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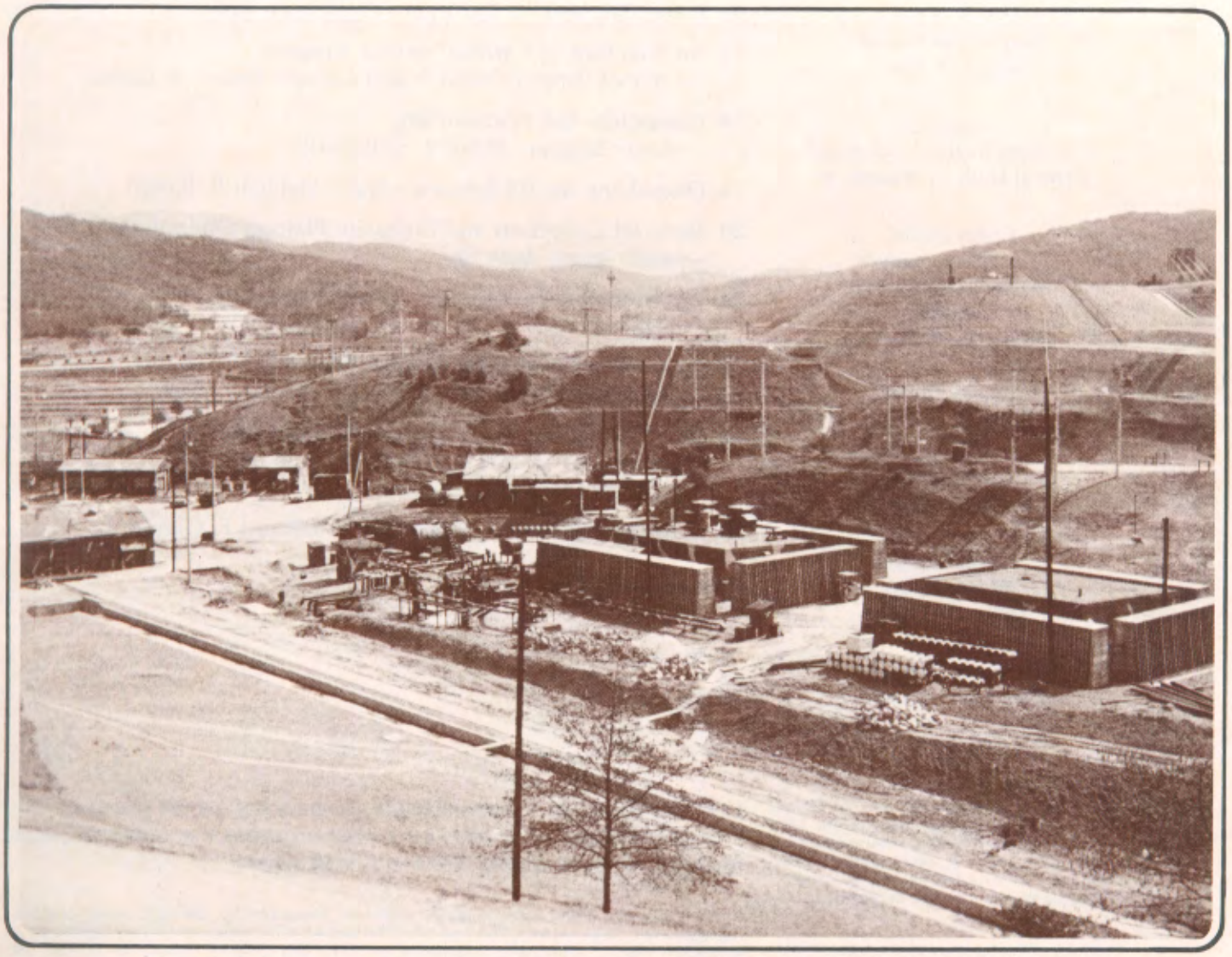

Trans-Korea Pipeline

ARMY LOGISTICIAN

PROFESSIONAL BULLETIN OF UNITED STATES ARMY LOGISTICS

PB 700–87–5 **November-December 1987**

ARTICLES

DEPARTMENTS

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

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COVER—Although a modernization program has greatly improved the Trans-Korea Pipeline System, the author maintains that other problems must be solved to ensure "the fuel line to victory."

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ALOG EMPHASIS

MISSILE PARTS GET NEW LIFE

The Army Missile Command has extended the service life of 12 limited-life components of the Patriot missile from 5 to 7 years. Continuing tests will determine if that period can be extended even further. Army Materiel Command officials estimate long-term savings of $1.7 billion as a result of the extension.

TWO SCHOOLS NOW COLLEGES

The U.S. Army Logistics Management Center, Fort Lee, Virginia, and the U.S. Army Management Engineering Training Activity, Rock Island, Illinois, have been designated as colleges. The new designations, as approved by the Department of the Army, are, respectively, the U.S. Army Logistics Management College and the U.S. Army Management Engineering College.

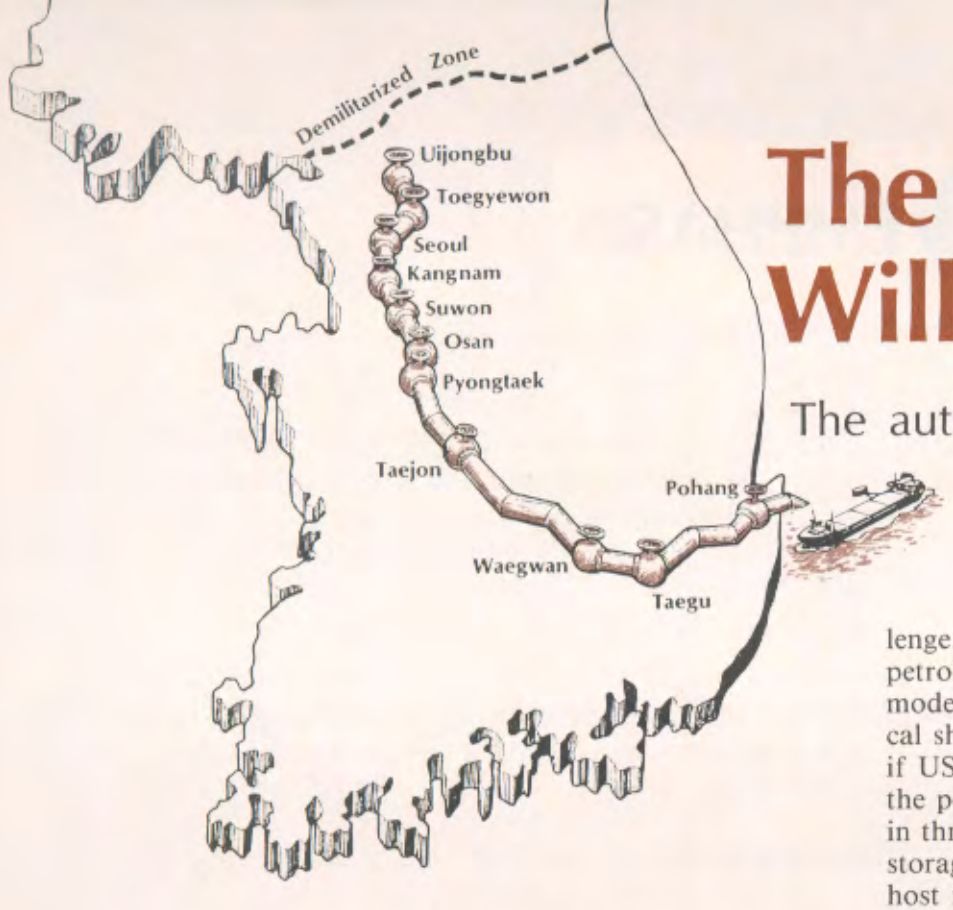
U.S.-GERMAN POL HANDBOOK OUT

Under the auspices of the U.S.-West German Army Supply and Transportation Working Group, the U.S. and West German Army Quartermaster Schools have developed and published a handbook on mutual logistics support of petroleum operations. Titled the POL (petroleum, oils, and lubricants) Interoperability Handbook, it describes the technical means and procedures that U.S. and German units can use for transporting and handling bulk petroleum. The handbook is currently in distribution.

FOUNDING EDITOR RETIRES

Thomas A. Johnson, founding editor of *Army Logistician*, retired from Federal service on 2 September 1987. Johnson was instrumental in conducting the operations research in 1968 and 1969 that resulted in the Deputy Chief of Staff for Logistics and the Secretary of the Army establishing *Army Logistician* as the official periodical for Army logistics, with the first issue (September-October 1969) being distributed in August 1969. Johnson served continuously since as the periodical's editor-in-chief. Johnson's combined military and civilian service career spans more than 43 years, and includes service as a combat infantry leader in Third United States Army in Europe in World War II. He retired from the Virginia Army National Guard in November 1985 as a brigadier general. He continues to serve as Virginia's State Director of Selective Service.

(Continued on page 43)



The Trans-Korea
Will There Be En

The author explains why the current

The U.S. Army owns and operates the Trans-Korea Pipeline (TKP) system. Operating 24 hours a day, each day the system pumps approximately 40,000 barrels of refined petroleum product to both military and commercial customers.

The pipeline was built to meet the modern warfare requirement of expeditiously providing fuel for all United States Forces, Korea (USFK). The system consists of a 283-mile-long, high-pressure, buried steel pipeline and the associated bulk storage terminals and pump stations. The pipeline begins on the southeast coast of Korea at Pohang with 10-inch diameter pipe and ends just south of the demilitarized zone at Uijongbu with 6-inch diameter pipe (see map above). To overcome the hydraulic gradient and friction loss while still achieving maximum delivery rates, pump stations and bulk storage terminals are located at seven locations along the route. The fuel storage capacity is approximately 1.6 million barrels and consists of both aboveground and underground tankage.

The pipeline system was built between 1969 and 1971 and is currently undergoing a major modernization program to meet wartime bulk petroleum requirements of USFK. Although the modernization was initiated to meet this challenge, the upgrade is not sufficient to meet the petroleum demand of a war. Even when the modernization program is completed, four critical shortcomings must be addressed and resolved if USFK plans to fight and win the next war on the peninsula. These shortcomings are a shortfall in throughput capacity, an insufficient in-country storage capacity, an unrealistic dependence on host nation support (HNS), and a late arrival of Reserve components.

History of Petroleum Distribution

The history of petroleum distribution in Korea dates back to 1951, when the first petroleum terminal was built at Inchon to support the Korean War. The system consisted primarily of an offshore tanker mooring system, a submerged pipeline, and bolted-steel 10,000-barrel storage tanks. Inland distribution to supported customers was primarily conducted by rail and tank truck.

In 1965, the Pohang petroleum terminal with an associated offshore tanker mooring system was completed, thereby expanding the capability and flexibility of petroleum distribution. The Pohang terminal was built both as an alternate point for fuels to enter the theater and as a base terminal for the future pipeline system. As planned, the Trans-Korea Pipeline from Seoul to Pohang was completed and became fully operational in 1971. Because of the Pohang terminal's improved tactical location and ability to handle larger oceangoing tankers, the Inchon terminal was deactivated in 1972. The pipeline system was expanded to its current length in 1981 with the extension of the pipeline from Seoul to Uijongbu.

The Trans-Korea Pipeline was originally designed and built to provide surge capabilities in a war. Therefore during peacetime the pipeline can handle more fuel than is normally required for

Pipeline—
ough Fuel?

by Major Gary W. Bradley

program to modernize the pipeline system is not enough.

military operations. This surplus capability not needed during peacetime is leased to a commercial refinery, which uses the pipeline to transport fuel; the refinery reimburses the Army at competitive tariff rates.

A historical review of petroleum distribution activities in World War II, Korea, and Vietnam demonstrates the peculiar characteristics of petroleum logistics in an undeveloped area. The lack of adequate facilities to receive, store, and distribute bulk fuels and the resulting long lines of supply had varying effects on the services' abilities to support their forces and accomplish other support missions. Petroleum support in Vietnam was more difficult, perhaps, than support in a developed area, mainly because many basic necessities were not in the theater until long after forces had been committed.

Three conclusions can be reached concerning petroleum distribution in each of the three major conflicts—

- Pipelines are the most efficient means of transporting the ever-increasing quantities of bulk petroleum required in modern warfare.
- Pipelines should be extended as far forward into the combat zone as practicable.
- Prescribed levels of petroleum supply in theaters of operation have in the past been unrealistically high when related to storage facilities available.

These conclusions were understood and incorporated into the Trans-Korea Pipeline system as it operates today.

Throughput Capacity

The term *throughput capacity* refers to the amount of fuel that can pass through a pipeline during a given period. As I am using the term, *throughput capacity* refers to the number of barrels (each containing 42 U.S. gallons) that travel through the pipeline per day. The throughput capacity of the pipeline system is not sufficient to meet the fuel requirements of war. As mentioned earlier, the pipeline system operates during peacetime with a substantial surge that is leased to commercial customers. The original design of the system assumed that this surge would be sufficient to meet the increased petro-

☐ **Forward mooring points, completed in 1985, allow tankers to discharge their cargo without dropping anchor.**

leum requirement of war. Because of the lack of an inland distribution plan, this assumption could never be properly proved.

In early 1986, a coordinated effort among the petroleum elements of Eighth United States Army, the 19th Support Command, and the 2d Quartermaster (QM) Group was initiated to develop an inland distribution plan that addressed petroleum requirements. The study indicated that there was a shortfall in throughput capacity to meet the continued fuel requirements of USFK.

As the operations and executive officer for the 2d QM Group from August 1984 through May 1986, I was responsible for the operation, maintenance, and management of the TKP. Although the inland distribution plan officially documented a throughput deficiency, planners had also taken that assumed fuel shortage into consideration. Because logistics is a national responsibility, seeking host nation support was not considered practicable.

The TKP is the only fully functioning and integrated pipeline system on the Korean peninsula. Several Korean commercial oil companies rely heavily on the TKP to provide inland distribution of their fuel from Korean refineries to the local populace. In fact, the TKP now delivers approximately 50 percent of the commercial heating fuel to Seoul. Because of economic and technical constraints, commercial oil companies have increased their reliance on the TKP rather than build their own pipeline systems. In fact, the Army is currently staffing a design and funding proposal from one of the companies to increase the throughput capacity of the TKP by adding pump stations and manifolds. The increased capacity would both meet the needs of the commercial concerns and reduce the shortfall of USFK fuel requirements for war.

An alternative to increasing the TKP capacity is augmenting the current distribution system by introducing fuel into Korea through logistics-over-the-shore (LOTS) operations. Although well established for containerized supplies, LOTS operations involving fuel are still in the equipment-verification and -testing phases. This operation would involve the transfer of fuel from a vessel moored offshore through a floating or submersible hoseline into a tactical petroleum terminal. Inland distribution would be from the terminal into the theater by rail or tank truck. During Team Spirit '86, the 2d QM Group attempted a petroleum LOTS exercise using Active Army units from the United States. Marred by safety constraints, technical difficulties, and bad weather, the exercise was canceled.

Petroleum LOTS operations may play a significant role in the petroleum resupply of Korea in the future, but until then the current system should be expanded if USFK plans to fight and win.

□ Despite the facilities-construction part of the Trans-Korea Pipeline modernization program, which will greatly increase in-country tankage by adding cut-and-cover tanks, there will still be insufficient in-country storage capacity.

Storage Capacity

The fuel storage capacity in Korea is not sufficient to meet the requirements of war. One objective in petroleum logistics is to have adequate storage facilities. To determine the adequacy of storage facilities, an examination of on-hand days-of-supply must be made. Realistic planners must realize that during a war fuel that is not within the theater may never get there. The solution is simple: increase the in-country storage capacity. The answer sounds easy, but the means to achieve that end are not so easy.

Congress requires that all future construction projects first be turned down by the Korean Government funding process through the combined defense improvement projects (CDIP). Funding requests through CDIP channels take several years to complete their cycle, and results certainly are not always favorable. Recent congressional actions have canceled, delayed, or modified storage tank construction requests, thereby greatly reducing the programmed increase needed to meet contingencies of the future. In light of recent budget reductions, the future looks equally bleak.

To mitigate the reality of limited new U.S. storage tank construction, two avenues are being aggressively pursued. One is to modernize the current system, and the other is to seek long-term leasing contracts from in-country sources. The modernization program involves the complete refurbishment of all existing aboveground tanks. Many of these tanks are more than 30 years old and in extremely poor repair. The other effort involves the search for long-term, bulk-storage contracts with local companies to convert the days-of-supply actions to in-country storage. These avenues will not eliminate the current storage capacity shortfall, but at least they will allow the system to maintain its current capability until new construction projects are approved and completed.

Host Nation Support

The current emphasis in Korea in planning for logistics support of U.S. Forces in wartime is to maximize use of host nation support. This means that in distributing bulk fuel inland from the wholesale terminals to the fighting units' supply points, the USFK plans to rely heavily upon tank trucks provided by the Korean Government. A general overview of the host nation concepts depicts an unrealistic dependence on this support.

In the initial stages of a conflict, U.S. Forces will converge on numerous assembly points throughout Korea, where all civilian trucks with drivers will be marshaled, inventoried, and signed over to U.S. Forces. Once physical control is transferred, the vehicles will be convoyed to the various terminals and readied to move bulk fuel as required. The 2d QM Group is the unit responsible for this mission. The plan sounds simple, but numerous personnel, maintenance, and equipment problems must be solved before mission success can be assured.

The first problem is personnel. The 2d QM Group is simply not manned or trained to handle the augmentation of vehicles and drivers. Proper vehicle movement coordination, convoy control, and security require assets equivalent to those of a transportation battalion. The 2d QM Group has only three U.S. personnel assigned for transportation movement and control. Associated with and complicating this are the questions of how to communicate with, feed, and house this new army of Korean civilian drivers.

The second problem involves maintenance. In training exercises using host nation support vehicles, the vehicles did not come with repair kits or parts, and the 2d Group's maintenance section didn't have repair parts for the vehicles. Developing a maintenance capability is an absolute necessity if continued petroleum resupply is to be successful.

The final problem involves equipment shortages. Basically, all drivers and trucks will be received in an as-is condition. That is, they are assigned directly from their civilian organizations without special outfitting to improve their survivability in a tactical environment. Significantly absent are fire protection and remote delivery capability for the trucks and arms, ammunition, and NBC equipment for the drivers. Without this equipment, the drivers will not be able to carry out resupply operations during hostilities.

Host nation support is essential to bridge the gap between requirements and U.S. capabilities; the deficiencies I have described *must* be addressed if that support is to be a functional augmentation.

Reserve Forces

Although Reserve components are identified to augment the petroleum organizations in Korea, their scheduled arrival date places great doubt on their ability to affect the outcome of a war. Most petroleum operating organizations are located in the Reserve components.

