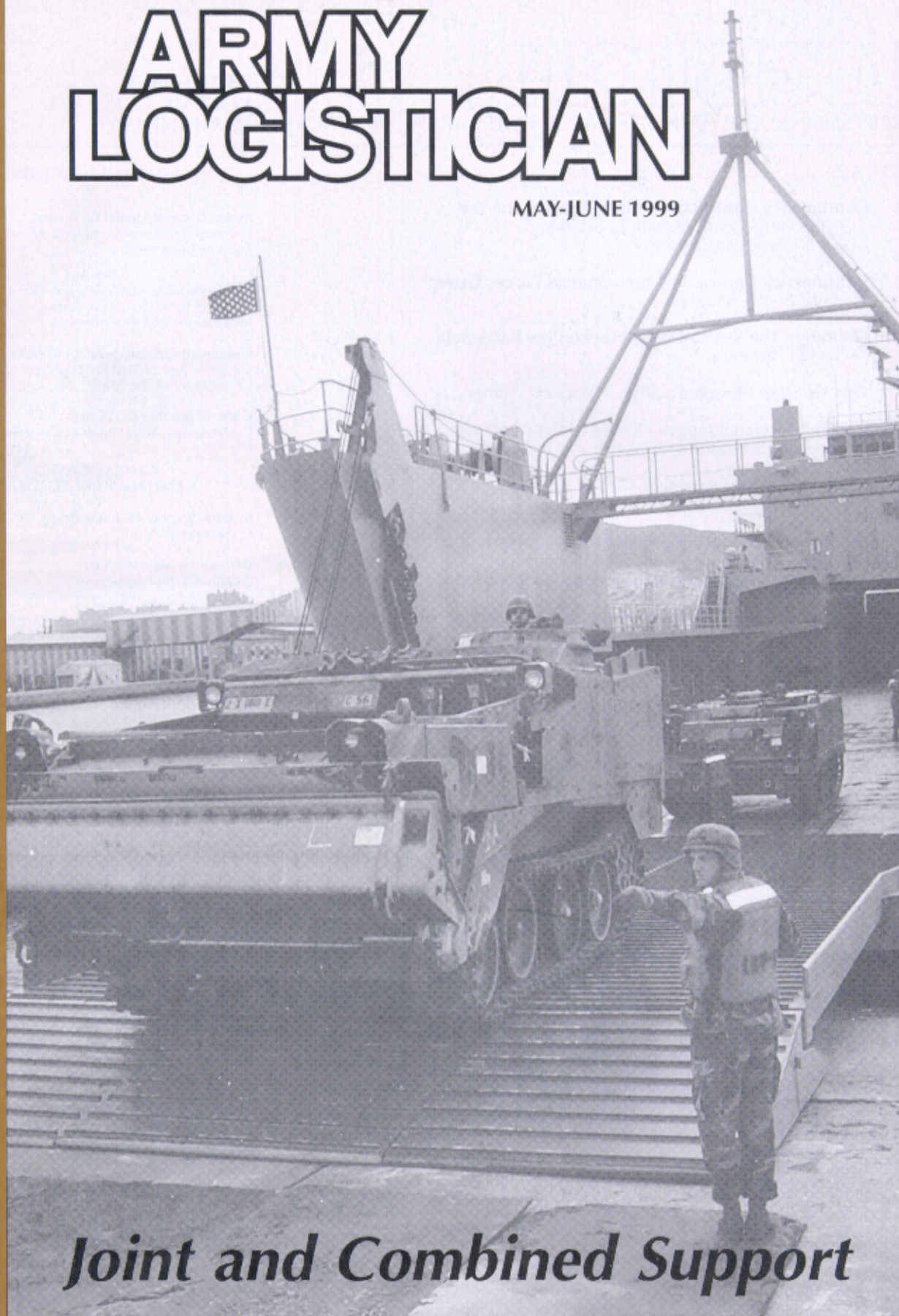


ARMY LOGISTICIAN

MAY-JUNE 1999



Joint and Combined Support

ARMY LOGISTICIAN

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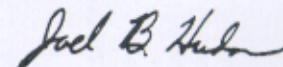
An M9 armored combat earthmover is offloaded from a logistics support vessel during Exercise Foal Eagle, an annual combined-joint exercise in South Korea. Exercises such as Foal Eagle provide opportunities for soldiers to practice wartime operations with personnel from other U.S. Services and other countries. Articles beginning on pages 34 and 38 propose development of joint and combined support systems to sustain all warfighters.

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

By Order of the Secretary of the Army:

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to the Secretary of the Army
05510

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- Future Operational Capabilities to Sustain Army Missions
- Fueling the Force in the Army After Next
- More Tooth, Less Tail: Contractors in Bosnia
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LOG NOTES

Ammunition Storage

I have been in command of a wartime host nation support ammunition company for 5 months now. I have noticed several problems and am proposing a possible solution.

The Army is fooling itself regarding ammunition in the Korean theater. The United States is relying on a poorly designed wartime host nation support concept that stores wartime ammunition for U.S. units and wartime ammunition that the U.S. Government will hand over to the Republic of Korea Army (ROKA). Under this concept during wartime, six units with 15 soldiers and varying number of Korean National (KN) and Korean Service Corps (KSC) members are supposed to provide the ammunition support for the theater until real direct support (DS) ammunition companies arrive in country. These 15-soldier units are not authorized the materials handling equipment (MHE) needed to move and handle the ammunition. With only 15 personnel weapons, these units rely on the Koreans for base defense as well as to provide personnel and the MHE to move the ammunition. This system is not effective—these units cannot perform their wartime mission.

If the U.S. units are designed only to provide accountability and surveillance of the ammunition, that is all we equip them for—the U. S. Government could contract this job to the Koreans. We are doing this at continental U.S. (CONUS) posts. During peacetime, the mission of the wartime host nation support units is to act as liaisons between U.S. units needing ammunition and the Korean units who store the ammunition. Do we really need the extra bureaucracy in the ammunition community? No, we do not. U.S. units needing ammunition could go to the ROKA ammunition supply points and deal directly with the Koreans to get their training ammunition.

Or we could maintain control of ammunition operations on the peninsula by bringing two ammunition ordnance companies to the Korean theater; there is enough mission for two DS ammunition companies. The first company should be a DS ammunition company with a platoon in the Camp Red Cloud area, a platoon at Camp Page or Camp Long, and a platoon with company headquarters at Camp Humphreys. This company would provide direct support to the warfighting units in the north and should be assigned to the 501st Corps Support Group. The platoon at Camp Humphreys would be given the follow-on mission of beginning to develop the corps storage area for the western corridor, while the two forward platoons would operate ASP's in the 2d Infantry Division rear.

The second ammunition company should be divided between Taegu and Pusan. This company would provide direct support to the units in their area and operate the port facility as needed during peacetime. The company would rotate into the wartime missions of sustainment operations at the port, support the reception, staging, onward movement, and integration mission, and develop and then hand over the theater storage area mission to a CONUS reserve ammunition unit. This unit should be assigned to a multifunctional support battalion in one of the rear area support groups.

This two-company concept would allow the ammunition companies to support the ground component command until the theater has fully matured. As the theater develops, the 6th Ordnance Battalion should be a reserve unit brought into the theater as the need for a functional ammunition battalion develops in the theater.

With this concept, the Army would realize an increased level of support and

a reduction of senior grade personnel strength. This change would eliminate four billets (one lieutenant colonel, one command sergeant major, and two majors), reduce the captain billets from nine to two, and reduce the first sergeant and chief warrant officer(W-3) billets from 6 to 2. Although there would be an increase in the number of E1 to E4 billets, the units currently employ a large number of Koreans, both KN and KSC. The number of KN and KSC employees would decrease with the increase of enlisted billets, thus decreasing the multimillion-dollar KN employment budget that the battalion currently uses to accomplish its mission.

CPT Michael R. Molino
Camp Page, Korea

Revisiting Ammunition Management

I am an ordnance officer stationed in Korea rather than at Redstone Arsenal and therefore, according to Dr. Robert M. Ford, not one of the best or brightest ordnance officers in the force. It is perhaps because of my lesser intelligence that I don't understand several of the points that Dr. Ford made in his commentary on page 41 of the September-October 1998 issue.

Dr. Ford's commentary was a response to an article in the May-June 1998 *Army Logistician* suggesting that we change two related facets of the munitions branch of the Ordnance Corps. In the May piece, Mr. Rayburn recommended that we transfer the responsibility for ammunition-related issues to the Quartermaster Corps and, concurrently, that ammunition training move from Redstone Arsenal to Fort Lee. The end state of this consolidation would be a properly aligned supply system and a more cost-effective training base.

Dr. Ford suggested that conducting

ammunition training at Fort Lee would: one, cost the same as at Redstone because we would be teaching the same subjects to the same students; and two, be impractical since one needs a demolition range for explosive ordnance training.

Simple logic suggests that this is only half of the story. Consolidating supply training at Fort Lee would not directly save training dollars, but would save administrative funds. Indeed, this concept is the driving force behind base realignment and closure (BRAC). By moving ammunition management training to Fort Lee, we can leverage the benefits of the facilities and resources at Fort Lee to offer our soldiers a superior training environment, eliminate an entire training brigade staff, and reduce the support structure at Redstone by several hundred positions.

As to the issue of explosive ordnance training, I recommend that we expand on what is already well established joint training and move the explosive ordnance disposal (EOD) phase I to Eglin Air Force Base. Our EOD experts already do part of their training at Eglin; why not more? Were we to make these two moves, we could, as Mr. Rayburn suggested, save millions of dollars.

Dr. Ford also made an impassioned plea not to put ammunition under the auspices of the Quartermaster Corps. He cited an example of the challenges he faced as a supply and services battalion S3 NCOIC as a reason why not to make this move. I found his vignette to be less than insightful. There is no doubt that each class of supply offers its own unique challenges. However, what Mr. Rayburn recommended was merely changing the proponent branch for ammunition, a far cry from making 55B's into 76W's or 92A's.

Dr. Ford continues to argue that, since the Ordnance Corps has managed ammunition for over 200 years, we should continue this practice. I am not sure that this is wise. Instead of keeping with tradition for the sake of that tradition, I believe that we should align our class V managers with the class I, II, III, IV, VI, VII, IX, and X managers. Too often ammunition management in the field is slighted because it is out of the purview of those who manage the rest of the Army's supplies. It is time

to correct this oversight. Mr. Rayburn's recommendations are on target. His ideas deserve support from the schoolhouse, not ridicule.

CPT Charles B. King III
Camp Kwangsari, Korea

Misidentified Units

I am the commander of Charlie Company, 1st Battalion, 228th Aviation Regiment, in Panama. My company is the CH-47D company in theater, which supports USARSO and SOUTHCOM.

In your ALOG News article (March-April 1999, page 1), "Relief Operations in Honduras Rely on Hub-and-Spoke Logistics," you misidentified the aviation units responsible for the disaster relief in Honduras. My company—aviators, flight engineers, and crew chiefs—along with the battalion's UH-60 companies (Alpha and Delta) and 214th MEDEVAC, all participated in the Hurricane Mitch disaster relief operation. Alpha Company, Charlie Company, and half of 214th MEDEVAC are stationed in Panama (Fort Kobbe). Delta Company and 214th MEDEVAC (forward) are stationed in Honduras (Soto Cano Airbase).

Your article states, "The supplies are moved by CH-47 Chinook helicopters from Company C, 159th Aviation Regiment, and UH-60 Black Hawk helicopters from Company D, 228th Aviation regiment (both units from Fort Bragg, North Carolina)." While it is true that C Company, 159th, is from Fort Bragg and did participate in the exercise, D Company is not from Fort Bragg, but is part of the 228th "Winged Warrior" battalion. Also, what should have been noted is that CH-47's from C Company, 1-228th, and UH-60's from A Company, 1-228th Aviation Regiment, participated in the operation. The Winged Warrior battalion has the first U.S. aviation assets to react and participate in disaster relief missions in Honduras and Nicaragua. Our soldiers deserve the same recognition that the soldiers from Fort Bragg received.

CPT Gregory Polizzi
Fort Kobbe, Panama

Editor's Note: The Army Logistician staff sent a note to Captain Polizzi apologizing for the misinformation we published about his unit. We do recognize the 1-228th Aviation Regiment's important role in the Hurricane Mitch relief effort. Our apologies to the soldiers of the battalion.

The Purchasing Revolution

I read, with considerable interest, all of the articles in the January-February 1999 issue of ALOG magazine. I feel a need to comment on two of them.

The first article was titled "Government Purchase Cards: Putting the 'U' Back Into Purchasing" by Bruce Sullivan. The article was excellent, however, some of Mr. Sullivan's statements should be clarified.

The first statement is, "At the same time, the supply manager captured demand statistics for the item, which would be used to determine whether or not it should be added to local inventories to meet future needs." The word "captured" used in past tense may imply to some Government purchase card users that demands need not be captured for items so purchased. This is not entirely accurate. While the Office of the Deputy Chief of Staff for Logistics has lifted the requirement to capture demands for nonstandard, nonstocked, commercial off-the-shelf items, they have not done so for national stock number (NSN) items listed in the Army Master Data File.

The second statement that needs clarifying is, "This means that a cardholder can buy a centrally managed item by ordering directly from the supplier if it is less expensive or can be obtained faster than through the supply system." Again, this statement is not entirely accurate. A cardholder can buy an asset directly from the supplier (I interpret this as commercial vendor) only after he submits a valid requisition to the appropriate national inventory control point (NICP), receives a supply status code that authorizes local purchase or shows the estimated delivery date will not meet the required delivery

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date, and the commander determines that readiness will be adversely impacted. Further, while Mr. Sullivan did not touch on this, in order to avoid a funds violation, extreme care must be exercised to ensure that all purchases of NSN items are processed through the Army Working Capital Fund or that credit is not granted at time of turn-in of the item for disposal or repair.

The second article, titled "A-Mart: Army Shopping On Line" by Jodi Santamaria, again was excellent. Both the Army A-Mart and the Defense Logistics Agency (DLA) EMail have great potential to enable direct vendor delivery, thus reducing depot stockage levels. I do have a couple of concerns. First, any order placed against these purchase mechanisms should be password protected in order to prevent waste, fraud, and abuse. (DLA is working toward that end. Hopefully, AMC will also.) Second, there must be an automatic feedback from the NICP to the respective supply support activity to capture demands in SARSS and ULLS, and to process the appropriate financial transactions.

I don't want to be misunderstood; both A-Mart and EMail have tremendous potential. I think we all should throw our full support behind their de-

velopment. However, caution would dictate that neither of these systems be used to order supplies until the shortcomings are resolved. In fact, that is Forces Command's published position.

Thomas R. Welch
Fort McPherson, Georgia

New Ways to Shop

I enjoyed the article on the IMPAC card in your 30th Anniversary Issue (January-February 1999, page 28). This is one of the best methods of purchasing items I have seen in a long time. I have been a loggie in USAREC—Great Lakes for 23 years, running the battalion S4 as a civilian. I've done more DA 3953's and SF 44's than I care to think about. Now I don't have to talk to the contracting folks as often. This saves them much time and makes my log life so much easier. We can get the things we need now with less hassle and less paperwork. This keeps the troops happy knowing that I can support them with what they need in a timely manner, provided the money is available.

I'll try the A-Mart as soon as I have access to the Internet.

Les Bentley
Lansing, Michigan

Support Versus Sustain

I can't tell you how refreshing it was to pick up your November-December issue at the British Army School of Logistics and read Mike Sparks' letter, "Sustainment, not Support Units." It seems ironic that our two armies are so diverse in some respects and yet so similar in others.

The Royal Logistic Corps has only been formed just over 5 years, but since its inception the motto has been, "We Sustain." While we too have followed the idea of service "support" units, with our sustainment motto (which we inherited from the Army Catering Corps), we hopefully maintain our focus on the vital lifeblood, which is army logistics.

Mr. Sparks is accurate in his assertion that "support" appears to be very much a second-fiddle concept, implying that logisticians rely in some way on the combat arms, whereas "sustainment" implies an indivisible umbilical cord between the two. Because we have learned to embrace "mission command" as an essential tenet of the maneuverist approach to warfighting, army logisticians can feel comfortable at all levels in using in the mission statement "in order to sustain X Brigade or Division."

The stated aim of the Royal Logistic Corps is "to sustain the soldier in peace and war," and it is a sound concept which we should endorse on both sides of the Atlantic.

CPT Matthew Dietz, RLC
North Yorkshire, England

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NEWS

ARMY SECRETARY ANNOUNCES STAFF CHANGES

On 16 February, Secretary of the Army Louis Caldera announced the transfer of responsibility for Army logistics missions from the Assistant Secretary of the Army for Installations, Logistics, and Environment [ASA (ILE)] to the Assistant Secretary of the Army for Research, Development, and Acquisition [ASA (RDA)]. The move will consolidate acquisition and logistics policy and oversight.

The two affected organizations have been renamed. The former Office of the ASA (RDA) is now the Office of the Assistant Secretary of the Army for Acquisition, Logistics, and Technology [ASA (ALT)]. The former Office of the ASA (ILE) is now the Office of the Assistant Secretary of the Army for Installations and Environment [ASA (IE)].

JOINT FORGE LOG SUPPORT CONTINUES

U.S. Army, Europe, and the U.S. Army Corps of Engineers have joined forces to provide continued logistics support services to U.S. forces stationed in the Balkans as a part of Operation Joint Forge. The services will be provided through a 1-year competitively awarded contract with Brown & Root Services Corporation beginning 28 May 1999.

Logistics support services covered in the contract include life support, transportation, and maintenance services. Life support services include maintenance of temporary housing and facilities, laundry operations, water production and distribution, food services, and temporary construction. Transportation and maintenance services include shuttle bus and other transportation, road repair and maintenance, snow and ice removal, railhead operation and cargo handling, equipment maintenance, hazardous materials and environmental services, mail delivery, refueling, fire fighting, scrap sales and disposal, and redeployment, staging, onward movement, and integration operations.

Contracted logistics support for Operation Joint Forge

has been provided since December 1995 when U.S. forces were deployed to support the NATO-led Implementation Forces. The original contract with Brown & Root Services Corporation to support military contingency operations was scheduled to end in May 1997. The contract was extended for 2 years to provide sustainment services for U.S. peacekeeping operations.

ARMY BUDGET SUPPORTS READINESS

The Army's budget request for fiscal year (FY) 2000 maintains the Army's ongoing commitments to modernization and quality of life programs while seeking funding increases that are "largely targeted toward near-term readiness." As presented to Congress, the Army budget proposes total obligational authority of \$67.350 billion, an increase from FY 1999's \$65.509 billion. The budget submission also projects a spending request of \$71.482 billion in FY 2001.

The military personnel request is \$27.849 billion, which is an increase from the \$26.818 billion appropriated in FY 1999. This amount will support an Active Army of 480,000 soldiers (the same as last year), an Army National Guard of 350,000 (a decrease of 7,000), and an Army Reserve of 205,000 (down 3,000). Army civilian employment will decline from 224,000 to 218,000. A pay increase of 4.4 percent is sought for both military and civilian personnel.

The budget request for operation and maintenance is \$22.934 billion, up from \$21.056 billion in FY 1999. Spending for Active Army logistics operations will increase from \$1.498 billion to \$1.648 billion. The operation and maintenance funding will support Active Army ground operating tempo of 800 miles for the M1 Abrams tank, 934 miles for the M2 Bradley infantry fighting vehicle, and 970 miles for the M3 Bradley cavalry fighting vehicle and a monthly average of 14.5 flying hours for each aircrew and 17.8 flying hours for each aircraft. It also will provide for 10 brigade rotations each (9 active and 1 Army National Guard) through the National Training Center at Fort Irwin, California, and the Joint Readiness Training Center at Fort Polk, Louisiana, and

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NEWS

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5 brigade rotations through the Combat Maneuver Training Center in Germany, as well as training for 9 corps and division command groups and staffs through the Battle Command Training Program.

The procurement budget reflects a small increase, from \$8.509 billion in FY 1999 to \$8.570 billion in FY 2000. Among the procurement requests are \$102.8 million for 8 UH-60 Black Hawk utility helicopters, \$190.4 million for 450 vehicles in the family of heavy tactical vehicles (which includes the palletized loading system, heavy equipment transporter system, and heavy, expanded-mobility tactical truck), \$425.9 million for 2,179 trucks in the family of medium tactical vehicles (an increase from 1,439 trucks bought last year), \$91.7 million for 867 high-mobility, multipurpose, wheeled vehicles (up from 671 purchased last year), and \$646.2 million to upgrade 120 M1 Abrams tanks to the M1A2 configuration.

The Army also seeks \$4.426 billion for research, development, test, and evaluation (down from \$5.032 billion in FY 1999), \$695 million for military construction (down from \$1.234 billion), \$1.112 billion for family housing (down from \$1.235 billion), \$1.075 billion for all environmental programs, and \$1.169 billion for chemical demilitarization. The chemical demilitarization request will support continued construction of disposal facilities at Anniston, Alabama, Pine Bluff, Arkansas, and Umatilla, Oregon; completing final designs and starting construction at Aberdeen, Maryland, and Newport, Indiana; and continuing environmental permitting and design at Blue Grass, Kentucky, and Pueblo, Colorado.

DEPLOYMENT CENTER ESTABLISHED

A Joint Deployment Training Center (JDTC) was established last December at Fort Eustis, Virginia. At its opening ceremony, Lieutenant General Roger Thompson, Deputy Commander in Chief of the U.S. Transportation Command, said that the center will "establish a positive paradigm for all the services in future deployments."

The JDTC will work with the Services to ensure that their schools follow a common core curriculum for de-

ployment training in their schools. Thompson believes this will make the JDTC a "hotbed of joint deployment training and doctrine development. People will wonder why we didn't do this 25 years earlier. Commanders of unified commands and all Services will definitely benefit from the JDTC's contributions to improving the deployment process." Thompson sees the JDTC as the right idea for executing today's doctrine for projecting military forces from their continental United States bases.

The JDTC is an element of U.S. Transportation Command, the single manager of transportation for the Department of Defense, headquartered at Scott Air Force Base, Illinois. Like its parent organization, the JDTC will have members of all the armed services on its staff, as well as civilians. Its customers will be Department of Defense (DOD) forces worldwide.

Fort Eustis was chosen as the site for the JDTC because of its history of transportation and deployment training, as well as its proximity to other DOD and service schools and the military transportation units and facilities in Hampton Roads and on the East Coast.

FINAL ARMY DRAWDOWN UNDERWAY

The final phase of downsizing the Active Army to meet the goals recommended by the Quadrennial Defense Review panel is underway. The reduction and reorganization plan, which began last October and will continue through June 2001, reduces the active duty force to an end strength of 480,000 soldiers. Approximately 5,000 spaces will be eliminated in this final phase, completing the total planned reduction of 15,000 spaces.

Force structure reductions will be achieved by reorganizing units rather than eliminating them. This moves the Army toward the Division XXI design with minimal risks, while improving deployability and strategic mobility.

There are two major parts of this reorganization plan: a limited conversion of selected heavy divisions to the recently announced Division XXI design and a standardization of field artillery units into a three-battery, six-firing-platform configuration. The conversion reduces the number of armor and mechanized companies in each maneuver battalion and increases the number of dismounted infantry soldiers in the platoons. A reconnaissance troop is added to each maneuver brigade. Battalion mortar assets are reduced from six tubes to four tubes.

These limited conversions will occur in the 1st Infantry Division (Mechanized) and 1st Armored Division (both split-based in Germany and Fort Riley, Kansas); the 3d Infantry Division (Mechanized) at Fort Stewart and Fort Benning, Georgia; a brigade of the 2d Infantry Division at Fort Lewis, Washington; and the

3d Brigade, 4th Infantry Division (Mechanized), at Fort Carson, Colorado. The Army's first division to be digitized, the 4th Infantry Division at Fort Hood, Texas, began conversion to the new design last October. Ultimately, all heavy divisions will be fully digitized.

