to get up what rations of hard bread, coffee, and salt we can, and make the country furnish the balance.

In his *Memoirs*, Grant wrote, "We started from Bruinsburg [Mississippi] with an average of about two days' rations, and received no more from our supplies for some days; abundance was found in the meantime."

Time was also a critical factor in both campaigns. Even with the abundant forage Grant expected to find, he knew he could not afford any long halts that would exhaust available local supplies. He would have to keep his army moving. To this end, he wrote Sherman, "I believe we could be in Vicksburg in seven days."

Grant's decision to cut his line of supply, like Scott's, also facilitated maneuver. Grant was able to position his army between Pemberton at Vicksburg and Johnston in Jackson. Through the use of interior lines, Grant gained the opportunity of "threatening both or striking at either." So he struck at both, capturing Jackson on 14 May and then defeating Pemberton at Champion's Hill (between Jackson and Vicksburg) on 16 May. Pemberton then withdrew into Vicksburg, and on 18 May Grant's siege of the city began.

The final point Scott's and Grant's campaigns had in common is that both were successful. Russell Weigley writes that Grant considered his decision to cut loose from his line of supply to be the most important innovation in the Vicksburg Campaign. While Pemberton was preoccupied with trying to cut Grant's nonexistent line of communications, Vicksburg fell to Grant's siege. While crediting Grant with a successful campaign, Weigley wryly adds—

> Nevertheless, breaking away from the line of communication was not so much an innovation as Grant's accounts make it seem. Scott had essayed a similar gamble in Mexico. Indeed, Grant had been there to observe it and no doubt learned and remembered the lesson.

Grant usually is thought of as the Federal commander who eventually defeated the great Robert E. Lee in Virginia. His service as a quartermaster in Mexico is at best a footnote to his career, but it was through that experience that Grant learned a valuable logistics lesson. Scott had shown him that, under certain conditions, an army could cut loose from its line of supply, survive, and win. Putting his quartermaster experience to good effect, Grant replicated that strategy outside of Vicksburg in 1862 and 1863. **ALOG**

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Logistics and Lee's Antietam Campaign

by Major William T. Gillespie, Jr.

Confederate President Jefferson Davis and General Robert E. Lee originally pursued a defensive strategy in the war against the Union. However, after the success of Lee's Richmond campaign in June and July 1862, which repelled a serious Union invasion, and with controversy mounting in the North over the course of the war, they felt the time had come to strike an offensive blow into Northern territory. Following the decisive Confederate victory at the battle of Second Manassas in Virginia at the end of August 1862, Davis and Lee found the perfect opportunity to make their plan a reality.

While Lee had several objectives in striking the North, the Maryland campaign of September 1862 was primarily a rear battle operation, targeting Union logistics and the political and emotional will of the Northern people to continue the war. The historical lessons of the strategic and operational role played by logistics in Confederate planning and execution of the Maryland campaign of 4 to 20 September 1862 are still applicable today, especially with the increased terrain responsibility found in current Army rear-area operations doctrine.

Confederate Strategic Objectives

From 4 to 7 September, a ragged group of nearly 55,000 men in gray from the Confederate Army of Northern Virginia crossed the Potomac River at White's Ford near Leesburg, Virginia, just northwest of Washington, D.C. This was the Confederacy's first major attack on Union soil. Though thousands of Lee's men were shoeless, lacked ammunition and supplies, and were fatigued from marching and the recent fighting at Second Manassas, they felt invincible.

While Maryland, a border state, remained in the Union, it was deeply divided; its people had strong ties to both sides. Davis and Lee hoped that, by moving Confederate forces into Maryland, both the undecided and suppressed Confederate supporters would rally to the Southern cause.

Davis and General Braxton Bragg had the same plan for the liberation of Kentucky in the western theater. The two simultaneous offensives into Maryland and Kentucky also might influence the upcoming congressional elections in the North and help Democrats—many of whom favored peace—to outpoll the Republicans and demand an end to the war on terms favorable to the South. Aside from its possible effect on the elections, a Confederate victory on Northern soil might cause the war-weary people of the North to question the leadership of President Abraham Lincoln and force him to sue for peace.

