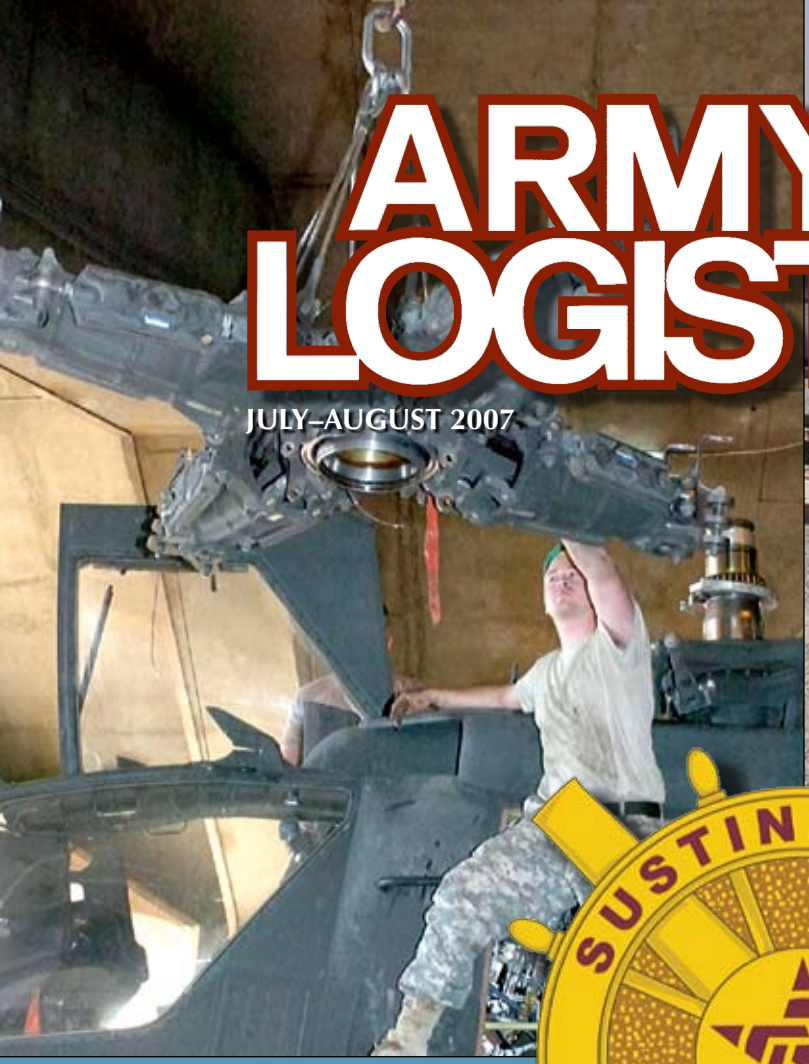
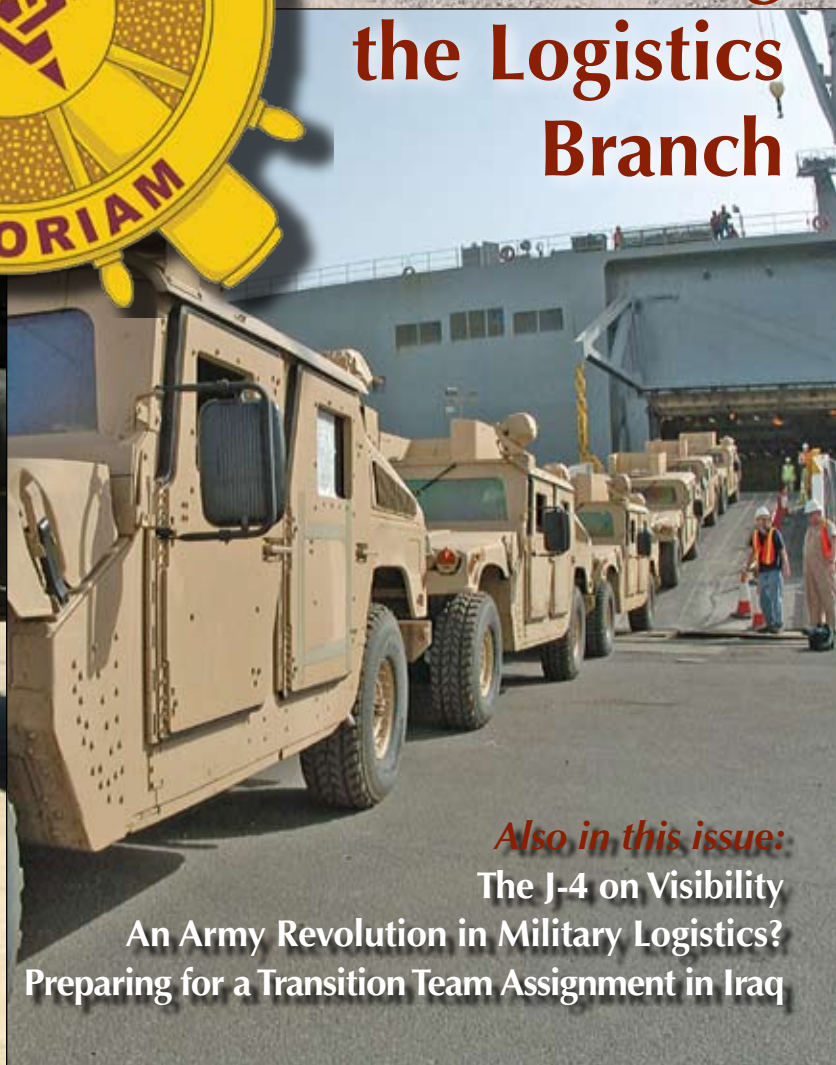
ARMY LOGISTICIAN