The second segment of the downsizing program, the artillery reorganization program, will begin in June. In this phase, 12 corps-level multiple launch rocket system (MLRS) battalions will be converted from 3 batteries of 9 launchers (or 3 by 9) to a standard 3 by 6 design in preparation for fielding of the more advanced M270A1 launcher. This conversion will improve firepower at the division level by reorganizing divisional MLRS's from 1 battery of 9 launchers to a battalion of 18 launchers. Eleven existing Army National Guard cannon battalions will receive the MLRS, significantly increasing their firepower.

HYBRID CARGO HAULER PROTOTYPE LOOKS PROMISING

The Army Tank-automotive and Armaments Command (TACOM) National Automotive Center, defense contractor Lockheed-Martin Control Systems, and truck manufacturer Stewart & Stevenson are developing a "hybrid" combat cargo hauler that uses both diesel and electric power. Its unique HybriDrive™ propulsion system can provide significant benefits for military trucks, such as enhanced mobility, increased performance, reduced signature and emissions, and extended range. Fuel consumption is 25 to 50 percent less than that of a conventional truck, which is significant, since 70 percent of the tonnage carried onto the battlefield today is diesel fuel.

Hybrid electric propulsion eliminates the conventional automatic transmission, which means that the truck driver does not have to shift gears. Drive shafts, axles, and other drive system components will last longer. On level ground, the driver does not have to apply brakes to decelerate; simply removing his foot from the accelerator causes the vehicle to slow. When moving downhill, brakes are necessary to stop the vehicle safely. Energy produced during this "regenerative braking" is stored in a pack of 12-volt, lead-acid batteries and is reused by the system rather than dissipated as heat in the service brakes. This will reduce brake wear up to 65 percent. Fuel-efficient, constant speed diesel engine operation reduces oil changes and overhauls.

The hybrid prototype is an M1085 5-ton truck from the Army's family of medium tactical vehicles. Its 290-horsepower turbocharged diesel engine powers a generator that, in turn, provides electricity to the electric drive motors. Sudden power for accelerations and hill

climbing is provided by the battery pack.

The diesel engine/generator combination could enable a production version of the truck to act as a large portable generator. A production version also could use its batteries to drive a few kilometers in a stealthy, no-engine mode.

For more information, call the TACOM National Automotive Center at (810) 574-7806 or visit TACOM's website at <http://www.tacom.army.mil/tardec/nac/index.htm>.



□ A representative of Lockheed-Martin explains features of the truck with hybrid electric propulsion to soldiers at Fort Lee, Virginia, one of several demonstration sites for the prototype.

DEPLOYMENT STOCK PLANNING IMPROVED

The Deployment Stock Package Concept, an automated class IX deployment stock planning program, will quickly calculate and requisition stocks to maintain readiness of deployed units. The automated system is being developed by the Army Logistics Integration Agency (LIA), Alexandria, Virginia, the Army Materiel Systems Analysis Agency (AMSAA), Aberdeen, Maryland, and the Velocity Management Group's Stockage Determination Process Improvement Team led by the Army Combined Arms Support Command, Fort Lee, Virginia.

The system improves parts availability for deployed units by electronically providing information about what assets are available and where they are located and by providing more accurate requirements calculations based on improved data. The automated system quickly adjusts requirements and automatically prepares a requisition for additional stocks when force changes and other constraints impact the unit mission.

Accurate and timely generation and distribution of class IX deployment stock information are critical for today's smaller and more responsive Army. With Army streamlining initiatives that reduce order and ship times, fewer parts will be kept on hand during peacetime. When units are required to deploy, they must develop a deployment stock package (DSP). The deployment stock package analyzer (DSPA), which is part of the Deployment Stock Package Concept, quickly develops the initial DSP and adjusts it based on changes in the expected contingency.

More information about the Deployment Stock Package Concept and a demonstration and download of the DSPA software are available on the LIA and AMSAA homepages.

NEW CAMOUFLAGE SYSTEM TESTED

Positive results from recent operational testing of a new ultra-lightweight camouflage net system (ULCANS) may mean that it soon will replace the camouflage system now in use.

The new netting is 33 percent lighter than the light camouflage screening system (LCSS) now in use. It has significant thermal suppression capability, which reduces its thermal signature to enemy sensors, says Jeffrey G. Taylor, a project officer with the Army Communications and Electronics Command, Fort Monmouth, New Jersey.

"The old system is heavy, costly, and has no thermal infrared suppression capability. It solar-loads easily and becomes a hot target in the sun," Taylor said.

The old LCSS also is difficult to manufacture in custom sizes and shapes. Its steel hog ring assembly and small plastic lanyard pins can damage aircraft engines and canopies. The netting picks up debris and snags so severely on equipment that sometimes it must be cut to remove it.

By contrast, ULCANS is highly snag resistant, has no sharp or metal parts, and can be used over aircraft. It is easy to manufacture in specified sizes and shapes. ULCANS has radar-scattering and near-infrared background matching capabilities that are equal to or better than the old system. It is one-sided, so there is no confusion as to which side should be exposed.

ULCANS will be fielded initially as a general-purpose woodland screen and will be available in sets composed of hexagons and diamonds that are the same size and shape as the modules of the current system. These components can be joined together to configure screens in various sizes and shapes to cover just about any military item.

Type classification of the ULCANS woodland screen is scheduled to take place this summer, but funding for total package fielding is not yet available. Although no price has been set for the ULCANS, it will cost significantly less than the combined cost of the LCSS and its support system (approximately \$1,000).

ARMY TESTS PRIVATIZED HOUSING

Under a pilot program for the Army's Residential Communities Initiative (RCI), Fort Hood, Texas, is working with a Department of the Army task force to privatize the installation's 5,482 units of family housing. Three other installations—Fort Lewis, Washington, Fort Meade, Maryland, and Fort Stewart, Georgia—will partner with the private sector later this year to develop plans to privatize their housing.

Over the next 6 years, more than 40 installations in the United States will privatize their housing under RCI, turning over an estimated 85,000 housing units to private developers. Housing at overseas installations will continue to be maintained by the local installation. Army officials said RCI will help to eliminate a \$6 billion backlog in construction and maintenance for Army family housing caused over the years by inadequate funding and complex procedures.

Under RCI, the Army will join with private sector firms to develop plans to provide housing and service facilities for Army families. In most cases, responsibility for an installation's family housing will be transferred to a developer with a long-term land lease in return for an agreement to renovate or replace existing quarters and build new units when required. The developer also will be responsible for operating and maintaining the housing units for the term of the lease. The Army will maintain its jurisdiction over housing areas and will continue to provide fire and police protection.

RCI is an evolution of the Army's Capital Venture Initiatives program. That program, which is being used to privatize housing at Fort Carson, Colorado, requires bidders to submit costly, detailed proposals. Under RCI, the Army will select one developer for each future project through a Request for Qualifications (RFQ) process that will not require detailed proposals. Instead, the RFQ will focus on the developer's past performance, financial strength, organizational capabilities, and a preliminary project concept. RFQ's are expected to take developers less time to prepare and cost them significantly less than detailed proposals.

Congress provided legislative authority for the RCI program in the 1996 Military Housing Privatization Initiative. RCI will broaden use of the legislation by de-

veloping projects that focus not only on family housing but also on the community and supporting facilities. Community centers, childcare facilities, recreational centers, and storage facilities all could be considered under the community plan.

For more information, visit the RCI website at <http://www.rci.army.mil>.

DTIC PROVIDES VALUABLE RESEARCH TOOL

To increase customer awareness and facilitate access to its services, the Defense Technical Information Center (DTIC) is offering its Secure STINET until November 1999 free of charge to Department of Defense agencies, military services, and military schools.

Secure STINET provides access to the unclassified portion of DTIC's technical reports collection on the results of Defense-sponsored research, development, test and evaluation, and studies and analyses since 1985; the last 5 years of active technical effort and management system summaries of research and development efforts and studies; the latest unclassified documents added to DTIC's technical reports collection; access to the British Library's "inside web" and the Canada Institute of Scientific and Technical Information's SwetScan and document delivery service; and a language translator.

DTIC, an element of the Defense Information Systems Agency, contributes to the management and conduct of Defense research, development, and acquisition efforts by providing access to, and exchange of, scientific and technical information. Additionally, DTIC supports many World Wide Web sites. These Internet services provide a wide array of information as well as links to other relevant web sites. For more information or to register for Secure STINET service, call (703) 767-8267, DSN 427-8267, or 1-800-225-3842 or send email to bcporder@dtic.mil or ptillery@dtic.mil.

TOBYHANNA IMPLEMENTS JCALS

Tobyhanna Army Depot, Pennsylvania, is taking advantage of the full benefits of Joint Computer-aided Acquisition and Logistics Support (JCALS). Through a cooperative effort, the JCALS Integration Office at the Army Materiel Command (AMC), the Army Communications-Electronics Command (CECOM), and Tobyhanna Army Depot have implemented JCALS in managing the depot's mission work load in an integrated data environment (IDE). JCALS is a Department of Defense program designed to allow users easy access to global data bases and automatic information transfer in

a common computer working environment.

JCALS consists of two systems—a workflow manager and a global data management system—that, together, quickly provide technical data needed to carry out projects and pass that information to those who need it. At CECOM, JCALS is used in two main programs: the IDE and the joint technical manual (JTM) program. At Tobyhanna, JCALS also is used for the IDE and soon will be used for the JTM's.

The JTM capability, when it is fully operational at both CECOM and Tobyhanna, will enable the electronic transfer of technical manual information among the personnel at these and other JCALS sites. The JCALS system also enables the electronic transfer of information for other areas such as engineering and finance, which will become part of the integrated data environment.

The pilot area for the IDE at CECOM and Tobyhanna is the flexible computer integrated manufacturing process. JCALS enables the custom design of automated process flows. Item managers at CECOM can model process flows to and from their work partners at Tobyhanna in the acquisition of spares. Tobyhanna personnel can respond to the item managers' requests for price quotes and subsequently the manufacture of spares. Different people working on the same project can share project data, and engineers and technicians can access previous projects to gauge past performance.

As with any new system, a few challenges must be addressed. These include ensuring that the appropriate hardware and communications equipment are available for the system to function as designed and training the staff at both sites on the architecture of the system.

DRI PROGRESS REPORTED ON WEB, CD-ROM

In March, Secretary of Defense William S. Cohen introduced a CD-ROM, "Partnering for Excellence," that reports on the status of the 1997 Defense Reform Initiative (DRI) and new reforms underway in the Department of Defense (DOD). The same information is available on the World Wide Web at <http://www.defenselink.mil/dodreform>.

Although DOD has made progress in fulfilling the DRI, more can be done, and the department should "institutionalize" the process, Cohen said. DOD needs reforms because it does not have enough funds to pay for all of its high-priority readiness and modernization needs, even with promised sustained budget increases, he said. "It needs [additional] base closures for the same reason," Cohen added.

The CD also contains information for communities

To obtain a copy of the CD, write to the Office of the Assistant Secretary of Defense (Public Affairs), Directorate for Public Communications, 1400 The Pentagon, Washington, DC, 20301-1400, or call (703) 697-5737.

SOLE—The International Society of Logistics (formerly called the Society of Logistics Engineers) will hold its annual conference on 31 August to 2 September at Bally's Las Vegas Hotel in Las Vegas, Nevada. The theme of the conference is "Logistics and the Impact on the Bottom Line." Presentations will explore all facets of Government and commercial logistics operations, engineering, analysis, and acquisition. Attendees will include senior managers, systems and design engineers, production personnel, logisticians, acquisition personnel, and marketing managers.

In conjunction with its conference, SOLE is sponsoring a transportation and logistics forum known as TRANSLOG International, which will be held August 30 to 2 September. Now in its fourth year, TRANSLOG International uses a holistic perspective in addressing near-, mid-, and long-term transportation logistics issues. The TRANSLOG theory is that people and products can be moved faster, better, and cheaper only when transportation, infrastructure, supply chain management, information technology, reliability, safety, and environmental issues are viewed, planned for, and implemented as an integrated whole. TRANSLOG International also encourages the creation of Government, public, and private sector partnerships to improve the efficiencies of transportation logistics systems. Because TRANSLOG International is interdisciplinary in character, individuals and groups outside the fields of transportation and logistics are encouraged to participate in the forum. Registration information can be found at <http://www.sole.org>. For more information, see the TRANSLOG International homepage at <http://www.translog.nu>.

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Contingency Contracting: Strengthening the Tail

by Brigadier General William L. Bond
and Major Nicholas L. Castrinos

The conference room was quiet; the chief of staff was deep in thought. It was D+8, and, logistically, things were a mess. The infantry task force still lacked any organic transportation assets to move their soldiers and heavy equipment forward. The Air Force was concentrating on flying in only combat units and their equipment. Few aircraft were being devoted to combat support units and all the equipment required to support the growing base camp.

A knock on the door broke the chief's train of thought. "Yes?" he said. It was the support operations officer. "Sir, our logistics problems are getting worse," he reported. "Our bottled water supply is becoming critical. Another couple of days without a delivery from the Air Force, and we will have to start rationing. The infantry battalion commander wants to know when his unit will receive engineer support in building the base camp defensive positions. He currently has a critical requirement for 50,000 filled sandbags. His unit has been working nonstop since D+3. On top of this, they also are providing base camp security. He can't keep this pace up much longer."

The chief exhaled. "Here it comes," thought the support operations officer. Looking up, the chief asked, "Any information on those contingency contracting officers who were being held up at home station?" "Yes sir," replied the support operations officer, "they were dropped off the TPFDD [time-phased force and deployment data list] at D-3. I'm not sure why. With a little luck, they should be here within the next 3 to 5 days. On the subject of LOGCAP [Logistics Civil Augmentation Program], under their contract they still have another week before they have to have support in place. They should be able to start providing limited support within the next 5 to 7 days. Sir, that's all the information that I have."

An Alternative Scenario

The conference room was buzzing with conversations among staff officers. The chief of staff sat back in his

chair and had to smile. While things were still tight, the infantry task force was in place and moving forward. The Air Force was still flying in mostly combat units, but that would change soon. Combat support units would follow. The chief was looking forward to receiving the organic support equipment needed to sustain his task force. As he looked out the window, he could see local nationals filling sandbags for the camp's defensive positions. The contingency contracting officer had hired a local labor company 2 days ago. "Thank goodness," he said to himself. "That infantry unit could not continue to build the camp and provide security much longer."

As the chief turned back in his seat, he spotted the COCO [chief of the contracting office] and waved him over. "Major, give me an update."

As the COCO sat down, he opened his notebook. "Well, sir, as of D+7 we now have over 45 contracts in place with local vendors. Yesterday, one of my purchasing NCO's [noncommissioned officers] located a water bottling company north of here. The preventive medicine team just finished certifying the plant. The company will start delivering bottled water sometime tomorrow morning. We also located a bus and heavy equipment company. While their transportation equipment is not state of the art, it is capable of moving our soldiers and their equipment forward, including M1's and Bradleys [tanks and infantry fighting vehicles]. The total value of all contracts so far is just over \$1.5 million. Sir, that's all the information I have right now."

Every Commander's Logistics Force Multiplier

With today's austere logistics tail, any operational deployment will require vast amounts of contracted services and commodities. Contracts will cover everything from small local purchases by units for items as mundane as bolts and nuts, to basic repair parts for office equipment, to million-dollar contracts for power. Literally hundreds of thousands of dollars per day could be obligated during a deployment.

Following the Persian Gulf War, the Army created

contingency contracting officers (CCO's) to support commanders beyond their organic support capabilities. These officers are found at the division and corps levels. Each division in the continental United States (CONUS) is authorized two CCO's, normally a major and a captain. They usually are assigned to the division support command (DISCOM). At the corps level, CCO's are authorized on the corps support command (COSCOM) staff and within elements of the COSCOM. A total of 6 to 10 CCO's usually are assigned to the COSCOM. The senior CCO in the corps is a lieutenant colonel who acts as the chief of the corps acquisition section; the other CCO's in the corps are captains and majors. The chief of the corps acquisition section is responsible for planning and executing contingency contracting for the corps; training subordinate CCO's and contract support personnel; and advising the COSCOM and corps commanders on all aspects of contingency contracting.

Forward-deployed divisions and corps currently are not assigned CCO's. This should change with Force XXI. At present, military contracting officers in Europe are centrally located and assigned (allotted) by the commander of U.S. Army Contracting Command, Europe. When deployed, these military (and sometimes civilian) contracting officers become CCO's and support deployed forces just like their counterparts in CONUS.

Recently, a new additional skill identifier was approved for purchasing NCO's. While this is a step forward, it will take several years before a sufficient number of purchasing NCO's will be available for deployment.

The CCO's Mission

Bottom line up front: assuming that there is an economic base to draw from in a theater of operations, a deployed contracting officer can provide the task force commander with almost any combat support or combat service support function or supply that his organic force structure is designed to provide. For example, in Kuwait CCO's routinely provide troop transport, heavy equipment transport, bottled water, self-service supply center supplies, rental vehicles, leased office equipment, cell phones, and just about any other item you can think of that is not restricted (such as medical items).

The CCO's generic mission is no different than that of a contracting officer in a systems or installation contracting office: to provide responsive support to the customer (the commander), comply with laws and regulations, and apply sound business judgment. What is different, though, is the environment in which the CCO performs. Contingencies, by their very nature, are emer-

gency situations: war, low-intensity conflict, peacekeeping, disaster relief, humanitarian relief, and noncombatant evacuation. The CCO can face physical danger, extreme mission urgency, and 16- to 18-hour workdays, 7 days a week. In addition, he may be deployed to a location he knows little about, dealing with vendors who often have little or no knowledge of U.S. Government procurement practices and working without the home station support of more experienced contracting personnel. This is a daunting mission!

The CCO's Responsibilities

In contingency operations, contracting is much more tangibly a logistics function than in installation or systems contracting. Contingency contracting is sometimes referred to as "life support" contracting; this term reflects the reality that, in bare-base environments, the military force is almost completely dependent on the CCO for food, water, shelter, sanitation, and other basic necessities. This is especially true in the early stages of an operation. The CCO will think and act as a logistician.

In many contingency operations, the CCO becomes the largest employer in the local area as soon as he arrives. Contract obligations to support a task force often can run into millions of dollars every month (as in Bosnia). The CCO must be aware of the economic impact of his actions on the local economy and populace and keep his commander informed. The CCO, by virtue of his day-to-day contact with vendors, workers, and businessmen, often has as good or better insight into the hearts and minds of the local population as any member of the force. This insight also must be shared with the commander whom the CCO supports.

Serving as a CCO can lead to some significant ethical dilemmas. Sometimes, the need to support the mission can conflict with the requirements of laws and regulations. The CCO must exercise sound judgment and act in accordance with his training, experience, and conscience to do the right thing. He will be a risk manager. To be blunt, the CCO will likely encounter situations during contingencies in which there is no way to avoid jeopardizing the mission of the force without stretching procurement laws and regulations. CCO's are encouraged to use U.S. laws and regulations as a baseline. Commanders must understand that CCO's cannot pick and choose which laws and regulations they will follow. Current acquisition laws and regulations are broad enough to allow CCO's the means to get the job done without violating their provisions.

Recent contingencies have shown that CCO's will support the mission. CCO's will document their actions, request relief from restrictive laws and regulations, and

seek alternative methods of procurement (such as using the host nation's resources). Yet the bottom line is that the CCO will support the commander and the task force mission.

CCO's Need Support

As noted above, the existing modification table of organization and equipment (MTOE) authorizes only two military contracting officers per division. While NCO positions are listed in the MTOE, they currently are not filled Army-wide. As with any customer support organization, CCO's need NCO's and clerks. Without proper office support staffing, a contracting office will be slow to provide critical contracting support or, in the worst-case scenario, unresponsive to anything not deemed critical.

The contingency contracting office must be supplied with at least the minimum number of personnel to perform its function. This typically means assigning two NCO's (E6 or 7) and two junior enlisted soldiers (E3 or 4). While providing office support personnel who have a background in supply would be ideal, it also may be unrealistic. Fortunately, any NCO or junior enlisted soldier can be trained in a matter of days to support a contingency contracting office.

While office support personnel are critical, there are several other contingency contracting support functions that are equally important. Field ordering officers, contracting officer's representatives, and class A agents support the CCO outside of the contracting office. What follows are brief descriptions of each of these support jobs.

Field ordering officer (FOO). While CCO's are responsive, they cannot purchase multiple items for multiple units in a timely manner. Day in and day out, micro-purchasing is a time-consuming process that is best accomplished by FOO's. FOO's come from within a unit; the job is considered an additional duty. FOO's work directly for their units, quickly buying the many items that a unit requires day to day. While FOO's are supervised by the CCO, they have the procurement authority to furnish timely support to their units. FOO's can provide needed supplies within hours, while the CCO can take longer (perhaps days). FOO's may be appointed by letter, in accordance with Service procedures, to make purchases up to the micro-purchase threshold (the aggregate amount does not exceed \$2,500).

Contracting officer's representative (COR). A CCO cannot be everywhere at once. Ensuring that a contractor performs his service in accordance with the terms and conditions of the contract is critical to both the CCO and the supported unit. This is the job of the COR. A COR is appointed by a CCO to act as his authorized representative in the technical monitoring or adminis-

tration of a contract. Like FOO's, COR's come from within a unit and the job is considered an additional duty. Under no circumstances may a COR direct changes that affect price, quantity, quality, delivery, or other terms or conditions of a contract. The mission of the COR is to monitor and enforce the contract as written. The most important job of a COR is issuing a receiving report to the CCO. Without this report, the CCO cannot authorize payment to the contractor.

Class A agent. Class A (disbursing) agents are nominated by their command and appointed by the finance and accounting officer to make cash payments as specified in their appointment orders, including cash payments to vendors for goods and services acquired through procurement procedures. Class A agents support the CCO in over-the-counter purchasing or in situations that demand on-the-spot payment for supplies or services. Appointment of class A agents normally is limited to commissioned officers, warrant officers, or senior NCO's by Service and command procedures. The agents have no procurement authority; they are disbursement agents only.

Training FOO's, COR's, and Class A Agents

It is the CCO/COCO's responsibility to train FOO's, COR's, and class A agents (though responsibility for training class A agents is shared with the finance and accounting officer). We strongly recommend that this training be done routinely in advance of actual contingencies. Once deployed, the CCO's time is very valuable and contracting support personnel typically serve only as an additional duty. To realize the full benefit of having FOO's, COR's, and class A agents, they must be trained before they hit the ground in a contingency.

If You Don't Read Anything Else, Read This!

Here is the perfect CCO deployment scenario. A situation develops that has national security implications, and the CCO's unit is alerted for possible deployment. While the unit is preparing for deployment, the commander normally will deploy some sort of advance party or survey team. This team usually will fly either into the contingency area or as close as possible on military aircraft or civilian airliners. It is critical that the CCO be part of this team.

Before deploying, the CCO must be given bulk funding authority (enough to cover all expenses for the first 30 days—probably 1 to 5 million dollars) and placed on temporary duty orders. As a member of the survey team, he will advise the team leader on contracting requirements and provide contracting support to the team as needed. Once the survey team is finished and ready to redeploy to home station, the CCO should *remain in place in the theater*.

The CCO then starts work on preparing for the arrival of forces. It should be noted that, at this point, it is not certain that the contingency deployment actually will occur. But the CCO must be ready on very short notice to support an execution order from the National Command Authority.