Davis and Lee hoped that a victory in the North finally would gain the Confederacy diplomatic recognition as an independent nation from European countries and possibly bring Britain and France to aid the South both logistically and financially. British and French recognition of the Confederacy also might induce them to intervene and mediate the conflict.

Lee's Campaign Objectives

Lee thought he had 3 to 4 weeks after the battle of Second Manassas before General George McClellan's newly reorganized Army of the Potomac could resume offensive operations to pursue him. He also thought that McClellan would be slow and cautious in his pursuit. Lee figured that he probably would face the Army of the Potomac near Harrisburg, Pennsylvania; if giving battle there did not look favorable for the Confederates, Lee

☐ The Union's industrial base greatly exceeded the Confederacy's. Disrupting Union logistics and protecting and augmenting the South's resources were objectives of Lee's campaign. The photo above shows one of the South's major industrial sites, the Richmond, Virginia, Arsenal, after the end of the war.

easily could withdraw his army to Virginia, using the north-south barrier of South Mountain, Maryland, to protect his movement.

Operationally, the Maryland campaign was, to a large degree, about logistics: protecting the South's and attacking the North's. In particular, the South needed to protect its breadbasket in the Shenandoah Valley of western Virginia. Supplies drawn from the Shenandoah Valley were so critical to Southern success that Davis believed that the loss of the Virginia Central Railroad and communication with the Shenandoah Valley would be more harmful to the Confederacy than withdrawal from the Virginia Peninsula (between the James and York Rivers, which leads to Richmond from the east) and evacuation of Norfolk.

The challenge of feeding a large army, as well as the city of Richmond, was aggravated by the weaknesses of the Confederate commissary organization and by the tightening of the Union naval blockade of the Southern coasts. These problems meant that protection of the Virginia Central Railroad and the country north of Richmond, where Lee hoped to secure foodstuffs, became a very high priority.

September and October were the key harvest months. Without Union armies to bother them, Virginia farmers could harvest their crops and feed Lee's army and Richmond during the coming winter. Supply needs made the protection of northern and western Virginia Lee's paramount goal. By moving his army into the rich countryside of western Maryland, Lee also would provide new food supplies for his hungry soldiers. The lands in the mountain valleys and near the Potomac River were fertile and perfect for supporting a large, foraging army.

Lee's main objective in invading the North was Harrisburg, the capital city of Pennsylvania, and its key lines of communication (LOCs) and logistics stores: telegraph lines, critical railroad lines and bridges, and supply depots. Harrisburg was one of the largest Union supply depots and, like other Union depots and LOCs in the Union rear area, was weakly defended. Successfully raiding Harrisburg would give the South the psychological victory it needed to attain its strategic purpose.

Governor Andrew Curtin of Pennsylvania was frightened when Lee's forces crossed the Potomac River into Maryland. Having little confidence in President Lincoln and General McClellan, he started to withdraw state materiel and supplies from southern Pennsylvania. While they moved to Harrisburg, Lee's forces also rendered other critical LOCs useless and emptied Union supply depots captured along the way.

Frederick, Maryland's second largest city, held a strong position in state politics. Frederick's merchants had food supplies, clothes, and shoes that Lee's troops needed. However, because his mission was in part political—to encourage support for the Confederacy in Maryland and recruit sympathetic Marylanders to join his army—Lee bought all necessary supplies and ordered his troops to respect private property and avoid pillaging.

The Baltimore and Ohio Railroad and the Chesapeake and Ohio Canal were critical Union LOCs for bringing agricultural products from Ohio and other Midwestern states to the East. Harper's Ferry, Virginia (now West Virginia), by which both the railroad and the canal passed, also was a large Union ordnance storage area and weapons foundry. Harper's Ferry therefore was a critical Confederate objective because its capture would allow Southern troops on the move to gain easy resupply from the Union stores there.