The arrival of Reserve components in the theater is based on a document called the

☐ **If we place too much dependence on host nation support, petroleum supply will be a problem in any future conflict.**

time-phased force deployment list (TPFDL). Units near the top of the list arrive first. Historically, combat units are generally time-phased first into the theater with logistics units phased to follow. The assumption is that adequate logistics support in-country is sufficient to support both the existing and arriving forces. This assumption has merit for most logistics considerations—*but not for fuel.*

The most critical Reserve elements from a fuel-logistics perspective are the transportation truck companies. Their late arrival places an unrealistic dependence on host nation vehicles. Should war begin, the Army's ability to activate, deploy, and reestablish bulk fuel support would be very limited. It is an accepted belief that, according to current policy, Reserve pipeline operating, supply, and truck companies will not arrive until long after they are needed. Army medium truck companies are the most critical Reserve elements because they assume the mission of the host nation support vehicles.

The Army force structure needs to be reviewed and updated to give us the capability to meet the petroleum storage, movement, and distribution requirements of forces in the Korean theater. Doctrinal concepts and contingency plans for combat operations will not, however, in themselves provide fuel to combat forces during war. Proper organizations, personnel, and equipment to support large-scale operations are required if fuel is to be provided in sufficient quantities to ensure the mobility of today's combat forces needed on the battlefield.

In short, Reserve components arrive too late to support a fuel resupply system already hampered by unrealistic dependence on host nation support.

Petroleum resupply to support combat operations is essential if USFK plans to fight and win the next war. The current, fully functioning peacetime petroleum pipeline system may not have the framework and capability to support a war. Although a modernization program is underway to upgrade existing facilities and capabilities, it is not enough. While the program attempts to solve the shortage of in-country storage capacity, it does not address the inadequate throughput capacity, the host nation support shortcomings, and the likely late arrival of Reserve components. Immediate action to correct these problems is essential to ensure the fuel line to victory. **ALOG**

Major Gary W. Bradley, a graduate of the Basic Procurement Course at the Army Logistics Management Center, Fort Lee, Virginia, is currently assigned to the War Headquarters Office, SHAPE, Belgium. He was formerly executive officer and operations officer, 2d Quartermaster Group (Petroleum), in Korea. He holds a master's degree from Webster University, St. Louis, Missouri, and is a graduate of the Armed Forces Staff College.

USAREUR's Logistics Strength

by Lieutenant Colonel Bruce A. Block

Webster's defines "sinew" as a solid resilient strength, which aptly describes U.S. Army, Europe's (USAREUR's) general support centers (GSC's). These logistics organizations, an integral part of USAREUR's 21st Support Command, form the "sinew" that ties together the Army's European logistics strengths.

Four general support centers—GSC Benelux in Luxembourg and GSC Germersheim, GSC Kaiserslautern, and GSC Pirmasens in Germany—are part of the 29th Area Support Group (ASG), headquartered in Kaiserslautern, Germany, and provide logistics support for a wide geographical area. The 29th ASG's repair program for fiscal year 1987 was a $39-million program, operating under the inspect-and-repair-only-as-necessary concept. The program provided for the repair of end items, such as combat vehicles and ground mobility equipment, and components, such as transmissions and transfers.

First, let's look at the commonality among the four centers. The four general support centers share a common logistics mission; however, each center has a number of individual missions and projects that make it organizationally different. A general support center is a logistics organization with the principal mission of supply (storage, care, and preservation and minor repair of theater reserve stocks) and maintenance (USAREUR's theater immediate general support repair program), as directed by USAREUR's 200th Theater Army Materiel Management Center (TAMMC). Each center has a general support repair mission to repair materiel in support of USAREUR's readiness.

Next, let's look at some of the individual missions of the centers. GSC Benelux repairs the M880 family of tactical trucks and other ground mobility equipment. The GSC's at Germersheim and Kaiserslautern repair combat and automotive vehicles as well as automotive components. GSC Pirmasens focuses totally on the full range of communications and electronics equipment. The centers also have the capability to perform intermediate general support maintenance on selected items for using units. With general support maintenance being moved to echelons above corps, this workload is expected to increase significantly.

A second common part of the general support center mission is theater reserve storage. This mission includes receiving, inventorying, maintaining, exercising, and shipping reserve stocks. Since most of the materiel is stored outdoors, particularly end items, maintaining and operating the equipment is particularly important to ensure that it is operationally ready.

GSC Benelux stores the full range of tank and automotive materiel and is the only center storing aircraft. GSC's Germersheim and Kaiserslautern store petroleum products, wood and paper products, repair parts, and self-service supply items as well as combat vehicles, wheeled vehicles, troop support equipment, and secondary items. GSC Pirmasens stores communications and electronics equipment, communications shelters, and meals, ready to eat (MRE's). The MRE's are stored in caves in the Pirmasens area.

Each center performs other missions and is structured to provide unique logistics support capabilities for the 21st Support Command. This is where the resilient strength lies, forming the sinew that ties the 21st Support Command's logistics capability together.

GSC Benelux is the only center that is contractor-operated and operates in two countries, Luxembourg and Belgium. The U.S. staff consists of the commander and 35 personnel. They act as Government contracting officer and quality assurance representatives, monitoring contractor performance for transportation, storage, and maintenance missions at all sites. GSC Benelux operates Sanem and Bettembourg, Lux-

embourg, facilities with a local national workforce of 700 personnel employed by the Warehouse Service Agency, an agent of the Luxembourg Government. GSC Benelux also monitors performance of a facility located in Bovigny, Belgium, and operated by the German *Bundeswehr*. The multinational aspect of GSC Benelux operations provides unique and unusual logistics management challenges.

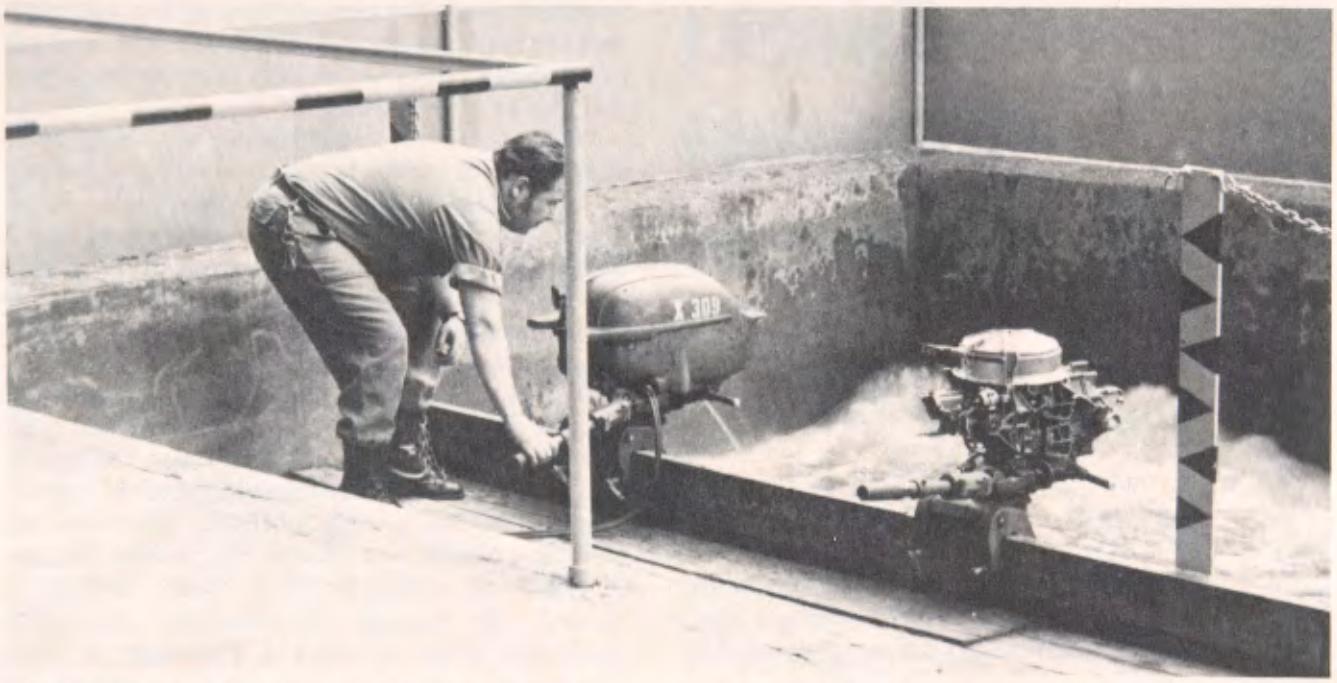
GSC Germersheim, staffed with approximately 1,100 personnel, manages the corps reserve storage activities located at Villmar and Kitzingen. This center was established in 1982 and was tasked to identify selected sites in V and VII Corps for pre-positioning of materiel. Two sites—Villmar near Limburg in V Corps and Kitzingen in VII Corps—are in operation and are being stocked with pre-positioned materiel to support the corps. A German Government contractor (part of the Federal Ministry of Economics) operates the sites and maintains the equipment under the supervision of GSC Germersheim. This allows for dispersion of stocks and includes equipment maintenance as a contractor responsibility. Up to six additional sites, three in each corps, are to be established under similar arrangements by 1990.

The 8592d Civilian Support Group (CSG), under the command and control of GSC Germersheim, provides general support and backup direct support maintenance for all tactical bridging in USAREUR. This support is provided primarily by contact teams onsite and is instrumental in assisting USAREUR corps and divisional engineer units in maintaining bridging capability. The 8592d CSG also performs a theater army repair program for bridges and bridge components and operates a supply support activity providing bridging-peculiar parts.

The USAREUR Bridge Park is managed by the 8592d CSG. Obsolete bridging is stocked at the Bridge Park to fill total bridging requirements. Engineer units draw and emplace the bridge sets during tactical exercises to help soldiers maintain their skills on the obsolete equipment. When the bridging is returned to the Bridge Park, CSG personnel ensure property accountability and maintain the sets. The 8592d CSG is a multifaceted maintenance unit, performing a key role in supporting USAREUR's tactical-bridge readiness.

The 4506th CSG is also an important part of GSC Germersheim. This unit provides personnel to perform the supply mission and administrative support for other CSG detachments on the Germersheim installation.

GSC Kaiserslautern, the largest CSG, with over 1,600 personnel, operates USAREUR's retrograde processing point for all supplies except for



☐ **Technicians at the General Support Center Germersheim repair M60 tanks (left). Outboard motors are tested by this technician (above) at the 8592d Civilian Support Group, which has primary responsibility for bridging support in Europe.**

small arms and medical and selected automatic return items. At this location, serviceable, and in some cases unserviceable, materiel is returned to the supply system for redistribution. This is an extremely busy supply operation, receiving and shipping hundreds of items daily. The payoff from this operation is in the redistribution of materiel to fill requisitions, eliminating the need to pass requirements to the continental United States supply base.

GSC Kaiserslautern also supervises the civilian support groups. The 8121st and 8910th CSG's provide supply support to GSC Kaiserslautern. This includes operating the 21st Support Command's general supply support base and the retrograde processing point. The 8593d and 8907th CSG's provide maintenance support for supplies in storage and direct general support for automotive equipment in the theater reserve stocks program. CSG's are well integrated into GSC Kaiserslautern operations and provide timely, professional support.

GSC Pirmasens has a long history of communications and electronics maintenance, with a civilian workforce of over 500 personnel. Three electronics maintenance detachments, equipped with the AM/MS M105 automatic test equipment, are managed by GSC Pirmasens. These detachments, each staffed with seven soldiers, are located in Hanau, Schweinfurt, and Pirmasens. Their mission is to test and repair electronic circuit boards and components. These detachments are located 3 hours (driving time) from their parent unit and present unique command and control challenges in providing support to V and VII Corps. GSC Pirmasens also manages the 8909th CSG. This unit provides the personnel resources to perform the maintenance mission. These highly skilled experts have a long tradition of repairing all electronic items from simple parts to complex components and complete systems.

The general support centers are unique, highly professional logistics organizations ensuring support for the overall USAREUR logistics mission. They are staffed by highly skilled, dedicated, and loyal technicians, many of whom have spent their entire careers at a general support center. The GSC's collectively provide the sinew that forms USAREUR's logistics strength. **ALOG**

Lieutenant Colonel Bruce A. Block commands the General Support Center Germersheim. He is a graduate of the University of Nebraska, holds a master's degree in systems management from the University of Southern California, and is a graduate of the Army Command and General Staff College.

Direct Support for Reforger

by First Lieutenant Cindy L. Higgins

The Return of Forces to Germany (Reforger) exercise is one of the greatest challenges facing a nondivisional direct support maintenance company stationed in Europe. Every year, combat units deploy from the continental United States to Europe for Reforger. When they arrive, the 517th Maintenance Company of the 21st Support Command, U.S. Army, Europe (USAREUR), provides direct support maintenance support for equipment drawn from the POMCUS (pre-positioning of materiel configured to unit sets) warehouses.

Besides testing the mission capabilities of the company, Reforger also offers valuable training in all areas of wartime operations. For a maintenance support unit's planning purposes, Reforger is divided into four phases—planning and preparing for the exercise; supporting the issue and marshaling area; supporting the turn-in of equipment; and returning to normal operations and evaluating the unit's performance.

The first phase is planning, which starts at the unit level with an analysis of the Reforger support mission to determine requirements. In-progress reviews in the 51st Maintenance Battalion, the 517th Maintenance Company's parent unit, begin several months before the exercise so its component units have adequate time to organize support teams to operate field maintenance sites. The support teams are formed following a study of the equipment of the combat units to be supported. This study ensures that the skills needed for performing onsite repairs will be available. Having the right maintenance people to put all equipment in proper working order should enable each supported unit to reach a 100-percent readiness rate before it moves to the forward assembly area. The typical forward support maintenance team consists of 20 soldiers with automotive vehicle, tracked vehicle, armament, signal, and engineer specialties.

While personnel requirements are being determined, the battalion is also evaluating the equipment required to support the field sites. Equipment needed but not on hand in the company is either temporarily transferred from other units in the 51st Maintenance Battalion or is located by higher headquarters and loaned to the battalion on a temporary hand receipt.

To identify the most practical maintenance site in each marshaling area, Reforger project officers, company commanders, and site officers-in-charge (OIC's) and noncommissioned officers-in-charge (NCOIC's) visit potential locations and analyze possible equipment placements. Because of peacetime requirements in West Germany to protect the natural environment, equipment placement often presents a challenge to those charged with selecting field sites. To ensure that all planning is complete, the 517th Maintenance Company conducts a deployment rehearsal that includes placing and camouflaging equipment and occupying a 360-degree defensive perimeter. A successful rehearsal guarantees a successful Reforger.

The second phase of the exercise is providing issue and marshaling area support. This phase tests logistics planning, tactical discipline, and mission-oriented maintenance support capabilities. The unusually large support mission of Reforger '86 placed a special logistics support demand on the 517th Maintenance Company. The 517th was tasked by the 51st Maintenance Battalion to support 10 battalions and 2 company-sized units in 2 marshaling areas near Karlsruhe and Germersheim. The large size of the Karlsruhe marshaling area required two contact teams. Deployment of the teams occurred 3 days before arrival of the units to be supported.

Through close coordination with the marshaling area control group, site OIC's can keep abreast of movement schedules and make initial contact with incoming advance parties to provide them with information about the maintenance support available. After the units arrive at the marshaling area, OIC's and NCOIC's of the support team rove the area in search of possible maintenance jobs. Without this search, relatively few maintenance needs would be identified early enough to correct deficiencies before the supported units moved to the forward assembly area.

☐ **A soldier of the 517th Maintenance Company fills a water trailer during Reforger '86.**

As jobs are identified, work order requests are submitted to the field site shop office and then radioed to the company shop office for processing. When possible, repairs are made onsite in the marshaling area (including all major assembly replacements). All repair parts and major assembly replacements are provided by the 517th Supply Support Activity, or other 51st Maintenance Battalion units, or are requisitioned from other sources within USAREUR.

As each combat unit leaves the marshaling area in convoy, contact teams provide needed on-the-spot repairs and limited recovery support until the unit clears the support area. The 517th Maintenance Company successfully completed the second phase of Reforger '86 in that every direct support job begun for a deploying unit was completed before that unit departed from the marshaling area. Seventy-five jobs were completed by the three maintenance teams deployed.

The third—and possibly most important—phase is turn-in support. During this phase, the 517th assists the Combat Equipment Group, Europe, in meeting the goal of having 95 percent of the supported units' vehicles turned in before they redeploy to the continental United States. Company support teams are located at the combat equipment company sites and work around the clock in warehouses, shops, and tents to accomplish the turn-in support mission. This is the most demanding part of the exercise because of the maintenance required after vehicle use during Reforger.

The fourth and final phase occurs after the Reforger troops have headed homeward. Mechanics of the 517th spend the next few weeks cleaning up the maintenance backlog that accumulated while they attended to the higher priority Reforger jobs.

As a Reforger exercise becomes history, equipment is put away and repair parts stockage is returned to normal levels. As the seas appear to calm, company commanders and junior leaders are busy behind the scenes spending countless hours analyzing Reforger activities, compiling detailed after-action reports, and revising standing operating procedures—all to ensure that future Reforger exercises and other 21st Support Command missions are completed to the highest standards. **ALOG**

First Lieutenant Cindy L. Higgins is the adjutant, 51st Maintenance Battalion, 21st Support Command, USAREUR. She is a graduate of Furman University, Greenville, South Carolina, and the Ordnance Officer Basic Course.

Architecture of Combat Ser

Just when you thought you'd seen everything, the 21st Support Command (SUPCOM) has developed a new logistics teaching tool. This new teaching tool, called *architecture*, is earning respect for the ease, clarity, and thoroughness with which it explains the intricacies of combat service support in a fresh and dramatic manner.

In this instance, the term *architecture* simply means a graphic depiction of a flow of action in the form of a combined map and chart. Each graphic presentation shows the operational concepts of support that will be made available within a specified area of operations. The 21st SUPCOM uses the diagrams to depict the flow of European-theater logistics and track forces and supplies as they move through the communications zone and rear combat zone into the corps areas.

The original idea for the architecture concept came from V Corps. The commander of the 21st SUPCOM attended a briefing at V Corps, which featured schematic drawings depicting "the battle," "the threat," and "V Corps air defense." He was so impressed with the presentation that he decided to further develop the concept and transform it into a logistics analysis and training tool.

☐ **310th SUPCOM noncommissioned officers study the class III architecture, which typically contains a key explaining symbols and a special insert diagraming a worst-case scenario.**

The task of developing the first logistics product using the architecture concept—and each product was to be called an *architecture*—was assigned to the 21st SUPCOM Assistant Chief of Staff for Logistics (ACSLOG). The subject chosen was the distribution of bulk petroleum (class III) into the European theater.