While the CCO does have bulk funding authorization, he will not obligate (spend) any of this money during this phase of the operation. What he does instead is start identifying potential vendors in the area who can provide the support that will be needed by the joint task force. Once he identifies these companies, he will negotiate what are called blanket purchase agreements (BPA's) with them. While the BPA may sound like a contract, it is not. It is only an agreement between the company and the U.S. Government under which the company agrees to provide a service or commodity at an agreed price if needed. There is no requirement for the company to provide the item and no requirement for the Government to purchase from the company, just an agreement that the company will provide the service or commodity if asked. The beauty of this arrangement is that if the deployment is canceled and the CCO returns to his home station, no funds will have been spent because no actual contracts were signed.

The CCO will set up BPA's with hotels, rental car agencies, transportation companies, sanitation and refuse companies, airfield service companies (to include refueling), and any other company that the CCO thinks will be needed to provide support. This process may take 1 or 2 days or a week or more, depending on the location of the contingency. Once the BPA's are in place, the CCO can provide timely support to the commander; it is just a matter of calling in support if the contingency kicks off.

Let's return to the perfect deployment scenario to see how this process works out. In the middle of the night, the CCO gets a phone call from the emergency operations center at his home station. They just launched 2 C-17's, 2 C-5's and 4 C-141's carrying 300 soldiers and their heavy equipment. The planes will arrive in less than 8 hours.

If the CCO does not have BPA's in place, he has failed the commander. There is no way he will be able to find, much less arrange for, support within 8 hours. On the other hand, if he does have BPA's in place, he can pick up the phone and start making calls against the agreements. Once he places a call against a BPA, funding is needed. This is where the bulk funding becomes critical. CCO's will do almost anything to support a contingency mission, but the one thing they will never do is obligate money without authorization. It is little wonder that CCO's consider bulk funding critical to the success or failure of a contingency mission. CCO's will

fight, argue, or flat out demand that bulk funding be provided before they deploy on a survey team.

Eight hours later, the planes start arriving and 300 tired, hungry soldiers start deplaning. Because the CCO had his BPA's in place and the bulk funding to support the mission, the troops see buses and trucks standing by to move them forward and air field servicing companies ready to offload equipment and transload it onto flatbed trailers for movement. The CCO even could have contracted for a hot meal to be served to the soldiers before they moved forward. In short, he can provide almost any combat support or combat service support function needed during this timeframe. He is a force multiplier!

Lessons to Remember

As the Army gets smaller, the need for contingency contracting officers only will grow. New doctrine on CCO's was scheduled to be on the street in January. This doctrine will cover how CCO's will be employed on the battlefield and how support should be provided. Every commander should either read this new field manual or ensure that his staff does. While this new doctrine will help improve CCO support, it remains paramount that commanders include CCO's in regularly scheduled training. Local field training exercises, National Training Center rotations, and Battle Command Training Program exercises will enhance our ability to support the logistics commander in the next contingency.

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Contingency Contracting for a Special Forces Group

by Major Eric C. Wagner

The breakup of the Soviet Union theoretically ushered in a "new world order," according to President George Bush. In reality, what we have seen is a world in turmoil—one without the monolithic threat of the Soviet Union, yet just as deadly. The insidious problem of transnational threats, posed by narcotics traffickers and terrorists armed with weapons of mass destruction, presents one of the most significant challenges to our Nation. Today these increasingly powerful adversaries are equipped, and in some cases trained, by former Soviet military professionals now seeking employment with the highest bidder. Changes in today's world make it necessary for us to rethink the way we do things. The existing military logistics system does not always function efficiently in the environments encountered within this new order. In such cases, it may be necessary to have someone on site who can contract and purchase locally.

First Line of Defense

It has been military policy to use special operations forces as one of the first lines of defense in controlling and containing these new threats. Within the Army Special Operations Command, special forces groups are exceptionally adept at taking the battle to the enemy. These highly flexible organizations can be tasked to perform a variety of roles overseas. The core competencies of foreign internal defense, special reconnaissance, direct action, unconventional warfare, and counterterrorism allow special forces units to engage in operations required to defeat transnational threats abroad successfully. This ensures a credible first line of defense through peacetime engagement, cooperative training efforts, and, if necessary, the use of armed force. A special forces team is the ideal force of choice to use in the low-intensity operations that appear to be so prevalent today. Special forces teams are well equipped and highly trained, yet they suffer from limited sustainment capabilities during contingency operations.

The low-intensity operations frequently encountered in today's unique political environment are classified as contingency operations. Field Manual 100-7, Decisive

Force: The Army in Theater Operations, defines contingency operations as those operations requiring "the employment of military force in response to a crisis caused by a natural disaster, terrorists, subversives, or other required military operation." This definition supports the strategy of using tailored special forces teams to determine the extent of a situation quickly, solve the problem, or stabilize the situation for follow-on forces.

Austere Operating Environment

The fact that most special forces operations are conducted in or near failed nation states in the Third World adds to the difficulty of these operations. These countries typically have a limited infrastructure and could be conducting operations to deny contact, assistance, and trade with neighboring states. This typical scenario makes for a very austere operating environment.

To conduct this type of operation successfully, the deployed special forces team must be completely self-sufficient to operate in a challenging environment. Conducting operations in this environment requires either a significant external logistics effort or the ability to acquire supplies and services locally. Since it is impractical in most situations to conduct large logistics operations in denied or politically sensitive areas, supplies and services usually must be procured locally. Therefore, to ensure success, it is essential to equip this type of organization with all of the organic assets needed for operating in a variety of challenging environments.

Contingency Contracting Officer

Currently, the special forces group does not possess the authorized personnel needed to conduct the contingency contracting operations required for self-sufficiency in austere environments. To solve this problem, a contingency contracting officer (CCO) could be added to the special forces group's modification table of organization and equipment (MTOE). This change would increase significantly the logistics flexibility and independence of deployed special forces teams. This increased flexibility in the group can be achieved by authorizing only one new position within the organiza-

tion. The benefits of an increased contracting capability far outweigh any difficulty experienced in obtaining a new position.

Combat Multiplier

The CCO assists the deploying team in the requirements determination process, which identifies the supplies and services required during operations. By identifying shortfalls of on-hand equipment, he can provide the framework for procuring items in the United States and in the area of operation. Finding and correcting deficiencies allows the team to deploy more expeditiously and effectively. The CCO develops a historical data base of previous operational requirements and compares the historical requirements list, along with lessons learned, against similar, future operational requirements. The use of historical data significantly shortens the acquisition process and increases the speed and efficiency of predeployment mission planning. This provides an efficient and organic planning capability to deploying teams.

For missions such as counterdrug and demining, legal considerations concerning the use of different types of funds requires significant knowledge of congressional language contained within annual funding legislation. These funds are scrutinized closely by Congress and must be spent precisely to guarantee that the funding legislation is followed. Mission or exercise audits can cause significant legal problems for the commander and team members. To avoid this problem, the CCO and the unit lawyer can conduct research to ensure that funds are used properly and legally during the operation.

The CCO can assist in the varied planning and budgeting considerations for ongoing and future programs. Within a special forces group, the lawyer, the CCO, and the finance officer can provide a comprehensive evaluation of the sufficiency of funding for future operational requirements. The CCO can compare supplies and services from a previous requirements list, apply inflation factors, and project those figures forward to obtain accurate budget estimates. Detailed budgeting maximizes the use of funds and minimizes the impact of shrinking resources. The successful application and synchronization of all resources provides the commander with a powerful combat multiplier.

CCO Deployment With the Group

The CCO can support a high visibility or complex mission effectively by deploying with the special forces element. Some operations, such as demining, will require full-time manning by a contracting officer. In situations where the group CCO is unavailable for deployment, the CCO can coordinate with other theater contracting assets for continuous coverage. This coordination effort will ensure adequate coverage for the teams

at all times.

However, not all operations require full-time manning. In such operations, the CCO will deploy with the team and initiate contracting actions to create the necessary support structure. The CCO will return in the middle of the deployment mission to ensure that adequate support is being maintained. As the mission nears completion, the CCO will deploy to conduct contract closeout actions and assist in redeployment. He will repeat this process with all of the teams that require assistance. It is critical to schedule CCO deployments to maximize time and effort while minimizing travel costs.

Establishing the CCO Position

To correct the contracting personnel deficiency within special forces groups, the Army Special Forces Command should send a request to the Assistant Secretary of the Army for Acquisition, Logistics, and Technology. This request will initiate action with the Acquisition Corps. If approved, the Acquisition Corps Military Acquisition Position List (MAPL) will be changed to include an approved CCO position in each special forces group. This authorization will remain valid through the annual justification process. Simultaneously, within the Special Forces Command, the increased personnel authorization will require an approval to generate the requirement and fill from the personnel system. The complete authorization process possibly could take a year or more, but the significant gains achieved through successful authorization will far outweigh the administrative hurdles.

The placement of a CCO within a special forces group provides the commander with a unique combat multiplier during all phases of an operation. In a drawdown environment, an increase in personnel authorizations could be met with resistance. However, the placement of a CCO needs to be viewed as a low-cost investment that increases the organization's capabilities by providing greater independence and increased efficiency through significant cost savings. The CCO's ability to assist in requirements determination, legal advice, deployment execution, and budgeting will provide the necessary capability for deployed special forces teams to conduct their operations autonomously to the fullest extent in support of national security goals. **ALOG**

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Planning: The Key to Contractors on the Battlefield

by David L. Young

No one knows better than I the tremendous work that Brown and Root has done in Somalia. The flexibility and competence demonstrated by your employees were key factors in allowing U.S. forces to transition logistical support to the UN. . . .

—General John M. Shalikashvili, USA
Chairman, Joint Chiefs of Staff, 1993-1997

The battlefields of the future will be distinctly different from those of the past. Soldiers, sailors, marines, and airmen will have more advanced weapon systems, greater access to information, and increased quality of life. They also will share the battlefield with a greater number of civilians. The increased civilian presence will result from growing reliance on Department of Defense (DOD) civilian employees and contractors to perform combat support and combat service support (CS and CSS) functions. But a greater role for civilians raises an important question: How do we integrate contractors into the commander's operation plan (OPLAN)? The success of contractors on the battlefield requires cooperation, support, and advance planning from the joint force commander's (JFC's) staff.

Contractors typically are used to provide life support, weapon systems support, and other technical services. The common denominator in all of these efforts is that contractors are asked to provide direct support to our military forces worldwide, including those in forward-deployed locations. The JFC does not have the option of going to war (or a military operation other than war) with an all-military team. Someone must plan for the

integration of civilian assets into the total force structure. Problems in past planning efforts are typified by the General Accounting Office (GAO) report on Bosnia—

Despite significant efforts to effectively manage LOGCAP [Logistics Civil Augmentation Program], U.S. Army, Europe Officials' inexperience and lack of understanding of the contract, the contractor's capabilities, and program management created problems during deployment and resulted in unnecessary costs.

An OPLAN that includes contractor support should answer such questions as—

- Will the operational environment permit the use of contractors? If so, when?
- What are the host nation's restrictions on the use of contractors?
- How will support be provided to the contractors, in such areas as force protection, timing and means of deployment, life support (food, lodging, and medical care), and facilities?
- How will command and control be exercised? What organization will administer the contracts? To what extent will contractors be integrated into the force?
- How will the operational-level budget for supporting contractors be administered?

The Operational Environment

The Army describes the operational environment in terms of METT-T: mission, enemy, terrain, troops, and time. The initial plan for the invasion of Haiti called for a forced entry, and the planners were told that no civilians would be allowed into the theater until after the shooting stopped. Fortunately, the METT-T factors changed. The operational environment supported per-

missive entry, and contractors went ashore soon after the troops. Planners must weigh the likelihood that contractors will not be allowed (or will not be able) to enter the theater at the start of a major operation. The military forces may be required to be self-sustaining for a period of time. It should be noted, however, that the LOGCAP contractor entered Somalia, Rwanda, Haiti, and Bosnia only days after the first U.S. troops deployed.

Peacetime preparation is vital to using contractors successfully. The commander must know the contractor's reliability before deployment. One of the advantages of a contract like LOGCAP is that it lasts for 5 years (if all option years are exercised), so the commander in chief's (CINC's) planning staff can get to know the contractors during deliberate planning and exercises. Contracts awarded during crises are much riskier than those that are carefully planned and developed before a deployment. It is better to include a "deployment clause" in a systems maintenance contract at the time the contract is awarded rather than add the requirement in the midst of a crisis. DOD Instruction 3020.37, Continuation of Essential Contractor Services During Crises, provides a checklist of planning considerations for deployment of civilian contractors. The question of whether or not the operational environment will be conducive to using contractors largely depends on the contractor's state of readiness.

Relationships With the Host Nation

Permission to enter the country and conduct business. There were no functioning host governments to deal with when the LOGCAP contractor was deployed to Somalia, Rwanda, and Haiti. (The latter had a government, but it was largely nonoperational). Operation Joint Endeavor in Bosnia, for which a large logistics base was planned in neighboring Hungary, was a very different situation. The logistics planners suggested that U.S. contractors, especially the LOGCAP contractor, be included in the omnibus agreement (similar to a status of forces agreement) with the Government of Hungary. The suggestion was rejected; some members of the negotiating team incorrectly believed that the U.S. Government should not get involved in the contractor's relationship with the host government, that this was something the contractor should work out on his own. Because there was no formal agreement, the contractor had difficulty gaining permission to bring outside labor into Hungary. The Hungarian Government capitulated only after receiving assurances that a large portion of the contractor's work force would be Hungarian.

Liability for host nation taxes. Further problems developed when the Hungarian Ministry of Finance ruled that the LOGCAP contractor was subject to the value-added tax (a type of corporate income tax) and that the contractor's employees were subject to Hungarian in-

come tax. The U.S. Government countered with the argument that LOGCAP is a U.S. Government cost-reimbursement contract and that costs were simply passed through the contractor to the U.S. Government. The omnibus agreement excused the U.S. Government from all Hungarian taxes. That argument fell on deaf ears, and Brown & Root Services Corporation (then the LOGCAP contractor) paid over \$18 million dollars in taxes, for which it was reimbursed by the U.S. Government. The money eventually was recovered after the Hungarian Government agreed to amend the omnibus agreement.

Other government permits. Additional challenges included requirements to obtain permits for everything from minor construction to operating washracks. In summary, the contractor was not permitted to operate with the same freedom as a U.S. military unit would have been and was left on his own to negotiate many issues with the host government. The U.S. Government was in a better position to negotiate for the contractor and had a legal, financial, and operational interest in doing so. A contractor's success in supporting U.S. forces depends heavily on the synergistic relationship between the contractor's staff and the JFC's staff.

Support for Contractors

The first challenge for the planner in preparing for contractors on the battlefield may be a conceptual one: what is the JFC's responsibility to civilian contractors? The JFC may be required to provide only limited support to host nation contractors, but the situation is far different for contractors brought in with the force from the continental United States. The U.S. Government assumes greater responsibility for the contractors it brings into the theater.

Force protection. The Government's responsibility for providing force protection to contractors derives from three factors: a legal responsibility to provide a safe workplace, a contractual responsibility that is stipulated in most contracts, and a practical responsibility to help contractors to do their job. The threat level in Somalia was such that the LOGCAP contractor required a military escort nearly all the time; at various times, as many as 12 to 18 marines or soldiers were assigned to escort duty. In contrast, the LOGCAP contractor travels nearly 1 million miles a month on the open roads of Bosnia, Croatia, and Hungary, and for the most part without the benefit of any force protection. The contractor practices good threat awareness and joins with military convoys where possible, but many times his employees travel alone and unprotected. The lesson for the planner is that force protection must be part of the deliberate plan and include the flexibility to respond to a situation as it develops. The contractor may require constant force protection (the Somalia model) or limited support (the

Bosnia model).

Getting contractors into the theater. It is generally wise to write contracts so that contractors are required to be self-sufficient in their operations. Contractors with a large work force and a lot of equipment to transport can charter their own aircraft or surface vessels and not compete with U.S. forces for strategic lift. The decision, however, is not always simple. If contractors are required to provide their own transportation, the Government will certainly pay for it under the terms of the contracts. Planners also must consider the availability of debarkation space at the airport or dock. Whether contractors flow through the time-phased force and deployment data (TPFDD) system on Government transportation or are told to find their own ride, they must be provided space to disembark in the theater.

Food, lodging, and medical support for contractors. As with transportation, the contractor can be directed to provide for his own life support, or the Government can provide it. It generally is less expensive for the Government to provide these services to contractors than to have them purchase their own. Regardless of contract type (fixed price or cost reimbursement), it is feasible and legal for the Government to provide meals, lodging, and medical care to contractors in a theater of operations. However, provision of medical care can present significant challenges. DOD Instruction 3020.37 states that "civilian contractors in a theater of operations are entitled to the same medical care as military personnel." The JFC may lack the facilities to provide medical care to a large number of contractor employees if the issue has not been addressed in the logistics support plan.

Real estate facilities for contractors. Where will the contractors set up shop in the theater? What are their requirements for work space? Will they need facilities in a secured area, such as inside a military compound? Contractors can be directed to find their own facilities and, if necessary, hire guard services to protect those facilities. The planner should be concerned with cost, physical protection requirements, and coordination of the contractor's requirements with the military's requirements. This last factor is often overlooked. In an area where facilities are limited, contractors may be competing with the military for space. It may be desirable to require contractors to get U.S. Government permission before entering into real estate leases. The Joint Acquisition Review Board normally will make these decisions once it has been established in the theater.

Command and Control

With 9,000 contractor personnel deployed in support of Operation Desert Storm, it was a good thing the war was short-lived. Command and control of so many contractors could have posed real problems. Though a situ-

ation like that may seem daunting, several organizations are available to support the JFC in administering contracts.

Joint Acquisition Review Board (JARB). The JARB concept is not entirely new, but it was refined and used with notable success in Operations Joint Endeavor and Joint Guard in Bosnia. The JARB's purpose is to review and monitor all contracting activity in a theater to promote efficiency and cost effectiveness. Contracting officers supporting the Gulf War sometimes competed with each other for scarce resources (such as vehicles), which resulted in higher prices and less efficient allocation. All acquisitions in the Bosnian theater above a specified threshold are reviewed by the JARB to determine four things: is it a valid military requirement? Can the requirement be satisfied with organic (military) assets? Should the requirement be met through contracting? What is the cost impact? Most actions referred to the JARB are for life support services for which the JFC has budgetary responsibility. The membership of a JARB consists of the senior logistics officer (the J4, usually represented by the senior contracting officer) and representatives of the user commands (the customers), the Army Materiel Command (AMC), and the Defense Contract Management Command.

Principal Assistant Responsible for Contracting (PARC). Joint doctrine for contracting has not been fully developed, so, unfortunately, contracting is being conducted in an ad hoc fashion. For that reason, it will be helpful to use an Army term (PARC) to designate a position that should be created in a theater. (For the purposes of this discussion, recognize that in a joint environment this billet could be filled by any of the Services and that the title of the position may be different.) The legal authority to award contracts flows from Congress through designated lines of authority. The PARC is a contracting professional (part of the Army Acquisition Corps) designated by the JFC to represent him in contracting matters. The PARC usually chairs the JARB.

AMC's logistics support element. AMC has a logistics support element designated for each CINC's area of responsibility. If LOGCAP is used, AMC will deploy a program management team known as "Team LOGCAP" to provide onsite program management.

Defense Contract Management Command (DCMC). DCMC is a subordinate command of the Defense Logistics Agency (DLA), which is designated a combat support agency. DLA deploys a DLA contingency support team to act as the agency's single point of contact with the JFC. Contract administration is one functional element of the total team. DCMC's mission is to provide post-award administration of DOD contracts. In this role, DCMC conducts onsite monitoring of the contractor's activities to ensure that the contractor com-

plies with the terms of the contract. Although the JFC's planning staff may invite DCMC into the theater, their legal authority to operate must be established through a contract delegation from the procuring contracting officer who issued the contract. DCMC administered the LOGCAP contract on behalf of the Army Corps of Engineers in Somalia, Rwanda, Haiti, and Bosnia.

Army Corps of Engineers. The Corps of Engineers Transatlantic Programs Center developed the original LOGCAP contract in 1992 and managed the effort until AMC assumed responsibility in October 1997. The Corps continues to provide program management of the Operation Joint Forge sustainment contract, the successor to LOGCAP in Bosnia. Although the Corps' primary focus is construction, they have in-depth knowledge of services and support contracting in the contingency environment.

Contractor integration into the force. The extent to which contractor personnel are integrated into the force must be decided by the JFC based on the advice of staff counsel and lessons learned. There are some recurring issues. Should contractors be issued battledress uniforms? Should they be required to follow force protection rules (including travel restrictions)? Should they be required to live on post? Should they be required to follow general orders with regard to use of alcohol? These issues are best settled by mutual agreement between the Government and each contractor *before* deployment. Except by mutual consent (contractual agreement), contractors are not subject to general orders or other policies designed for good order and discipline among the troops.

Operational Level Budgeting

Budgeting for life-support contractors, such as the LOGCAP contractor, has long been a problem. The costs normally are borne by the Service component with lead responsibility for common-user logistics in the hope that reimbursement may come through a supplemental appropriation from Congress. U.S. Army, Europe (USAREUR), has primary responsibility for managing LOGCAP costs for the Bosnia deployment (which topped \$459 million in the first year alone).

Although the Logistics Management Institute and GAO found LOGCAP to be a cost-effective method of providing CSS, GAO expressed serious concerns about the Army's ability to control and report costs effectively. By the end of the first year of LOGCAP in Bosnia, USAREUR had developed the necessary cost-reporting systems to overcome earlier criticisms. However, the Army Audit Agency and GAO believe that most CINC and JFC staffs lack the expertise to manage a contract of that size. The apparent solution is for the JFC to assemble a professional contract management cadre, in-

cluding financial experts, to augment the operational staff. DCMC can provide invaluable assistance to the JFC in monitoring contractor costs.

Contractors are a valuable asset to the JFC. Planning is necessary, however, to capitalize on their strengths and minimize the potential for disruption. Although joint doctrine for contracting is not fully developed, there is a growing body of information available. While one might desire a simple checklist that would cover all possible considerations, the subject is far too complex. A few guidelines might prove helpful.

Maintain organizational simplicity and unity of command. Develop a simple organizational structure with unity of command over Government personnel responsible for contract administration. By using the services of AMC, DCMC, and the Army Corps of Engineers to manage contracts, the JFC can consolidate oversight functions, reduce duplication of effort, and reduce the number of support personnel required in the theater. For example, personnel from all three commands joined to form the Joint Logistics Support Command in Haiti. Such arrangements offer unity of effort while permitting the different organizations to align with their parent commands for contracting authority.

Minimize the number of contractors. Obviously, one contractor with several thousand employees is easier to manage than a hundred small contractors with a few employees each. Strong consideration should be given to employing one major contractor, such as LOGCAP or AFCAP (Air Force Contract Augmentation Program—similar to LOGCAP), to provide all common-user logistics support.