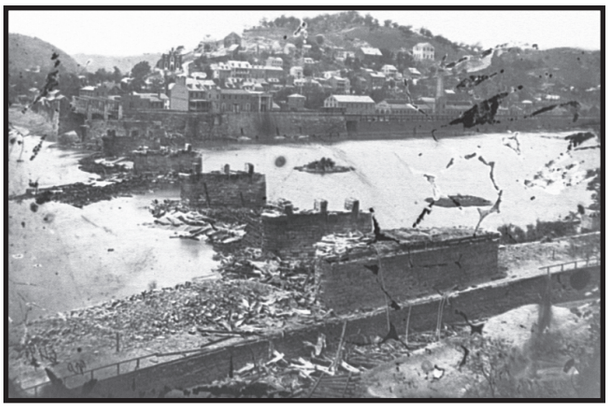
Lee thought that the capture of Harper's Ferry would be a quick and easy victory, requiring little more than a show of force to obtain the surrender of its Union garrison. Lee also planned for his army to remain in Maryland through the fall of 1862, so he needed to keep his own rudimentary LOCs open to bring forward additional supplies from the South. For this LOC, he intended to use a wagon route from Winchester, Virginia, that passed through the gap at Harper's Ferry, so he needed to hold Harper's Ferry. Lee also intended to destroy the Cumberland Valley railroad in Maryland and empty its Union depot.

Lee's Plans Thwarted

Unfortunately for the South, Lee's plan fell apart from the beginning. Four unforeseen events led to its demise. First, General McClellan reorganized the Army of the Potomac in days, rather than weeks as Lee expected, and arrived in Frederick on 12 September.

Second, Lee did not receive the reception in Maryland that he had anticipated. On 6 September, Lieutenant General Thomas J. "Stonewall" Jackson's advance guard of 5,000 ragged men marched down Market Street in Frederick and camped on the north side of town. The remainder of Lee's 40,000-man army soon followed. On his arrival in town, Lee drew up a "Proclamation to the People of Maryland" that invited them to side with the Confederates. It soon became obvious that the citizens of Frederick and most of western Maryland, though polite, had little sympathy for the Southern cause. Seeing ragged, underfed, and poorly supplied soldiers did not give Marylanders hope that the South could win the war. Lee had miscalculated western Maryland's support; Southern sympathizers were primarily in Baltimore, southern Maryland, near the capital city of Annapolis, and in eastern Maryland.

The third event that disrupted Lee's plans was the resistance of the Union garrison at Harper's Ferry. Rather than fleeing, those soldiers were ordered to stand and fight until reinforcements could arrive. What Lee thought would be an easy victory turned into a 3-day siege (12 to 15 September), which delayed his schedule and tied down



☐ Capture of the Union arsenal and armory at Harper's Ferry was a significant component of Lee's strike into the North. In this photo, note the destroyed railroad bridge crossing the Potomac River into Harper's Ferry.

more troops than he expected.

Finally, an official copy of Lee's campaign order, Special Order 191—wrapped around three cigars—was found by Union soldiers at an abandoned Confederate campsite on 13 September. With this Confederate order in hand, McClellan knew Lee's plans and the division of his forces.

Both the Union and Confederate Armies were able to consolidate their forces near Sharpsburg, Maryland, by the night of 16 September. Thus the stage was set for the 17 September battle that would become the bloodiest day of the Civil War—the Battle of Antietam. Union casualties were 12,400, and Confederate losses were 10,300—a total of 22,700 casualties in 1 day. The large casualties forced the Army of Northern Virginia to withdraw to Virginia; the Army of the Potomac rested in place. Most historians agree that McClellan missed an almost perfect opportunity to destroy Lee's force, but he refused to pursue and seek decisive engagement.

The aftermath of the battle was tremendous. Both Union and Confederate soldiers lay intermingled in makeshift hospitals. Many would die of thirst, hunger, and their wounds before receiving treatment. Nurse Clara Barton was on hand to witness events and treat the wounded. Because of her Antietam experience, Barton would go on to improve combat medical organization and eventually found the American Red Cross.

Consequences of Confederate Failure

While the fighting on 17 September was a tactical draw, the outcome was significant. For the Southern soldiers, their invasion of the North was at least a psychological victory. They also had seized Harper's Ferry and gathered important supplies. Union forces would not pursue the Confederates quickly and would not cross into Virginia again until November, giving farmers critical time to harvest Virginia's badly needed crops.

However, the Confederates lost 13,000 men during the campaign, including 9 generals. The South could not sustain such large casualties. It would become harder for the South to replace large numbers of soldiers, especially experienced combat leaders. More importantly, the Maryland campaign did not achieve the strategic objectives of liberating Maryland, winning a major victory on Northern soil to force the North to sue for peace, and gaining European diplomatic recognition.