JULY–AUGUST 2007



Introducing the Logistics Branch



Also in this issue:

The J-4 on Visibility

An Army Revolution in Military Logistics?

Preparing for a Transition Team Assignment in Iraq

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Cover: The publication of this issue of ***Army Logistician*** coincides with the planned implementation of the Logistics branch on 1 July. In a historic development, this new basic branch will bring together officers in the grades of captain and above from the long-established Quartermaster, Ordnance, and Transportation branches. The cover symbolically depicts this change as the insignia of the Logistics branch unites logisticians engaged in quartermaster, ordnance, and transportation missions. The photos also show the essentials of logistics visibility as defined by the Director for Logistics, J–4, on the Joint Staff: (moving clockwise from upper left) supplies in process, in storage, in transit, and in use. See the articles on pages 1 and 3.

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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Introducing the Logistics Branch

A new era for the Army's logistics officers is beginning with the scheduled establishment of the Logistics branch on 1 July. The notion of a basic branch for logistics, bringing together officers from the Quartermaster, Ordnance, and Transportation branches, has long been discussed among Army logisticians and leaders. Now, as a reflection of the increasingly multifunctional nature of support on the modern battlefield, the Logistics branch is becoming a reality.

Establishment of the Logistics branch is part of the creation of the Logistics Corps and the Logistics Officer Corps. The Chief of Staff of the Army approved the creation of all three entities on 2 May 2006.

The Logistics Corps includes all commissioned officers, warrant officers, and enlisted Soldiers in the three long-established functional logistics branches—Quartermaster, Ordnance, and Transportation—as well as the new Logistics branch. Enlisted personnel will remain in one of these branches while also being members of the Logistics Corps. The Logistics Officer Corps includes all commissioned and warrant officers within the Logistics Corps. Warrant officers will remain in one of the three historical branches while also being part of the Logistics Officer Corps. The Logistics branch includes only commissioned officers in the grades of captain through colonel who have graduated from the Combined Logistics Captains Career Course (CLC3) or from earlier versions of an advanced logistics officers course.