Developers within the office of the ACSLOG decided that architectures would be best depicted on a large map of the European theater. This format permitted logistics planners to display the flow of logistics commodities and also accurately depict actual war plans. Staff coordination in the development of the initial architecture helped ensure a quality product on the first try. After being briefed on the class III architecture in September 1985, the 21st SUPCOM commander approved it as the model for all remaining classes of supply for other support activities.

A series of logistics-oriented architectures was then developed. The current inventory of architectures includes a technically accurate distribution flow for every class of supply except classes VI and VIII. Several functional support and special subjects have also been prepared in architecture format. Most architectures have been prepared in both classified and unclassified versions. The chart (above right) lists the architectures that have been developed to date.

In general, each architecture depicts the flow of an item from its arrival in the theater and movement through the rear combat zone and communications zone to its eventual delivery to its ultimate customer in the corps. Each method of storage is shown, although the actual storage sites are classified. Each form of transportation needed for an efficient distribution system is also displayed. Every architecture also shows known requirements and the manner in which the 21st SUPCOM will meet those requirements.

Standard symbols and color schemes allow easy identification of features common to several

vice Support

by Colonel James J. Harmon
and Captain Steven A. Curlee

Inventory of 21st SUPCOM Architectures

Subject	Unclassified Version	Classified Version
Class I	X	
Classes II, IV, and VII	X	
Class III	X	X
Class V	X	X
Class IX	X	
Military Police Combat Support	X	X
Engineer Support	X	X
Reception and Force Tracking	X	X
Reforger '86	X	
Force Tracking		X
Noncombatant Evacuation Operations	X	
Host Nation Support	X	
Reserve Components		X

architectures. Most architectures also contain special inserts to elaborate special systems or unique situations. Each architecture, for example, has a worst-case scenario depicted. Included in the worst-case insert is a suggested solution to the problem. Our Reforger '86 architecture, for example, contained a number of inserts explaining unique situations, including marshaling area operations, driver holding area operations, and port operations.

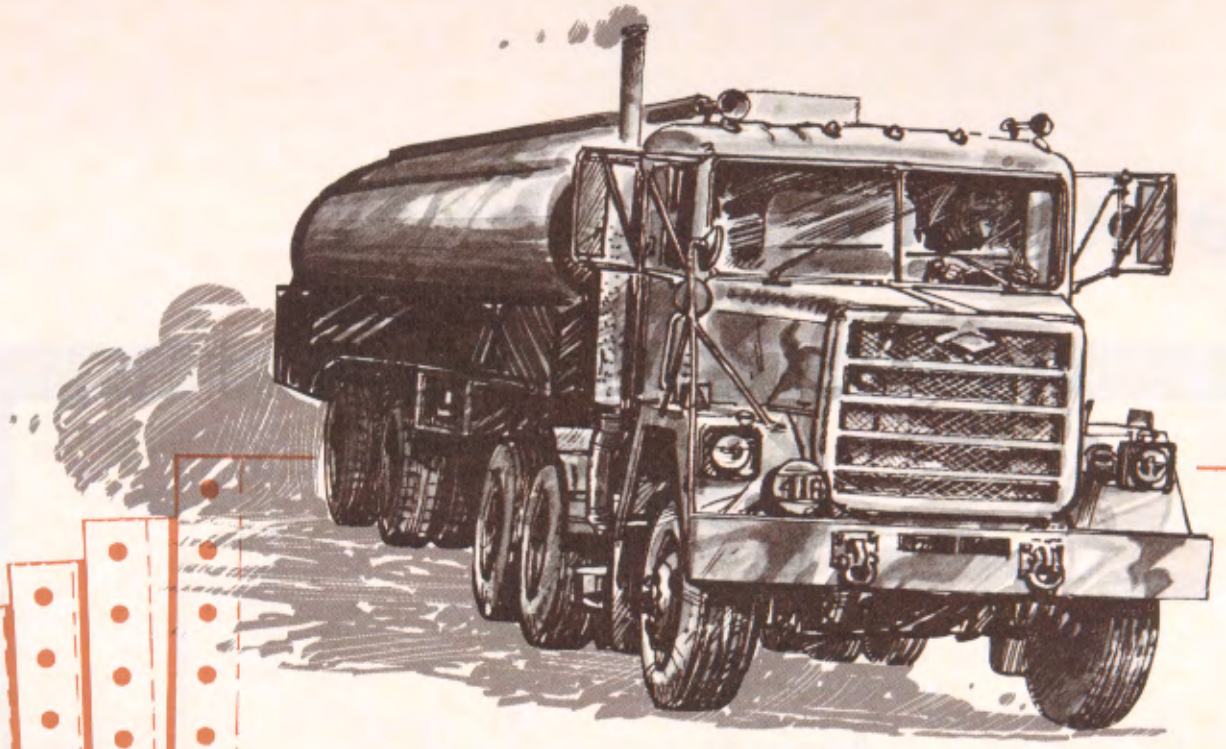
The value of the architecture concept as a teaching tool is immeasurable. From the moment the action officer begins to develop a chart, his training begins. Only after much study and research is he confident enough to display his work for all to see and question. War plans that at first seem complete later are discovered to contain loose ends and vague statements, which must be resolved before the architecture can be completed. Even after the work seems complete, every additional briefing raises new questions and issues that must be answered and incorporated into the architecture and war plans.

The 21st SUPCOM has developed briefings, booklets, and videotapes on its various architectures. If you are interested in more information on any of them, write—HQ, 21st SUPCOM, ATTN: AERGS, APO NY 09325-3730.

The impact of the architecture concept within the 21st SUPCOM is enormous. Architectures provide a means to communicate the important role of logistics resupply in the European theater. They take fragmented war plans and make them easy and fun to learn. For these reasons, the architectures of support will have a lasting impact on U.S. Army, Europe. In pioneering new ideas in logistics support, the 21st continues to live up to its motto, "First in Support." ALOG

Colonel James J. Harmon is chief of staff, 21st Support Command, in Kaiserslautern, Germany.

Captain Steven A. Curlee is assigned to the S3 section of the 260th Quartermaster Battalion, Hunter Army Airfield, Georgia. Previously he was the staff petroleum officer for the 21st Support Command.



Computers Aid Transporters

by Master Sergeant Henry J. Statkowski

The 3d Support Command in Germany uses a spreadsheet program to track the V Corps fleet.

The Army has used computers for years: they plot artillery fire, they keep the supply system working, and they track military cargo worldwide. A computer that is used properly (even a pocket calculator) is a significant improvement over the old-fashioned stubby pencil when it comes to heavy-duty number-crunching. Our Army runs on numbers, from national stock numbers to social security numbers, from items on hand to ton-miles accrued.

The V Corps' 3d Support Command, headquartered in Wiesbaden, Germany, is actively pursuing data automation, data processing, and all-around computer assistance in every area where it might prove beneficial. There are desktop computer terminals throughout the headquarters, either networked or serving as stand-alone terminals. Serving word processors, data-based management systems, spreadsheet software, and graphics packages, they are limited only by the users' imagination. Furthermore, desktop computers are not restricted to the support command's headquarters but are also available at battalion and company levels.

What does this mean to Army transporters? It means that we, too, can benefit from high-technology computer applications at the operations level. How well are we using our transportation assets? How readily available are they, and has their availability changed over the recent and distant past? If half of a particular vehicle fleet were deadlined, what impact would such action have on upcoming operations? The computer, with accurate human input, can help logisticians answer these questions and, in a process that takes minutes instead of hours, produce an accurate answer or projection.

For example, the 3d Support Command's Office of the Assistant Chief of Staff for Transportation has developed a spreadsheet program to tell, at a glance, how V Corps' transport fleet is doing. With daily input from our 181st Transportation Battalion (Truck), we can ascertain the average number of assigned assets for the month (or year) by prime mover or semitrailer, or by a combination of the two (i.e., equipment set). Additionally, we can determine the average number of vehicles available for mission taskings and the average number being used. The spreadsheet program does not result in micromanagement but merely identifies indicators that might warrant further investigation. For example, the data might indicate that 30-foot flatbed semitrailer sets are being used far less than the 40-footers, resulting in less on-the-road training for the 30-foot flatbed drivers. Consideration of such data is apt to raise important questions, such as "Why is this so?"

Our "vsr"-series of spreadsheets take their data from the battalion's daily vehicle status report. These reports show, by type of asset, the quantity of vehicles *assigned*, *not available* for tasking, and *available* for tasking; the *total tasked*; and the *total remaining* (those not tasked). Both the individual and consolidated monthly spreadsheets (samples shown on pages 16 and 17) include these data for each type of transport asset. The information is arranged into 12 individual monthly spreadsheets for each type of transport asset within the battalion. Each of these monthly spreadsheets is capped by a yearly wrap-up for that particular type of transport asset. And each of these yearly wrap-ups is further capped by a consolidated wrap-up show-

Consolidated Yearly Spreadsheet	Consolidated Monthly Spreadsheet	Individual Monthly Spreadsheet	Transportation Asset
vsr87	vsrf87	vsrf0187 through vsrf1287	30' x 40' Flatbed Cargo Assets
	vsrh87	vsrh0187 through vsrh1287	Heavy Equipment Transporters
	vsrp87	vsrp0187 through vsrp1287	Bulk POL 5,000-gallon Tankers

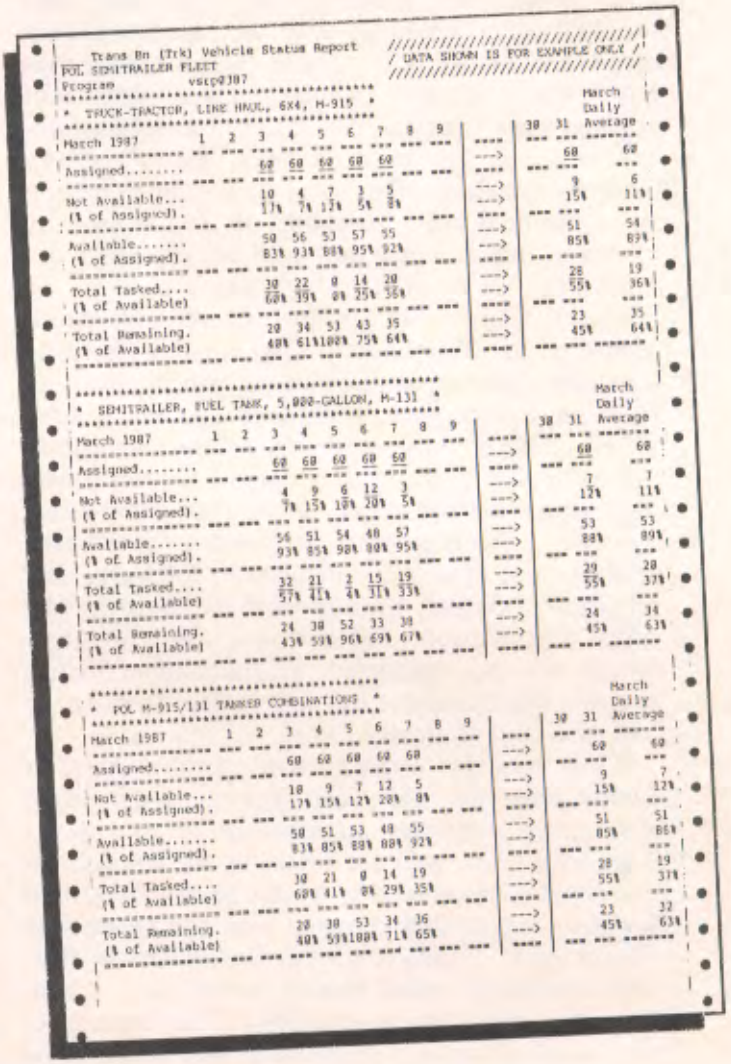
The vehicle status spreadsheet program developed by the 3d Support Command provides monthly and annual data, used to summarize trends and make projections.

ing tractor-semitrailer averages for all assets. The chart on page 15 shows how summary information from the individual and consolidated monthly spreadsheets is used to produce the consolidated yearly spreadsheet.

Each spreadsheet is divided into three parts: prime mover data; semitrailer data; and tractor-trailer combination data. The last part, combination data, is an extrapolation of data from the first two parts. Based on tables of organization and equipment, modification tables of organization and equipment, or tables of distribution and allowances, the ratio between prime mover and semitrailer may not always be one-to-one. Additionally, the relationship between the number of prime movers assigned, available, and tasked and the number of semitrailers assigned, available, and tasked is reflected in the number of tractor-trailer combinations assigned, available, or tasked.

The individual parts of the equipment set have a major impact on asset availability of tractor-trailer combinations. If a unit has 60 semitrailers but only 45 prime movers available, it can move only 45 trailerloads at any one time; in this instance the number of prime movers would be the limiting factor. Likewise, if a unit has 60 prime movers and only 45 semitrailers available, it can still move only 45 trailerloads at any one time, the quantity of semitrailers here becoming the limiting factor. If more prime movers than semitrailers are down for maintenance, or if the semitrailers are scattered throughout various units while the prime movers sit idle, computing the total number of prime mover and semitrailer combinations may not be as simple as A plus B equals C. Petroleum, oils, and lubricants (POL) transport units normally have a one-to-one ratio. On the other hand, in flatbed trailer units semitrailers generally outnumber the prime movers by a two-to-one ratio. By breaking the spreadsheet into three parts, problem areas affecting prime movers, semitrailers, or combinations of the two can be individually identified.

The standard format on each spreadsheet is identical. Thus, "assigned" data are always located on rows 9 (prime mover), 29 (semitrailer), and 49 (tractor-trailer combination) of each spreadsheet. Although the wording may differ, all headings are formatted identically. A sample spreadsheet for our POL tanker fleet is shown



Trans Bn (Trk) Vehicle Status Report
POL SEMITRAILER FLEET
Program vsrp0387

/ DATA SHOWN IS FOR EXAMPLE ONLY /

* TRUCK-TRACTOR, LINE HAUL, 6X4, M-915 *

March 1987	1	2	3	4	5	6	7	8	9		30	31	March Daily Average
Assigned			60	60	60	60	60			--->			60
Not Available (% of Assigned)			10 17%	4 7%	7 12%	3 5%	5 8%			--->			6 11%
Available (% of Assigned)			50 83%	56 93%	53 88%	57 95%	55 92%			--->			54 89%
Total Tasked (% of Available)			30 60%	22 39%	0 0%	14 25%	20 36%			--->			19 36%
Total Remaining (% of Available)			20 40%	34 61%	53 100%	43 75%	35 64%			--->			35 64%

* SEMITRAILER, FUEL TANK, 5,000-GALLON, M-131 *

March 1987	1	2	3	4	5	6	7	8	9		30	31	March Daily Average
Assigned			60	60	60	60	60			--->			60
Not Available (% of Assigned)			4 7%	9 15%	6 10%	12 20%	3 5%			--->			7 11%
Available (% of Assigned)			56 93%	51 85%	54 90%	48 80%	57 95%			--->			53 89%
Total Tasked (% of Available)			32 57%	21 41%	2 4%	15 31%	19 33%			--->			20 37%
Total Remaining (% of Available)			24 43%	30 59%	52 96%	33 69%	38 67%			--->			34 63%

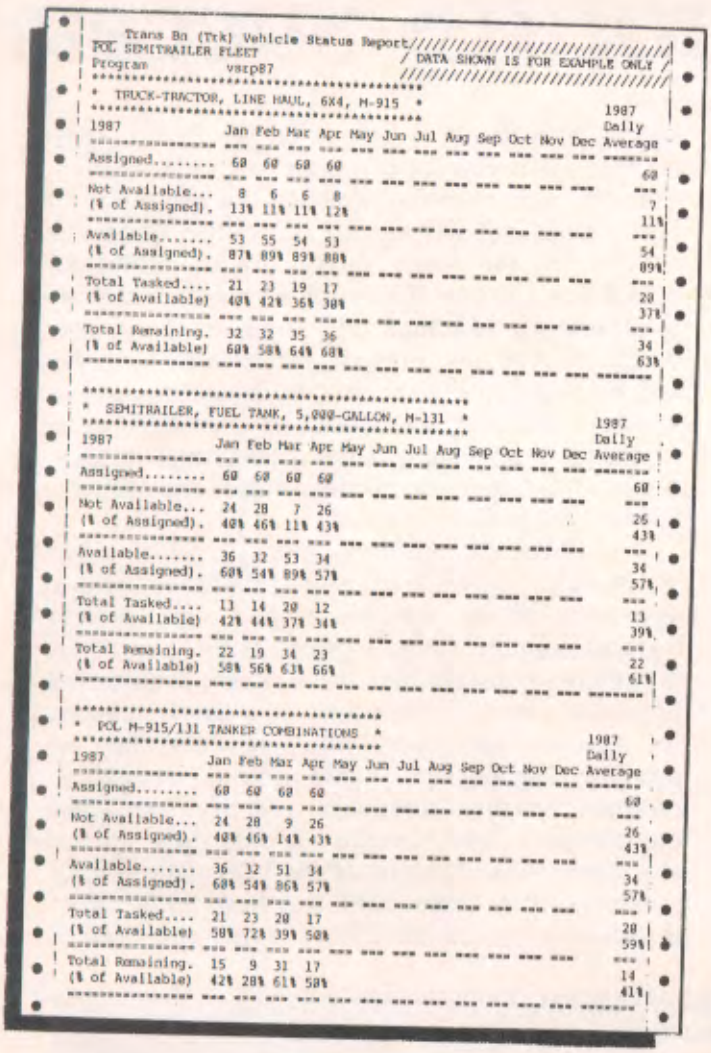
* POL M-915/131 TANKER COMBINATIONS *

March 1987	1	2	3	4	5	6	7	8	9		30	31	March Daily Average
Assigned			60	60	60	60	60			--->			60
Not Available (% of Assigned)			10 17%	9 15%	7 12%	12 20%	5 8%			--->			7 12%
Available (% of Assigned)			50 83%	51 85%	53 88%	48 80%	55 92%			--->			51 86%
Total Tasked (% of Available)			30 60%	21 41%	0 0%	14 29%	19 35%			--->			19 37%
Total Remaining (% of Available)			20 40%	30 59%	53 100%	34 71%	36 65%			--->			32 63%

☐ **Sample individual monthly spreadsheet.**

above. This program is identified as "vsrp0387," derived from "Vehicle Status Report for POL for March 1987."