But the Union success in turning back the Confederate invasion gave Lincoln the political opening he needed to issue the Emancipation Proclamation. Britain and France had both made slavery illegal years earlier, and the Emancipation Proclamation discouraged them from recognizing the Confederacy. That not only further eroded the importation of necessary supplies into the South but also directly undermined the South's labor force. Over 180,000 slaves were dedicated to Southern war production, but with the North offering freedom to the slaves of rebellious slaveowners, those slaves had a strong incentive to run away or sabotage Confederate war efforts.

The Confederate Maryland campaign of 1862 offers an excellent case study of the importance of strategic and operational logistics and rear battle operations. Without the resources and means to get them there, the Southern soldiers suffered from poor operational and tactical logistics support. As the war progressed, the South's strategic logistics were becoming nonexistent because of the impact of prolonged war and more effective Union coastal blockades.

While errors were made on both sides during the campaign, a great lesson learned was the importance of maintaining and protecting LOCs and logistics resupply areas. This lesson is still applicable today, especially with the increased terrain and security responsibilities created by rear-area operations doctrine. It was very difficult for both armies to have a large standing army ready for battle, along with the requirements to protect overextended LOCs and sustain combat service support functions. The Union could quickly recover from Lee's Northern raid, but the Confederate Army, ever more reliant on the supplies of its foe, was headed for inevitable defeat. Amazingly, to the South's credit, the war would drag on almost 3 more years. **ALOG**

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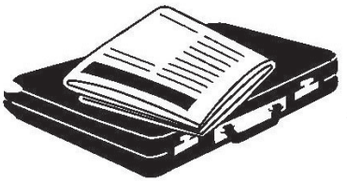

ALOG NEWS

ARMY TRANSFORMATION EFFORTS YIELD THREE NEW ORGANIZATIONS

Three new Army organizations were established on 1 October: the Installation Management Agency, the Army Network Enterprise Technology Command/9th Army Signal Command, and the Army Contracting Agency.

The Army Installation Management Agency (IMA), a field operating agency under the operational control of the Assistant Chief of Staff for Installation Management, centralizes support of all Army installations under one headquarters. The IMA is part of the Army's initiative to mold installation support functions into a corporate structure, enabling equitable, efficient, and effective management of Army installations worldwide. The IMA will support readiness; promote well-being of soldiers, civilians, and family members; and preserve installation infrastructure and environment. An IMA Board of Directors, composed of leaders from major Army commands and Department of the Army (DA) headquarters, will oversee IMA operations and recommend programs, major construction projects, resource and finance strategies, and installation standards, goals, and objectives.

The IMA is headquartered in Arlington, Virginia, with regional offices at Fort McPherson, Georgia; Fort Monroe, Virginia; Fort Sam Houston, Texas; Fort Shafter, Hawaii; Rock Island Arsenal, Illinois; Heidelberg, Germany; and Seoul, Korea.

The Army Network Enterprise Technology Command/9th Army Signal Command (NETCOM) has the mission to operate, manage, and defend the Army's information enterprise and its portion of the Global Information Grid, which is vital to the support of warfighters serving around the globe. NETCOM, headquartered at Fort Huachuca, Arizona, is a direct reporting unit to Headquarters, Department of the Army, under the oversight of the Chief Information Officer (CIO)/G6. The former Army Signal Command is the core organization for NETCOM. Operational elements on the staff of the former Director of Information Systems for Command, Control, Communications, and Computers (DISC4) are also part of the new NETCOM organization. In addition, NETCOM assumes technical oversight of installation-level directorates of information management.

The Army Contracting Agency (ACA) reports to the Assistant Secretary of the Army for Acquisition, Logistics, and Technology and centralizes much of the Army's installation contracting activities under a single headquarters. An ACA Information Technology and Electronic Commerce Commercial Contracting Center will handle the procurement of all information technology acquisitions for customers such as NETCOM.

ARMY APPROVES BUSINESS REFORMS

Of the proposed reforms submitted to the Army Business Initiatives Council this year, the Secretary of the Army has approved 23 initiatives for Army-wide implementation. Both the Army and the parallel Department of Defense (DOD) Business Initiatives Councils were created to identify and implement changes in business practices, with resulting savings reallocated to higher priority programs. The Business Initiatives Council process is a central component of Secretary of Defense Donald H. Rumsfeld's "Battle on Bureaucracy" campaign, which was announced on 10 September 2001.