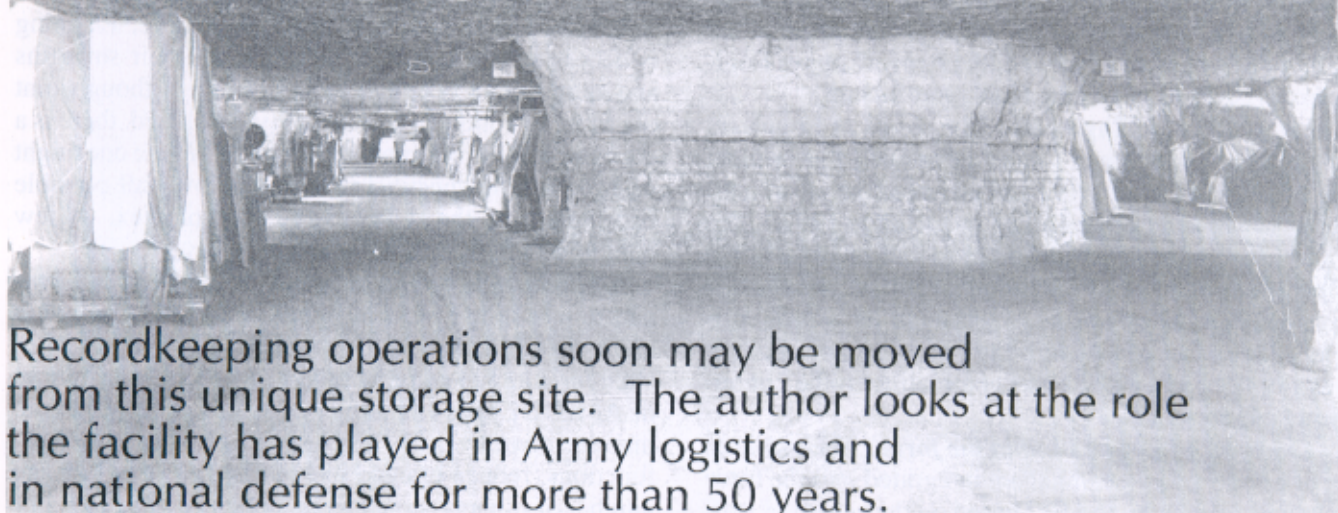
Include the contract management team and key contractors in the planning effort. Early involvement by Government contract administrators and contractor personnel can increase significantly the chances of mission success, as well as the reliability of preliminary cost estimates. GAO estimates that LOGCAP costs exceeded the estimated budget for the first year in Bosnia by 32 percent, partially due to changes in the operational plan and failure to coordinate early estimates properly.

With proper planning, the growing presence of contractors on the battlefield can be a source of strength for the men and women of our Armed Forces. **ALOG**

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The Atchison Storage Facility

by Thomas J. Slattery



Recordkeeping operations soon may be moved from this unique storage site. The author looks at the role the facility has played in Army logistics and in national defense for more than 50 years.

Two Army Industrial Operations Command (IOC) employees work 50 to 150 feet underground, maintaining millions of technical documents in a secure, specially equipped, controlled-climate facility. Their unique workplace is the Atchison Storage Facility, home of the Army Materiel Command (AMC) Master Duplicate Emergency Files Depository (MDEFD) and the AMC Technical Data Repository (TDR) for more than 25 years.

IOC once stored some machine tools for defense production there, including specialized munitions. Now this unique underground storage facility may fall victim to downsizing, as the two IOC employees and their recordkeeping operations tentatively are scheduled to move to the Lake City Army Ammunition Plant on 1 August. The Defense Logistics Agency (DLA), which currently manages the entire underground facility, is considering ending use of the site and reporting it as excess property.

The facility's history began with George W. Kerford and his descendants, whose limestone quarrying operations at the site created huge, cavern-like rooms beneath the ground. Starting in 1886, the Kerford family built one of the most successful African-American businesses in the nation. The transformation of a portion of this mine into the Atchison Storage Facility is a fascinating story.

World's Largest One-Level Storage Facility

The Atchison Storage Facility is located approximately 2 miles southeast of downtown Atchison, Kan-

sas. It is situated in the heart of the Nation on the Missouri River, 72 miles northwest of the Lake City Army Ammunition Plant (LCAAP), which is near Independence, Missouri.

The site is known also as "Atchison Cave," which is a misnomer, because it is not really a cave, but a vast complex of underground mines. Limestone was mined from within a bluff, creating huge cave-like rooms. The total underground surface area of the complex is approximately 127 acres. It has been described as the world's largest single storage unit on one level, with floor space equivalent to a multimillion-dollar storage building. One hundred seventy-eight pillars of unmined limestone, each 20 to 30 feet in diameter, support the massive rock ceiling.

Food Storage Site

During World War II, an Atchison businessman suggested to the Under Secretary of Agriculture that the Kerford mines would make a natural place to store reserve farm products. In July 1944, the Kerford family ceased mining operations and leased their underground quarry to the Federal Government for \$20,000 a year. (Much later, around 1955, the Kerfords sold the site to the Government for \$1,325,000.)

At a cost of almost \$2 million, the Federal Government transformed a portion of the underground mines into a cooler for the preservation of food. The temperature in the mines was lowered to 32 degrees so that the War Food Administration could store perishable food, such as sides of beef, eggs, vegetables, fruits, butter,

lard, and salt pork there. Twelve railcar loads of dried eggs were delivered there in September 1944. By 1949, the underground storage area contained 8,872 tons of eggs, 20,493 tons of prunes, 1,061 tons of raisins, and 48 tons of skimmed milk. At that time, the Federal Government estimated it had saved \$700 million by maintaining food and other materials in this underground storage facility.

A Change in Mission

Production machine tools had been scarce during the early days of World War II. Based on that lesson, the Army Ordnance Department leased the underground facility in December 1951 as a place to store specialized defense industrial production machine tools to be held in reserve for use during mobilization. The facility was to be a part of the Ordnance Corps Production Equipment Readiness Program, under which critical machine tools, including those necessary for production of special weapons, were to be maintained in operating order so they could be shipped to manufacturers as soon as their emergency requirements were received.

On 28 March 1952, the site became known as the U.S. Storage Facility-Atchison Cave and was assigned to Lake City Arsenal (now Lake City Army Ammunition Plant). The Army converted two of the largest mines into a storage facility—the east mine, which covers 16½ acres, and the west mine, which covers 46 acres. The transformation involved installing electric lights, paving concrete floors, and constructing a receiving dock at the facility entrance, docks for barges along the Missouri River, and a railroad dock that could accommodate 20 railcars.

An ammonia-to-brine dehumidification system was installed to reduce moisture and maintain a humidity level of 42 percent in the underground rooms. This system is still in use. Heat from the dehumidification process helps to maintain the underground temperature at between 65 and 72 degrees. Large circulating fans provide a continuous flow of air through the entire storage area. Fresh air is received underground from ducts connected to airshafts to the outside. In the winter, the ducts are closed and the interior air is recycled throughout the mine. The limestone pillars absorb heat in the summer and provide some warmth in the winter.

rooms were paved with approximately 6 inches of concrete to allow equipment to be moved easily.

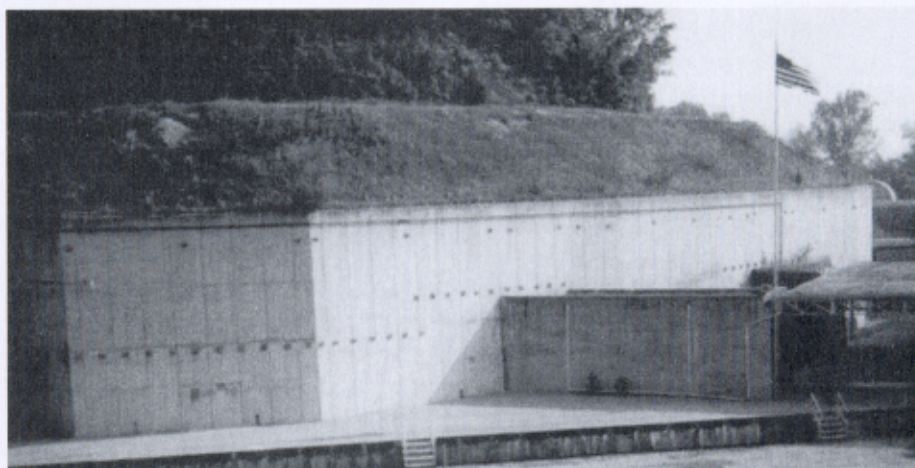
The rock ceiling was coated with gunite to seal off all fissures

ily. Cinderblock walls were installed to separate the area into large rooms. Three sump pumps were set up to collect and remove any water that seeped into the underground facility. A generator was installed to provide power in case of emergency.

Page Airways, Inc., of Rochester, New York, was awarded a contract to manage the underground operation. Over 5,000 items of production equipment critical to the Ordnance Corps Production Equipment Readiness Program were moved into the Atchison facility during the 1960's. As of 31 July 1962, the total number of machine tools in storage at the underground facility was 5,220, which included 23 for the Army Signal Corps, 1 for the Air Force, 26 for the General Services Administration, and 17 slated for disposal.

Page Airways maintained a cycling chamber to study the condition of items held in storage. The contractor also operated a machine-tool rebuild shop near the entrance to the east mine. The shop rebuilt various types of machine tools to required tolerances and compiled data on costs, labor, replacement parts, and tolerance requirements. For example, the shop rebuilt 27 machine tools during the first 6 months of 1960. The shop completely disassembled, inspected, and replaced worn machine parts. Machinists operated each rebuilt machine for 8 hours, checked its tolerances, and made adjustments to ensure its readiness. The cost for labor and materials to rebuild these machine tools was \$65,949. The replacement cost of the 27 machine tools would have been \$703,577.

The contractor performed periodic inspections on the equipment in storage, and all outgoing machines were inspected again and a test run conducted before they were shipped. Excess and obsolete items sometimes were purged from the equipment in storage through donation to state agencies, acceptance of bids from the private sector, and demilitarization of items not claimed by other organizations.



□ Loading dock and entrance to the Atchison Storage Facility.

Nylon material from excess parachutes proved to be valuable as economical, fire-resistant dust shields for stored equipment. The Army Ordnance Storage Facility, as it was called then, was the Army's redistribution center for these dust covers. On 1 January 1960, the facility stored 8,544 parachutes of various sizes. During the first 6 months of 1960, 789 parachutes were issued as dust covers for idle production equipment.

Safety First

The contractor continuously performed preventive maintenance on the facility's ceiling and walls. To assure stability of the underground facility, Page Airways installed over 3,000 5- and 7-foot bolts in the ceiling during the first 6 months of 1961 to help prevent cave-ins. Another 8,700 ceiling bolts were installed in 1962.

For the safety of the employees, the ceiling and structure of the facility were monitored continuously for any falling rocks and shifts in rock formations. Micro-seismic equipment was set up to detect movement of the limestone strata that formed the roof of the mines. Over the years, early detection and analysis of movements in the rock strata led to further preventive measures to ensure adequate ceiling support. Although some cave-ins have occurred in the undeveloped portions of the mines, the developed sections have not had any major problems.

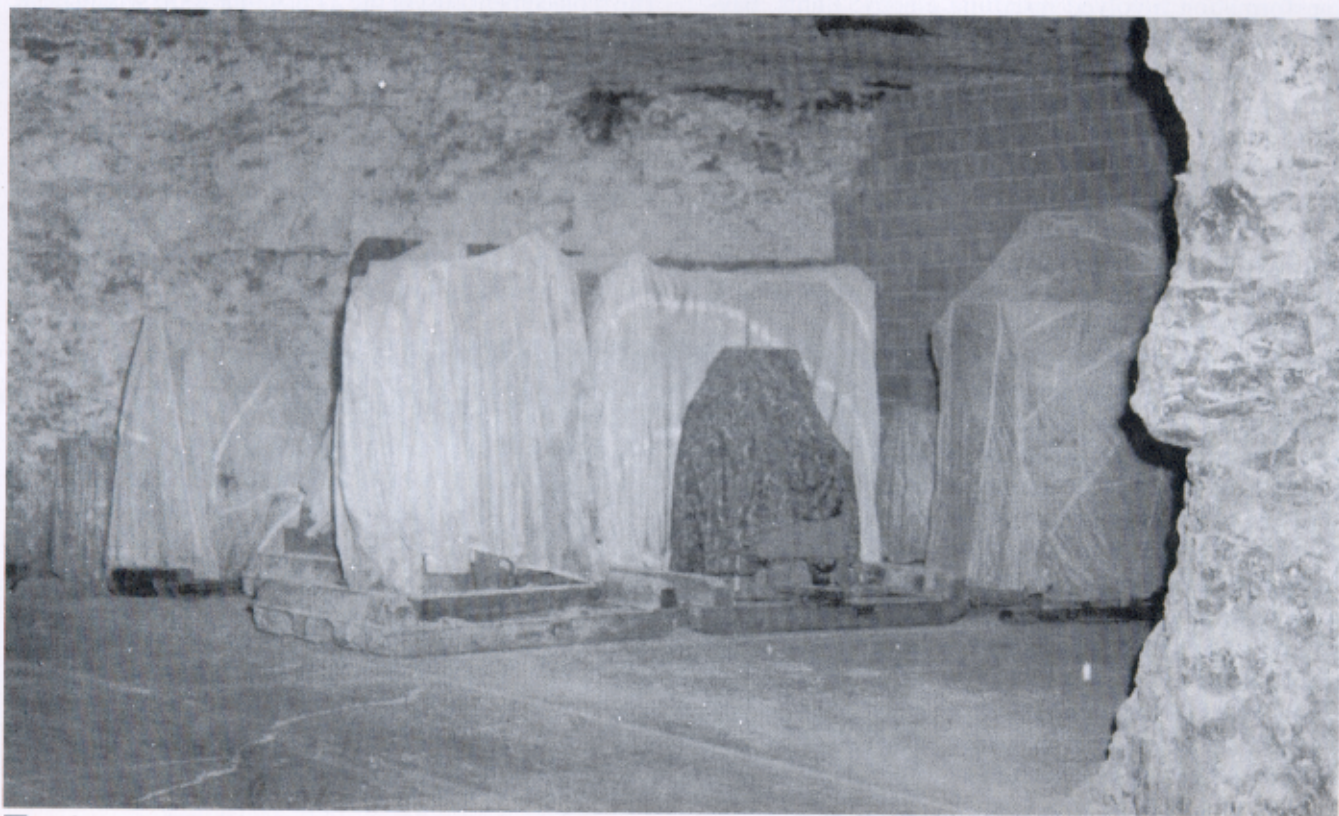
At various times, the Atchison community has used

the underground storage facility for meetings to escape the heat of a hot summer's day. On 23 July 1963, for example, the town used the facility to present a program supporting the memorial for Amelia Earhart, a native of Atchison. "Atchison Cave" was the only facility in town large enough and cool enough to accommodate such a large crowd.

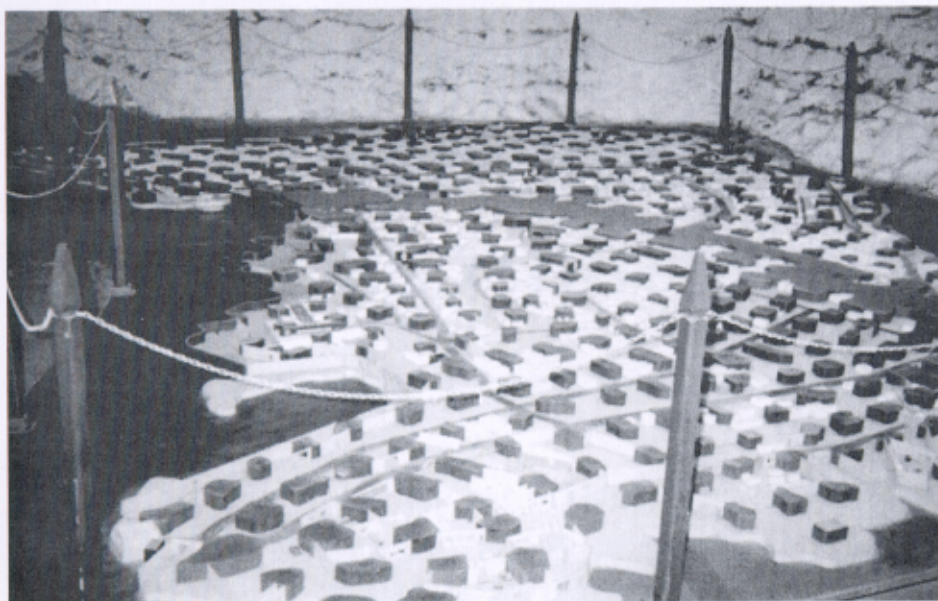
Atchison Storage Facility Today

On 19 September 1963, the Army agreed to transfer responsibility for operating the Army Ordnance Storage Facility to the Defense Supply Agency (DSA), which assigned the facility to the jurisdiction of the Defense Industrial Plant Equipment Center. DSA became the Defense Logistics Agency (DLA) in 1977. The facility's name subsequently was changed to the Atchison Storage Facility.

Today, Riojas Enterprises is the Atchison Storage Facility's operating contractor for DLA. Less than a dozen contractor employees are involved with storing and repairing industrial plant equipment still kept at this huge site. IOC and other organizations that store industrial plant equipment at the underground facility are in the process of disposing of the obsolete production equipment, so the quantity of equipment in storage continues to shrink. Currently, there are only about 300 excess machine tools remaining in the main storage area. Medical supplies other than medicine, military cloth-



□ Nylon material from excess parachutes was used as fire-resistant dust shields for stored equipment.



□ In this model of the underground storage area, blocks represent the locations of storage vaults.

ing, boots, blankets, and cots are stored in the larger portion of the facility.

Emergency Files Mission

The AMC MDEFD in vault 1 has 2,650 square feet of floor space. This depository's mission is to store records required for emergency purposes or to replace those destroyed as a result of natural or man-made disasters. Stored there are paper copies of documents, magnetic tapes, microfiche, and microfilm from AMC headquarters and IOC arsenals, depots, ammunition plants, and activities. Vault 1 also contains technical publications, files, regulations, circulars, pamphlets, manuals, military standards, and supply catalogs of value to AMC's major subordinate commands. The stored information has proven useful in the past to Government lawyers engaged in litigation over such matters as foreign military sales and clean-up of contamination at AMC sites. Today, to improve its efficiency, the depository's goal is to become paperless. Therefore, users are instructed that information to be stored there should be sent on floppy disks, CD-ROM's, or magnetic tape.

The AMC TDR, located in vault 2, consists of 7,600 square feet of floor space. The repository has in storage approximately 21 million aperture cards containing vital engineering records, drawings, and technical data package information on AMC and AMC subordinate organization products ranging from tanks to small arms to ammunition. The information covers research and development, engineering, test and evaluation, and product operations related to AMC responsibility for the production, use, and maintenance of munitions and equipment. These data are kept on 3.7-inch aperture cards, each of which contains three 35-millimeter im-

ages on microfilm. The cards are maintained in cabinets by the two-person IOC staff and are filed by the drawing identification number.

Headquarters AMC and most subordinate organizations have phased out their use of aperture cards, so the depository no longer receives the volume that it once did. AMC plans to place two-thirds of the drawings and other technical data now on the aperture cards on optical disk CD-ROM's. At least 7 million aperture cards containing technical data on obsolete equipment will be deleted from the new system. The MDEFD will become the sole source for that information, and for that reason the depository continues to maintain an old electric accounting machine adapted by IBM to process the information on the cards. John Barrington, the supervisor of the MDEFD, stresses that their efforts emphasize collecting current copies of technical or operational information needed to reconstitute an operation from scratch rather than on collecting historical data. Mary Underwood, records control clerk, has assisted Barrington in these efforts since 1973. Both are members of the IOC Mobilization Operations Team at Rock Island.

Because of disarmament treaties, downsizing, and sophisticated technological advances, the Atchison Storage Facility's mission has changed significantly over the years, and now operations there may be shut down completely. However, history will forever note the facility's unique role in Army logistics and its contribution to national defense for over half a century. **ALOG**

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Combat Service Support— Rising to the Challenge of Shrinking Resources

by Captain Willie Rios III

One combat service support unit discovers ways to take on new missions, continue to meet the needs of its customers, and improve the services it offers.

With the end of the Cold War in the early 1990's, many unique combat service support units were inactivated as a part of the overall drawdown within U.S. Army, Europe (USAREUR). However, the support provided by these units was still in high demand. One solution was to consolidate maintenance services in many of the general support (GS) maintenance units in the theater. One unit in particular, the Equipment Support Center, Mannheim (ESCM), 51st Maintenance Battalion, in Germany, took on many of the diverse missions that still had to be performed throughout USAREUR. The unit has undergone many changes since its inception in 1945. The result of these changes is a multifunctional combat service support unit that is effectively equipped to support theater readiness.

Consolidation

With the deactivation of the USAREUR Bridge-Park in 1992, ESCM assumed the mission of maintaining and repairing all engineer bridging assets throughout Europe. This new mission included the storage and care of all Army war reserve bridging stocks within the theater. The stocks were issued to both active and reserve component units rotating through and training within the theater.

Another unit, the 8908th Civilian Support Group, also was deactivated in 1992, and ESCM assumed its mission to provide GS maintenance repair of tracked vehicles. This included repair of major end-items and components, such as fire-control equipment, under the Army Working Capital Fund program (formerly known as the Defense Business Operating Fund). ESCM also assumed

the major end-item repair mission under the GS maintenance program.

Not Your Ordinary Maintenance Company

ESCM is a clear example of a diverse unit whose mission has been expanded; one that truly fits the mold of a multifunctional maintenance company. The unit's mission statement can be broken down into several categories. Its primary mission is to provide GS maintenance with a limited depot repair capability. Additional missions include bridging and engineer and electronic base operations (BASOPS) missions. The goal set by the commanders of both the 29th Support Group and the 51st Maintenance Battalion is to ensure a high readiness rate for all supported units by delivering an efficient and high quality product and by providing the best possible service to their customers.

GS Maintenance Mission

ESCM executes the European theater's GS maintenance program as directed by the 21st Theater Army Area Command (TAACOM) for theater sustainment maintenance management and the 29th Support Group for local sustainment maintenance management. Using integrated sustainment maintenance concepts and principles, ESCM repairs over 1,000 class VII end items and subcomponents yearly. Under the Army's Working Capital Fund program, ESCM is responsible for repairing unserviceable subcomponents and returning them to the supply system for future use. These subcomponents include engines and transmissions from the M88A1 armored recovery vehicle, M60A1 armored vehicle

launch bridge, M915A1 truck tractor, and M939 cargo truck; fire control equipment, including laser rangefinders, from M1A1 and M2A2 combat vehicles; thermal receiver units; control boxes and sight units; and automotive end items from the tractor-truck series.

ESCM's success comes from repairing those items that bring about the greatest potential cost avoidance to the theater as well as those items within USAREUR that require a high readiness rate. To date, the repair of fire-control equipment has realized the greatest return. To ensure that ESCM remains in the forefront of GS maintenance, several new programs and equipment acquisitions have taken place within the last year. Because of these innovations, ESCM has built a reputation throughout USAREUR as the leader for both efficiency and quality within the maintenance community.

GS Bridging and Boating Repair

Bridging repair is an area still in much demand within USAREUR. This was very evident during Operation Joint Endeavor and Operation Joint Guard. ESCM is the only Army unit within the theater that is capable of repairing both bridging and boating equipment to GS standards. This is due, in large part, to the assumption of USAREUR's bridge park mission and to personnel who have the experience and knowledge needed to repair such high-demand equipment. The majority of repairs center on the armored vehicle launched bridge (AVLB), interior bridging sections, and MK1/2 bridge

boats. During fiscal year 1997, over 75 percent of all GS repair and return job orders directly affected equipment readiness for those units deployed in support of Operation Joint Endeavor and Operation Joint Guard.

ESCM also provides onsite maintenance and repair by employing maintenance contact teams throughout Germany. These teams are responsible for repairing the vast majority of the AVLB fleet within USAREUR at the units' locations. This type of support directly impacts the state of readiness within USAREUR by reducing transportation waiting time, transportation cost, and maintenance time to repair.