The underlined numbers on the March report show where data were manually entered by the computer user; all other numbers were internally generated by the spreadsheet program. On 3 March, for example, the user entered "60" M915 truck-tractors assigned, "10" not available, and "30" tasked for missions. The program computed the percentage of prime movers not available, the quantity and percentage available, the percentage tasked, and the quantity and percentages remaining for the day. Similar entries were done for the semitrailers. The computer's central processing unit hummed, generating combined data. With the computer's assistance, the possibil-



Trans Bn (Trk) Vehicle Status Report
POL SEMITRAILER FLEET
Program vsrp87
DATA SHOWN IS FOR EXAMPLE ONLY

* TRUCK-TRACTOR, LINE HAUL, 6X4, M-915 *

1987	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	1987 Daily Average
Assigned.....	60	60	60	60									60
Not Available...	8	6	6	8									7
(% of Assigned).	13%	11%	11%	12%									11%
Available.....	53	55	54	53									54
(% of Assigned).	87%	89%	89%	88%									89%
Total Tasked....	21	23	19	17									20
(% of Available)	40%	42%	36%	30%									37%
Total Remaining.	32	32	35	36									34
(% of Available)	60%	58%	64%	68%									63%

* SEMITRAILER, FUEL TANK, 5,000-GALLON, M-131 *

1987	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	1987 Daily Average
Assigned.....	60	60	60	60									60
Not Available...	24	28	7	26									26
(% of Assigned).	40%	46%	11%	43%									43%
Available.....	36	32	53	34									34
(% of Assigned).	60%	54%	89%	57%									57%
Total Tasked....	13	14	20	12									13
(% of Available)	42%	44%	37%	34%									39%
Total Remaining.	22	19	34	23									22
(% of Available)	58%	56%	63%	66%									61%

* POL M-915/131 TANKER COMBINATIONS *

1987	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	1987 Daily Average
Assigned.....	60	60	60	60									60
Not Available...	24	28	9	26									26
(% of Assigned).	40%	46%	14%	43%									43%
Available.....	36	32	51	34									34
(% of Assigned).	60%	54%	86%	57%									57%
Total Tasked....	21	23	20	17									20
(% of Available)	58%	72%	39%	50%									59%
Total Remaining.	15	9	31	17									14
(% of Available)	42%	28%	61%	50%									41%

☐ **Sample consolidated monthly spreadsheet.**

ity of math errors was eliminated (assuming, of course, the original data were correct to start with).

If an entry was made in the "assigned" block for a particular day, the computer entered a default of "0" on the "not available," "available," "total tasked," and "total remaining" blocks for that day. Thus, if no vehicles were tasked for a particular day (5 March, for example), the user was not required to make an entry for that item. We built in this automatic default as a time-saver. On the other hand, if no data were entered for "assigned," as on a weekend, the program did no calculations whatsoever and left cells blank in that column.

Totaling all the individual daily entries, the computer calculated the average of each for the month and placed them in the far-right column. When averaging, note that the computer counted numbers, including zeroes, but did not count blank spaces. Since the weekends had no data, they were excluded from the process.

The "vsrp87" yearly wrap-up (left) takes the individual monthly daily averages and displays the year-to-date averages. Thus, one can tell at a glance what portion of the fleet was available and tasked throughout the year. With the POL tankers, for example, taskings have remained fairly constant even though availability has fluctuated due to maintenance problems on the aging M131 fleet. With enough backtracking, one can spot trends or project an impact for upcoming exercises.

The 3d SUPCOM's "vsr" spreadsheet programs cover the POL tanker, heavy equipment transporter, and flatbed semitrailer (both 30- and 40-foot) fleets. The programs were written in Multiplan for our Xenix-based Intel 310 office computer network, but they could be constructed using any similar spreadsheet program.

The "vsr"-series of spreadsheets lend themselves to modification, depending on the user's requirements. They can be copied forward for a new year with all the entered data deleted using the "blank" command. Special spreadsheets can be formulated to cover a selected timespan—for example, one not necessarily within the same year. With minor modifications, this type of spreadsheet application can be used to track leave, training, and duty time and to record other information about transportation soldiers.

When available, computer applications are limited only by the imagination of their users. Created by a senior transportation sergeant, this application of desktop computing has provided data for force modernization actions, identified fleet utilization problems, and shown where improvement could be made. It works well for us. You may find that this program or a similar one can assist you at your organization. **ALOG**

When he wrote this article, Master Sergeant Henry J. Statkowski was the chief movements supervisor, Transportation Plans Division, Office of the Assistant Chief of Staff for Transportation, Headquarters, 3d Support Command, Wiesbaden, Germany.

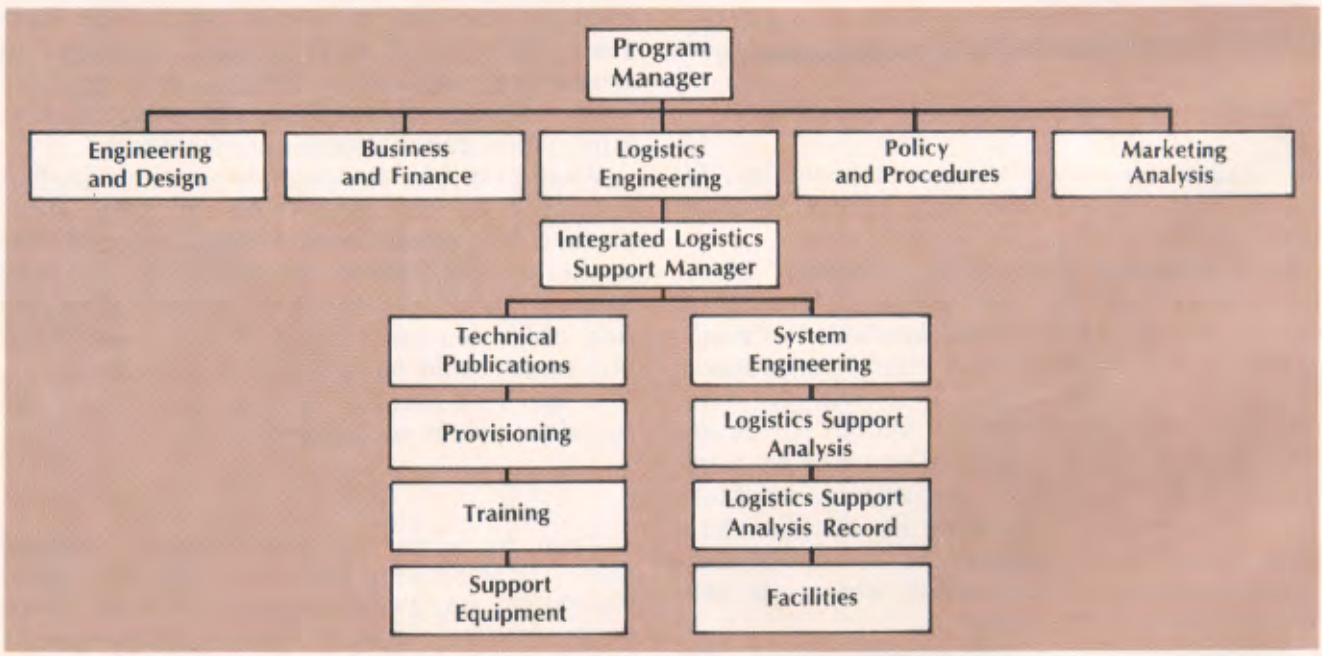
Organizing for ILS Success

Recent changes in the Army's materiel acquisition system have increased the pressure on both contractor and Army integrated logistics support (ILS) organizations. The rapidity of the Army streamlined acquisition process (ASAP) permits fewer design changes and, therefore, requires that ILS be considered as early as possible in the process and have influence equal to that of design engineering. In addition, the increasing use of fixed-price incentive contracts constrains contractor resources and increases risk, frequently resulting in ILS cutbacks.

To ensure that the ILS function is not bowled over in the rush to meet design and performance goals, ILS organizations must have the same level of influence that design organizations have. Unfortunately, in both the contractor and Army scheme of things, ILS functions, usually found in a product assurance organization, are separated from the program manager by intervening bureaucratic layers. Only reorganization will provide a stronger voice for ILS.

In private industry, integrated logistics support and its supporting system engineering (operations research and systems analysis) organizations should have equal weight with the design engineering and technical divisions (see chart below). This organization would prevent the possibility of both design engineering and ILS falling under the control of the same director and, therefore, would prevent the ILS requirements being overshadowed by technical and engineering requirements. It will also provide the necessary checks and balances during the proof-of-principle, development, and proveout phases of the ASAP cycle to ensure that manpower and personnel integration and maintenance considerations are properly addressed and implemented.

It is extremely important that, as design nears completion, upper-level managers have proper awareness of the logistics support analysis and logistics support analysis record (LSA/LSAR). It is equally important that these system engineering personnel receive design data in a timely manner for analysis and entry into the data base to produce LSA outputs. These outputs are used to produce technical manuals, identify spare-part requirements, and develop facility and special equipment requirements. If the LSA data are not available, then these tasks will have to be completed with hypothetical data rather than objec-



Proposed contractor organization.

by Major Stephen P. Barton

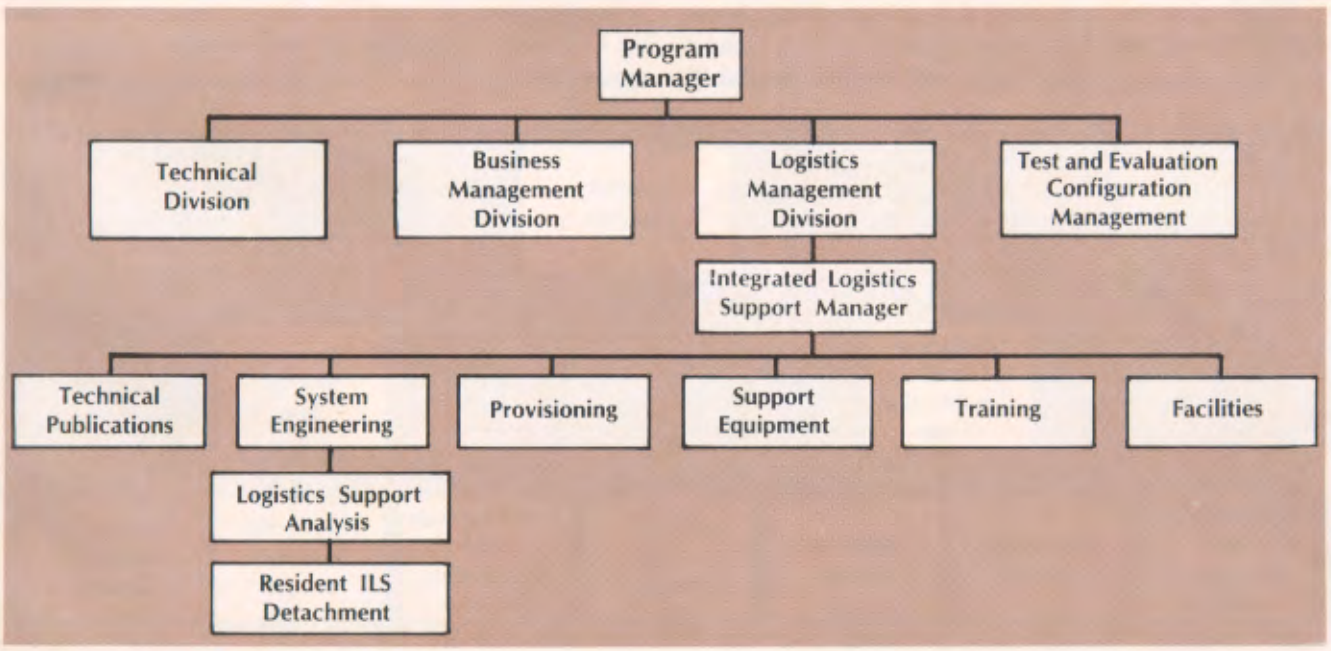
tive data produced by the LSA process.

Army ILS offices should be organized to support the checks-and-balances effort of the contractor's organization (see chart below). To keep upper management in touch with the program's progress, Army program management offices should have an ILS branch within the logistics management division at the same level as the engineering branch within the technical division. Having these functions managed under the current system of matrix management would dilute the effect of the input to the primary decision maker—the program manager.

A resident ILS detachment should also be part of the ILS organization and should be located at the contractor's facility. It would provide key input to maintenance and logistics planning, initially review and approve logistics support analysis and design, and provide timely user input to initial system design. The detachment's final actions would be to review and validate the LSAR data before the data are put into the common data base system for review. The detachment's working reviews should flag any issues that cannot be worked out before the executive-level review and forward the unresolved issues to the ultimate user. If this effort is conducted properly, the final review and approval of the LSAR should be an executive review with very few issues. The detachment should represent all elements that will ultimately use the data so timely and critical input can be made to the logistics support analysis and ILS planning as well as the design of the weapon system.

The acquisition community has to come to the realization that support considerations are as significant as performance considerations during the design and development of a new system. To guarantee balance in these considerations, ILS must be an integral part of the development team throughout the acquisition process. ALOG

Major Stephen P. Barton is the assistant product manager for special electronic-mission aircraft at the Army Aviation Systems Command, St. Louis, Missouri, and was on assignment with the training-with-industry program at Boeing Vertol, in Philadelphia, Pennsylvania, when he wrote this article. He is a graduate of the Armed Forces Staff College, the Program Managers Course, and Western Michigan University in Kalamazoo.



Proposed Army organization.

Materiel Collection and Exc

by Major John J. Bray, Jr.

Doctrinal changes have virtually eliminated maintenance companies with a general support mission from an Army corps' area of responsibility. Maintenance within a corps will be performed primarily to return repaired items to customer units instead of to the supply system. (However, unique corps units such as a light equipment repair company and a missile maintenance company may still retain a general support repair capability.) Corps units with a general support mission had the inherent ability to collect, classify, retrograde, and cannibalize equipment.

To compensate for removing entire company-sized units from the corps area, and with the quick and flexible support of the customer units in mind, the Materiel Collection and Exchange Platoon (MCEP) was created.

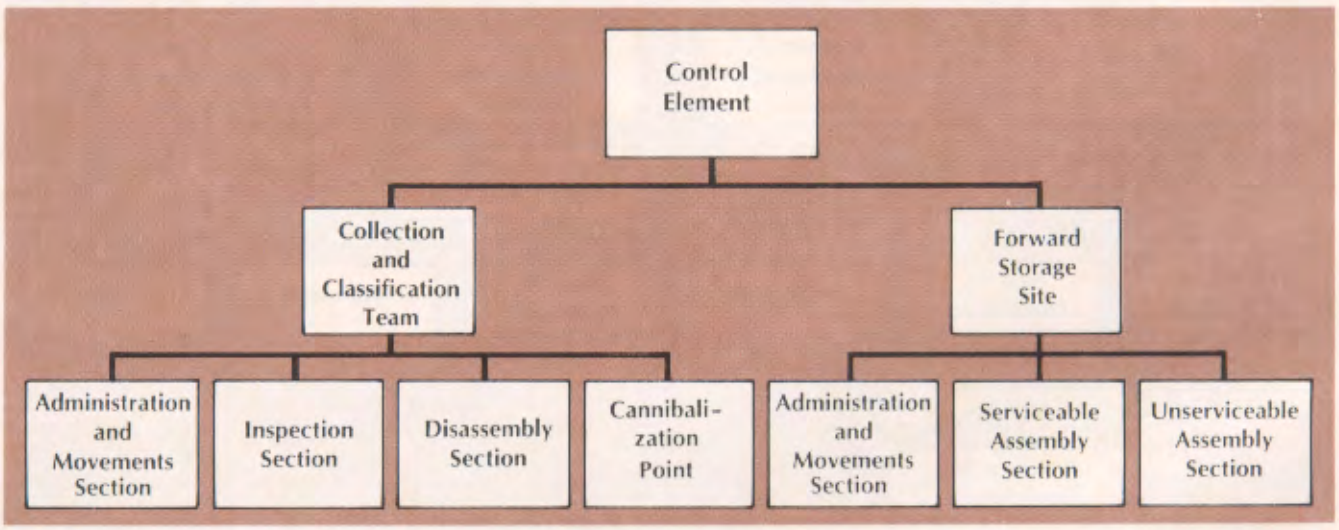
As of 1 August 1986, three MCEP's had been fielded in VII Corps in Europe and are now operational. An MCEP is assigned to each of the three maintenance battalions of 7th Support Group, 2d Support Command. One direct support support maintenance company in each battalion was selected to have an organic MCEP. The selection of the appropriate maintenance unit to operate an MCEP was based on several factors.

These factors included the geographical locations for optimal customer responsiveness, based on area support; real estate and facility availability; tables of organization and equipment (TOE's); and wartime deployment scenarios. The MCEP's are located in Kitzingen (Wuerzberg area), assigned to the 147th Maintenance Company, 87th Maintenance Battalion; Boeblingen (Stuttgart area), operated by the 263d Maintenance Company, 1st Maintenance Battalion; and Nuernberg, operated by the 317th Maintenance Company, 71st Maintenance Battalion.

The MCEP's peacetime mission, in the eyes of the supported customers, is that of a turn-in point for equipment categorized as class II (controlled) or class VII supply items. I will refer to pieces of equipment in these classes of supply simply as "end items." A secondary mission in support of both divisional and nondivisional units is that of a source of repair parts through cannibalization.

More specifically, an MCEP's varied (but related) functions include—

- Operation of a turn-in point for selected end items.
- Collection and classification verification actions necessary to turn in end items. (Equipment that is turned in to the MCEP has already been inspected and classified by a direct support maintenance company. The MCEP verifies that classification.)
- Timely response to disposition instructions provided by the servicing corps materiel manage-



Organization of the Materiel Collection and Exchange Platoon (MCEP).

hange Platoon Operations

ment center (CMMC).

- Disassembly of selected items turned in by customer units.
- Processing of recoverable components into the repair parts supply system.
- Operation of a cannibalization point.
- Retrograde of end items to theater supply or maintenance activities (as directed by the CMMC).
- Processing of scrap metal into property disposal activities.
- Operation of a forward storage site (FSS) for the issue of serviceable major assemblies. (An issue of a major assembly is made for the repair of equipment at a direct support maintenance company. This high-priority issue occurs only when there is none of this type of assembly on hand at the direct support unit.)
- Turn-in operation for the receipt of unserviceable major assemblies from maintenance companies. (These assemblies are removed from an end item in conjunction with its direct support repairs.)

The MCEP organization is shown in the chart on page 20.

The FSS, an operation independent of the end item turn-in mission, handles class IX major assemblies such as engines, transmissions, transfers, and axles. The basic functions of the FSS are the receipt, storage, and issue of serviceable assemblies. The FSS stock is accounted for by the CMMC. (In the case of VII Corps, the 800th CMMC accounts for the stock.) The CMMC also determines assembly stockage levels to adequately support customer equipment maintenance needs. Issues from the FSS are made solely for the repair of equipment at direct support maintenance units, that is, for only high-priority maintenance requirements. Simple replenishment of major assembly stocks at a maintenance company does not involve the FSS. After an issue is made from the FSS, the CMMC effects replenishment of FSS stock.