Logistics commissioned officers will begin their careers in one of the historical branches; thus, second lieutenants will still be accessed into either the Quartermaster, Ordnance, or Transportation branch. Commissioned officers will be inducted into the Logistics branch as captains when they complete CLC3 or a Reserve Components Captains Career Course. By adopting this approach, commissioned officers will begin to focus on developing as multifunctional logisticians, capable of planning, integrating, and executing sustainment operations, at their fourth or fifth year of service. However, they also will maintain their proficiency in one secondary area of concentration/functional area of expertise.

Reserve component officers will transition to the Logistics branch at the same time as Active duty officers. Any Reserve component officers who have not attended a functional area 90A course should do so by December 2009. These courses include—

- CLC3.
- Reserve Component Multifunctional Combat Service Support Course.
- Associate Logistics Executive Development Course, Phase I.
- Support Operations Course.

Multifunctional training is scheduled to be added to the Reserve Components Captains Career Courses in October 2008.

The Logistics Officer Corps and the Logistics branch are designed to meet several emerging needs. The Army logistics community needs—

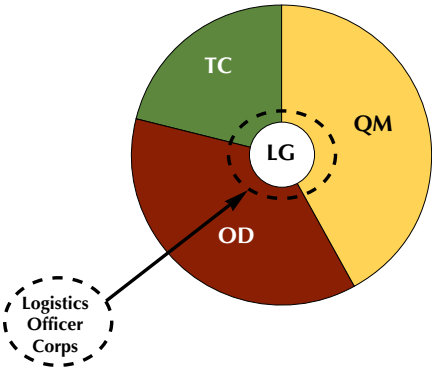
- Officers to be designated and trained as multifunctional logisticians earlier in their careers.
- Logisticians with functional expertise and ways to encourage and retain that expertise.
- Officers to be motivated to remain competent in multifunctional logistics and to gain experience in multifunctional positions.

The Logistics Officer Corps and the Logistics branch are designed to develop and maintain the right balance between the Army's need for functional logistics expertise and the Army's increasing need for multiskilled logistics leaders.

The establishment of the Logistics branch and the Logistics Officer Corps continue the Army's progress toward achieving a cadre of multiskilled leaders, or "pentathletes." The evolution toward the Logistics basic branch started with the development of the Combined Logistics Officers Advanced Course, progressed through that course's transition into CLC3, and advanced with the creation of functional area 90A for multifunctional logisticians. Now, after years of discussion and debate, the Army's need for multifunctional logisticians is recognized with the birth of a new basic branch—Logistics.

ALOG

The Logistics branch insignia depicts a diagonally crossed cannon and key surmounted by a ship's steering wheel. Bearing on the hub is a stylized star. Inscribed on the ship's wheel is the Latin phrase, "Sustinendum Victoriam," which means "Sustaining Victory." Soldier red is the Logistics branch color. The key represents the Quartermaster branch's supply and service responsibilities; the ship's wheel denotes the Transportation branch's responsibilities for the movement of troops, supplies, and equipment; the cannon represents the Ordnance branch's responsibilities for maintenance and munitions; and the stylized star represents the unity and integration of logistics functions.



This chart depicts the relationships among the Logistics Corps, the Logistics Officer Corps, and the Logistics branch. The outer ring shows the Logistics Corps, which incorporates all enlisted Soldiers, warrant officers, and commissioned officers in logistics and four branches—Quartermaster (QM), Ordnance (OD), Transportation (TC), and Logistics (LG). All enlisted Soldiers are in the outer ring, where they remain in the three historical branches. The middle ring (dotted line) shows the Logistics Officer Corps, which includes all warrant and commissioned officers. Warrant officers and lieutenants are part of the Logistics Officer Corps but also remain in one of the historical branches. The inner ring represents the Logistics branch, which consists of officers in the grades of captain (after graduating from the Combined Logistics Captains Career Course) through colonel; these officers also hold one functional specialty.

Frequently Asked Questions About the Logistics Officer Corps and Logistics Branch

Will the Ordnance, Quartermaster, and Transportation branches go away?