Electronic BASOPS

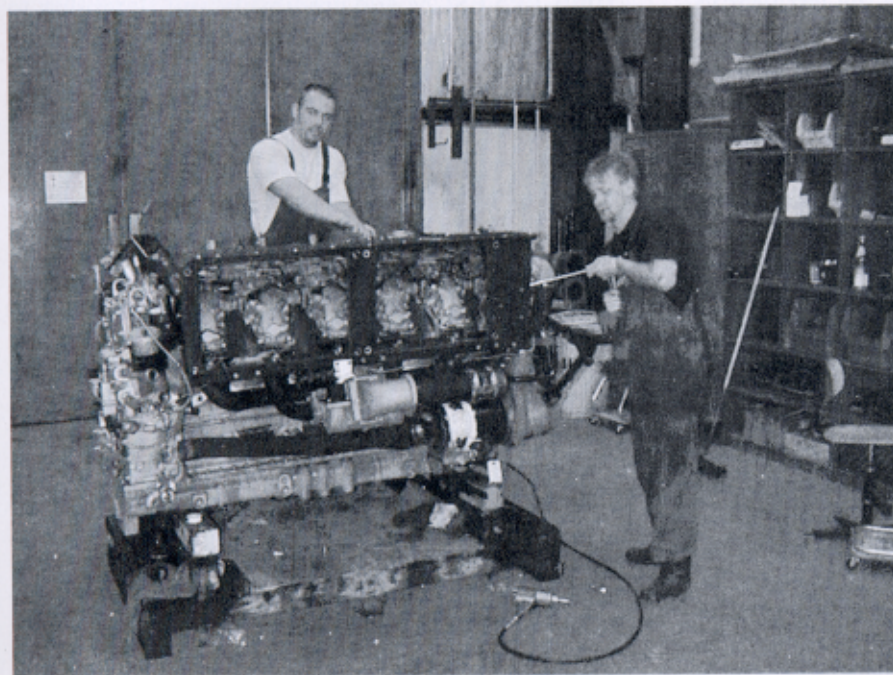
Another key mission that makes ESCM so diverse involves the repair of commercial electronic equipment. This long-standing mission of the ESCM recently was consolidated with the mission of the 29th Support Group Maintenance Center of Excellence, Würzburg, Germany. Under this program, ESCM repairs and classifies electronic equipment throughout Germany by employing maintenance contact teams to either repair on site or provide pick-up and delivery of equipment for customers. In an average month, this 19-person section averages well over 400 maintenance job orders.

Apprenticeship Program

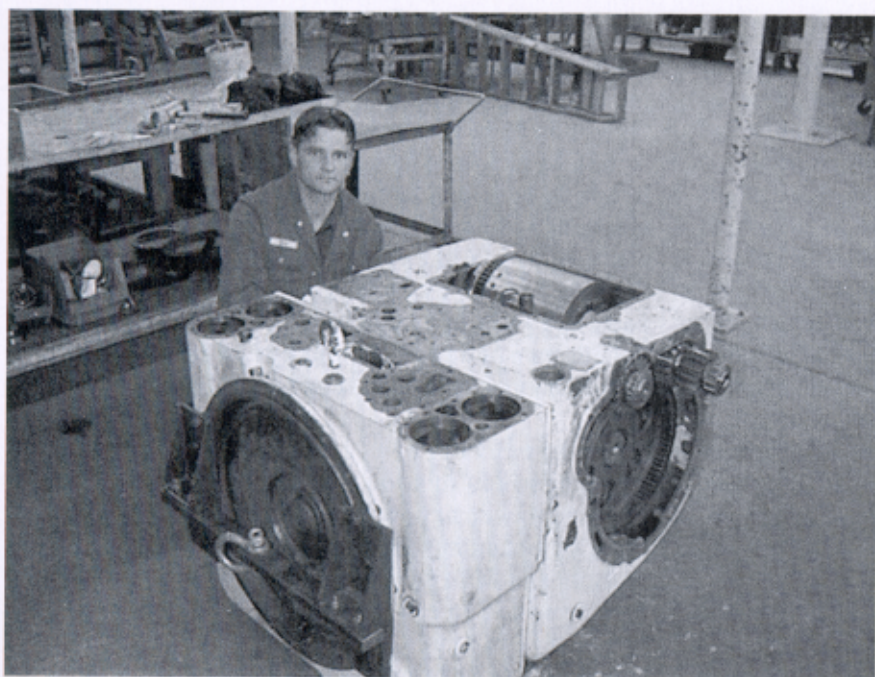
ESCM also manages a 2½ year onsite apprenticeship program for approximately 18 students a year. This program was established in 1965 by the Army in conjunction with the states within Germany. After the students are trained on Army systems and commercial equipment, they can be employed within the system. Currently, 40 percent of ESCM's personnel have graduated from this program. Eighty percent of each graduating class is employed within ESCM. The other graduates have the training and experience necessary for employment within the civilian sector.

21st Century Efficiencies

One of the innovations currently underway at ESCM that will ensure that ESCM remains competitive well into the 21st century is the fielding of a state-of-the-art engine test stand. During fiscal year 1997, ESCM was awarded a contract to modify its existing test stands. The



□ Repairmen work on an M88A1 recovery vehicle engine.



□ M88A1 recovery vehicle transmission being repaired.

updated test stands will ensure that quality products are returned to the Army supply system. They will be equipped with the latest computer digital technology, much like that used by civilian maintenance contractors and other production industries.

One of the challenges that ESCM faces every day is providing repairs at the lowest cost possible. ESCM has employed many techniques within the last year to master this tremendous challenge. One of them is the adoption of the inspect and repair only as necessary (IROAN) concept. While this is not a new concept, many of the employees have adopted IROAN into their everyday lives this past year due to a more astute awareness of competition from outside sources and other units. Other techniques ESCM has employed include the creation of a research and development team, the implementation of ISO 9001 operational standards, and the reorganization of sections into work centers.

The research and development team is responsible for researching future repair candidates as well as analyzing equipment and repair trends. This team, which was established in July 1997, has increased the potential of ESCM's repair program by 85 percent. One unique equipment purchase that the team recommended was a specially modified endoscope. The endoscope, much like the one used in the medical community, allows the repair mechanic to view the internal condition of an unserviceable engine. The endoscope will reduce the repair cost substantially by allowing the mechanic to gain visibility without disassembling the entire engine.

In October 1998, ESCM was awarded ISO 9001 certification, making it the only Army unit within Europe with this honored distinction. This certifies that ESCM has documented quality processes and efficient procedures to achieve customer satisfaction in all that it produces. ISO 9001 is an industrial certification process, known worldwide within the industrial community, that adds credibility to an operation both internally and externally. Internally, the benefits include an improved quality system, improved products, increased competitiveness, and commitment to quality. Externally, customers can expect consistency in both quality and delivery.

Finally, ESCM is restructuring its work force in conjunction with ISO 9001 and total quality management procedures. To ensure that quality

processes are integrated throughout its facility, ESCM has restructured the makeup of its quality control personnel within the work centers and teams. Work teams consisting of three to four personnel, a supply clerk, and a quality control representative also have been established within the centers.

Units like ESCM add credibility and flexibility to the theater by sustaining critical maintenance functions that are in high demand. The future of the Army is to develop and integrate units like these into multifunctional maintenance companies and centers that will meet readiness and sustainment maintenance demands of the future.

ALOG

Captain Willie Rios III currently is participating in the Army's Training With Industry program at Supervalu, Inc., in Seattle, Washington. Previously, he was the commander of the Equipment Support Center-Mannheim, 51st Maintenance Battalion. He is a graduate of the Field Artillery Officer Basic, Airborne, Nuclear Warhead Detachment, Aerial Delivery and Materiel, and Combined Logistics Officer Advanced Courses.

Unit-Level Water Resupply— It's in the Bag

by Major Robert O. Bosworth

Recent developments in the water-packaging arena have created alternatives to the 5-gallon water can as the method of choice for water resupply at the unit level.

The Army Forces Command (FORSCOM) has been using a water-packaging system that produces 1-liter bags of water that are small enough to fit into the cargo pocket of the battledress uniform (BDU). Several active-duty and Army National Guard light infantry units have been testing 6-gallon water bags developed by local contractors. The 1-liter and 6-gallon bags already have been used successfully at the Joint Readiness Training Center (JRTC), Fort Polk, Louisiana, and soldiers in the field have given them their stamp of approval. To logisticians, the ultimate benefit of these water bags is the flexibility they provide for supporting soldiers in the field.

An Ageless Challenge

Distribution of water from the brigade support area (BSA) to the individual soldier always has been a challenge. The process starts in the field trains and extends forward to the company combat trains. Unit supply personnel traditionally maintain a large inventory of 5-gallon water cans to provide continuous water support to soldiers. If 200 cans are required for a logistics package (LOGPAC) to resupply one infantry battalion in the field, a minimum of 400 cans must be maintained on hand, because another 200 cans must remain in the field trains for the next LOGPAC. The effort expended to collect the empty water cans and refill them in time for the next LOGPAC has been a constant headache for logisticians.

In an effort to improve logistics support to soldiers, FORSCOM purchased three vertical form, fill, and seal machines from the General Packaging and Equipment Company in Houston, Texas. These water-packaging systems were built to military specifications and can produce 30,000 1-liter bags of water a day at a cost of 30 cents per bag. The filled bags

are distributed to units in cardboard boxes that hold 16 bags each. According to the FORSCOM project officer for the water-packaging system, the systems have been used with great success to support military operations and exercises at different locations around the world, including Egypt, Hungary, and Thailand.

The water-packaging system also was used at JRTC in support of the 41st Separate Infantry Brigade's (SIB's) rotation in June 1998. The 41st SIB's S4 reported that the water-packaging system gave logisticians at JRTC a degree of flexibility they had not had before. The 1-liter and 6-gallon water bags bridged the water resupply gap between LOGPAC's and company combat trains. Supply personnel were freed from the burden of tracking 5-gallon water cans distributed among various units, and combat trains had two quick and efficient options for providing water to individual soldiers. The bags also were ideal for units that pre-positioned or cached water in the field.

In addition to providing alternative water resupply methods for LOGPAC's, the water bags were especially effective for treating heat casualties at battalion aid stations in the 41st SIB's BSA at JRTC. Chilled 1-liter



☐ Water bags packed in MRE boxes are more stable in a moving vehicle than 5-gallon cans with their high center of gravity.



□ A soldier from the 76th Separate Infantry Brigade (Light) fills his canteen from a 6-gallon water bag during annual training at Camp Atterbury, Indiana.

water bags provided relief to heat casualties and to soldiers in casualty evacuation situations and mass casualty exercises. Frozen 1-liter water bags were crushed to break up the ice inside and create an ice pack that conformed to the contours of bruised and injured limbs.

Kicking the Can

While FORSCOM has been refining the individual 1-liter bag, several light infantry units have examined the 6-gallon water bag as another practical alternative to the 5-gallon can. Captain William M. Connor, Jr., has written an article about the success of the 2d Battalion, 27th Infantry, in using 6-gallon water bags during its JRTC rotation. See his article, "Water Resupply in the Light Infantry," in the July-December 1997 issue of *Infantry* magazine. That unit's experience sparked the interest of the 76th SIB (Light), an enhanced National Guard brigade based in Indiana. The 76th SIB is preparing for its JRTC rotation in the year 2000. Its 2-week annual training exercise at Camp Atterbury, Indiana, in July 1998 focused on a JRTC scenario. Water resupply was crucial during the exercise as daily temperatures soared into the 90's and humidity levels edged into the high 80's.

The brigade's 113th Support Battalion used three 600-gallons-per-hour reverse-osmosis water purification units (ROWPU's) to produce over 40,000 gallons of purified water to support the brigade. The ROWPU site produced the water and stored it in 3,000-gallon fabric bags. The water was pumped from the bags into 3,000-gallon semitrailer-mounted fabric tanks and transported

to the BSA. It was distributed to the battalion field trains' 400-gallon water tanks at a water point collocated with the field ration break point. The water was transported from the BSA to the combat trains by LOGPAC. Instead of relying solely on 5-gallon water cans, the 1st Battalion, 152d Infantry, and 1st Battalion, 293d Infantry, supplemented their cans with 6-gallon water bags.

The S4 noncommissioned officer in charge of the 1st Battalion, 152d Infantry, read Captain Connor's water resupply article and contacted Parish Manufacturing, an Indianapolis-based company specializing in liquid-packaging products. The company designs packages for products such as milk, water, condiments, photo-development chemicals, and juice concentrates. Using an empty meal, ready-to-eat (MRE), box and a copy of Captain Connor's article as a guide, the company produced a 6-gallon-capacity bag made of linear, low-density, octane-based polyethylene with a 2-year shelf life. The bag was designed to fit inside an MRE box.

MRE boxes make perfect field-expedient containers. A 6-gallon bag of water can be unwieldy and tends to shift or roll on uneven surfaces. But the two-ply, 2.5-millimeter-thick bags are durable when packed in MRE boxes. For example, they withstood being dropped out of a UH-60 helicopter hovering 15 feet off the ground, pushed out of the back of high-mobility, multipurpose, wheeled vehicles (HMMWV's), and rolled down steep ravines and dragged back up by soldiers. In addition, the 2d Battalion, 27th Infantry, successfully sling-loaded boxed water bags during its JRTC rotation.

In a static resupply situation, some units pulled the

bag out of the box and left it on the tailgate of a vehicle while soldiers filled their canteens. Other units preferred to keep the bag in a box. They cut a small hole in the box and let the tube stick out through the hole. To consolidate loose MRE's, LOGPAC personnel placed unboxed MRE's in black plastic trash bags and put the water bags in the empty MRE boxes.

The MRE boxes can be stacked in the back of a HMMWV or other resupply vehicle. They also are stable in a moving vehicle, unlike the 5-gallon water can with its high center of gravity. One additional benefit provided by the MRE box is its limited insulating capability. Several units placed their water bags in large, plastic trash bags with ice and slipped the combination into the MRE box. The water remained chilled for several hours.

Resource Savings

Units have reported significant reductions in resupply times with the water bags, since they no longer have to inventory and transfer 5-gallon water cans. During annual training at Camp Atterbury, the 1st Battalion, 152d Infantry, cut its LOGPAC resupply times by as much as 25 minutes. Companies used a forward logistics assault team to resupply platoons and squads. When the tactical situation did not permit the resupply vehicle to stop, personnel dropped supplies out of the back of the vehicle at predesignated locations. The platoons or squads recovered their supplies and redistributed them at their convenience without having to track and maintain the 5-gallon water cans for exchange during the next resupply mission.

In addition to the variety of options packaged water provides logisticians, its cost makes it even more attractive. Budget-conscious leaders know that cost is a key issue for units deploying to the field. Bottled water can

cost over 70 cents a liter, and commercial transportation costs raise the overall cost even higher. The military 5-gallon water can (national stock number 7240-00-089-3827) costs \$9.24. A 1-liter water bag costs 30 cents. A 6-gallon water bag costs 62 cents. The low cost, simplicity, and versatility of bagged water makes it a winner with leaders, logisticians, and soldiers alike.

The appeal of packaged water is not limited to military operations. A 6-gallon water bag could serve families and small groups of people better than the 1-gallon water jugs usually provided by relief organizations during floods, tornadoes, other natural disasters, and emergency situations.

A potential leadership challenge with water bags is trash in the field. Since the MRE boxes and water bags are disposable, their convenience may encourage soldiers to toss them on the ground and forget about them. Empty boxes and bags should be collected and disposed of properly. The solution to this issue is training, individual soldier discipline, thorough policing in the field, and supervision by noncommissioned officers.

Although the 5-gallon water can still is useful, the Army is taking steps to capitalize on the versatility of packaged water. Its potential in both water resupply and field medical care is especially appealing. The low cost and flexibility of 1-liter and 6-gallon water bags for military operations make them an attractive option for logisticians. The expendable nature of MRE boxes and water bags reduces the inventory challenges and clutter that supply personnel have dealt with in the past. The demonstrated success of packaged water in the field makes it a viable alternative to the 5-gallon water can for water resupply at the unit level.

ALOG



□ The 6-gallon water bag comes with a plastic clip on the hose to keep water from leaking out.

Major Robert O. Bosworth is a resident training detachment battalion team chief assigned to the 113th Support Battalion of the 76th Separate Infantry Brigade (Light), Indiana National Guard, as part of the Active Component/Reserve Component program. He has an M.S. degree from Towson University in Maryland and is a graduate of the Armor Officer Basic Course, the Quartermaster Officer Advanced Course, and the Army Command and General Staff College.

The author wishes to thank Steve Mayerhoefer, Major Kimberly Wilson, Captain William M. Connor, Jr., Sergeant First Class Thomas DeKemper, and John Billheimer for their assistance in preparing this article.

Modular Design for Future Logistics

by Captain Eric S. Elsmo

The author believes that the Army must be ready to take advantage of the technological concept of modularity in designing its equipment.

The Army After Next is characterized primarily by vastly improved information technology that impacts all other developmental areas. One critical yet overlooked aspect of improved technology is modularity. Information technology, coupled with advances in systems engineering and modular design, will enable logisticians to meet effectively the changing requirements predicted for future combat operations.

The dictionary defines modularity as "a system that is designed with standardized units or dimensions, for easy assembly and repair or flexible arrangement and use." Because it is simple, the concept of modularity appears intuitive, conjuring images of children's building blocks, prefabricated homes, or modern office workspaces. In fact, these examples incorporate many fundamental and efficient elements of modular design. Modularity is not a new concept; products have incorporated elements of modular design for centuries. Frankly, it is only the degree of functionality and ability to be upgraded that distinguish successful modular systems from all others.

For example, the General Motors family of automotive products is modular by definition. Features and styles may change among brand names, while the chassis and frames remain the same. Yet how easy is it to change a Pontiac Transport into an Oldsmobile Silhouette? For modularity to be useful, it must be functional and easy to implement at multiple levels.

Complex modular mechanical systems used by the Army After Next will require a high degree of technology. The way in which components connect to each other becomes critically important. The ability to integrate moving parts into a modular format assumes far greater advances in systems engineering and interface technology in order for a module to plug in and out easily. Computer interfaces are relatively simple compared to mechanical modules. Mechanical interfaces also must incorporate electric, fluid, motion, and power transfers into their design.

Modularity Enhances Performance

Modularity will provide 21st century leaders with equipment designs that offer enhanced capabilities, such as flexibility, adaptability, and continuity. These enhancements will increase the efficiency of multilevel systems dramatically. A significant aspect of modular design is that benefits are incremental in nature, expanding on capabilities inherent in a system.

Flexibility is one of the most obvious but least understood benefits of a modular system. In modular design, flexibility refers to the degree to which a system responds to change. Flexibility must be incorporated into system architecture early in the design process, creating loose interfaces that promote variety.

The twist to equipment flexibility is that it has a direct relationship to force composition. So far, the Army has been tailoring force structure to equipment in order to meet national security requirements. Modular design will provide equipment flexible enough to reverse this process. Planners in the Army After Next will have the option of determining equipment needs first and matching forces later.

Equipment flexibility has far-reaching implications for doctrine and organization. If planning and budgeting are no longer based on manpower but on equipment, then force structure planning and budgeting must be refocused. Planning and budgeting for a modular force with modular equipment will not deal with specific systems but with a concept of system management and implementation. Future doctrine will be based directly on technological innovation.

Another advantage associated with modularity is its ability to adapt. Adaptability is characterized by a system's ability to respond to a user's needs. Adaptability differs from flexibility in that its focus is not on upgrading or changing system components but on matching and modifying those components to meet existing requirements.

Modularity also will provide systems with the characteristic of continuity. From an operational perspective, continuity refers to a system's ability to provide support without interruption. In combination with future ultra-reliable systems, which are projected to provide operational readiness rates of over 99 percent, modular systems will offer essentially uninterrupted service. This means that during combat operations, systems will fail only because of enemy intervention or acts of God.

Continuity has powerful implications, because logisticians in the Army After Next simply will not deal with the types of limitations associated with today's equipment. Issues such as maintenance and equipment readiness will not have the same meaning for logisticians in future combat operations. Consequently, combat commanders in the Army After Next will be able to focus on the tactical situation far more effectively than they can today.

Modularity Produces Efficiency

The combined effects of the enhanced capabilities associated with modularity will result in increased efficiency. Efficiency is the hallmark of a modular system. Efficiencies will be seen in time saved, reduced manpower requirements, increased output, and reduced costs. For example, modular weapon systems will give future commanders the capability to customize an individual piece of equipment, or groups of equipment, to meet the needs of a particular contingency. As Charles A. Krohn suggested in a September 1993 article in *National Defense*, "Design of armored vehicles should be based on a modular concept of systems and protection. So, for example, a tactical tank with heavy protection packages and a lighter strategic tank can both be designed to be deployed rapidly by air."

A tank, or any other form of modular equipment that is not part of the first wave of combat force, would not necessarily be standard equipment for a deploying unit. In the Army After Next, modular equipment could be created specifically for the contingency and be assembled during transit. The chassis may come from one location, while the turret may be sent from another, with the two marrying up in the theater of operations. The new piece of armor then would be employed during the logistics pulse or refit phase of the operation.

This armor example is simplistic since it only involves two components. In most cases, weapon systems would have multiple components coming from a variety of lo-

cations. It is critical to grasp the power that modular equipment design, coupled with velocity management, can offer leaders in the Army After Next. Adaptive modular equipment can provide commanders with new tools they can use to shape future battlefields.

Incorporating modularity in the Army After Next will take the responsibility for component repair out of the hands of the military and place it back in the hands of the manufacturer. By reducing or eliminating repair functions through modular replacement, the Army can realize efficiencies at every level. Most importantly, modular systems will enable the Army to get on with the business of fighting the enemy by enhancing the throughput of combat power.

The issue is not if modularity will be employed, but to what degree. Industry is being driven to modularity by quantum increases in information technology and by the impact these increases have on demand. Modular equipment design will enable military leaders in the Army After Next to do more with less: diminished repair equipment requirements, fewer people, and less money. And modularity will provide soldiers with more time—a commodity of which they have precious little today.

Although modularity inevitably will be a part of the Army's future, this does not mean that we have the luxury of taking a passive approach and allowing industry to work out the details. Functional modularity for tomorrow starts with a well-planned and focused effort today. Those elements that are considered in the first phase of a product's life-cycle development are critical to success. Just a small change in the initial conditions of a system's development can drastically alter its long-term behavior.

For functional modularity to work, we must act now. The soldiers of the 21st century will feel the effects of the decisions we make today. It is our responsibility to plan for the future of our fighting force in the Army After Next, and modular system design must be a part of our plan.

ALOG

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Rock Island Arsenal— Not Your Average Job Shop



Rock Island Arsenal sometimes is described as a military “job shop,” a place where the Army and other services can go when they need parts that are unique and that can’t be produced quickly or profitably by the private sector. Last fall, the Arsenal’s manufacturing versatility was put to the test by a project to produce urgently needed parts, not for a weapon but for a key transportation link built over a century ago.

The Government Bridge links Rock Island Arsenal, located on an island in the Mississippi River, with the city of Davenport, Iowa. In combination with another span known as the Rock Island Viaduct, which connects the island with the city of Rock Island, Illinois, the Government Bridge carries local traffic across the river as well as traffic onto and off of Arsenal Island. On average, more than 18,000 vehicles use the bridge daily, along with an uncounted number of pedestrians and bicyclists.

Built in 1896, the Government Bridge is owned and operated by the Federal Government. Residents of the two-state area known as the Quad Cities recognize the bridge both as a local landmark and an engineering marvel because of its long record of reliability.

Last October, the Government Bridge was forced to curtail operations temporarily because of a damaged gear on the bridge’s swingspan, which is the part that opens to let barges and other river traffic through. Bridge op-

erators decided that continuous turns of the swingspan, which can number a dozen or more a day, could cause a complete breakdown of its drive mechanism.

As a preventive measure, the number of turns made by the bridge was restricted to three a day. The bridge was left in the open position to allow barges to pass through for 18 hours a day and was open to vehicular and rail traffic three times a day. Traffic could use the bridge for 2-hour periods during the morning and afternoon rush hours and for a late-night period primarily set aside so trains could cross.

A “quick fix” was performed in November to get the bridge back into full operation until permanent repairs could be made. The damaged gear was replaced with a spare gear that already was on hand. The fix was completed with the installation of two new drive shafts and couplers that were manufactured and installed by a team from the arsenal’s Science and Engineering and Arsenal Operations Directorates. Had this manufacturing expertise not been available, it is likely that bridge repairs would have been delayed for several months—the time it would have taken to find and hire a qualified contractor.