Among the 23 Army initiatives are the following—

- Use Active component appropriations to reimburse RC funds for the cost of RC personnel who are on active duty in support of systems acquisition and logistics functions. This will help ensure that soldier expertise is available early in the system development process.
- Seek congressional support to allow the Army to reimburse Reserve component (RC) funds with procurement funds under the control of program managers when RC units receive new equipment training (NET). Under current practice, RC appropriations pay for NET, and those funds often run out when NET schedules are accelerated or delayed.
- Analyze whether and how the Army can privatize lodging.
- Use email signatures for awards, travel requests, and other purposes.
- Conduct a pilot project to test the concept of funding temporary duty costs for training by the installation conducting the training rather than the installation sending the soldier. The pilot project is being conducted at Fort Lee, Virginia.

- Create a Web-based, automated timecard process and software for civilian employees for Army-wide use.
- Eliminate the use of preprinted letterheads on correspondence and switch to computer-generated letters and memoranda that incorporate letterheads.
- Create a single, Web-based site to coordinate, process, and track staff actions at Department of the Army headquarters.
- Develop a centralized, authoritative source for staffing and coordinating Army regulations for publication.
- Establish Resource Management Online, a Web-based system designed to support major command- and installation-level resource management requirements.
- Use Procurement Desktop-Defense (PD2) to distribute contract documents securely by email.
- Improve the recovery of unused airline tickets, thereby avoiding funding losses to the Government.

Two Army initiatives were submitted to the DOD Business Initiatives Council and have been approved by that body for DOD-wide implementation—

- Use fixed-price contracts for environmental restoration projects. Under these contracts, the contractors doing the environmental cleanups purchase insurance to protect against major cost overruns.
- Test the Army contractor reporting system, recently reestablished by the Secretary of the Army, for possible use throughout DOD. The system is designed to obtain contractor workyear information and identify supported organizations and thus provide visibility over contractor resources.

Since its creation in June 2001, the DOD Business Initiatives Council has approved 48 initiatives for implementation. It is estimated that these initiatives will save from $200 million to $400 million a year.

NEW CAPSTONE TRAINING MANUAL PUBLISHED

The Chief of Staff of the Army approved the release of Field Manual (FM) 7–0, Training the Force, on 21 October 2002. The new manual supersedes FM 25–100, of the same title, dated 15 November 1988, while retaining its basic, fundamentally sound tenants and updating them to reflect the Army Transformation, the contemporary operating environment, and technology.

The new manual integrates lessons learned from recent military operations and is applicable to all segments of the Army. It combines training and leader development into one program, links training to joint, multinational, and interagency operations, and synchronizes Army training doctrine with the full spectrum of Army operations.

The changes reflected in FM 7–0 resulted from findings of the Chief of Staff's Training and Leader Development Conferences that indicated that leader development is most effective if it is integrated into all of a unit's training activities. The conferences also pointed out the need for Army training doctrine to be updated to better address the full spectrum of operations.

FM 7–0 will be followed soon by the publication of FM 7–1, Battle Focused Training, which updates FM 25–101 of the same title. FM 7–0 is the capstone, overarching Army training doctrine, while FM 7–1 deals with the specifics of how to train.

SINGLE STOCK FUND EXTENDED DOWN TO DIVISION LEVEL

Extension of the Army Single Stock Fund (SSF) to the division, nondivision, and regiment levels has begun following approval of SSF Milestone 3 implementation by the Army's four-star leaders in October. The XVIII Airborne Corps at Fort Bragg, North Carolina, and the Army Training and Doctrine Command subsequently converted to Milestone 3 SSF operations in November. The leaders also approved an accelerated Milestone 3 implementation schedule for U.S. Army Europe, the 321st Materiel Management Center (U.S. Army Reserve) at Baton Rouge, Louisiana, and selected Army National Guard and Army Reserve units.