No, the Ordnance, Quartermaster and Transportation branches will not "go away," nor will they be absorbed into the Logistics branch. All four branches (Logistics, Quartermaster, Ordnance, and Transportation) will make up the Logistics Corps.

Enlisted Soldiers will remain branch oriented.

Warrant officers will continue to have functional military occupational specialties (MOSs).

Lieutenants will be accessed into either the Quartermaster, Ordnance, or Transportation branches.

Each officer's officer record brief will reflect the branch that he held as a lieutenant throughout his career. This will document his functional experience and will indicate the one primary functional area (FA) of expertise each officer (in the grades of captain through colonel) will be required to hold and maintain proficiency in.

How will this work for Medical Service Corps officers?

Medical Service Corps officers are an integral part of all brigade combat team support battalions. They can still choose to attend the Combined Logistics Captains Career Course. When they complete this course, they will gain the 90A identifier as a secondary or tertiary area of concentration on their officer record brief. This will allow them to hold 90A positions in sustainment units and to compete for command of those units.

How will this work for aviation maintenance officers?

Aviation maintenance officers, formerly area of concentration 15D (aviation logistics), no longer attend the Combined Logistics Captains Career Course. Aviation officers will not gain the 90A identifier as a secondary area of concentration and will not participate in the Logistics Officer Corps.

What will happen if an officer does not attend the Combined Logistics Captains Career Course during his fourth or fifth year of service?

The officer will continue to be tracked as a Quartermaster, Ordnance, or Transportation officer until he attends the Combined Logistics Captains Career Course. This will not prevent him from being assigned to a 90A position if the need arises.

The officer will have to attend the Combined Logistics Captains Career Course before coming into the window for promotion to major.

What should a commander tell his officers when they ask what jobs they should have in order to succeed as a Logistics branch officer?

Senior leaders and mentors should stay current by reading the latest Department of the Army Pamphlet 600–3, Commissioned Officer Development and Career Management. The developmental charts in the pamphlet show the type of experiences that build on one another in order to help the officer achieve his personal goals and be experienced in multifunctional logistics.

Logistics Corps Creed

I am an American Soldier and a logistician.
I am the heir of Quartermaster, Ordnance, and Transportation Soldiers who have served our Nation in war and peace since 1775.
I provide the Nation's warfighters of all services what they need, when they need it, where they need it.
I anticipate the warfighter's need for sustainment in all situations, at all times, under all conditions.
I integrate logistics into the commander's plans and decisions.
I ensure continuity of support to sustain the momentum of the force.
I respond rapidly to the ever-changing needs of the warfighter.
I improvise to sustain the force with innovation and ingenuity.
I live by the Army values and the Soldier's Creed.
I lead by example.
I am true to the motto of the Logistics Corps, "Sustinendum Victoriam"— "Sustaining Victory!"

In Search of Logistics Visibility: Enabling Effective Decisionmaking

BY LIEUTENANT GENERAL C. V. CHRISTIANSON

Joint force commanders (JFCs)—and by extension, their logisticians—require timely, accurate and relevant information to make effective decisions. This requirement is especially critical in the joint logistics environment (JLE). The joint logistics community must continuously execute processes, effectively coordinate the allocation of limited resources, and clearly understand the supported joint commanders' requirements across the broad range of military operations. To execute these functions effectively and efficiently, joint logisticians must have visibility.

This article serves as a reference point for discussion, a framework for concept development, and an integrating tool for the countless efforts across the Department of Defense (DOD) and industry to improve logistics visibility in the broadest and most holistic sense of the term. It offers a proposed definition of visibility, highlights key issues and concepts for consideration, and presents ideas for future efforts based on where the most pressing requirements for visibility lie within the JLE. Clearly, complete, system-wide access to all information is not attainable, or even desirable. So, this article will also broadly describe the types of visibility required by different elements within the JLE.

What is Logistics Visibility?