As a second mission, the FSS is the turn-in point for unserviceable major assemblies from direct support maintenance companies. These unserviceable assemblies are acquired as a result of equipment repair at direct support units. The assemblies are then retrograded throughout the newly formed European Redistribution Facility (ERF) to repair facilities above corps. The issue of a serviceable assembly to a direct support maintenance company and the receipt of an unserviceable assembly from that unit create the "exchange" function of the MCEP.

The FSS does not directly interact with supported customer units. It does business only with direct support maintenance companies. The collection and classification team (CCT) contains those elements from which corps customer units routinely receive support.

Three basic categories of end items are brought to the CCT by customers who want to be relieved of their equipment—

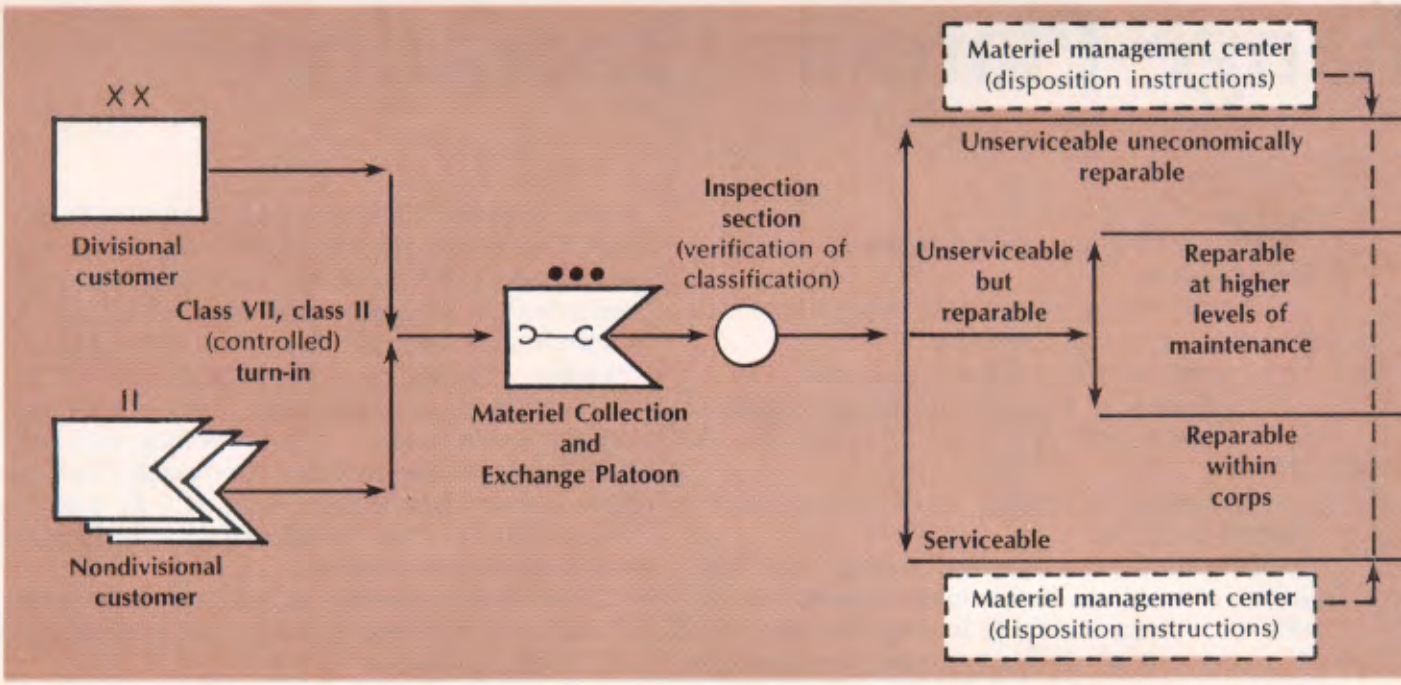
- Excess serviceable equipment.
- Unserviceable but reparable equipment.
- Unserviceable equipment that is uneconomically reparable.

The flow of materiel through the CCT is detailed in the chart on pages 22 and 23. An example will illustrate the process.

A customer arrives at the MCEP with a piece of equipment that its direct support maintenance company has inspected and classified. This piece of equipment (unserviceable or excess serviceable) will have its classification verified by the MCEP inspection station. This process of two independent inspections (one at the direct support level and another at the MCEP) is commonly referred to as the "two-man rule." This ensures accuracy in reporting the condition of the asset for proper disposition instructions. Unless both inspection results agree, the item is not accepted by the MCEP. This becomes a problem for the maintenance battalion materiel officer to resolve.

The end item, with its supporting paperwork—and after reconciliation of all documentation—will eventually be accepted into the MCEP account. The customer is then relieved of accountability and responsibility and given turn-in credit for the equipment.

Immediately after the receipt of the item, the MCEP's administration section reports the asset to the CMMC. In VII Corps, the 800th CMMC, upon receipt of a serviceable item, will determine if there is a need within VII Corps units for this item. If there is a need within the corps, the end item will be issued from the MCEP to a gaining



□ **Materiel flow through the MCEP.**

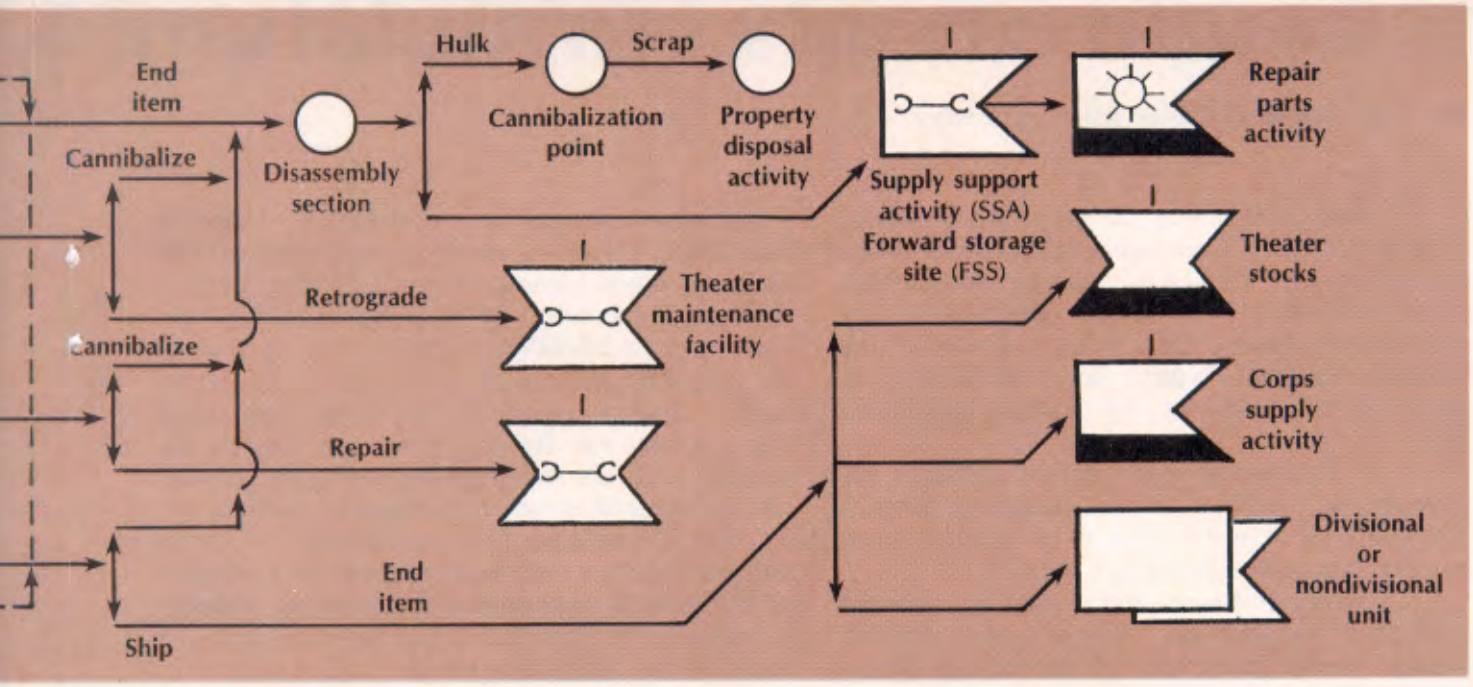
unit. If a serviceable item is earmarked by the CMMC for a specific using unit, then that designated customer would accept the item onsite at the MCEP's location. If the end item cannot be used to fill a shortage in a VII Corps unit, the 800th CMMC reports the existence of this item to the 200th Theater Army MMC (TAMMC). The 200th TAMMC then screens the entire USAREUR theater to determine if the item can be used. Disposition instructions are granted to reflect the TAMMC's decision.

The MCEP may be directed to arrange for the shipment of equipment to one of several locations. Unserviceable reparable items may be retrograded to the appropriate maintenance facility. This source of repair depends upon the level and extent of maintenance required to upgrade an item to a completely serviceable state. If the item can be used within VII Corps, and if the item can be repaired at the direct support or organizational level, then one of the VII Corps' maintenance units will conduct the repair. If the item cannot be used within the VII Corps, then the item is shipped in accordance with disposition instructions to an echelons-above-corps facility. When transport of the end item is necessary, the movements element of the MCEP arranges for road or rail transportation in coordination with the movement control center (MCC). In the Corps, the 229th MCC manages the transportation.

In most cases, if an item is uneconomically reparable, the 200th TAMMC will grant, through the 800th CMMC, disposition instructions for cannibalization. Once these disposition instructions are received, the item moves to the disassembly section.

The 200th TAMMC has identified repair parts and major assemblies that must be removed from end items before placing the "hulk" in the cannibalization point. These components, identified on the periodically published mandatory recoverable item list (MRIL), are retrieved by the disassembly section. Major assemblies are immediately turned in to the FSS. The FSS then turns the assemblies in to a specialized repair parts activity. In the case of VII Corps, the final destination of assemblies (from the perspective of the MCEP) is the ERF. Unserviceable assemblies are, in turn, retrograded by the ERF to the appropriate general support or depot maintenance activities for repair. Upon completion of these high-level repairs, the assemblies will replenish the supply system.

Other recoverable repair parts are processed through the maintenance company's supply support activity (SSA), more commonly known as tech supply. These parts include carburetors, alternators, batteries, and other small items that can be commonly repaired by repair sections within a maintenance company. After the repairs are made, these parts are stocked at the SSA for issue to customers.



After MRIL parts have been removed, the "hulk" is positioned in the cannibalization point, an outdoor activity readily accessible to customer units. The end item accounting personnel are relieved of responsibility, and accounting is shifted to the cannibalization point stock record account using the necessary supply documentation.

Customer units are encouraged to visit the "cann point" and shop around. If a customer unit finds something it needs, the unit representative can fill out a request on the spot. The customer may then remove the repair part from the "hulk." A copy of the request is forwarded to the customer unit's servicing SSA to establish a demand for the part that was removed.

A listing of "cann point" items is published at least monthly and distributed to customer units. Additionally, units may contact the MCEP directly and receive a "picture-in-time profile" of "cann point" items.

When a "hulk" is no longer an asset to customers and is simply taking up valuable yard space, it is turned in to a property disposal activity as scrap. When this happens, the "cann point" is relieved of accountability. The decision regarding the length of time a "hulk" remains in the "cann point" is made by the MCEP control element in conjunction with the maintenance battalion materiel staff. A 2 1/2-ton cargo truck, for example, is a popular item. It would have more intensive customer interest than an item that may have been displaced by another type of vehicle. Since M151-series vehicles have been replaced extensively by the M1000-series vehicles, there would probably be little or no demand for components from an M151. This item would be processed for disposal more quickly than an item commonly fielded to many units.

Since its establishment, the MCEP has worked extremely well. Relieving supported units of excess or unserviceable items quickly and efficiently has fostered good customer relations and ensured that equipment is redistributed to where it would best serve the needs of USAREUR. Retrieval of recoverable components and the cannibalization operation have put essential parts back into the supply system and enabled units to fulfill their readiness needs. The MCEP thus far has been a success. The prognosis is one of purifying or streamlining a supply and maintenance system that is already functioning very smoothly. ALOG

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Requirements Formulation:

by Lieutenant Colonel Jeffrey A. Boucher

The Contracting Office at Army Training and Doctrine Command (TRADOC) headquarters reviews TRADOC contract actions that exceed $250,000. Procurement analysts in this office have a competition going to see who can discover the most bizarre contractual requirement. So far, some of the leading candidates are—

". . . *Contractor will replace all tires on Government vehicles with recapped tires.*" (Shouldn't we wait for tires to wear out *before* we ask a contractor to replace them?)

". . . *Army container which contains garbage is defined as garbage.*" (Now we've defined garbage trucks, cans, and dumpsters as things that get pitched in a landfill.)

". . . *wrench . . . to withstand 300 foot-pounds of torque . . . of any composite biodegradable material . . . weigh no more than 7 ounces.*" (Someone wants to buy a biodegradable torque wrench?)

". . . *software must be compatible with our computer.*" (What computer?)

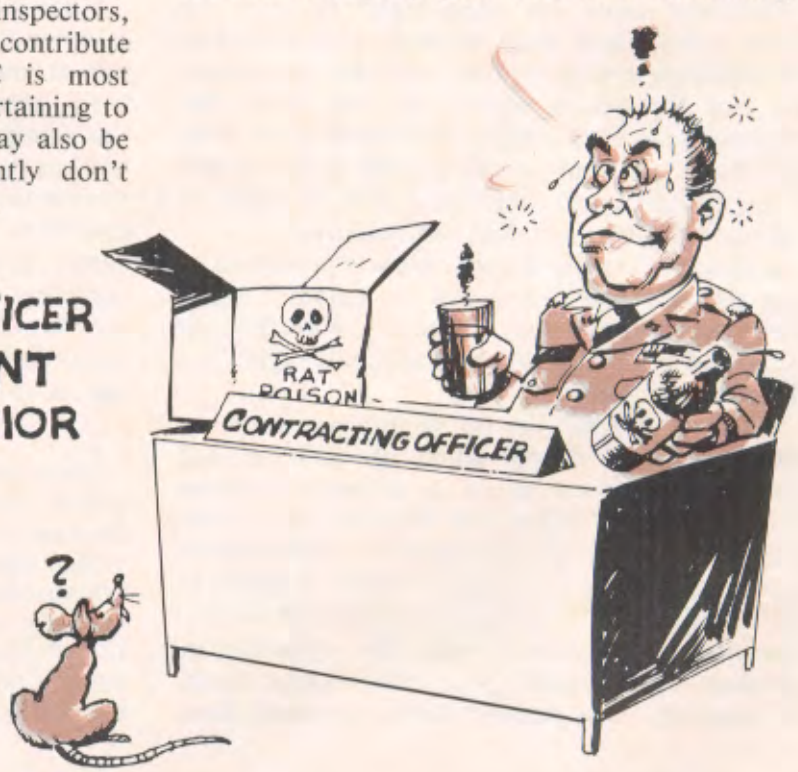
These examples provide comic relief to a most serious acquisition task, but they also represent problems with requirements formulation—problems that confuse contractors, baffle inspectors, increase costs, delay acquisitions, and contribute to mission failure. While TRADOC is most familiar with requirement problems pertaining to service contracts, supply acquisition may also be affected. It appears that we frequently don't know, or can't describe, what we need.

It's impossible for any contracting officer or contracting system to satisfy a requirement if the customer doesn't know, or can't explain, what is needed. Examination of 10 problem-ridden procurements in TRADOC revealed that in 9 cases the requiring activity either misstated the actual need or was not aware of the actual need when the contract was signed. While the contracting activity took the heat for the problems, resolution of difficulties actually rested with the activity that formulated the requirement. What is perceived to be a contracting failure may actually be a failure in requirement formulation. Failures in requirement formulation can rarely, if ever, be remedied by contracting alone.

After finding problems in 90 percent of our sample of procurements, we made informal inquiries into other supply and service contracts written by several commands. As we analyzed the difficulties we found with requirement formulation in these as well, some common elements began to emerge.

Those individuals best qualified to formulate contractual requirements rarely do so. Most requirements seem to have been written by a GS-7 or GS-9 or a company-grade officer. Senior manage-

"THE CONTRACTING OFFICER MUST SAMPLE RODENT CONTROL POISONS PRIOR TO USE ON POST."



What Do You Need?

rial and technical personnel participate only in the editorial process. Even editorial reviews give way to the time pressure associated with expiring funds. Thus, the quality of requirements tends to deteriorate toward year-end.

A second common element is the failure of requiring activities to recognize the need to service an acquisition action. Once a requirement is written, funded, and delivered to a contracting officer, most customers expect it to go away until time for delivery or performance. Few activities routinely provide the contracting officer with an on-call, technically competent point of contact. Still fewer schedule routine in-process reviews for key contracts unless a major system in involved.

The third common element noted was absence of attempts to standardize, train for, and inspect the requirement formulation process outside major system acquisition.

A Suggested Format

Proper management of acquisitions by functional managers will ensure that qualified personnel formulate and coordinate requirements. Without managerial control, the prospect of successful acquisition is never good. Still, a format for requirements might be suggested that facilitates control and interface. Toward this end, TRADOC recommends that individuals involved in contracting follow a seven-part procedure.

• *Part 1: Minimum-essential requirement.* State the Government's minimum-essential requirement as succinctly as possible. Do not use brand names or contractor names; the Competition in Contracting Act (CICA) frowns on specifying a source in this section. Because exceptions to CICA generally take longer than competitive procedures allow, lengthy delays can result from specifying a brand name or contractor. If, for some reason, a sole source situation exists, then add 60 days of acquisition leadtime and include specific reasons why reliance on a single source is necessary. Coordinate this justification of sole-source purchase with your installation or activity CICA advocate.

Do not relate how you think the job should be done. Part of what we're paying for is the contractor's knowledge, creativity, and methodology. If we specify how a job should be done, we curtail our opportunity to see various approaches presented on contractor bids and proposals. Moreover, contractors who compete for their very existence are forced to keep up with state-of-the-art technological and procedural improvements. By tying a contractor to our perception of how a job should be done, we frequently deny application of new techniques.

• *Part 2: Future requirements.* This part seeks to determine where the acquisition is going. A requiring activity often does not know about the funding or direction of subsequent phases of a project. By including what is known about future requirements, the contracting officer can determine if it makes good business sense to cause a contractor to price options so they can be quickly implemented when required. The Government must exercise caution in specifying options to ensure that contractors are not burdened with the production of estimates that will probably not be used. Generally, acquisition actions relative to ongoing and recurring projects can, and should, use prepriced options.

Part 2 also should indicate any existing contracts that furnish the same or similar requirements. Contracting officers may be able to exercise options on other contracts or combine requirements to obtain a more advantageous buy.

• *Part 3: Government-furnished equipment, materiel, and publications and required interfaces.* This section delineates what the Government will provide the contractor in connection with the requirement. Start with a list of applicable Government publications. Making these available to the contractor helps both parties avoid misunderstandings.