In speaking to the Association of the United States Army convention shortly after the Milestone 3 approval, the Army Chief of Staff, General Eric K. Shinseki, observed that the Army is "already revolutionizing our logistics processes with the Single Stock Fund. We will centralize Army supply management, streamline the supply chain, and eliminate duplication in tracking and accounting . . . [SSF implementation is a] significant step in Transformation and one of the most substantial logistics changes since World War II."

The SSF is a Headquarters, Department of the Army (DA), business process reengineering initiative to improve the logistics and financial processes in the Army Working Capital Fund-Supply Management Army (AWCF–SMA) business area. SSF is merging wholesale and retail elements of the AWCF–SMA below the DA level into a single, nationally managed fund. Implementation of SSF Milestones 1 and 2 was approved in October 2000 and completed in April 2001. Milestone 1 incorporated theater and corps and installation-level Army Working Capital Fund assets under SSF processes. Milestone 2 incorporated operations and maintenance stocks above the division authorized stockage list (ASL) level into the SSF. Under Milestone 3, all operations and maintenance stocks

above the prescribed load list (PLL) and shop stock levels will be included in the SSF.

LOG INTERN PROGRAM STARTS AT ALMC

An internship program that will prepare supply and materiel maintenance interns to move successfully into Army logistics management positions is scheduled to begin in January 2003. Known as the Department of the Army (DA) Logistics Intern Training Program, it is the result of a partnership between the Logistics Management Proponency Office (LOGPRO) under the DA Deputy Chief of Staff, G4, and the Army Logistics Management College (ALMC) at Fort Lee, Virginia.

The intern training program will consist of 24 weeks of classes at ALMC. The classes will focus on the interrelationships among logistics functions, structures, and systems; emerging concepts; and logistics initiatives in an everchanging Army. Instructional modules from 14 separate ALMC courses and from the Center for Army Leadership at Fort Leavenworth, Kansas, will make up the majority of the program. In addition to logistics instruction, interns will improve their communication skills through writing assignments, presentations, and leader development exercises. Two offerings of the program are planned for each year.

Students who complete the program will receive credit for completing the 14 ALMC courses. The Florida Institute of Technology Graduate Center at Fort Lee also will grant 12 graduate-level semester credits toward a master's degree in management, logistics management, or acquisition management under a cooperative degree program with ALMC.

For more information on the DA Logistics Intern Training Program, call (804) 765–4304 or DSN 539–4304 or email pawlowsa@lee.army.mil. Application information can be found at the LOGPRO Web site at www.logpro.army.mil/logpro/index.jsp.

ARMY USES NEW ROUGH-TERRAIN CONTAINER HANDLERS IN AFGHANISTAN

The 403d Transportation Company, 1st Corps Support Command, at Fort Bragg, North Carolina, operated the Army's new state-of-the-art rough-terrain container handler (RTCH)-240 in combat when it deployed to Afghanistan. Of the 17 RTCH–240s now in the Army inventory, 16 belong to the 403d. The RTCH–240 replaces the DV–43 rough-terrain container handler. Innovations on the RTCH–240 include a telescopic boom that can rotate 180 degrees, a safety locking device, a computerized internal diagnostic system, a lift capacity of 53,000 pounds, and the ability to stack containers three high. The diagnostic system allows operators to move equipment without worrying about tipping or overextending the boom because it will turn off the engine and freeze operations when it senses unsafe acts.

☐ **The RTCH–240 can rotate a container 180 degrees with its boom and can stack containers three high.**

MTMC TIGHTENS REQUIREMENTS FOR SUSTAINMENT CONTAINERS

The Military Traffic Management Command (MTMC) has begun implementing strengthened documentation requirements for all Department of Defense containerized sustainment cargoes.

Under the new requirements, all shippers will be required to provide detailed transportation control movement documents, or shipping instructions, and supporting documents to the MTMC Operations Center at Fort Eustis, Virginia. After the documents are reviewed, per-

sonnel at the center will coordinate directly with ocean carriers for container pickup. The center has been staffed to provide same-day service, so that shippers can expect to receive review of their documentation and contact with an ocean carrier on the day they submit their documents.

Undocumented cargoes have been a problem for many years, delaying container processing, increasing security risks, complicating field distribution and warehouse management, and slowing delivery of supplies to customers.