Rock Island Arsenal’s manufacturing skills were put to the test again by a project to replace the bridge’s entire drive mechanism, which is an interlinked series of



□ At far left, the Government Bridge, as seen from Rock Island Arsenal looking toward downtown Davenport, Iowa. At left, an arsenal employee uses an air hammer to loosen bolts on the old shaft. Below, the damaged gear on the bridge's wingspan is removed.

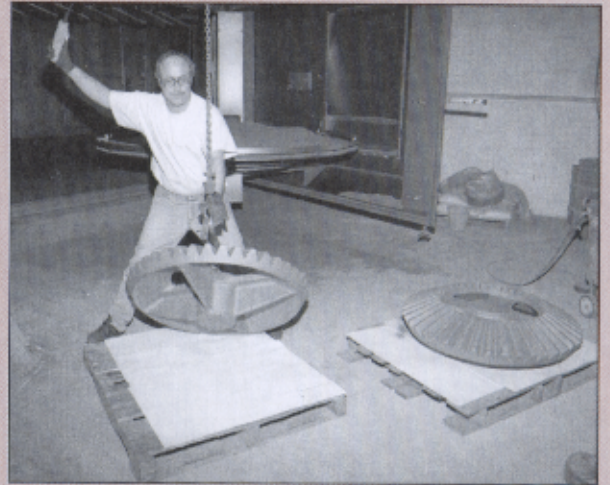
components that turn the swingspan open and shut. The project to make permanent repairs to the bridge had a firm deadline but lacked a clear set of building instructions. Project requirements included tight tolerances and enough strength and durability to withstand extremely hard use.

Arsenal engineers, designers, and planners used 102-year-old drawings that had been drafted when the bridge first was designed as one source of a plan for producing bridge parts. They also tapped the knowledge of employees who were involved in past bridge repair projects and others who had extensive experience in bridge operations. Reverse engineering and computer modeling and testing also were used in what was essentially a prototyping effort.

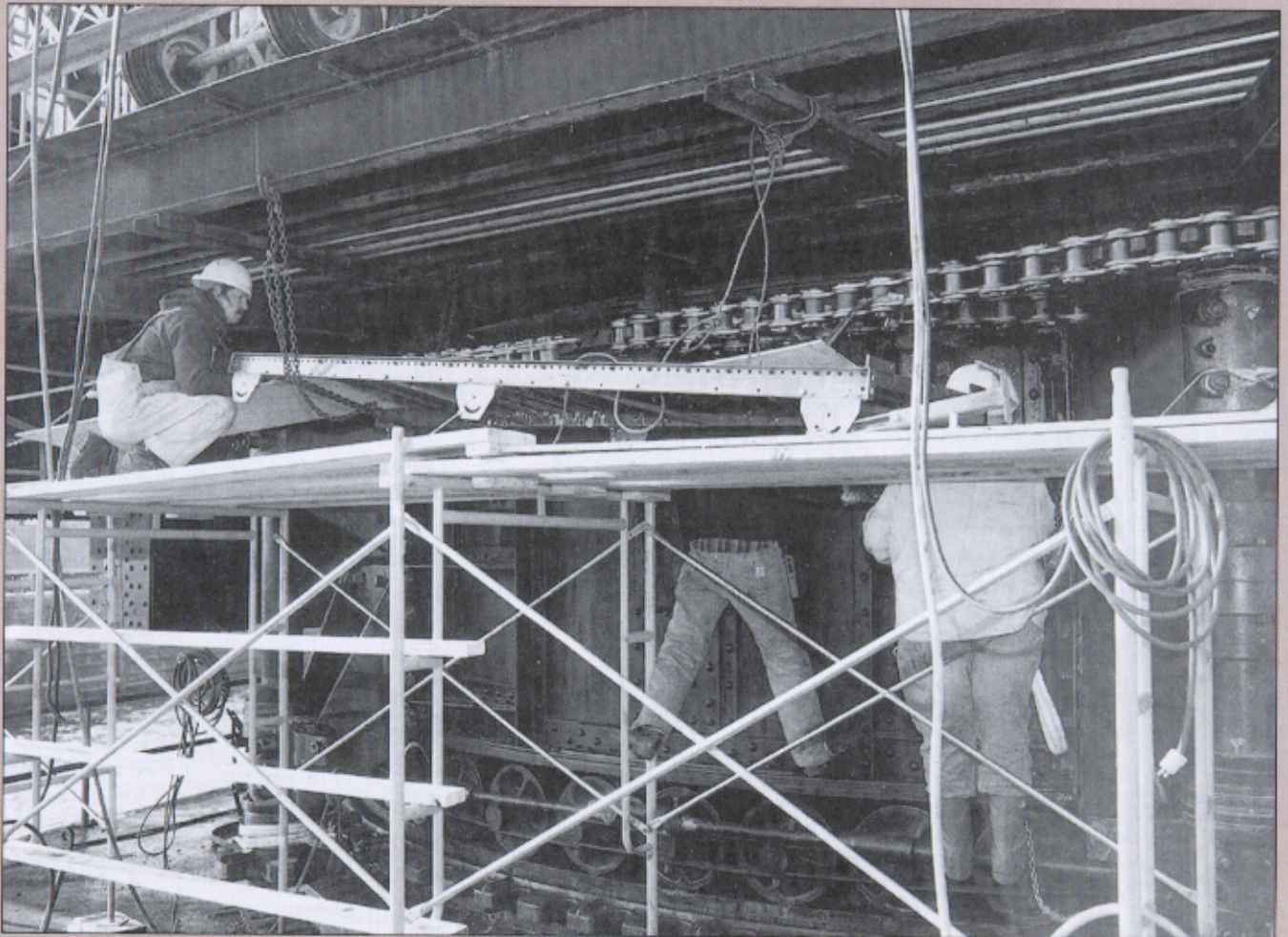
Among the parts produced for the new drive mechanism were gears, shafts, couplers, and drive chains. All manufacturing of new parts had to be completed by 15 January of this year so they could be installed and tested during the winter shutdown of the Mississippi River lock and dam system.



The project involved a variety of the arsenal's manufacturing capabilities, including foundry, casting, heat treating, machining, and finishing. Tolerances on some parts were measured in thousandths of an inch. Everything built had to be able to withstand the stress of moving the swingspan, which weighs more than 2 million pounds and is operated in all types of weather in a midwestern climate known for temperature extremes.



□ The new gear manufactured by Rock Island Arsenal is prepared for final machining (left) and placed on a pallet for transport to the bridge site (right). Below, the arsenal repair crew threads the arsenal-built chain onto the bridge's turntable.





□ Above, a new shaft for the bridge's drive mechanism is unloaded. Below, the new shaft is bolted securely into place. At right, sparks from a welding torch illuminate the face of an arsenal employee making repairs on the bridge.



Plans called for some spare parts to be built and set aside in case of future breakdowns. All the new engineering drawings made for this project—drafted by computer rather than pencil and ruler—were preserved for the time in the 21st century when the drive mechanism may need to be replaced again.

The window of opportunity for installing the parts began the week after Christmas, when the river was closed to barge traffic, and ended on 1 March, when the 1999 navigation season resumed. Timing was critical, because if the project wasn't completed on time, river and vehicular traffic would be disrupted.

Repairs to the Government Bridge were completed on time and within budget, a testimony to the record of support to the soldier in the field enjoyed by Rock Island Arsenal managers and employees since 1862.

Army Logistician thanks Paul Levesque, editor of Rock Island Arsenal's post newspaper, the Target, for his assistance with this article.

Logistics Torture Chamber

by Michael J. Barnansky

Drop it, shake it, squeeze it, and freeze it. These are but a few of the many trials endured by packaging and containers at the specialized laboratory of the Packaging, Storage, and Containerization Center.

The demands of the military distribution environment are, by necessity, the most grueling imaginable. To illustrate the demands our military equipment must face, consider how the home computer is treated. One would never take his personal computer, throw it into the back of a pickup truck, drive over miles of rough dirt roads in foul weather, and load it into the cargo hold of an aircraft for an unpressurized, high-altitude, extremely cold trip, only to land in a steamy jungle environment and endure more extremes of heat, humidity, shock, and vibration. Yet these are the conditions commonly encountered by our military equipment, which is used not to "surf the net" at home but to serve the soldier in a theater of war where lives are at stake.

Laboratory personnel of the Army Materiel Command Logistics Support Activity Packaging, Storage, and Containerization Center (PSCC) use their vast experience and over \$5 million worth of specialized equipment to shake, freeze, drop, soak, tumble, and crush packages and packaging materials before they get to the field. The goal is to ensure that materiel is protected from damage while in the military logistics pipeline. The professional, engineering, and technical personnel responsible for these tortures come from a wide range of disciplines and include chemists; packaging specialists; technicians; and electrical, mechanical, industrial, packaging, and civil engineers.

Torture Chamber for Packaging

Located at Tobyhanna Army Depot, Pennsylvania, PSCC is one of the largest applications engineering laboratories in the world. Three separate laboratories make up the engineering and testing facilities: a container testing laboratory, a materials testing laboratory, and a standard conditioning laboratory. The test equipment used within these "torture chambers" ranges from an infra-

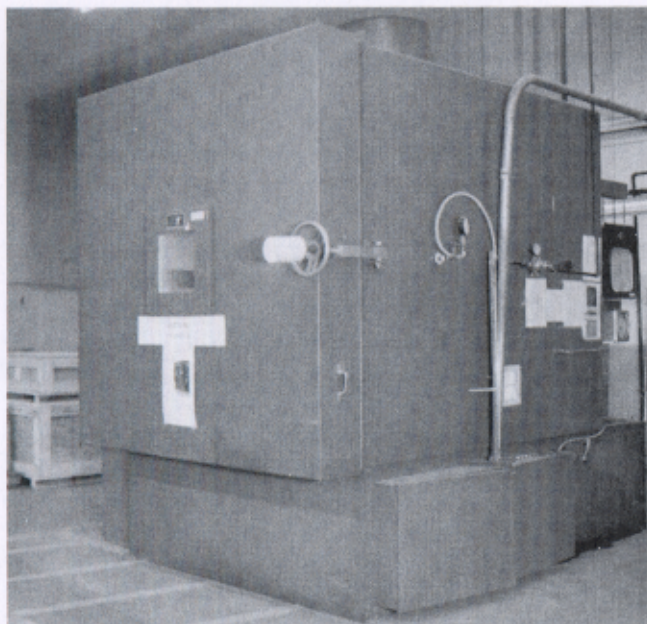
red spectrophotometer that analyzes the infrared spectrum of materials to a compression tester capable of applying 30,000 pounds of force.

Duplicating Conditions

To prevent damage to a packaged item in transit, all modes of transportation must be considered. As the oxygen canisters that caused the now-well-known ValuJet incident demonstrated, changes encountered during an air cargo flight can create dangerous conditions within hazardous materials containers. PSCC emulates air cargo shipment in an altitude chamber that can change air pressure to simulate changes in altitude from 2,000 feet to 90,000 feet in less than 45 minutes. Temperature also affects the performance characteristics of different materials. A 12-by-8-by-10-foot cold chamber applies the "big chill" by dropping from room temperature to -85 degrees Fahrenheit in less than 2 hours.

Unique Military Challenges

One problem peculiar to military packaging is that the destination of the item being shipped often is unknown. Thus, military packaging frequently must be able to protect very sensitive, expensive, or dangerous materiel against the worst possible environmental conditions. In the commercial logistics arena, the method, mode, duration, and conditions of transport usually are known, and the protective packaging requirements are fairly straightforward. Although standard commercial packaging has its place in the military distribution system, much of the materiel used by the soldier in the field is far too critical to trust to commercial packaging designed to endure a cushioned ride over a smoothly paved road. Combine this requirement with the current trend toward tighter budgets and downsizing, and some of the challenges facing today's logistician become apparent.



□ This altitude chamber can replicate air cargo shipment pressure and temperature changes from 2,000 feet (site level) to 90,000 feet.

The Readiness Factor

Another challenge is long-term storage. To ensure readiness, a wide range of materiel must be stored in various climates throughout the world and protected from wide swings in environmental conditions by efficient packaging and containers. This often is accomplished by providing a dehumidified atmosphere. The static dehumidification system currently used to protect Army field hospitals during long-term storage was designed and tested at the laboratories. Although a dry environment is preferred for long-term storage, a very dry atmosphere also can produce static electricity in electronic components, such as sensitive circuit boards, and drying of rubber seals in hydraulic equipment. In some applications, active, powered systems are required to provide the proper atmosphere to protect equipment and materials effectively. In addition, all variables must be considered. The talcum-like, ultra-fine, blowing sand of some desert environments can wreak havoc with equipment that is not properly protected. PSCC specialists and engineers travel throughout the world to provide onsite technical assistance to agencies that have such long-term storage requirements.

Hazardous Materials Packaging

The Department of Defense, in cooperation with the U.S. Department of Transportation (DOT), follows the rules found in Title 49 of the Code of Federal Regulations, including those for the packaging of hazardous materials and the required testing of those packagings.

The PSCC laboratories receive a constant flow of hazardous materials containers that must pass a series of performance tests before use. The containers come from various Army activities and other Federal agencies, such as the Defense Logistics Agency, National Institutes of Health, and DOT. Under a formal agreement with DOT, the PSCC laboratories conduct the required series of performance tests on all containers pulled by DOT inspectors across the United States. All tests are videotaped for proof of accurate, unbiased testing.

Private Sector Partnering

The PSCC laboratories maintain a strong association with leaders in the packaging industry and stay on top of developments that have potential application within the Department of Defense. In addition, the labs have representatives in several Government-industry associations, including the American National Standards Institute, the American Society for Testing and Materials, and the International Safe Transit Association. The goal of partnering is to modernize and eliminate unnecessary packaging standards. Several engineers and specialists at PSCC and its packaging and transportation division have received national recognition for their proactive efforts in partnering.

While the means to test and evaluate packaging and materials are complex, the ends are simple: provide well-protected equipment to the soldier in the field. As our customer, the soldier can provide us with valuable feedback. What product or process needs improvement? What new problems or environmental conditions have not been accounted for in standard test procedures? Is there a better way to package an item, or a more effective method for protecting a particular piece of equipment? The most valuable and technologically advanced equipment is worthless if the soldier receives it in a damaged and unusable condition.

PSCC's commitment remains to provide responsive, professional service to the warfighter through the application of engineering expertise and sound scientific principles.

ALOG

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Financial Electronic Commerce in the Logistics Community

by Valerie A. Lindsey

The Defense Finance and Accounting Service-Indianapolis (DFAS-IN), in partnership with the Army, is seeking ways to improve supply management in the 21st century. The General Accounting Office (GAO) designated supply management as a high-risk area and recommended that the Department of Defense (DOD) adopt new supply management tools and practices. GAO found that, while DOD has made "tremendous progress in reducing its inventory since 1989," financial accountability remains weak, and DOD needs to implement more modern commercial practices. One of the practices that DOD is exploring is a Government credit card. Widespread use of a Government credit card will keep cash in the Treasury, eliminate in-transit disbursements and interfund billing, streamline current processes, reduce processing costs, dramatically improve payment to merchants, and help to identify other potential efficiencies.

Charge It!

All of us are familiar with credit cards. By using credit cards, we reduce the amount of cash we carry, become eligible for advance notice of sales or specials, and increase our purchasing power. However, there is a certain amount of risk associated with using a credit card. DOD and the Army can reduce their initial risk by restricting Government credit card use to purchases between agencies.

Many businesses now use a single credit card for all of their purchases. Some of these cards draw on several "purses," such as one for local purchases, one for travel, and one for automated data processing equipment purchases. The DFAS-IN proposal is not quite so far reaching—yet. Initially, we propose that a Government credit card be used only for purchases between Government agencies. This will improve supply requisitioning, eliminate disbursements from the U.S. Department of the Treasury, stop in-transit disbursements, and reduce costs. This first step will promote a cultural change in how agencies operate and lay the groundwork for more comprehensive changes later.

The Government credit card will supplement, not replace, the International Merchant Purchase Authorization Card (IMPAC). Both cards will be used: IMPAC for local purchases and the Government credit card for interagency purchases.

Supply customers will use their Government credit cards to purchase all reparables and consumables. These cards will contain information about the unit holding

the card, including its accounting classification. The card can be set up either with a reasonable monthly limit, as most of us have on our personal credit cards, or with a monthly unit budget allowance for supplies (taken from the unit's funding authorization document). The latter is more practicable, because it does not require the current budget process to be changed. A miscellaneous obligation document can be set up at the beginning of the month and disbursements posted against it as purchases are made.

We believe that the best way to associate a unit's accounting classification to the credit card is to use the DOD Activity Address Code (DODAAC) and accounting process code (APC). These codes are used now in systems such as the Standard Army Retail Supply System (SARSS) and the Army Military Command Installation Supply System (AMCISS). The credit card number can be transferred to the billing address to help move billing information through the supply system to the servicing credit card bank.

System Safeguards

The Government credit card will have several built-in safety measures in addition to those already included in the logistics supply system. Only merchant codes of Government suppliers, such as national inventory control points, the General Services Administration (GSA), and the Defense Logistics Agency (DLA), will be loaded onto the card. A cardholder cannot use the unit credit card at local businesses. One-time dollar limitations can be set for each card to prevent unauthorized purchase of high-dollar items. This restriction can be lifted temporarily for authorized exceptions following proper approval by the certifying official or budget officer.

Immediate Account Access

The DFAS-IN plan will give all authorized and concerned parties immediate access to their accounts through the Internet for purposes of review, approval, and correction. Ideally, the certifying officer can review all purchases on line to reduce or eliminate the need for a paper trail. Additionally, credits for damaged or missing requisitions can be processed through the Internet.

The customer will be responsible for knowing his unit's DODAAC and the appropriate APC for the item being requisitioned. This is vital, since the credit card number will be tied to the unit's DODAAC and APC. This minor change will improve the supply requisition

process, facilitate more accurate reporting, and save the time spent by accounting personnel in correcting erroneous APC assignments. The supply request will be charged to the unit credit card when the customer exits the supply support activity automated system, SARSS, or AMCISS

Purchase Options

If an item costs less than \$2,500 and is authorized for local purchase, the supply clerk initiating the request will use the unit IMPAC card to make the purchase locally. If the item costs more than \$2,500 or cannot be obtained from a local vendor, the clerk will use the Government credit card and the requisition will go through a national gateway to the Defense Automated Addressing System (DAAS), which is maintained by the DLA Design Center. (A gateway is a combination of hardware and software that links two different types of networks.) The DAAS data base contains a list of all authorized users of the national supply system, their shipping and billing addresses, and ordering and shipping information for all wholesale merchants and inventory control points. DAAS will forward the requisition with the credit card number to the appropriate source of supply.

The wholesale logistics merchant (for example, DLA, GSA, or an Army national inventory control point) will operate much like a commercial merchant who receives a credit card order. The wholesale merchant will receive the requisition from DAAS, verify the viability of the credit card with the servicing credit card bank, and process a material release confirmation for shipping and billing purposes. The wholesale merchant will pass the billing to the bank servicing the credit card. He should receive payment within 3 working days, which is a significant improvement over the current process that sometimes delays payment for weeks or even months.

The servicing credit card bank will provide a daily summary of charges to the Treasury Department and a detailed bill to the customer and supporting operating location. Also, all transactions will be posted to an Internet site that is available to authorized users through a web browser. There is no firm transaction fee, but it should be no more than 95 cents each.

The servicing operating location and the certifying officer can review the detailed transactions, query the website by merchant or by cardholder, create reports, and so on. The disbursing office can download the summary bill from the website. The servicing operating location will reconcile the detailed accounting information with the original obligation and balance it with the disbursing summary bill. After the certifying officer has approved all charges, the disbursing office will post the disbursement to record the debit made by the Treasury Department. The Treasury Department will process an appropriation transfer to move funds from the

customer's appropriation to the wholesale merchant's appropriation. Accounting reports will not be changed significantly.

When the goods are received, the customer will verify that the order is what he requested and process a receipt in the supply system. When the shipment is short or damaged, the customer will notify the appropriate wholesale merchant. If the merchant is unwilling to issue credit before a missing item is received, the certifying official can notify the servicing bank to request that a portion of the charges be withheld or wait until the wholesale supply point receives and accepts the complete shipment.

The servicing credit card bank will use the Treasury Department's automated CASH-LINK system to pass the charge to the Treasury Department. The Treasury Department will send a summary 810, Cash Verification (an electronic data file), to the servicing finance center. The finance center also will receive detailed accounting information from the servicing bank, and its centralized disbursing office will reconcile the detailed information with the summary bill.

After the bill is reconciled and the customer has approved it, centralized disbursing will send the collection information to the credit card merchant and post the disbursement to the accounting system. The servicing finance center will pass an 821, Positive Cash Verification, or an 812, Adjustment (if there was a credit or adjustment to be made to the payment), to the Treasury Department.

Turn-ins and credits will flow in the opposite direction from purchase charges. The customer and wholesale supply merchant will resolve any discrepancies in the goods received. The wholesale supply merchant will initiate a credit for damaged, returned, or missing goods using the credit card number of the cardholder. The servicing bank will process the credit and charge the merchant a nominal processing fee. Excess turn-ins to the wholesale supply system will be credited by national stock number. It is conceivable that the wholesale merchant will pass the bank credit charge to the customer under this circumstance. Ideally, we will move away from stockpiling and ordering based on "what if."

A Government credit card will provide enhanced and more timely fund accountability and improve the payment process. More importantly, it will enable the logistics and financial communities to concentrate on analysis, forecasting, reduction or elimination of stockpiling, and management of assets instead of micromanaging and error correction.

ALOG

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Joint and Combined Theater Logistics—The Future Reality

by Lieutenant Colonel Gary R. Engel

In his book, *Supplying War: Logistics From Wallenstein to Patton*, Martin Van Creveld defines logistics as “the practical art of moving armies and keeping them supplied.” Joint and combined operational concepts go even further in defining logistics to include support not only for armies but also for the other components of our military force, including those of our coalition or allied partners.

Focused logistics support operations continue to play a vital role in delivering combat power in any military operation. In the introduction to Joint Publication 4-0, *Doctrine for Logistics Support of Joint Operations*, General John M. Shalikashvili, then Chairman of the Joint Chiefs of Staff, comments, “Logistics is the foundation of our combat power. We must, therefore, continue to develop and refine joint doctrine that promotes the most efficient, effective use of all available assets. Adherence to that doctrine is the key to our success.”

Joint Vision 2010 established focused logistics as a crucial element of our joint doctrine. Focused joint logistics operations require support systems that are efficient and effective and embody the five logistics characteristics contained in Field Manual 100-5, *Operations*: anticipation, integration, continuity, responsiveness, and improvisation. The Army Training and Doctrine Command (TRADOC) and one of its major subordinate commands, the Army Combined Arms Support Command (CASCOM), are developing an Army-specific theater support command structure that will provide common-user, theater-level, modular logistics support to joint and combined forces. Current operational logistics doctrine, including the concept under development by CASCOM, is based on legal requirements that demand that each Service component train and supply its own forces. In my opinion, the current and proposed changes do not

achieve a joint and combined focused logistics support system that will be both effective and efficient in supporting present and future military forces. CASCOM's current efforts to develop a system that manages joint theater distribution confirm my belief. The logistics system that supports our forces on future battlefields must be a seamless organization that provides state-of-the-art support with joint efficiency and maximum effectiveness.

While efforts by agencies such as CASCOM and other Department of Defense logistics organizations are steps toward improved theater-level support, I believe future logistics operations in any theater must be both combined and joint. Stovepipe support systems in the individual Services will not support focused logistics. We must develop an operationally joint and combined, centrally orchestrated logistics “system of support systems” for the future.