Interface requirements that should be considered will fall into one of these areas—managerial, supervisory, quality, technical, mechanical, or electronic.

Describe each required interface in detail, using position titles shown on the installation or activity staffing guide to avoid confusion. Avoid descriptions like "normal quality control interface" and "essentially the same as the industry standard." Describe Government-furnished property, equipment, and materiel completely, and plan to provide the contractor with an opportunity to examine and evaluate what is furnished.

Generally, it's better to offer such things to a contractor at the contractor's option. There are instances where forced use of Government assets may actually increase cost. Let the market make those determinations for you by offering, not mandating, Government-furnished equipment, property, and materiel.

• *Part 4: Schedule, standard, and special qualifications.* List the date, time, and place a service or product must be delivered or performed. In determining this requirement, keep in mind that your milestones may or may not coincide with reasonable production times. A contractor recently told an installation commander, "General, I can do this job at a very inexpensive price, or I can do it very quickly. I'm not sure I can do it quickly and inexpensively." The message is clear: if you're pushing for unreasonable producton times, prepare to pay more.

Of particular importance is the standard to which a contractor must perform. First, keep in mind that the objective is to require that level of quality assurance necessary to meet the need. More isn't better. Excessive quality requirements increase cost without significant contribution to mission. Second, make sure that quality standards are consistent throughout your requirement and that they apply to administrative elements as well as to technical elements. Also, personally read any military schedules, qualifications, or standards you require. If they're not correct, or not applicable, throw them out.

A quality assurance representative should be available in contracting to assist you. Also, technical expertise is most useful in the formulation of consistent, workable quality standards. Be sure that the standards you specify are usable as a practical matter. It's difficult to measure the metallurgical properties of reinforcing steel in a building after the concrete has been poured. Measure required properties first, and inspect to ensure that the proper material is used. Similarly, it may be difficult to measure a standard of .010-inch wax thickness on a tile floor. It does little good to have quality assurance requirements that can't be measured.

Finally, specify all special (that is, military-unique) qualifications or requirements necessary for the procurement. Some typical areas are security clearances, educational level, and experience level; in the supply arena, considerations include special packaging, coating and plating, and space constraints. Be sure that these special qualifications and requirements support the need and do not cause the contractor to meet tighter standards than the Government requires.

• *Part 5: Funding and probable cost.* Amount, fund cite, and expiration date of funds are normally found on request documents. It's also helpful if the contracting officer knows the project funding profile, if applicable. A Government cost estimate is helpful, even if not specifi-

"CONTRACTOR WILL REPLACE ALL TIRES ON GOVERNMENT VEHICLES WITH RECAPPED TIRES."

" DEFINITION OF GARBAGE - ANY CONTAINER WHICH CONTAINS GARBAGE IS DEFINED AS GARBAGE."

cally required. Also, include any data that may be useful in dealing with a contractor on the cost or price issue, such as: "Similar services were acquired 3 years ago from Pan Am Services, Inc., for $147,362"; or, "Items furnished by the Garret Corporation cost 10 percent more last year but had a 40 percent longer service life. Consider cost per months of operation."

• *Part 6: Contractors.* In requirement formulation, the requiring activity should include the names of contractors who have expressed an interest in a specific requirement. While past policy regarding the interface between contractors and requiring activities could perhaps best be described as hands-off, a new age may be dawning. So much of what we require is rooted in the commercial world that a healthy dialog between contractors and those who formulate requirements might be especially beneficial for both groups. There are some important ground rules:

—Don't take anything from a contractor.

—When meeting with a contractor, have a third party present.

—Don't ask for anything from or promise anything to a contractor. Any exchange of items, tasks, or documents must be approved by the contracting officer.

—Don't waste the contractor's time. He doesn't make any money sitting in your lobby.

—Always make a memorandum of the date, time, and salient points of discussions with contractors. Note who was present.

—Coordinate demonstrations, both for and by the contractor, with the contracting officer.

—When in doubt, ask your contracting officer.

• *Part 7: Contacts.* A point of contact and an alternate should be listed, along with other personnel who may have been key to requirement formulation, such as the engineer who formulated the Army standards. Also, the requiring activity should schedule, in writing, in-process reviews.

It's On You

While the format I have suggested may be too complex for simplified purchase requirements and not comprehensive enough for major acquisitions, it's a good starting point in any case. This format may be particularly productive for installation service and supply requirements.

Remember, requirement formulation is on you. Contracting is not responsible for requirement formulation. If you state your requirement in a clear, timely manner, you'll have a much better chance of obtaining the required goods and services—on time, at a correct quality level, and at a fair and reasonable price.

Of course, we can continue the unproductive practices of blaming contracting for requirement problems. That may be what someone in the requiring activity had in mind when he wrote, "The contracting officer must sample rodent control poisons prior to use on post." ALOG

Lieutenant Colonel Jeffrey A. Boucher is the deputy principal assistant responsible for contracting at Army Training and Doctrine Command (TRADOC) headquarters and is primarily concerned with installation contracting. A field artillery officer, he wrote parts and maintenance contracts to support the fielding of the M1 tank and the M2 infantry and M3 cavalry fighting vehicles. He has also served as a TRADOC systems manager and a weapon system manager.

Supporting Operations in Latin America

by Colonel Allan G. Little and Major Robert J. Ross

One of the fastest-growing areas of importance to national security has been in our own hemisphere—Latin America. Many missions that are critical to safeguarding our security there involve Army forces assigned to U.S. Army, South (USARSO).

Army operations in Latin America are far different from those imagined by anyone who views the region as a collection of sleepy, backwater banana bases between Mexico and South America, where soldiers lazily swat mosquitoes on shady verandas and water ski for PT. The region is packed with action, challenges, and new Army units that meet them head-on. One of the most active of these new units is the 324th Support Group. The 324th Support Group is a major subordinate command of USARSO and plays a leading support role in almost every mission.

The 324th Support Group was formed in April 1985 at Fort Clayton, Panama. It is composed of a headquarters and headquarters company, a medium boat transportation company, an explosive ordnance detachment, and four battalions (support, medical, engineer, and signal). Just the names of these diverse units convey some idea of the variety of missions the group performs.

An element of the United States Southern Command (USSOUTHCOM), the group conducts its operations throughout USSOUTHCOM's area of responsibility. This area begins at Mexico's southern border, covers all of Central America, and extends to the southern tip of South America. As one might expect, it is a geographically diverse area.

From Sea Level to 13,400 Feet

Soldiers from the group's 154th Signal Battalion, for example, operated a communications station for 5 months at the U.S. Embassy in La Paz, Bolivia—13,400 feet up in the rugged Andes Mountains. Concurrently, soldiers from the 193d Support Battalion provided fuel to brigade helicopters in the steaming Beni district of the Amazon River basin. Over 2,500 miles north, the 142d Medical Battalion participated in disaster relief operations at the base of Volcan De San Salvador (Quezaltepec) in San Salvador, El Salvador. Such varied and diverse requirements have become commonplace to group units.

□ **Water purification operations conducted in support of Operation Blast Furnace in Trinidad, Bolivia (above). Discharge of a cargo truck from an Army landing craft, medium-8, during Exercise Kindle Liberty, Diego, Republic of Panama (facing page).**

The group provides more different kinds of support than a divisional support command. The support battalion's truckers are constantly on the roads and beaches: they completed more than 144 beach landings during one exercise alone. Driving off a landing craft, medium-8, or landing craft,

utility, onto an unimproved beach site and into the jungle is one of the few ways supplies can be distributed in many of the region's undeveloped areas.

Unimproved operational areas, typical in this region, call for considerable ingenuity. A small beach adjacent to one brigade support area, for example, afforded the only possible surface access to the site. Cargo trucks and utility vehicles drove from landing craft onto the beach almost daily. Soon, the trucks had displaced so much of the soft sand that the flow of follow-on traffic was jeopardized. After assessing the situation, the lieutenant in charge directed soldiers to gather available materials and build up the off-loading area. The next morning, trucks continued to move off landing craft onto the beach . . . over a coconut causeway.

Truckers also must contend with primitive mountain roads and some unique constraints, such as a pair of extremely tight turns on the drawbridge over the Panama Canal's Gatun Locks.

Supplies can also be moved by train (which has been operating across the Isthmus of Panama since the 1850's), helicopter, and a variety of fixed-wing aircraft. In a recent out-of-country operation, battalion soldiers routinely worked with 1930's-vintage DC-3's and a variety of light planes captured by Bolivian police during drug-suppression missions.

The support battalion's water purification and aerial delivery sections are two of the smallest in the group, but soldier for soldier, two of the busiest. No one goes anywhere for long without water in the tropics, so the purification section has members deployed every month of the year. They provide onsite support for exercises, civic action projects, and special missions. The riggers of the aerial delivery section pack and repair parachutes for the 2/187th Infantry Battalion (Airborne) and rig cargo for deliveries throughout the region.

Building Partnerships

The 142d Medical Battalion regularly teams up with the 1097th Transportation Company (Medium Boat) to conduct medical readiness training exercises in coastal areas like Panama's Darien Province, parts of which are still unexplored.

☐ A support site set up in Diego in the Republic of Panama (below). The main supply route of Gobea, Republic of Panama (right). A 536th Engineer Battalion civic action project in Latin America (far right).

Other training exercises range even farther afield; they have been conducted in seven countries in Central and South America. Local nationals have been so anxious to receive medical care from the group's specialists that they often walk 3 or 4 days to visit a site; care ranges from dental to veterinary. The 142d has also figured prominently in disaster-relief planning; since their activation 18 months ago, medical battalion members have stood ready to aid victims of volcanic eruptions, earthquakes, and other natural disasters.

Just as fundamental to partnership development as medical care are roads, bridges, rural school improvements, and basic sanitation facilities. The support group's 536th Engineer Battalion has constructed and improved eight bridges and 40 miles of road in the last year and a half. Like other 324th Support Group units, much of their work was done outside of Panama. This is significant in light of the challenging tropical environment. Rainfall of up to 1 inch per hour almost qualifies some projects as underwater construction!

Actual underwater projects *are* part of this battalion's mission, though. A nine-soldier diving section is organic to the engineer battalion's 15th Engineer Company. These soldiers perform underwater surveys and recovery operations and clear obstacles. After a massive mud and rock slide, they were available to assist clearing operations in one of the world's most important waterways, the Panama Canal.

The external communications support essential to each of these operations and organizations, as well as a host of others, is also provided by a group unit—the 154th Signal Battalion. Elements of this on-the-go battalion deploy whenever and wherever needed to establish, operate, and maintain reliable communications.

Another support group unit with a unique mission is the 36th Explosive Ordnance Detachment (EOD). The 36th is the only EOD in the Army assigned to a supported unit; all others are assigned directly to a major command. The 36th's members travel extensively while performing their mission. One of their most unusual tasks was associated with the support of a drug-suppression campaign.

At a particularly large jungle lab site in one country, over 500 55-gallon barrels of cocaine-processing chemicals were discovered. With no practical means of evacuation, that country's government asked the 36th EOD to destroy them. A plan was carefully drawn up and the required explosives were flown to the site. Just before demolition, the government reversed itself, giving the 36th a new mission: safely remove all explosives from the site.

In between this demanding workload, 324th Support Group soldiers continue to carry out their garrison support roles in the Army's eight forts adjacent to the Panama Canal.

Building Leaders

Each of these operations demands the most from every member of the unit. In the 193d Support Battalion, for example, junior lieutenants are designated as the officer-in-charge (OIC) of 20-soldier combat service support teams that provide supply, transportation, maintenance, medical, and field service support to an engineer

or infantry task force. These task forces routinely operate one or two countries away from their home station for 4 to 8 weeks.

Training means and techniques vary. The Support Battalion, for example, has developed a certification program to prepare officers as combat service support team OIC's. The program includes 21 hours of classroom instruction and practical exercises (on orders, operations, staff procedures, and communications), day-long orientations in each of the functional companies, and a 12-mile road march. The Engineer Battalion, on the other hand, recently conducted a 5-day command post exercise with supporting units to prepare for a large-scale construction mission in Costa Rica. Finally, all of the group's company grade officers participated in a 2-day military stakes competition. They were evaluated on their proficiency in areas of technical knowledge, field radio procedures, field first aid, weapons, map reading, and physical training.

All of the support group's commissioned officers, noncommissioned officers, and soldiers must know their business and address unique situations on the spot. National interests and prestige are frequently on the line, and missions are invariably politically sensitive. That develops leaders!

Full-time Training

In addition to supporting numerous actual operations throughout the year, the 324th is responsible for training its soldiers to the same exacting standards as all other U. S. Forces Command units. Of course, group soldiers receive their most effective training during actual missions, but they also receive valuable multiechelon training with the 193d Infantry Brigade's two infantry battalions, artillery battery, military intelligence battalion, and combat aviation battalion. All units routinely participate in combined and joint exercises throughout Latin America.

To take full advantage of unique regional training opportunities, many group soldiers also enroll in the Army Jungle Operations Training Center's 3-week course at Fort Sherman, Panama. Several are selected to receive additional jungle survival and operations training in Pana-Jungla school, the Panamanian Defense Force's grueling counterpart to the U.S. Army's.

Building Traditions

As the USSOUTHCOM area of responsibility takes on even greater significance to national security, so will the missions that are conducted there. Each one requires responsive, imaginative support for its success. Providing such support creates unparalleled opportunities to hone problem-solving skills and build self-confidence. Developing soldiers through mission accomplishment is fast becoming a tradition in the 324th Support Group. **ALOG**

Colonel Allan G. Little is the commander of the 324th Support Group.

Major Robert J. Ross was the 193d Infantry Brigade (Panama) materiel management officer at the time he coauthored this article. Currently, he is assigned to the 9th Infantry Division (Motorized), Fort Lewis, Washington.

Rear Operations in the Brigade Support Area

by Lieutenant Colonel Carmine A. Egidio, USAR
and Major Michael C. Hagerman, USAR

Much has been written recently on rear operations (formerly *rear area support, rear area combat operations*, and *rear battle*), from both doctrinal and practical standpoints. The transition under Army '86 doctrine to the forward-support-battalion concept promises to improve the rear-operations capability in the brigade support area (BSA). A dedicated support battalion with responsibility for rear operations in the BSA has been used for some time in the 187th Support Battalion, 187th Infantry Brigade (Separate), Fort Devens, Massachusetts. By explaining how our Army Reserve separate brigade has applied evolving rear-operations concepts, we hope to offer some ideas on how the logistician as tactician can meet the rear-operations challenge.

Rear Battle to Rear Operations

The latest version of the Army's AirLand Battle doctrine (FM 100-5, Operations, May 1986) establishes rear operations as an integral part of the overall battlefield effort. As a part of that effort, rear operations must be planned by the brigade commander and his staff as carefully as they plan close and deep operations.

FM 100-5 defines rear operations as "activities rearward of elements in contact designed to assure freedom of maneuver and continuity of operations, *including continuity of sustainment*" (emphasis added). In essence, rear operations defend against the deep operations of the enemy, referred to in doctrine as the Threat. At brigade level, rear operations are practically indistinguishable from other battlefield operations and are usually conducted with the same assets.

Rear operations clearly are no longer just the logistician's problem. To effectively conduct the battle and sustain his main effort, the brigade commander—through the support battalion commander—must manage the brigade's rear operations simultaneously with the brigade's close and deep operations. At the same time, brigade assets assigned to the rear-operations mission must not reduce the brigade's capability for decisive action.

The logistician thus has two demanding but equally important missions: sustainment and rear operations. In accomplishing the sustainment mission, the logistician must concurrently plan and execute effective rear operations. In fact, the rear-operations mission protects the sustainment effort.

Organization for Rear Operations

Threat doctrine places sustainment activities high on its list of priority targets. Whether through special-operations teams or large unit attacks, the BSA and its critical assets will be targets. As the "mayor" of the BSA, the support battalion commander must plan and execute rear operations. But how does the logistician-turned-tactician effectively balance support with rear operations requirements?

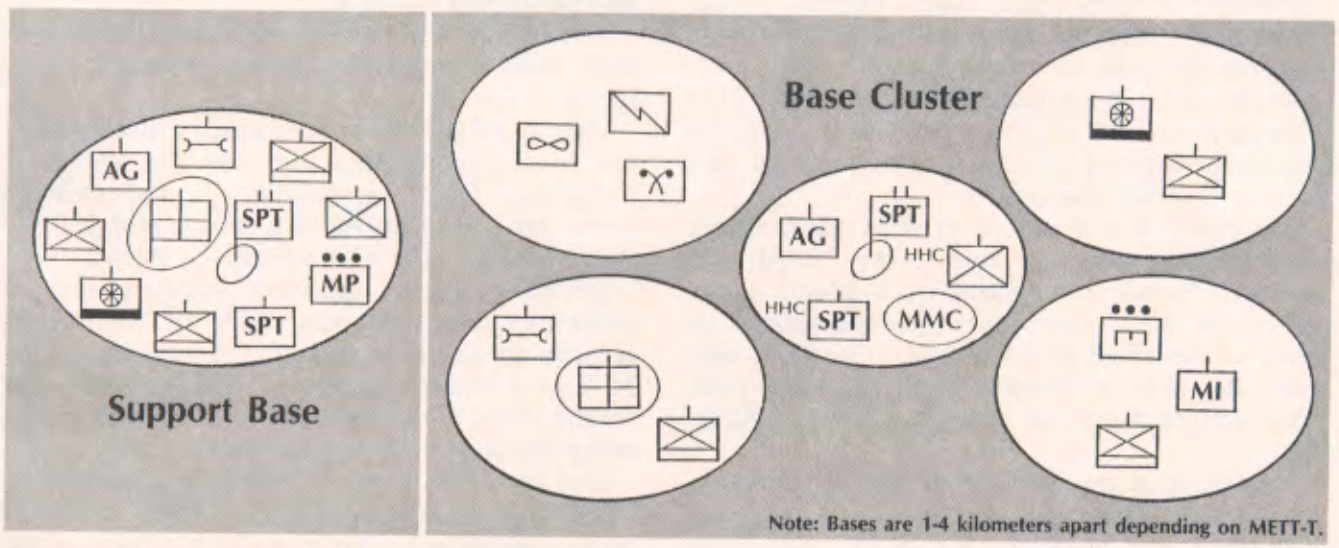
The 187th Support Battalion was confronted with this problem last year as it prepared for its own logistics exercise (LOGEX). No current, comprehensive plan existed for rear operations that incorporated the state-of-the-art concepts set out in FM 90-14 (Rear Battle) and the new FM 100-5. Drawing from various sources (see relevant "Readings" listed on page 37), we drafted a plan that has been tested during both command post exercises (CPX's) and annual training. For the most part, the plan works.