According to Navy Captain Ed Horres, MTMC's Director of Global Distribution, the purpose of the new requirements "is to generate timely, accurate, and complete information concerning sustainment cargo. We need to provide the warfighters with line-item content visibility for all shipments to ensure that they get what they need when they need it. Force protection is another major consideration. . . . our goal is to improve on-time delivery performance through better documentation."

The new program began 4 November with shipments to the U.S. Central Command. It will be expanded in the near future to include all global shipments.

ARMY UNIT WINS DEFENSE MAINTENANCE AWARDS

An Army unit was among the winners of the 2002 Defense Maintenance Awards. A Company, 201st Forward Support Battalion, Division Support Command, 1st Infantry Division (Mechanized), at Vilseck, Germany, was one of two winners in the small unit category, along with the Air Force's 510th Fighter Squadron at Aviano Air Base, Italy.

Six units received the awards in the categories of small, medium, and large units. The Phoenix Trophy, which is awarded to the overall winner of all the categories, was presented to the crewmembers of the aircraft carrier *USS Enterprise*, which is based at Norfolk, Virginia.

NEW MEDICAL LOGISTICS PROGRAM RELEASE APPROVED

The Department of Defense has approved implementation of the third stage, or release, of the development of its single major medical logistics system for all of the services. The goal of that system, the Defense Medical Logistics Standard Support (DMLSS) Program, is to improve the responsiveness of medical logistics support by implementing business process innovations that increase the effectiveness of medical logistics support and reduce cost.

Release 3 of DMLSS increases capabilities in equipment and technology management and stockroom inventory and allows the military services to use only one system for their medical logistics needs. In addition, information on pharmaceutical, medical, and surgical products now captured by DMLSS will assist DOD in developing improved contracts with suppliers that provide for pricing discounts.

DMLSS was developed in three major releases, each containing capabilities critical to providing effective medical logistics support to DOD hospitals and clinics worldwide. Current system capabilities include complete inventory management supported by electronic commerce, Web-based technology, and handheld wireless devices; product and price comparison tools; medical equipment and technology management; and facility management.

Fielding of DMLSS to Army facilities is scheduled to begin in January. Fielding to the Air Force and Navy is already underway.

DMLSS program developers estimate that, between fiscal years 2002 and 2012, the system will return approximately $6 in benefits for every $1 of costs incurred in developing and maintaining the system.

ARMY NATIONAL GUARD RESTRUCTURING PLANNED

The Army National Guard will change its structure in order to "become a more deployable, more mobile, and more flexible force, better suited to support our Nation at home and abroad," said Secretary of the Army Thomas E. White. "[The change] will also improve the structure and training of the Army National Guard in order to better align it with other ongoing Army Transformation programs and the latest defense strategy."

The Army National Guard Restructuring Initiative (ARNGRI) will strengthen the Guard's ability to meet its homeland security, major combat operation, base generation, support of the combatant commanders, and small-scale contingency requirements.

The initiative introduces two new types of organizations into the Army force structure—mobile light brigades (MLBs) and multifunctional divisions (MFDs). MLBs are lighter combat forces enhanced with systems and organizations that are faster and more responsive and are able to provide their commander with better situational awareness than existing brigades. Typically, the new MLBs will operate as subordinate units within the MFDs, which are designed to perform full-spectrum warfighting

missions, homeland security, and force generation. Together, these units will work with existing Army National Guard combat brigades to create organizations that are more versatile and responsive in supporting commanders both at home and abroad.

SOLDIERS REQUEST ASSIGNMENTS ON LINE

Officers recently joined enlisted soldiers in using the Internet to tell their assignment managers where they wish to be assigned.

The Total Army Personnel Command (PERSCOM) initiated a new system in July that allows officers to submit their assignment preference statements by logging on to the PERSCOM Web site and clicking on the officer preference statement dog tag. There, officers can view open, valid requisitions that assignment managers are working to fill. Based on branch, grade, and area of concentration, officers can request assignments by valid and open requisitions, location, or specific duty such as joint, ROTC, or recruiting operations.