Throughout history, logistics support has been provided to commanders at the operational level of war, usually on an ad hoc basis. Technological and operational innovations have been related to advances in logistics support capabilities. It is imperative to understand that the adversary who fully integrates technology, operational innovation, and logistics support often achieves an advantage in relative combat power over his foe. History has proven that the more an organization can fight or execute its mission as it has trained, the higher will be the probability of its success.

Current Doctrine

All current and proposed U.S. military logistics doctrine is based on Title 10 of the United States Code, which requires each Service component to train and supply its own forces. Under these legal constraints,

operational commanders depend on various Service components to provide the quantity and types of forces needed to accomplish the assigned mission. Compounding this problem in the operational theater is the fact that each Service, as well as each allied and coalition member, establishes individual logistics organizations to provide support to its forces.

Current and proposed doctrine builds on the concept of centralized planning and decentralized execution within all U.S. military operations. These concepts are based on the principle that performing a task should be left to the individuals who are in the best position to achieve the optimal solutions for mission requirements. Current and future logistics doctrine advocates modularity and split-based operations grounded on these fundamentals of centralized planning and decentralized execution.

The doctrinal concepts being developed by CASCOM focus on an Army-specific organization that provides common-user logistics support to Army, joint, combined, and allied forces in the theater of operations. It will be structured to incorporate available host nation support assets. This organization will report to the Army service component commander and will focus on eliminating logistics fragmentation within the Army service component. By incorporating the theater army-level personnel support command, transportation command, engineer command, finance command, medical command, and theater army support command into one large, streamlined support organization, fragmentation within the Army service component can be reduced.

Doctrinal Weaknesses and Vulnerabilities

Operations Desert Shield and Desert Storm clearly demonstrated the need to revise our existing theater-level logistics doctrine and infrastructure. Lieutenant General William G. Pagonis commented that, during the early phases of Desert Shield, "Logisticians had to compete for space on incoming planes to get experts in theater and create a structure for a deployment that was already well underway." It became apparent during the Gulf War that changes in tactics, strategy, and technology were dictating a corresponding modernization of logistics operations. Because of changes in technology and the nature of modern warfare, the operational commander in Southwest Asia was forced to establish the 22d Support Command (Provisional), an ad hoc organization that was tasked with ensuring adequate logistics support.

Numerous weaknesses and vulnerabilities are forcing pending changes, many of which are interrelated. All of these weaknesses can be linked back to most, if not all, of the five logistics characteristics that must be addressed to support our forces successfully. For example, by improving our ability to anticipate during plan-

ning, we can reduce our need to improvise. We must look at these characteristics not only in the context of today's force, but also of our military force of the future. Changes will occur while we continue to focus on the guidance in Joint Vision 2010 and as we come to understand that nearly all of our future operations will be combined operations. Areas that will require change in a combined operation include priority of support, total asset visibility, movement control, management of resources, and command and control.

Priority of support in the theater. As an operational logistician attending a tactical or operational briefing, I immediately wonder, "Who receives the priority of support, especially if the operation is being conducted in a constrained resource environment?" Under our current and proposed theater-level logistics support doctrine, priority of support becomes extremely unclear at the joint and combined levels. Therefore, each Service-specific logistician strives to maximize support to his individual customer while, in many cases, competing with another organization for the same resources. This factor is especially crucial when addressing the limited availability of transportation assets for force deployment.

Total asset visibility. The theater logistics structure must include the capability to redirect or cross-level critical items of supply from one organization to another. For maximum efficiency, the senior operational logistics commander must have total asset visibility and control of all available resources and supplies. Our existing and proposed logistics systems do not provide a logistics commander with total asset visibility or with the authority he needs to accomplish this cross-leveling task. As examples, during the war with Iraq, over 41,000 containers of supplies were delivered to the theater of operations, and approximately 28,000 of them had to be opened just to determine what they contained. Additionally, if the Marine Corps in the theater was short of M1 tank ammunition, it was the joint theater logistician who had to try to cross-level supplies from an Army organization if possible.

Movement control. Under current doctrine, the Army-specific theater movement control agency (TMCA) is tasked with managing and controlling the transportation networks in the theater. This certainly sounds good, but is this mission beyond what we should realistically expect of the commander? It is logical to assume that, outside the United States, the available transportation networks are controlled by the host nation, such as Korea. Obviously, the TMCA coordinates use of those networks, but this process may occur while the Air Force, Marine Corps, or other coalition members are attempting to use the same networks. Because no single Service can allocate transportation assets, deconflict movement access, or prioritize requirements for other Services, a joint theater movement control or-

ganization is required. Clearly, this organization must function in a joint and combined environment.

Management of scarce resources. Current and proposed doctrine does not provide for one joint manager, commander, or organizational structure to manage closely common, critical items of supply that may exist in limited quantities. Also, other critical items of support, such as limited transportation assets or medical facilities, must be managed efficiently. The theater commander must have an individual commander or organization that he can hold responsible for managing all commodities and support in his theater. Under current doctrine, the multiple logistics organizations that reside in a theater of operations do not allow for prudent management and control of limited resources. Economy-of-force operations can be affected seriously by the inability to manage scarce resources properly in a constrained environment.

Command and control. Simple, clearly defined unity of command and control is a crucial advantage to any organization, and logistics organizations are no exception. Doctrinally, command and control of U.S., allied, and coalition partners are fragmented and disjointed. Obviously, multiple operational logistics command and control organizations detract from effectively achieving unity of effort.

Service and Agency Competition

Many would argue that competition among the Services is simply a reflection of an integral, healthy part of American society. Currently, joint operations create highly competitive situations for logistics resources, especially during economy-of-force operations. Although competition is healthy at certain times and in certain places, it is not healthy as a part of the command and control structure in a theater of operations during war. At such times, there are already high levels of confusion and stress. During conflict, the military must forego interservice rivalries so it can function as a joint team that is capable of conducting combined operations. Additionally, supporting agencies both within and outside of the military, such as the Military Sealift Command, the Military Traffic Management Command, the Defense Logistics Agency, civilian contractors, and numerous other critical agencies, must be integrated fully to maximize support for the combat force.

Unity of Effort

An operational logistics structure that fails to achieve unity of command and maintains stovepipe organizations will detract from unity of effort. As Lieutenant General Leon E. Salomon said in his "Open Letter on a Unified Logistics Command" (*Army Logistician*, September-October 1995), "Stovepipes, with their single functional focus, create unnecessary layers that are of-

ten more procedure oriented than consumer oriented." Further, this type of operational environment often causes duplication of effort and wastes limited resources.

As an example, during Operation Desert Storm, each of the Service combat commanders procured enough antitank ammunition or bombs to destroy the entire Iraqi tank forces with their own combat forces. If analyzed from each Service's perspective, this procurement appears to demonstrate effective planning. However, realistic assessments conducted after the conflict indicated that there was entirely too much ammunition delivered to the theater. Obviously, the waste of limited transportation resources and funds caused by this oversupply of ammunition would have been further exacerbated in an economy-of-force situation. Did this waste delay the initiation of the Gulf War? Can we continue to afford this type of waste in the future? Unity of effort achieved through unity of command can eliminate or greatly reduce this problem for future military forces.

Needed: A Joint Theater Support Command

Guidance contained in Joint Chiefs of Staff (JCS) Publication 3-0, on the future direction of an organization, states, "Logistics, then, is key to arranging the operations of campaigns and should be planned and executed as a joint responsibility." JCS guidance also emphasizes that we must maintain the capability to operate in a combined environment. The JCS *Concept for Future Joint Operations: Expanding Joint Vision 2010* (May 1997) further states that "logistics functions will transition from rigid, vertical organizations of the past to integrated, modular, and specifically tailored combat service support packages." Obviously, the primary focus of the logistics community should be maximizing effectiveness and efficiency while providing all required support to the operational combatant commander in the joint and combined environment of the future battlefield.

Based on the above JCS guidance and the focus of logistics support operations, I believe that we must develop a single, theater-level, operational logistics command and control organization that is both joint and combined in nature. This organization would report directly to the commander in chief of the theater. Further, this joint theater support command (JTSC) would be responsible and accountable for all required logistics support provided by U.S. forces in the theater. The structure would be modular in design and would permit operations at any level of conflict through centralized planning and decentralized execution. Modularity also would enable split-based operations, as well as the incorporation of reserve component follow-on forces in a streamlined, tailored organization. The JTSC would focus on improving the five characteristics for logistics support to the theater commander (anticipation, integration, continuity, responsiveness, and improvisation), and would

serve as an enabler and a combat force multiplier in the delivery of combat power to any conflict or operation. Its simplified command structure and modular logistics support organization would enhance efforts to support both U.S. and allied combat forces.

Advantages of Streamlining

There are countless advantages to streamlining our logistics support structure and systems. The simplified command and modular structure of the JTSC is flexible by design, which allows for joint logistics operations that are focused, efficient, and effective. A senior logistician at the Naval War College recently stated, "Joint theater logistics commands provide the best alternative for effectively supporting the war fighter and bringing efficiencies in reduced organizational structures and required assets." Incorporating the five logistics characteristics improves the capability of the JTSC support forces because of the resulting unity of command and effort. Logistics support priorities, total asset visibility, theater movement control, and management of critical resources are simplified through a centralized, joint, and combined theater command and control structure that incorporates decentralized execution. Healthy competition can continue to exist among the logistics organizations of individual Services, but the JTSC can resolve issues quickly in the theater based on guidance received from the warfighting commander.

Disadvantages of Streamlining

There are several disadvantages that must be addressed when revising operational logistics doctrine for logistics support structure and systems. A theater-level logistics support structure can evolve into a rather large, although modular, organization, thereby creating problems, such as a large battlefield signature and difficulties in command and control. It also may not be possible to establish a single combined command with foreign allied or coalition forces in a multinational force environment for political, economic, or military reasons. Politically sensitive issues must be addressed in a modification of Title 10 of the United States Code before the doctrinal changes I propose can be accomplished. The individual Service components also may feel threatened in the current environment of constrained resources and force reductions. However, I believe that all of these challenges can be overcome by a truly joint and combined vision at all levels of our military command structure.

Focused joint and combined logistics is one of the four pillars of Joint Vision 2010, which demands that logistics support and systems "enable joint forces of the future to be more mobile, versatile, and projectable from anywhere in the world." Professor Milan Vego of the

Naval War College recently observed that, "Logistics is a critical element of combat power that assumes even greater importance at the operational level." FM 100-5 states that, "Joint integration of logistics is crucial to unity of effort. The concept of joint logistics cannot be fully realized until accountability and acquisition procedures are completely integrated." After an in-depth study of combined operations conducted during the Cold War, Lieutenant General Joseph Heiser concluded, "Logistics procedures must be standardized and harmonized to provide flexibility between nations."

Clearly, several factors are fostering change to current logistics operational doctrine. The large, cumbersome forces of the Cold War are being replaced with smaller, more agile, and more lethal forces that require a modern logistics infrastructure that can provide efficient and effective support. The current and foreseeable resource environment will continue to be constrained, with all of our forces being required to do more with less. Technological advances of the Information Age are providing excellent opportunities for increasing productivity and efficiency. The possibilities for improving our operational logistics structure are limited only by our imagination.

A truly joint theater support command that can operate efficiently in a combined environment is critical to the battlefield success of our future military forces. We no longer can afford a fragmented and compartmentalized logistics support structure that duplicates effort and generates waste. Logistics doctrine for current, effectively functioning systems should be changed only by demand based on customer support requirements. Evolving military forces and our commitment to our citizens are demanding this change. In meeting this demand, a JTSC will provide a versatile and flexible organizational command and control structure that gives our tailored operational support forces the capability to execute any mission with outstanding results.

ALOG

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CINC Support Command

by Nolan P. Welborn

The author believes that a joint support command is needed to provide the defense infrastructure—and the savings—for Joint Vision 2010.

"Commander in Chief, Support Command," has a nice ring, doesn't it? CINCSUP fits right in with CINCTrans (Transportation Command) or CINCSOC (Special Operations Command). How about an engineer as a CINC? It really isn't that strange an idea. When we admitted to shortfalls in the transportation community, we created a unified transportation command headed by a logistician. So let's do it again, except this time the new command could be headed by a logistician or an engineer. I propose that the Department of Defense (DOD) form a joint support command to manage the defense infrastructure.

The Problem of Redundancy

During the conflict in Grenada, Army and Navy radios could not communicate with each other. A common support structure would have prevented this problem. Organizations working from a common data base would not have knowingly bought radios that use different frequencies. In fact, just the opposite would have happened, by design: when the organization was developing the requirement for tactical radios, the issue of commonality would have been addressed before it became an operational problem. Of course, on some occasions different types of radios are necessary. The point is that, during requirements generation under a common support structure, all appropriate parties would be represented, their reasons for wanting common or different items would surface, and informed decisions would be made.

This radio issue was a major point in the discussions leading to enactment of the Goldwater-Nichols Act of 1986, though certainly not the only one. To correct such problems, the law sought to combine functions into common organizations where it made sense to do so. Yet, in the 1990's the stovepipe organizations of the various Services still were creating redundant support structures

that served individual Service needs. For example, three different information warfare commands were created to serve the Army, Navy, and Air Force independently. While it may be argued that the Services have different needs at the tactical level, the operational commander needs a system that looks across the entire spectrum. My proposed support command would provide that system.

The DOD infrastructure is huge. To free funding needed for modernizing weapons and establishing the proposed support command, radical changes in business practices must be instituted. A General Accounting Office (GAO) study cites DOD estimates that about \$146 billion, or almost two-thirds of the DOD budget for fiscal year (FY) 1997, was earmarked for support infrastructure. Another GAO study states that wasteful or inefficient activities divert limited defense funds from pressing needs such as weapons modernization. This study also suggests using consolidation, reengineering, outsourcing, privatization, and interservice agreements to achieve the desired savings. Areas identified by the GAO as potential sources of savings include acquisition infrastructure, central logistics, installation support, central training, force management, and central medical functions. All of these, except force management, would fall under the purview of the proposed CINC for Support. A reduced force management organization would result as a byproduct.

Former Assistant Secretary of Defense John White has stated that the way we support the warfighter must change. He believes that DOD must be leaner, more efficient, and more cost effective in order to serve the warfighter faster, better, and cheaper. We not only have the opportunity to change, we have the requirement to change, according to White. The forces envisioned in Joint Vision 2010 will require a radically different support structure and steadily increasing investments. To

afford these investments, DOD will need offsetting efficiencies in support operations. The best source of funds for those investments is within the existing support infrastructure.

Joint Installations for Joint Vision

Joint Vision 2010 states that four new operational concepts will be developed to achieve new levels of effectiveness in joint warfighting. In particular, two of these new concepts, dominant maneuver and focused logistics, require a lean and responsive support structure. A key element of dominant maneuver is the combination of seamless operations with reduced force buildup time and a smaller, more widely dispersed battlefield footprint. Focused logistics will require tailored logistics packages and direct delivery of sustainment to the strategic, operational, and tactical levels. Both concepts will require some sort of warm base to receive sustainment supplies and disperse forces into the fighting area. If you believe in the theory that we should train as we will fight, you can accept the idea that this warm base should resemble the base structure back home. However, the current base structure back home does not resemble the structure needed by the warfighting CINC's. The CINC's need a joint forces base designed to receive sustainment and provide support to all warfighters, regardless of Service affiliation.

In DOD today, each military department shares the common functions to develop, garrison, supply, equip, and maintain bases and other installations. This means that, when the warfighting CINC needs to establish his theater bases, he has to turn to each of the Services to tap into the experienced personnel and resources they possess. A much better solution would be for him to request a slice of an existing base that operates as a joint installation during peacetime. The practice of having each military department operate its own bases does not lend itself to the development of joint installations. It frustrates the creation of joint installations that CINC's can rely on for experienced staff or that can be adapted quickly to form the type of bases required under Joint Vision 2010.

Not only will creation of a joint support command support the combatant commander, it also will save enormous sums of money. Some may even argue that the greatest benefits achieved by this command would be the reduced costs associated with support infrastructure. However, I do not believe this is true. In my opinion, the *greatest* benefits are the long-term efficiencies that will grow out of a common support structure. All the Service providers in the support establishment will speak a common language. No longer will the various Services have the power to create their own versions of each element of support. Responsibility for creating the support structure will reside in the new support command.

However, to get the CINC the infrastructure he needs, the existing structure must be changed. Money must be found within the existing structure to make these changes. For this reason, potential ways of generating the needed funds cannot be ignored.

Alternatives to a Support Command

It is time to step back and take a hard look. Redundancy in support services must end. The combatant commanders need a platform that will support future concepts, and the bean counters need ideas to save funds. Consider the alternative approaches that have been tried in the past. But consider them with an eye toward how the savings can be shifted to other organizations, because that is what I'm proposing with the support command.

Consolidation efforts have been a proven winner when the objective is reducing overhead costs. Examples in the Army include creation of strategically located regional offices that provide civilian personnel services, as well as contracting centers and satellite organizations that limit the number of contracting activities operated by each major command.

Privatization is the latest buzzword being used by all the management consultants hired by DOD. The premise of privatization is that a private company can provide a product or service at a lower cost than a Government entity. The fallacy is that the private company has to make a profit. The truth is that the only way these firms can operate at a lower cost is to pay their employees a lower wage than the Government does. Understandably, this is a big fear of Government employees and the reason behind their resistance to making privatization work.

Outsourcing is another word for contracting out. This practice has been around DOD since it became popular during the Eisenhower administration. The procedure usually followed is laid out in OMB Circular A-76. All in all, it is not a bad system, and many services, such as janitorial work and grass cutting, currently are performed by contractors. But the easy work of contracting has been done already. The functions still performed in-house are those that are hard to identify, quantify, and measure. Another problem with expanding outsourcing into new areas is resistance by the organizations targeted for demise.

Reengineering is the process of taking existing work procedures and redesigning them to produce a more effective result with fewer steps between input and output. The problem with this initiative is that the DOD organizational structure does not lend itself to fundamental changes in business processes. The trend in business is to move away from a task-based organization to one built around the concept of redefining the task into homogeneous processes. Individuals are encouraged to

challenge why certain activities are performed rather than just investigate how they can achieve the same results for less cost. Improvements can and will be made throughout DOD by reengineering where appropriate, but huge cost savings will not be garnered without bold and innovative organizational changes. The existing organization is too fragmented, and there is no real mechanism in place to export process improvements from one Service entity to another.

Solution: A Joint Support Command

The duplication of effort at the management and policy development levels does not support the needs of the CINC's. Because of the various bureaucratic processes implemented by the different Services, the existing installation infrastructure is both costly and confusing. Over the years, initiatives such as consolidation, reengineering, outsourcing, and privatization have had only limited success in lowering infrastructure costs. There are a number of reasons for this, but the main one is that these initiatives have been tried by a lot of different organizations with no real economies of scale. To continue to pursue these initiatives in the same disjointed fashion will not produce the complete overhaul in the support infrastructure that the CINC needs.

This overhaul should create a single commander in chief tasked with providing all the support required by combatant commands as well as other specific commands. This new command then would be able to achieve economies of scale and use the best that each alternative (such as consolidation and outsourcing) has to offer. Creation of a support command will move DOD to the next level of fully implementing the Goldwater-Nichols Act. The spirit of this law is to combine resources where practical, whether combat capabilities or common user support. Implementation of this idea would assign responsibility for all support services to a CINC Support Command.

Under a support command, DOD would turn all bases, installations, posts, camps, and stations over to the ownership and direct responsibility of one CINC. Instead of Navy bases, Army posts, or Marine Corps depots, there would be joint installations. The CINC also would receive the current resources, staffs, facilities, funds, and equipment assigned to the functions associated with these installations.

It is true that the proposed support command would resemble the Services because Program Objective Memorandum (POM), budget, and contracting authority would have to flow to the command. To do otherwise would stymie anticipated gains. However, establishing this organization would remove a major function from the Services and allow a greater offsetting reduction in costs. This move would resemble the development of the European Union. However, instead of

creating a common currency with free trade across the borders, I am proposing common policies and cooperative support structures across the Services. I further propose that DOD develop a new career path for the officer interested in infrastructure support activities. This path would culminate in four-star-level positions with responsibility for all support activities for all the Services.

Recognize the enormity of this suggestion. Earlier, I pointed out that this support infrastructure would consume over 60 percent of the entire DOD FY 1997 budget. When a function consumes over 60 percent of the whole, it cannot be ignored. It is now time to do something because support takes too much of the budget and is not providing the efficient support that the combatant commanders must have to implement Joint Vision 2010. We must allow the warfighters to focus on their warfighting mission. We must actually reengineer the support infrastructure as directed by the Quadrennial Defense Review.

Final design of this new organization would include the acquisition infrastructure, central logistics, installation support, central training, and central medical functions. It would not include personnel and facilities associated with research, development, and testing, nor would it include production and procurement resources that support weapon systems. However, it would include logistics, equipment maintenance, materiel management, installation maintenance and management, communication, and supply operations. It also would include all financial processes, training activities, legal assets, chaplain services, and medical care provided to military members, their dependents, and retirees. In locations where two or more similar functions currently exist to support two or more Services, consolidation would be mandatory; consideration of Service uniqueness would not stand in the way.

This new unified command could use the U.S. Transportation Command (TRANSCOM) as an organizational model. It would have a four-star boss and a three-star deputy drawn from a different Service. The Army, Navy, Marine Corps, and Air Force each would provide components consisting of their existing personnel assigned to support functions, headed up by two-star equivalents. The Service two-stars would come from those jobs currently providing support functions, such as the heads of the Naval Facilities Engineering Command, Service headquarters installation management organizations, the Naval Supply Systems Command, and the Army and Air Force Materiel Commands. Of course, there are a number of other existing billets that would be placed appropriately throughout the organization, such as chaplains, lawyers, and medical services officers. It would go beyond the scope of this paper to try to develop a complete organizational structure. The idea is to build the skeleton of a new organization that consists of se-

nior leaders from each of the Services. These leaders should be skilled in all the various support disciplines and proven leaders able to work out the organizational details.

Implementation would be accomplished by using a phased approach. First, the framework would be stood up on paper. Second, all assets and facilities in a given geographic location (such as Norfolk, Virginia) would be turned over to this new organization without anyone moving physically. The new organization then would develop a growth plan to assume new areas incrementally as it gains the capacity to do so. This process would take anywhere from 5 to 7 years before all continental United States (CONUS) facilities could be incorporated effectively into the support command. Therefore, it is imperative that the selection of the senior leaders be made with the utmost care. They should be chosen with the idea that they will be left in place longer than a typical assignment, indeed long enough to develop a vision and see it through implementation.

Within 2 or 3 years after startup of the support command, redundancy should start to become obvious. Service parochialism would fall away when the command's organizational needs are satisfied without each component having to look only to its parent Service for answers. After just a few short years, DOD no longer would constitute a collection of different bases for each Service but instead would consist of fewer defense installations where the Services trained together and received support from a common logistics support group. Combatant commanders no longer would look toward different Services for warm bases to support dominant maneuver and focused logistics; they would look toward CINCSUP for a slice of an existing joint installation.

Benefits of the Support Command

The proposed support command would develop joint bases responsible for training and exercises as well as everyday support. The joint base would provide one-stop shopping for the CINC. In turn, life would become simpler for the CINC. The new command would eliminate duplication of efforts, which in turn would reduce the footprint in the theater. It would create an environment where all forces would be dealing with common organizations on a regular basis. When major exercises were performed, the combatant forces would look to their joint bases for the support tail that must follow. They no longer would look toward different sources for different pieces of support. No longer would forces come from one location and the support element from another, completely different location. Forces truly would train as they would fight.