With the diversity of units in the BSA, organization and unity of command is critical for successful rear operations. Depending upon the factors of mission, enemy, terrain, troops, and time available (METT-T), the support battalion commander, through the brigade S4, recommends to the brigade commander one of two BSA layouts—a large support base or a base cluster (illustrated in the chart below). In the base-cluster configuration, care must be taken not to disperse the bases so widely that communications and mutual support during attacks would be hindered.

In addition to support battalion units, the infantry battalion field trains may be collocated on the base or bases. Where more than one base is set up, nonorganic units are located with support battalion units, the commander of which becomes the base commander. In either case, the medical company is located off the base perimeter, surrounded by other units.

To coordinate rear operations, the 187th Support Battalion first established an ad hoc base cluster operations center (BCOC) within the support battalion S2/S3 section. Managed by the S2/S3 and segregated from the main operations area, the BCOC is manned primarily by the intelligence and security noncommissioned officer (NCO) and the NBC NCO. The BCOC is allocated its own communications capability and a radio operator. A status board was developed to track the various facets of rear operations (the chart on page 34 lists the topics included). This board is also used at the daily rear-operations briefings.

The BCOC's mission is to organize and execute the support battalion commander's rear-operations plan. Initial efforts involve coordinating and monitoring the implementation of base defense plans. This is best accomplished by a liaison team from the BCOC, often in the company of the support battalion commander or executive officer, who assist base commanders in fine-tuning their base-defense overlays. BCOC team members suggest obstacle and mine loca-



☐ **Support base and base cluster configurations.**

tions, planned artillery-fire targets, and likely projects for engineer support and identify BSA strongpoints requiring air defense priority.

Once the bases have submitted their base defense overlays, the BCOC produces the BSA rear-operations overlay. This is the controlling overlay for executing a BSA obstacle plan, coordinating artillery fires, and conducting rear operations. The overlay must show the fields of fire, base layouts, BSA road network, and critical sites. Once finalized, a copy is sent to the brigade S3 to help him coordinate activities in the event that brigade assets are committed to rear operations.

At the base level, the base commander sets up a base defense operations center (BDOC), which coordinates base defense efforts and communicates with the BCOC. Though the BDOC is manned by "out-of-hide" assets, the commander needs a good senior NCO and radio and telephone operator to manage it. The BDOC monitors base security and ensures the flow of communication between the base and the BCOC. To assist the already-busy base commander, our plan provides a generic base defense plan that he can tailor to the units on the base and that also allows for coordination of defenses among BSA bases.

Readiness for rear operations within the BSA inevitably leads to a degradation of the sustainment mission. Every person on the perimeter is one pair of hands less for POL missions, maintenance work, and other essential tasks. Balancing readiness and sustainment creates an ongoing dilemma for the support battalion commander. FM 100-5 highlights this problem: "The commander must . . . continually reassess his rear operations as . . . [the] threat and his own tactical situation change."

We found a good compromise to this problem, suggested in part by past *Army Logistician* articles ("Readings"). Based on available intelligence, the BCOC determines the applicable threat level as described in FM 90-14. This level provides the base commanders with planning guidance derived from the enemy's known capabilities.

Depending upon the brigade tactical situation, available intelligence, and the tactical rear-operations situation, the BCOC establishes an alert status—green, amber, or red. This status

Rear-Operations Status Board

- ☑ Threat level (level I, II, or III)
- ☑ Alert status (green, amber, or red)
- ☑ MOPP level
- ☑ Current air defense status (e.g., "weapons hold")
- ☑ Rapid deployment force status (go/no go)
- ☑ Area damage control teams status (go/no go)
- ☑ Brigade assets for rear operations (e.g., cavalry, MP's, etc.)
- ☑ Current enemy (Threat) activity in BSA (by type and location)

☐ The 187th Support Battalion, 187th Infantry Brigade (Separate), developed a status board to track the various facets of rear operations.

reflects the enemy's current activity rather than his capabilities. The rear-operations plan instructs the base commanders to increase security to the extent shown in the chart on page 35. By using the alert status categories, each link of the chain of command understands the general nature of enemy activity and the level of readiness required consistent with continued mission support.

Rear-operations Concept

Guided by FM 100-5, our plan emphasizes both passive and active defense measures to be taken by the bases.

Passive measures. Because passive measures are the most economical, they can be the most important. Good operational security through cover and concealment, dispersion, and camouflage will help hide a base from the threat.

Physical security, especially standard security checks at base entrances, adds to the passive security of the base and to the security of the BSA as a whole. To avoid ambush, BSA units should avoid operational patterns, such as always using the same main supply routes.

Due to the bulk of equipment and the density of storage sites situated in the BSA, creativity and initiative are keys in making passive measures effective. The S2/S3 should also study

methods of employing tactical deception within the BSA, such as setting up dummy supply points (FM 90-2, Tactical Deception).

Active measures. The basic concept for all active measures for rear operations is self-defense by BSA units.

In establishing his base overlays, the base commander carefully locates the required fighting positions, automatic-weapons positions, and obstacles. Despite the demands of the sustainment mission, fighting positions must be set up and improved. The base commander must balance this initial but necessary crunch against sustainment-mission requirements.

Unit leaders must ensure that each soldier is thoroughly briefed on the rear-operations mission. Each must know his fighting position and responsibilities in case of a red alert. This will require ongoing training and rehearsals on common tasks related to rear operations.

Self-protection: Rapid Deployment Forces

The base RDF. As part of his base defense plan, each base commander sets up a base rapid deployment force (RDF) to assist in base security and to react in case of attack.

Depending on the assets available, the suggested RDF is a squad-sized element led by a combat-experienced senior NCO, preferably one proficient in calling in indirect fires. The force should be equipped with at least one automatic weapon (M60 or small-arms weapon) and a PRC77 or other portable radio. Intensive training and rehearsals in infantry squad tactics should be conducted by the RDF NCOIC. The force should employ night-vision devices, if available.

The RDF is used by the base commander to conduct patrols as directed by the BCOC, especially during limited visibility and at night. In case of amber alerts, the NCOIC alerts his force and ensures that they are prepared for action. The BCOC commander deploys the RDF in case of red alert or actual attack on the base. When deployed by the BDOC, the RDF attempts to reinforce the base perimeter, repel enemy penetration through the perimeter, and perform other essential tasks. However, as FM 63-20 emphasizes, base RDF's are committed as reaction forces outside the base *only* in extreme circumstances.

The BSA RDF. Organizing a BSA RDF is more difficult. As a general rule, the support battalion commander-as-tactician will have few combat arms troops committed for rear operations. With the possible exception of the military police (MP) platoon and some aviation assets, most of the brigade commander's combat arms assets will be oriented toward the brigade's close and deep operations, in accordance with AirLand Battle principles. Unless the BSA is threatened with a level-III threat, brigade combat assets will probably not be available for rear operations. The BSA RDF thus must be found from among the assets of the BSA tenant units.

Based on Stephenson's article ("Readings"), we put together our BSA RDF using assets from

Brigade Support Area Alert Status

Alert Status	Meaning	Mission versus Support
Green	No enemy activity in BSA at present.	Normal support and security per SOP.
Amber	Confirmed enemy activity in BSA vicinity but no enemy activity in BSA itself.	25- to 50-percent alert per BCOC, with fighting positions manned, with automatic weapons deployed; base and BSA RDF's on alert.
Red	BSA elements in contact with enemy.	100-percent alert; emergency mission support only; all fighting positions manned and automatic weapons deployed; BSA RDF deployed as needed.

the maintenance company. As the author reasoned in that article, this unit has the largest number of personnel present in the BSA at any one time, the most crew-served weapons, and sufficient FM radios for RDF use.

Our plan calls for a two-squad RDF commanded by the support battalion executive officer (XO), with the battalion S4 as the alternate; it is composed of 1 officer-in-charge (OIC), two 10-man rifle squads (1 NCO and 9 soldiers), and 2 weapons sections (each comprised of 4 soldiers).

The RDF moves either on foot or by truck, with a vehicle for the force commander. A truck from the supply and transportation company, with a mounted .50-caliber machinegun, provides the RDF's lift. Each member carries his own weapon and basic load. Hand grenades are issued to squad leaders. Two portable radios—not on the modification table of organization and equipment (MTOE)—must be obtained for squad leaders. In addition, the XO, RDF OIC, and squad leaders should be equipped with maps of the area and the BSA overlay.

Once the BCOC calls an amber alert, the BSA RDF is alerted and the status of both personnel and equipment is verified. Additionally, the force's transportation assets are put on call and communications are checked.

When a red alert is called, the RDF assembles at its unit area and prepares to move out no later than 30 minutes after activation. Weapons and equipment are double-checked and all troop-leading procedures are accomplished while the RDF awaits deployment.

Conducting Rear Operations

As noted in FM 100-5, one of the most crucial aspects of rear operations is "the establishment of a reliable system for gauging and monitoring the true situation. . . ." The BCOC maintains close liaison with the brigade S2 to obtain intelligence on threat capabilities, including the potential for airborne, airmobile, and air attack. As appropriate, host-nation intelligence is sought regarding terrorist and guerrilla activity in the BSA and surrounding areas. Intelligence data can also be developed from those operating in the BSA (such as MP's, customers, and vehicle drivers), so long as they have been informed of the need for such information.

At the daily BSA commander's briefing, the commanders of all BSA tenant units are updated on current intelligence, projected threat activity, and rear-operations-status-board items. The challenge and password as well as radio frequencies (primary and alternate) for rear operations are verified. Prearranged signals, RDF employment, and other key facets of the BSA rear-operations plan are reviewed to ensure that all units involved understand them. We found these meetings to be a key factor in keeping all key players informed on rear-operations matters.

In conducting rear operations, whether during a CPX or in the field, we have quickly discovered the thin line between readiness and overreaction. Our LOGEX saw constant threat activity in and around our base-cluster BSA. As we plotted the various sightings and incidents on the map, it was easy to jump to a red alert, causing all mission support to stop. Experience, judgment, and common sense must prevail in determining the BSA alert status. The urge to throw the RDF at every threat has to be tempered by accurate information on the nature and extent of that threat.

During our last annual training, reports reached the BCOC that the perimeter had been breached and the RDF, on call, was deployed. They quickly realized that "good guys" and "bad guys" were difficult to differentiate without night-vision devices or supporting illumination. Each BDOC had to be kept informed of the RDF's location to avoid mistaking the force for the enemy.

The brigade MP platoon, when available for rear operations, can be used as an initial reaction force or in conjunction with the RDF. Direct coordination between the BCOC with both the MP platoon and the RDF must be made. In fact, we requested that our MP platoon leader or NCO attend the daily commander's briefing to allow for direct coordination on rear-operations matters.

Use of indirect fires within the BSA has spawned an ongoing debate. As a rule of thumb, indirect fires should be requested only for targets well clear of BSA bases or activities, such as key road junctions or terrain features causing blind spots in bases' fields of fire.

Lessons Learned

The psychological shift. After years of setting up and defending unit perimeters, the psychologi-

cal shift to managing and conducting rear operations across an entire BSA is one both the commander and staff must make. FM 100-5 emphasizes the psychological preparation needed for rear operations: "Soldiers and leaders at all levels must be alert to the rearward threat and psychologically prepared to deal with it." We view this as especially critical for support soldiers, who literally have to perform their jobs while looking over their shoulders for enemy activity. Emphasis on passive measures combined with aggressive patrolling around the base or base cluster is essential to conserve the sustainment force.

Communications. One of our biggest MTOE shortfalls is communications. To equip both the BDOC and BCOC RDF's, portable radios have to be borrowed from other units. The fielding of the mobile subscriber equipment system is expected to improve communications flexibility in the BSA for rear operations. However, Army planners should consider adding portable-radio capability to support battalions for the conduct of rear operations.

Use of brigade assets. Since the support battalion takes so many of its rear-operations assets "out of hide," it must carefully use available brigade assets. The support battalion commander and brigade S4 need to negotiate for assets such as the MP platoon, engineer support, and aviation help.

The Landry and Sullivan article even suggests that the brigade MP platoon be "loaned" to the BCOC ("Readings"). Likely MP missions include route reconnaissance, convoy security, reaction force support, and refugee control.

Rear Operations—The Challenge

Our plan as described here is a dynamic one, subject to revision as we learn. It faces yet another test at our next annual training when we plan to apply the lessons learned to a base cluster layout. We hope that the lessons we have described will shorten the learning curve for units that are just now addressing the rear-operations challenge. **ALOG**

Readings on Rear Operations

Field Manuals

FM 5-100 Engineer Combat Operations, May 1984.

FM 17-95, Cavalry, April 1981.

FM 24-1, Communications, September 1985.

FM 63-1, Combat Service Support Operations-Separate Brigade, September 1983.

FM 63-2, Combat Service Support Operations-Division, November 1983.

FM 90-14, Rear Battle, June 1985.

FM 100-5, Operations, May 1986.

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A simple comparison helps set cost-effective priorities for—

Scrubbing Secondary

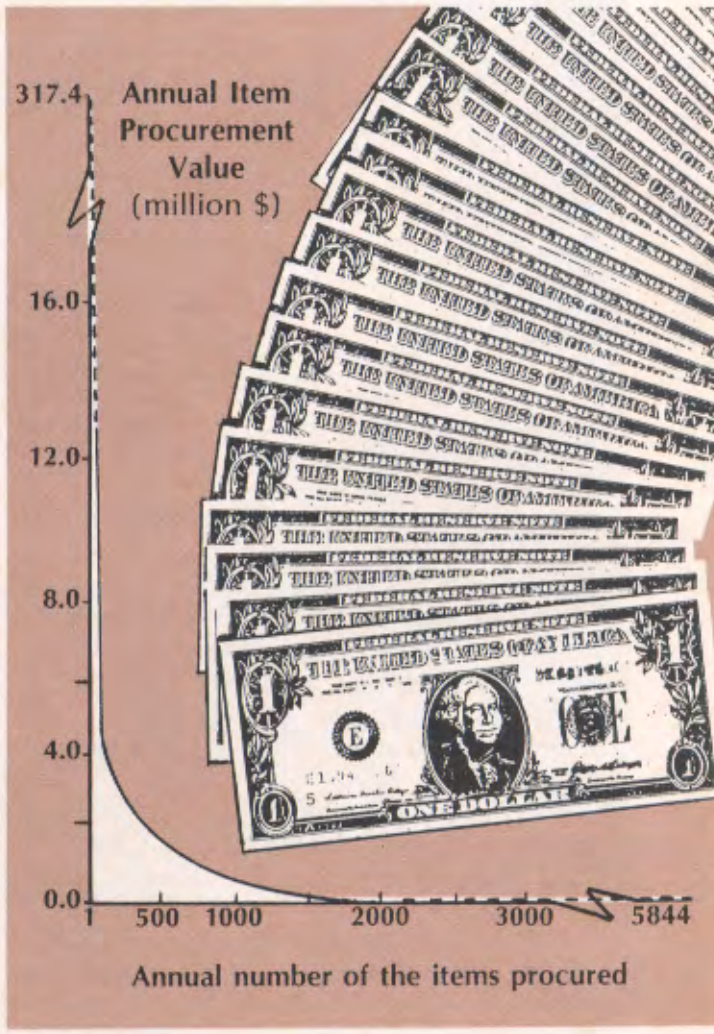
The Army spends billions of dollars every year to procure secondary items. The sheer quantity of these secondary items, whether end items, replacement assemblies, or spare or repair parts, is immense and makes accurate unit pricing a necessity. After all, unnecessarily spending a few pennies here and a few dollars there quickly adds up to millions of dollars in overspending.

Over the past few years, the issue of pricing accuracy has received much visibility. The Army Materiel Command (AMC), as the Army's materiel development and acquisition command, has implemented many initiatives to improve the quality control of unit prices for secondary items entering the Army inventory. One of these initiatives is item price "scrubbing."

"Scrubbing," or reviewing, an item's unit price involves comparing the current price with the price history of similar items and studying the item's engineering drawings and technical data. This is a time-consuming and expensive process. Therefore, since only limited resources are available, price scrubs should be limited to those items that display a high probability of being overpriced or that hold the promise of large potential savings as a result of price reductions. There is a deceptively simple screening method that helps determine which items should be selected for price scrubbing.

The first step is to determine how much is being spent to buy each item. Using unit price and annual demand data, an item's total annual procurement value can be easily computed. The chart to the right shows the relative procurement dollar values of a sample of 5,844 secondary items ranked from most to least expensive. The magnitude of the items' procurement values decreases rapidly for the first 500 items before beginning to level off. Let's assume the area under the curve represents the total procurement cost of all 5,844 items. In examining this area, we see that the bulk of the total procurement value is contained in a small portion of the 5,844 items, more than 95 percent within the first 1,500 items. The economic theory known as "Pareto's Principle of the Critical Few" applies to these "critically few" items.

This first ranking leads us to the few items comprising the lion's share of annual procurement dollars, but holds no clues as to which items should be subjected to price scrubbing. Therefore, we must determine where potential savings lie. However, these potential savings can be found only through price scrubbing. Since our goal is to prevent unnecessary price scrubbing and to assign priorities for the most productive



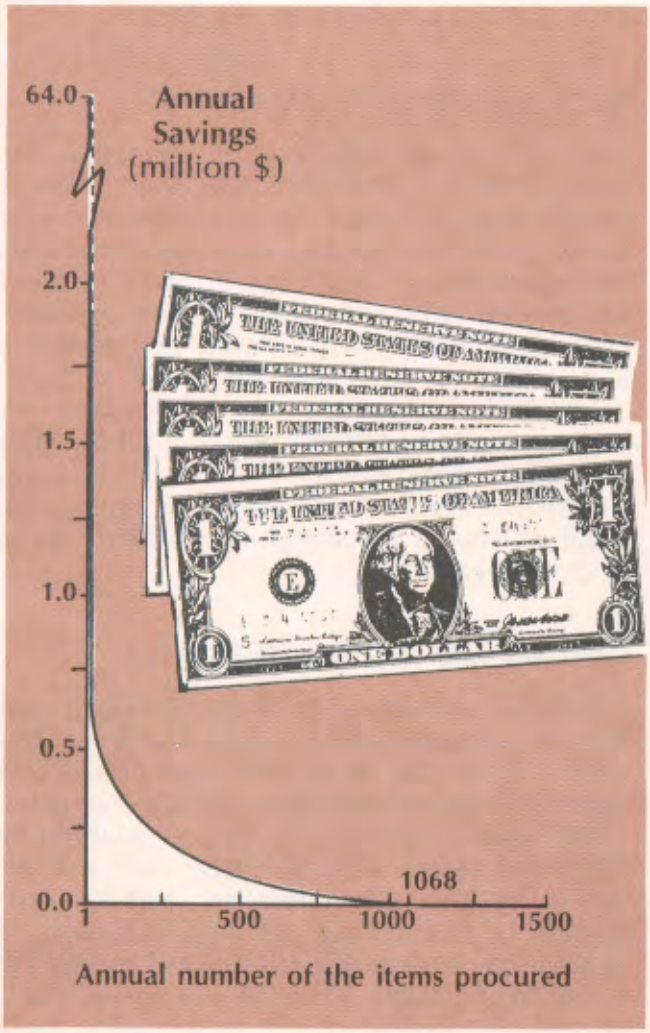
Procurement costs ranking.