Enlisted soldiers have had the capability to request assignments on line for almost a year. The Assignment Satisfaction Key (ASK) allows enlisted soldiers to post their assignment preferences for stateside, overseas, and special-duty assignments directly to the Total Army Personnel Database. The Soldier Assignment Module matches Army requirements with soldier assignment preferences, enabling assignment managers to fill vacancies with soldiers who prefer to be assigned to a particular area. Although only a small percentage of soldiers had input their preference information to the ASK system as of March, all soldiers are being encouraged to sign up with ASK as soon as possible.

To access ASK or the officer preference statement page at https://www.perscom.army.mil, a soldier must have an Army Knowledge Online account.

AIR BEAM TECHNOLOGY SPEEDS UP LOGISTICS

The wide span air beam shelter is the latest air beam technology product to be demonstrated by the Fabric Structures Group at the Army Soldier Systems Center (Natick). Inflatable air beams can "pump up" a military shelter within minutes, providing a faster, simpler alternative to metal frames. The shelter—used for short-term storage of aircraft, vehicles, and supplies—reduces field maintenance and dramatically cuts setup and breakdown time. Air beams for the wide span shelter reduce deployment time by 75 percent, weight by 50 percent, and volume by 25 percent compared to a similar metal-frame shelter.

The shelter uses a braided fiber construction. The material is made of durable, bendable Vectran fibers that provide a high load-carrying capability and necessary curvature. The braided layers stretch out when filled with air.

The 80-foot-wide and 33-foot-high wide span shelter is designed to withstand 110-miles-per-hour winds and hold snow up to 20 pounds per square inch. Four people can set it up without using ladders or other heavy equipment. Once the tent and air beams are rolled out, fastened to each other, and anchored into the ground, an inflation system pumps up the tubes to its setup height in about an hour. Reaching final pressure takes slightly longer.

☐ Soldiers from the 481st Transportation Company (Heavy Boat) at Mare Island, Vallejo, California, rescue a "distressed" vessel during last summer's Bay Warrior exercise. The landing craft, utility (LCU) *Harper's Ferry* (right) was tied securely to the side of the LCU *Missionary Ridge* (left) and "hip-towed" safely back to port. The U.S. Coast Guard cutter *Point Brower* (top left) and other vessels provided area security. This was the sixth annual Bay Warrior exercise but the first to include a joint homeland defense scenario. More than 300 Army, Navy, and Coast Guard reservists sharpened their warfighting skills and tested their interoperability and command and control capabilities in the exercise that took place in the San Francisco Bay area.

U.S. ARMY SOUTH TO MOVE

U.S. Army South (USARSO) will move its headquarters from Fort Buchanan, Puerto Rico, to Fort Sam Houston, Texas, during fiscal year 2003.

Fort Sam Houston was chosen as the USARSO site because of the availability of facilities and qualified workers, its relative accessibility to U.S. Southern Command and Latin America, and its ability to provide garrison support to USARSO without significant augmentation or construction.

The move is a result of an overall headquarters realignment to provide the Army with greater efficiency and personnel savings, said Secretary of the Army Thomas E. White.

Once at Fort Sam Houston, USARSO will be a major subordinate command of the Army Forces Command. About 100 USARSO positions, mostly military, will be reassigned to other new activities and positions that support Army's transformation. Additional personnel savings are expected as the garrison support agencies are restructured.

The move will cost an estimated $45 million. However, about $125 million designated for new construction at Fort Buchanan will be saved as a result of the move, and more money will be saved over time.

FORCE PROTECTION EQUIPMENT SHOW SCHEDULED

A Force Protection Equipment Demonstration (FPED) will take place on 6 to 8 May at Marine Corps Base, Quantico, Virginia.

The purpose of the FPED is to showcase commercially available force protection and physical security equipment so attendees can identify products that are appropriate for their needs. Some of the identified products will be assessed for possible follow-on testing or procurement by appropriate Government testing agencies. Department of Defense personnel and representatives of other Federal departments and agencies, state and local law enforcement organizations, and corrections agencies are invited to attend the demonstration.

The event will be sponsored by the Joint Staff in conjunction with the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics; the National Institute of Justice; the Department of Energy; and the Transportation Security Administration. The Army Product Manager for Physical Security Equipment at Fort Belvoir, Virginia, is coordinating the demonstration.

Vendor application instructions and online attendee registration are available on the FPED Web site at www.fped4.org.

☆U.S. GOVERNMENT PRINTING OFFICE: 2003–432-782-00020