General Michael Ryan has suggested that the Air Force consolidate support units at four to six superbases located throughout the United States. He wants to re-

organize to get rid of excess infrastructure and relieve the pressure caused by establishing bases at crisis points such as Bosnia, the Middle East, and Africa. His concern is that combat units deploy at a moment's notice. Support units such as food service, engineer, and medical are not organized for immediate overseas deployment. Why should this idea just be for the Air Force?

Natural working relationships would form among the staffs of the forces commands, Support Command, and TRANSCOM. These working relationships would no longer have to form each time a major exercise was undertaken or, even more importantly, in the event of a real crisis. Because of this training commonality, logistics and support would be ready to flow immediately to a theater, whether mature or immature. There would be no difference in the two theaters because there would be no learning curve for the staff performing the various support functions.

The support command would have global responsibilities in peacetime and wartime. Global teams therefore could be formed to staff and develop the support infrastructure with either a regional focus or a force focus, depending on the needs of the geographical combatant commander. In other words, the combatant commander truly would be supported.

"Thinking outside the box" is necessary to develop solutions to those factors impeding implementation of Joint Vision. I present the support command initiative as just such thinking. I believe that this initiative is the only practical way DOD truly can reengineer and garner the huge amounts of money needed to fund weapons modernization and develop new ways to provide the structure needed for dominant maneuver and focused logistics. Obviously, a number of details will require study and analysis to develop the support command. I have provided only a broad overview of where DOD needs to go and how to start. We must proceed while implementing Joint Vision, supporting the combatant commanders, and sustaining our readiness and flexibility. The journey will be challenging, and it should be interesting.

ALOG

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The Army's Introduction to Chemical Logistics

by Dr. Burton Wright III

When the United States entered World War I in April 1917, it had to prepare for a new type of combat of terrifying lethality: chemical warfare. This new warfare presented a host of challenges. The Army had to develop new weapons and defensive equipment, build a whole new production, testing, and storage infrastructure, and train personnel. It also faced an organizational challenge. Since there was no Chemical Corps as yet, much of the actual work of preparing for chemical warfare had to be performed by two existing branches, the Ordnance Corps and the Medical Department. Offensive warfare became the concern of the Ordnance Corps, while defensive matters were handled by the Medical Department.

Building Chemical Plants

In previous wars, the Army depended on civilian contractors to provide much of its materiel. However, there was a small problem with using this approach for chemical combat in World War I: civilian contractors did not like the idea of producing toxic gases. They could see no market for lethal chemicals after the war, and they regarded the production and handling of such materials as altogether too dangerous. The Allies (the British and the French) had developed their own system of supplying toxic gases, but American experts thought that system was too limited and costly for what they had in mind. So, as an interim measure, the U.S. Government had to set up its own chemical plants and develop its own capability to fill artillery shells with chemical agents.

With the help of Allied experts, a shell-filling plant was built at Edgewood Arsenal, Maryland, in September 1917, and it began producing shells the following January. This plant was quite a marvel of engineering for its day. Safety was the first consideration in its design. Showers and other decontamination devices were close at hand, as were fans. Each of the filling radials was entirely self-contained and separate from others in the plant, so that if an accident occurred, its effects would be confined to one area and no chemicals would leak into other parts of the plant.

When the Chemical Warfare Service (CWS) was created in 1918, it continued to count on support from the Ordnance Corps. It was the Ordnance Corps that helped

to solicit a reluctant civilian manufacturing establishment to provide toxic agents to the Army. To do this, the Army had to build plants similar to the one at Edgewood and then find companies willing to run them. During the short time the United States participated in World War I (April 1917 to November 1918), the Army built 15 different chemical plants, mostly in the East and Midwest, and operated them with Army personnel or private contractors.

Producing Chemical Offensive Weapons

Chemicals in World War I were used only in the offense. So, for controlled production of toxic agents after the birth of the CWS, a Gas Offense Production Division was formed in June 1918. Its head, Colonel Allan H. Waller, was a former commander of Edgewood Arsenal, which gave him a unique insight into the demands of his new position.

All plants providing chemical agents were put under the direction of Colonel Waller. For the most part, this centralization was a fairly efficient organization. By the end of the war, the United States was, by itself, producing as many toxic agents and shells as were Britain and France combined.

Britain and France had arrived at a reasonable system for producing munitions that the U.S. Army used in Europe. One must remember that much of the equipment used by American troops, ranging from aircraft to artillery, was supplied by either the French or British. One factor that helped the United States, as well as Germany, to develop a powerful chemical capability quickly was that both countries had large, existing chemical industries.

Developing Defensive Measures

In addition to producing chemicals and filling shells for offensive operations, the U.S. Army was required to supply protective equipment for its own and other service personnel. This was done in a similar cooperative system between Government agencies and private industry—a system that exists today in many forms.

Initially, the Medical Department set up its own system of mask development and production. It also received help from some of the finest universities in the

country, including Johns Hopkins, Princeton, and Carnegie Institute of Technology. In addition to the faithful Bureau of Mines in the Department of the Interior, other Government agencies provided assistance, such as the Bureau of Chemistry in the Department of Agriculture. [The Bureau of Mines had conducted the initial research and development of gas warfare for the Army.]

Upon formation of the CWS, much of the Medical Department's work was transferred to the new organization, along with medical personnel like Colonel Bradley Surrey. He had worked for the Bureau of Mines, had been commissioned a colonel in the Medical Corps, and had worked first for it and then for the CWS in charge of gas defense production.

The first 25,000 gas masks produced by the Medical Department were a cooperative effort between the Army and companies such as B.F. Goodrich (which made the face plates of the masks) and the American Can Company (which made the gas canisters). Unfortunately, these masks were not of any use in Europe because they did not protect the wearer against Chlorpicrin, which was beginning to be used widely in combat on the Western Front. So it was back to the drawing boards for the CWS, which had to develop masks capable of protecting the wearer against all of the chemicals then in use.

Although the relationship between the Army and private industry was good on the whole, the Army attempted to maintain exacting standards, and the only way to do so was to build its own gas mask factories. Experience during the Civil War and the Spanish-American War had shown that civilian contractors were not always capable of adhering to exact quality standards. When developing chemical protective equipment, the Army's standards had to be maintained, or many lives would be lost.

To build gas masks on a large scale, the Government took over five large factory buildings in Long Island City, New York, and converted them to gas mask production. At full operation, the plant employed 12,000 workers, of whom 8,000 were women. By combining Government and private production, the Army believed that it could provide enough masks to outfit all troops heading to Europe.

Some inventiveness had to be used to obtain certain components for masks. One critical component was the charcoal used in the canisters to filter out toxic elements. So the War Department initiated a drive to obtain coconut shells, which could be burned to make charcoal. Some shells were obtained from Ceylon and shipped to the Philippines, where a charcoal plant was quickly established. This plant produced up to 1,300 tons of charcoal a month, of which 300 tons were shipped to the United States. The Army also sought fruit pits for burning to make charcoal. Even the Boy Scouts were en-

listed to persuade Americans to contribute different types of pits (such as peach and apricot) for the war effort.

Testing Chemical Warfare

To test the weapons and equipment it developed, the CWS needed to establish some type of proving ground. The British Government already had built its own proving ground at a remote location in England called Porton Down. The United States had to build its proving ground in a similarly remote location. The British sent Major H.R. LeSuere, who had been instrumental in developing Porton Down, to provide his expert assistance.

The Army selected the pine forests of Lakehurst, New Jersey, to be developed into a proving ground. Laboratory buildings, barracks, observation points, impact ranges, and other facilities were quickly constructed. The Bureau of Mines provided William S. Brown to take charge of the testing program. Personnel of the Medical, Ordnance, and Quartermaster Departments and the CWS were assigned to Lakehurst to ensure that all aspects of the materiel were tested.

The first gas shells were tested at Lakehurst on 25 April 1918. The purpose was to develop an understanding of the bursting radius of particular types of shells, how the shells behaved in flight, how many shells it took to achieve an adequate concentration of chemicals, and so forth. This testing continued unabated until the end of the war.

The Army and the CWS performed remarkably well in so short a time. A fully functioning system that provided chemical testing, manufacture and shipping of weapons and equipment, and training of personnel was created in less than a year. By the end of that year, the U.S. chemical warfare effort could be compared very favorably with those of the British, French, and Germans.

The experience in chemical logistics in World War I was to help the CWS greatly in preparing for World War II. Again, the CWS had to build up a huge chemical supply system in a very short time. Even today, a similar system would have to be created to supply chemical protective equipment for a mobilizing military in the quickest possible time. One hopes such an effort will never again be required.

ALOG

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DCSLOG Publications Management System

by Gregory T. Tuttle

A new automated system provides instant access to the latest logistics policy and streamlines the review and approval process for Army logistics regulations.

About 2 years ago, the Department of the Army (DA) Deputy Chief of Staff for Logistics (DCSLOG) tasked the Army Logistics Integration Agency (LIA) to begin central management of all DCSLOG logistics regulations and pamphlets. Much of the Army's logistics policy remained on paper, and DCSLOG had no automated capability for managing it. In response to DCSLOG's tasking, LIA developed the DCSLOG Publications Management System (DPMS) and began using it in March 1998. Now, with the new system, DCSLOG is able to streamline the review and

approval process for Army logistics regulations and reduce the current staffing time significantly.

Background

DCSLOG's goal is to reduce current staffing time for publications by at least 50 percent. It often takes 30 or more months to process updates to regulations and Department of the Army pamphlets. Currently, about 140 of these publications are managed by DCSLOG, and several organizations help the DCSLOG staff to update them. The list of organizations includes, but is not limited to, the Army Materiel Command and its subordinate commands, other MACOM's, the Defense Logistics Agency, the Army Combined Arms Support Command and its subordinate schools, and LIA. LIA acts as the central coordinator, maintains the review cycle, and serves as the primary interface among the DCSLOG staff (the policy approvers), subject matter experts (the authors), and users. Although LIA has assumed its central management responsibilities, pronency for logistics policy and related regulations remains with the DCSLOG directorates. Organizations that assist DCSLOG in writing policy continue to do so using the new DPMS system.

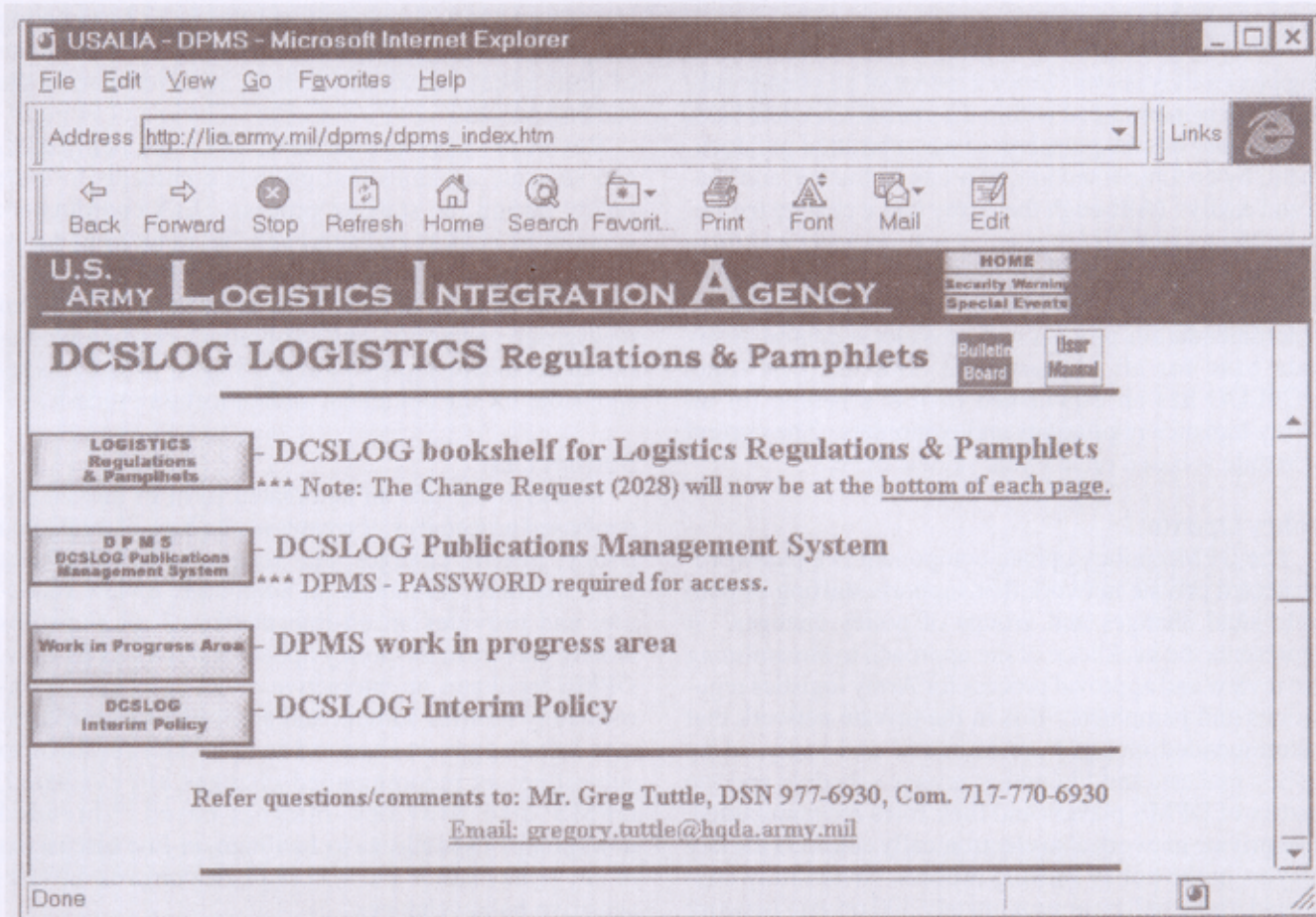
Two-Part System

DPMS has two components: policy access and policy update. The policy access component contains the latest Army logistics policy published by the U.S. Army Publishing Agency (USAPA), as well as approved interim policy changes pending official publication by USAPA.

DPMS gives policy approvers and soldiers worldwide Internet access to Department of the Army (DA) logistics regulations and pamphlets, including impending changes to these publications. It provides a data base management tool that can be used to formulate policy and facilitate the revision process for Army logistics regulations and pamphlets. DPMS acts as a key element in improving the policy update process by establishing electronic links among DCSLOG policy approvers, policy writers, the Army staff, major Army command (MACOM) reviewers, and LIA coordinators.

Policy Access

Soldiers using DPMS have instant access to the latest logistics policy 24 hours a day, 7 days a week, to include "heads up" access to DCSLOG-approved policy changes sent to USAPA for official publication. They have immediate access to publications such as AR 710-2, Inventory Management Supply Policy Below the Wholesale Level, and AR 735-5, Policies and Procedures for Property Accountability. They can perform text searches both within and across documents. Online access is provided through the DCSLOG home page,



□ The DPMS can be accessed easily through the LIA home page (above) or the DCSLOG home page.

<http://www.hqda.army.mil/logweb/>, or the LIA home page, <http://lia.army.mil/>. These websites contain policies on all areas of logistics, including clothing, subsistence, energy, transportation, maintenance, and readiness. All Internet users can enter the policy access portion of DPMS. Since all documents are provided in hypertext markup language, no special reader is required beyond the standard Internet browser.

The new system also provides soldiers with the capability to submit DA Forms 2028 (Recommended Changes to Publications and Blank Forms) electronically to DCSLOG for consideration and evaluation. In most cases, DA personnel, both military and civilian, are the change submitters. In some cases, personnel from the other Services and the commercial sector provide suggested changes to Army policy. Submitters receive automatic confirmation that their suggestions have been received by DPMS and that their recommended policy changes are being reviewed.

Feedback will be provided to submitters on the disposition of their suggestions after they are evaluated. The new electronic change capability reduces time delays between the submission of the suggestions and the

time they are received by policy makers. It also increases interaction among policy writers, approvers, and field users during the evaluation process.

Now that the ODCSLOG has an electronic data base of logistics policy and an automated mechanism for collecting feedback on policy, it can use DPMS as a policy analysis tool. DPMS search and retrieval capabilities allow policy makers to analyze policy decisions during the review and update process. For example, if someone on the DCSLOG staff wanted to assess the policy changes required to institute new policy on how the Army stores and manages inventory, he first would identify all existing Army policy that addresses inventory management. The results of a quick data base search within DPMS would indicate that 79 logistics regulations and DA pamphlets contain the word "inventory," and there are over 4,000 occurrences of the word "inventory" within the 79 documents. The 79 documents contain policy ranging from storage and supply activity procedures to inventory accountability procedures, to procedures for safeguarding sensitive items. Depending on the parameters of the change proposal, policy contained within 79 regulations and pamphlets may need

to be modified as a result.

Policy makers now have a feedback mechanism on logistics policy issues. Since a record of all change submissions is maintained within the central LIA data base, the number of change submissions submitted per document, by document section, now can be tracked and analyzed easily. (Although the Army had a change recommendation capability in place, it was on paper and there was no central Army data base to collect all logistics policy suggestions. DPMS now automates the change recommendation process and provides a central Army data base for all suggestions.) For the first time, DCSLOG has an established review schedule for all Army logistics regulations and pamphlets. The current schedule is based on a 3-year review cycle.

Policy Update

The DPMS policy update component is a password-protected private network that supports staffing of both individual changes and groups of policy changes. It represents the backbone of the approach to streamlining the review and approval process for Army logistics regulations and pamphlets. It is in the private network that recommended changes are reviewed and analyzed by policy makers, and the policy review schedule and the matrix of DPMS players and their roles are maintained. The private network also electronically connects the key players in the policy staffing process. When fully connected, there will be approximately 300 private network users.

Policy changes also can be staffed using the DPMS work-in-progress area. There policy makers can staff an entirely new publication or a revised version of an existing publication. In most cases, revised publications are composed of individual changes that are reviewed, analyzed, and evaluated successfully in the private network. Draft documents then are posted in the work-in-progress area for reviewers to download. Authors use the DPMS private network as a source for points of contact for reviewers participating in the staffing process. Reviewers are provided instructions on how and when to submit their comments for consideration in the update process. Using the work-in-progress area, policy writers have a great deal of latitude in how they collect and incorporate reviewer feedback.

DPMS Players

The DPMS private network consists of approvers, authors, reviewers, and coordinators. Approvers are in the DCSLOG proponent office for the subject policy. They have the final word on what becomes Army policy.

Authors are DA personnel from various organizations who write Army policy. They are subject matter experts for their respective policy areas. Authors help approvers to update policy by interpreting and evaluat-

ing recommended changes from the field, formulating the precise wording required, and assisting the rewrite of draft policy based on feedback received during the staffing process.

Reviewers represent the MACOM's, the Army staff, and separate agencies that provide comments to draft policy during the staffing process. LIA coordinators support the authors and approvers by monitoring publication review schedules, facilitating DPMS data collection and analysis capabilities, assisting with system newsgroup operations, and facilitating coordination between document approvers and USAPA. USAPA is responsible for the document authentication process.

Bottom Line

DPMS is not just an automated form of the old paper-based procedures; it creates a data base of published policy, interim changes, and recommended feedback from the field; maintains an automated review schedule; and provides an on-line matrix of relationships among players in the policy update and staffing process. DPMS facilitates an interactive review process. It immediately notifies authors and approvers when recommended changes are received and provides feedback to submitters as recommended changes are evaluated. DPMS also provides Internet-based "threaded newsgroup" capabilities to facilitate on-line discussion of key policy issues and to coordinate complex or time-sensitive policy changes.

DPMS has introduced automation technology to the publication-management and regulation-writing processes. Rather than having to endure printing and mailing delays, system users can access current logistics policy instantly. Review and staffing can be accomplished electronically. Finally, for the first time, soldiers can submit on-line recommendations for changes to Army regulations. Changes are tracked by LIA instead of disappearing into the bureaucracy. These three benefits will increase access to the latest Army policy while streamlining the policy review and update process.

For more information, call (717) 770-6930 or DSN 977-6930 or e-mail gregory.tuttle@hqda.army.mil.

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SYSTEMS

The information presented in Army Logistician's Systems is compiled, coordinated, and produced by the Army Combined Arms Support Command (CASCAM) Information Systems Directorate (ISD). Readers may direct questions, comments, or information requests to Lieutenant Colonel Thet-Shay Nyunt by e-mail at nyuntt@lee.army.mil or phone (804) 734-1207 or DSN 687-1207. —Editor

FUNDING ISSUES SLOW GCSS-ARMY RELEASE

Preliminary release of the Global Combat Support System-Army (GCSS-Army) Maintenance and Supply/Property modules has been delayed because of a lack of funding for the test and evaluation (T&E) phases of the acquisition process. Current funding and development projections now indicate a second quarter 2001 release date. It is possible that T&E activities may begin this fiscal year as funding becomes available.

FIELDING THE GCSS-ARMY: ONE ARMY, ONE DEPLOYMENT STRATEGY

Fielding new equipment in the Army is, of course, more than issuing major end items to units. Fielding involves numerous tasks to integrate the equipment into the units, including training soldiers and units to work in new ways and to develop new procedures or infrastructures as necessary.

New equipment fielding essentially represents the realization of a materiel solution to a problem on the battlefield. For instance, the need for greater maneuverability and firepower brought about the development of the M1 Abrams tank and its associated combat vehicles and support systems. The development and fielding of GCSS-Army will assist in enabling the emerging Revolution in Military Logistics and distribution-based logistics concepts.

Fielding new hardware and software for GCSS-Army is, in itself, revolutionary, because the strategy is to deliver equipment to, and conduct systems training for, the Total Army based on the Army's articulated priorities rather than by component (active Army, Army National Guard, or Army Reserve).

This concept initially caused raised eyebrows since the prevalent notion was that, in warfighting or contingency operations, the Army employed the active com-

ponent first and then the reserve components as needed. This notion, however, is inaccurate, given the Army's growing reliance on the reserve components over the last 25 years. Today, the formation of forces under the Digitized Division, Digitized Corps, and Force XXI concepts calls for an even greater integration of the active and reserve components. To support these modernization initiatives, the GCSS-Army fielding strategy required modifications to the Army equipping policy. The Department of the Army (DA) approved an Order of Precedence directive that allows the fielding strategy to deviate from the DA Master Priority List and to field regionally. In essence, the GCSS-Army fielding strategy brings the process more in line with real life, in which active and reserve units work together and often deploy together, as they did in the Middle East, Haiti, and Bosnia.

The traditional fielding model, which normally involves sending mobile training teams from installation to installation to deliver training, is replaced by a strategy to establish longer term training and support activities on a regional basis. GCSS-Army regional support centers (RSC's) (not to be confused with AR regional support commands) coordinate and distribute equipment, schedule and conduct training, and provide sustainment support for systems operating in their respective region. Planners envision the creation of 21 RSC's—17 in the continental United States and 4 overseas, anchored on active or reserve component installations to serve multistate regions.

Key to fielding success is each RSC's ability to exercise flexibility while adhering to hard schedules, targets, and milestones. To accomplish this, each RSC will have to establish and maintain coordinating relationships within its region for all components.

In Texas, for example, Fort Hood, with its high concentration of troops, could serve as the focal point for fielding to the larger geographic area around it. Fielding to all of Texas from Fort Hood, however, would be physically and logistically impractical, given the density and geographic dispersion of reserve component units in Texas. The flexibility of the RSC's would allow them to establish additional or supplementary training sites in San Antonio, Camp Mabry, Red River, Corpus Christi, or even at armories in Dallas or Houston as necessary. The advantage of the regional strategy is the establishment of long-term training and support relationships with area units, thereby maximizing decentralized execution and customer orientation.

Fielding of GCSS-Army, like the system itself, will change how the Army does business. The success of this fielding strategy depends very much on the level of active participation by each component, the level of detailed planning and preparation, and the ability of soldiers and units to cope with change.