Item Prices

by Edward F. Glavan, Jr.

price scrubs, we must find some price scrub indicator based on total procurement values alone. To simplify the development of our methodology, the 5,844 items in our example have already been subjected to a price scrub exercise. Now, we can easily compute the actual savings for each item by multiplying the difference between the original price and the scrubbed price by the annual procurement quantity.

Ranking the 5,844 items based on their savings produces a curve (shown in the chart below)



Procurement savings ranking.

similar to that in the first chart. As with the total procurement dollars, a small number of items, the critical few, account for most of the savings. In fact, the savings curve decreases to zero at the 1,069th item. Only 1,068 of the 5,844 items offer price reductions and, therefore, any savings.

Because our objective is to assign priorities for price scrubbing and gain the most savings from the fewest possible scrubs, we must now determine if the critical few procurement-value items match the critical few items that provide savings. If so, the highest-ranked procurement-value items would produce most of the savings.

Counting the items common to the critical few of both the procurement value and savings rankings reveals that the top 100 critical few in each listing have only 27 items in common, and in the top 1,000, only 273. This is not discouraging, however, because even though the lists of the critical few items did not match one-for-one, the portion of savings captured by these common items is still impressive. The 27 items common to the top 100 in each ranking capture 71.8 percent of the savings, and the 273 in the top 1,000 yield nearly 92 percent of possible savings. Ultimately, more than 99 percent of the savings are found in the top 3,000 procurement-value items.

Based on these comparisons, it is possible to say that, in general, price-scrubbing the items with the highest procurement value generates the greatest price reductions in the fewest price scrubs. Therefore, we should assign priorities for price scrubbing to items based on the magnitude of their annual procurement value. This is where the biggest share of the savings will be found.

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ALOG DIGEST

PURE REDISTRIBUTION TESTED

The recent Return of Forces to Germany (Reforger) exercise featured the first hands-on test of the Army's concept for redistributing equipment that units leave behind when they deploy.

Reforger-bound units from Fort Hood, Texas, and Fort Carson, Colorado, drew equipment from pre-positioned materiel configured to unit sets (POMCUS) sites in Europe. Meanwhile, Active Army, Army National Guard, and Army Reserve units "fell in" on the equipment the deploying units left behind, called POMCUS unit residual equipment (PURE). The local directorates of logistics performed all required paperwork for transferring the PURE, previously known as "uncovered POMCUS," and the receiving units performed technical inspections to determine maintenance requirements and general readiness. They also received training in inspecting and maintaining the Army's newest weapon systems, including the M1 tank.

During the test, paperwork simulations placed some of the PURE items in war reserve stocks. In addition, Department of the Army headquarters and the U.S. Forces Command tested the mobilization equipment redistribution system module of the logistics data network in tracking and supporting all transactions.

According to officials in the Office of the Deputy Chief of Staff for Logistics, practicing the redistribution of PURE will become a regular feature of Reforger exercises and may provide National Guard and Reserve units an opportunity to train with the Army's most modern equipment.

INSTALLATIONS TRY UNIFIED BUDGET

Fort Leonard Wood, Missouri, and Fort Riley, Kansas, are among six military installations testing the Department of Defense (DOD) unified budget concept.

Under the unified budget test now in progress, installation commanders are permitted to finance unfunded mission requirements by exchanging surplus funds in one budget account for funds no longer required in other budget accounts. DOD officials believe the unified budget will give installation commanders the flexibility to get the most from available funds.

In test results so far, Fort Leonard Wood has used money from several accounts to buy commercial equipment such as forklifts and tractors. Fort Riley has drawn money from several accounts to fund more battalion-level training exercises and to repair helicopters so it could meet its flying-hour goal.

The unified budget test is scheduled for fiscal years 1987 through 1989. Other participating installations include Naval Air Station Cecil Field, Florida; Marine Corps Logistics Base Albany, Georgia; Reese Air Force Base, Texas; and Royal Air Force Lakenheath, England.

AMC VIDEO TELECONFERENCES SAVE

In the first 16 months of its operation, the Army Materiel Command (AMC) video teleconference network, called the video-enhanced user system (VENUS), provided voice and visual links for approximately 33,500 participants in 1,489 conferences. After deducting operating expenses, the system enabled AMC to avoid approximately $1.6 million in travel and lost man-hour costs.

The VENUS network is the prototype for similar systems now being set up in other major commands. The Defense Commercial Telecommunications Network will link these major command systems in a common-user network to be established in 1989.

DA FORM 1687 REPLACEMENT TESTED

The 24th Infantry Division (Mechanized), Fort Stewart, Georgia, is testing an authorization card in lieu of the DA Form 1687 signature card to requisition and acknowledge receipt of supplies.

The authorization card is used to establish an account at several facilities rather than a single facility. It is serially numbered, and its serial number is recorded on the unit commander's assumption-of-command order, which is retained at the supply facility. Only the unit commander's signature is required on the authorization card. The card is presented to the supply activity, and, if the serial number matches, supplies are issued.

Under the present system, each commander

must maintain between 18 and 34 sets of signature cards. Only five persons are authorized to use each card, and the commander must change the cards as personnel changes occur, an average of three times per year. The cards must also be changed during unit deployments. Since each change takes from 45 minutes to 2 hours, a commander might spend the equivalent of 7 to 10 days per year maintaining the cards.

The 24th Infantry Division is testing the authorization card under the supply and maintenance assessment and review team (SMART) program. *Army Logistician* will announce the results of the test when it is completed.

LOG LESSONS SYSTEM IMPLEMENTED

The Army Logistics Center, Fort Lee, Virginia, has extended its logistics lessons learned (L3) automated system to all of the Logistics Center's associated schools—the Aviation Logistics, Ordnance, Ordnance Missile and Munitions, Quartermaster, and Transportation Schools and the Academy of Health Sciences. The L3 team from the Logistics Center has trained key personnel at each school on the system.

The L3 system maintains data collected by the Logistics Center's evaluation teams, the schools, the Center for Lessons Learned (CALL) at the Army Combined Arms Center, and the National Training Center. As of this Summer, there were 595 issues and observations in the L3 data base. The Army Training and Doctrine Command eventually plans to implement an automated network linking L3, CALL, and other lessons-learned systems.

GRAVES REGISTRATION CENTER PLANNED

To improve the Army's graves registration program capabilities, the Army Quartermaster School, Fort Lee, Virginia, is establishing a graves registration center. The center, being formed by consolidating Quartermaster School graves registration resources, will serve as a focal point of expertise for recovering, identifying, evacuating, and burying remains occurring during Army and joint service operations.

The center will be the proponent for graves registration doctrine and training for the Total Force. It will also improve the Army's response to contingencies such as the Grenada invasion and the Gander, Newfoundland, air disaster.

In a related development, the Army plans to activate the 54th Quartermaster Company (Graves Registration) at Fort Lee during fiscal year 1988. This company will be the only graves registration unit in the Active Army (there are four companies in the Army Reserve). Current plans call for activating two more Active Army and three more Army Reserve graves registration companies.

REFORGER SETS RECORD

The largest oversea deployment of Army forces ever in peacetime occurred during the 19th annual Return of Forces to Germany, Reforger '87.

The exercise began in August when Active and Reserve component Army units from 27 states moved more than 3,900 pieces of equipment to the ports of Galveston and Beaumont, Texas, and Baltimore, Maryland. The Military Traffic Management Command then supervised loading the equipment onto four Military Sealift Command fast sealift ships (including the USNS *Pollux*, shown below) for the voyage to Europe.

Upon arrival in Rotterdam, the Netherlands, the equipment moved by air, highway, and railroad to West Germany. The Military Airlift Command flew approximately 35,000 troops to Europe to pick up their equipment and participate in 3 weeks of field exercises. The soldiers and equipment returned to the United States in October.

☐ **The USNS *Pollux* takes on Reforger-bound equipment at the port of Beaumont, Texas.**

WARRANT OFFICER MOS STRUCTURE REVISED

A complete revision of AR 611-112, Manual of Warrant Officer Military Occupational Specialties (MOS's), includes a new MOS structure for warrant officers. Under this structure, the numbers (and in three cases, the titles) of ordnance and quartermaster warrant officer MOS's have been changed to correspond to the branch numbers (91 for ordnance and 92 for quartermaster).

The new MOS numbers, their titles, and previous designations are—910A, ammunition technician (411A); 911A, nuclear weapons technician (260A); 912A, land combat missile systems repair technician (271A); 913A, armament repair technician (421A); 914A, allied trades technician (441A, repair shop technician); 915A, wheel vehicle maintenance technician (630A); 915B, light systems maintenance technician (630B); 915C, field artillery vehicle maintenance technician (630C); 915D, armor/cavalry maintenance technician (630D); 915E, support/staff maintenance technician (630E); 920A, property book technician (761A, general supply technician); 920B, repair parts technician (762A, support supply technician); 921A, airdrop equipment technician (401A); and 922A, food service technician (041A).

The revised AR 611-112 is included in Officer Ranks Personnel UPDATE Number 11.

MOBILIZATION PLANS REVISED FOR INSTALLATIONS

Faced with funding constraints for facility construction, the Army Materiel Command (AMC) and the Army Corps of Engineers are revising the mobilization master plans for AMC installations to reduce the need for new construction to meet mobilization requirements. The goal is to ensure that a lack of facilities will not prevent AMC installations from meeting requirements if a mobilization occurs in the near future.

Starting this year, a new section will be added to the mobilization master plan for each AMC installation, including the Government-owned, contractor-operated Army ammunition plants. This section will address alternatives to constructing group I or II projects currently called for in each plan. Group I projects are those that should be built during peacetime in anticipation of mobilization day (M-day) requirements, while group II projects are those that should be designed during peacetime for construction immediately after M-day. Alternatives under study include changing operational requirements, relaxing regulatory constraints (such as reducing the need for ammunition storage capacity at some ammunition plants), and using alternative construction techniques.

The Army Corps of Engineers has been preparing mobilization master plans for AMC installations since 1982. The new sections will be added as each plan is updated during the next 2 years.

WATER-FREE FIELD LAUNDRY SOUGHT

The Army is developing a new, mobile field laundry known as the laundry and drycleaning decontamination system (LADDS). Consisting of a self-contained laundry unit and generator mounted on an XM979 trailer, LADDS will provide conventional drycleaning and nuclear-biological-chemical decontamination. It will use freon as a cleaning solvent instead of water. This solvent can be recycled by filtering and distilling in a closed-loop system. LADDS will be able to operate in temperatures ranging from 25 to 120 degrees Fahrenheit, cleaning up to 160 pounds of clothing, web gear, and canvas items each hour.

The Army plans to acquire approximately 1,200 LADDS units to replace the water-based field laundries currently in use. A contract for prototypes was recently awarded and testing is scheduled for next year. LADDS should be fielded by fiscal year 1993.

NEW NCO EVALUATION REPORT COMING

In January, the Army will introduce a new system for noncommissioned officer (NCO) evaluations.

The new system requires performance counseling, increases emphasis on values and specific NCO responsibilities, and highlights training requirements. It consists of the NCO evaluation report and the NCO counseling checklist. Major changes include a new form design; new roles for the rating chain; structured duty descriptions; rigid narrative rules and the use of bulleted comments to emphasize results and excellence, highlight significant performance, and minimize the impact of a rater's writing ability; and mandatory face-to-face performance counseling for all NCO's, corporal through command sergeant major.

The current enlisted evaluation reporting system will be phased out as the new NCO evaluation report is implemented. Most NCO's will receive their next reports under the current system.

ALOG EMPHASIS

(Continued from page 1)

FORCE PLANNING AUTOMATION DUE

Force development activities within the Army Materiel Command (AMC) will have automated support by the end of fiscal year 1990. The AMC automated manpower management information system (AAMMIS) is now under development at the Army Logistic Systems Support Activity. The AAMIS will provide an interactive data base for manpower and force management; authorizations documentation; budget preparation; manpower requirements determination, accounting, and allocation; and reporting and analysis of manpower utilization.

TRACK PAD LIFE EXTENDED

A new polymer for making combat vehicle track pads is expected to double the wear and shelf life of current pads. Scientists at the Belvoir Research, Development, and Engineering Center say that tests to date show the new pads could last for 2,000 miles on paved roads (a first for any track pad) compared to the current pad's 1,200 miles, and 4,200 miles cross-country. In storage, the new pads might last 20 years, while current pads go bad after 5 or 6 years.

FM 29-127 REVISED

Recently published FM 29-127, Heavy Materiel Supply Company, General Support, provides guidance to commanders, platoon leaders, section chiefs, and other supervisors on organizing and operating the company. This is the first complete revision of the manual in 16 years, and it describes how to move to a new site, set up equipment, and secure and defend the unit's area. The company is assigned to a corps support command or theater army area command and provides class IV (construction equipment) and class VII (major end items) supplies to divisional and nondivisional direct support units.

LOG COLONELS SET FOR STARS

Ten of 56 colonels nominated for promotion to brigadier general are from logistics branches. They are Colonels Dennis L. Benchoff, Ronald V. Hite, Nicholas R. Hurst, William J. Schumacher, and Johnnie E. Wilson of the Ordnance Corps; William Fedorchko, Jr., and Robert J. Jellison of the Quartermaster Corps; Richard G. Larson and Kenneth R. Wykle of the Transportation Corps; and Robert D. Orton of the Chemical Corps.

TMDE HOTLINE AVAILABLE

The Army Central Test, Measurement, and Diagnostic Equipment (TMDE) Activity, at Lexington-Blue Grass Army Depot, Kentucky, has established a hotline for TMDE supply and maintenance problems. For assistance, call AUTOVON 745-4157, -3564, or -3650 or commercial (606) 293-4157, -3564, or -3650 from 0715 to 1545 eastern time Monday through Friday. Call AUTOVON 745-4104 or commercial (606) 293-4104 for 24-hour service and leave a recorded message. Customers should only use the hotline if questions cannot be answered locally.

INSTALLATIONS REORGANIZED

Recently revised AR 5-3, Installation Management and Organization, presents the Army's new standard installation organization and its four modules—mission elements, nonsupporting tenants, supporting tenants, and U.S. Army garrisons. It describes installation management principles and responsibilities.

CRANE OPERATOR ASI DELETED

The Army recently eliminated additional skill identifier (ASI) G1, terminal crane operations. Training in terminal crane operations will now be offered as part of the course for military occupational specialty (MOS) 88H, cargo specialist, at the Army Transportation School, Fort Eustis, Virginia. ASI G1 was previously available to soldiers holding MOS 88H who completed a 2-week terminal crane operator course.

JEEPS MODIFIED FOR SAFETY

Approximately 20,000 M151A2 1/4-ton trucks, or "jeeps," are being fitted with rollover protection equipment to improve their safety. The jeeps, in both the Active Army and Reserve components, will be equipped with three connected rollbars made of steel tubing, seat and shoulder belts, side-door-opening nets, and a modified fuel system. Although the replacement for the jeep, the high-mobility multipurpose wheeled vehicle, is being fielded, the Army expects to use thousands of jeeps well into the next decade. The 1/4-ton ambulance and TOW missile launcher versions of the jeep will not be changed.

POST CONTRACTS FOR ENERGY

Aberdeen Proving Ground, Maryland, soon will be heating its buildings with steam generated by a commercial waste disposal plant. Waste, a renewable energy source, will substitute for much of the 3.5 million gallons of fuel oil the post uses annually in generating steam. This will be the Army Materiel Command's first use of a 1982 law that encourages military installations to contract with a "third party" for locally funded and operated energy-producing facilities rather than wait for scarce Army funds to build heating plants. Redstone Arsenal, Alabama, is negotiating a third-party contract and other installations are studying similar arrangements.

U.S. GOVERNMENT PRINTING OFFICE: 1987-181-042/1

TEAM-BUILDING DESCRIBED

Recently published FM 22-102, Soldier Team Development, describes the principles and techniques small unit leaders should follow to develop cohesive, combat-ready teams under the Army's AirLand Battle doctrine. The manual explains the characteristics and the formation, development, and sustainment of effective teams. It is designed as a companion document to FM 22-100, the Army's basic leadership manual.

RIGGERS GET RE-UP BONUS

The Army has initiated a selective reenlistment bonus for military occupational specialty 43E, parachute rigger. First-term soldiers in the ranks of private first class through specialist four and mid-term sergeants who reenlist will receive two times their base pay times the number of years reenlisting; first-term sergeants through master sergeants and mid-term staff sergeants through master sergeants will receive three times their base pay times the number of years reenlisting.

MAINTENANCE UNITS HONORED

The 1st Battalion, 6th Infantry, 1st Armored Division, stationed at Illesheim, West Germany, was the only Army unit among the six nominees for this year's Department of Defense Phoenix Award for maintenance excellence. The award, sponsored by the American Defense Preparedness Association, was presented to the Air Force's 50th Tactical Fighter Wing, based at Hahn Air Base, West Germany.

FOREIGN SALES GUIDE OFFERED

The Army Communications-Electronics Command (CECOM) has prepared a guide to the U.S. security assistance program for contractors and Government personnel. The Contractor Security Assistance Primer describes terms, laws, and regulations and explains how businesses can participate in foreign sales and direct sales. To obtain a copy, write—Commander, CECOM, ATTN: AMSEL-IL-MD-SY, Fort Monmouth, NJ 07703, or call AUTOVON 992-2834 or commercial (201) 532-2834.

SECONDARY ITEM STUDIES LISTED

A bibliography of studies and models titled "Secondary Item Management" is available to authorized persons. Write—DLSIE, ALMC, Fort Lee, VA 23801-6043, or call AUTOVON 687-4655 or commercial (804) 734-4655.

NONAVAILABLE ITEMS REVIEWED

The Army Laboratory Command, Adelphi, Maryland, is sponsoring a symposium on the subject of "Government/Industry Electronic Parts Nonavailability" at the Sheraton San Marcos, Phoenix, Arizona, on November 16-19. The symposium will explore initiatives for controlling item availability and minimizing the impact of item nonavailability on present and future systems. For additional information, call AUTOVON 290-2410 or commercial (202) 394-2410.

Coming in Future Issues—

- Planning Rear Battle for Combat Service Support Units
- Wartime Host Nation Support
- Project Rearm
- Automating Property Accountability
- What's in a Name?
- Personal Computers Improve Support
- Ensuring Transportation Support in Korea
- SCALP—Growing Capabilities
- Reviving Inland Waterway Transport
- Transportation Automation
- Inventory Accounting and Locator System Developed
- Materiel Readiness Support Activity Operations
- Using LOGMARS for Property Accountability

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