Current definitions of visibility focus almost entirely on asset visibility. In order to provide effective logistics support across the operating environment, the joint logistician must "see" more than just assets. He must fully understand the requirements for logistics support (who needs what) and the resources available (what there is to work with). The logistician also must be able to monitor joint logistics performance within the JLE (whether or not the logistics processes are in place and working). Without this kind of knowledge, the logistician cannot plan or execute effectively or efficiently.

For the purpose of this article, logistics visibility is defined as "access to logistics processes, resources, and requirements to provide the knowledge necessary to make effective decisions."

A *process* is a series of actions, functions, or changes that achieves an end or a result. Multiple processes occur across and within the JLE, such as depot repair, patient movement, force deployment, and the delivery of contingency contracting support. Before we can effectively develop visibility applications, we must clearly understand the end-to-end processes that deliver an outcome for the joint force. Mapping these processes is critical to knowing where and when to place visibility "sensors" that give us the knowledge we need to deliver those joint outcomes.

Resources can be defined by using the term "total assets." "Total assets" are defined as the aggregate of units, personnel, equipment, materiel, and supplies that are brought together in time and space to generate joint capabilities and their supporting processes. We must be able to see service-component logistics, multinational logistics, and other logistics assets in a way that provides integrated resource visibility to the joint warfighter.

Requirements are what the joint force needs to accomplish its mission. Requirements can originate from anywhere and can result in a tasking for anyone in the JLE. Requirements also change over time based on plans, current operations, and changes in the environment.

Collectively, visibility of processes, resources, and requirements make up the information that logisticians need to accomplish their mission; without each of these elements, they cannot prioritize effort. Logistics visibility provides the ability to plan, synchronize, and monitor operations to optimize outcomes. The ultimate effect we are trying to achieve is sustained logistics readiness.

Some think that visibility should extend across the entire logistics domain and should include complete, real-time access for everyone within the system. While it is true that every aspect of the enterprise must

be visible to planners, operators, or managers at some level, it is also clear that not everyone needs to be able to see everything all the time. At some point, too much information may be a hindrance and can actually detract from effective decision-making. Consequently, we should ask these questions about visibility: Which members of the JLE need visibility, and why do they need it? What do they need to see? Finally, where do they need visibility? These questions have significant implications for systems design, operational planning and execution, and resource allocation.

Who Needs Visibility and Why?

Everyone within the JLE has a requirement for some type of visibility. However, the ultimate purpose of achieving visibility resides at the tactical level, where operational requirements form the basis of all efforts across the JLE. The joint logistician's customer is at the tactical level! Each component of the JLE needs visibility to support the end user at the tactical level.

The JFC needs visibility to execute directive authority for logistics. Without visibility of JLE processes, resources, and requirements, the JFC cannot integrate service-component capabilities to achieve mission objectives.

The joint logistician matches resources with anticipated requirements to provide supportability assessments to the JFC. The supportability assessment determines if the JFC's operational concept can be sustained. As operational requirements change, the joint logistician also must have visibility so that he is able to reassign resources rapidly.

The services are responsible for delivering well-prepared forces and equipment to the JFC. At the strategic level, this mission demands different information and uses different processes than at the operational or tactical levels. In order for the services to deliver the forces and equipment necessary for mission accomplishment, they need visibility of the JFC's requirements. The services also need visibility of the processes that support the efforts of their theater components.

Planners and decisionmakers at the DOD staff level require visibility to provide responsive and relevant policy guidance and ensure that the DOD's strategic resources are applied appropriately. Their goal is to ensure that resources are used to achieve efficient and effective outcomes.

Finally, DOD's interagency, multinational, and commercial mission partners require visibility of processes, requirements, and resources that are necessary to support their participation in DOD operations.

What Do We Need to See?

Your position within the JLE affects what you need to see. What the end user wants to see is different from what the manufacturer, supplier, or distributor wants to see. Each player in the JLE tends to see his visibility requirement as *the* visibility requirement for everyone. The challenge is to provide the right kind of visibility across a very complex environment to the right user at the right time. Depending on the situation, joint logisticians need visibility of processes, resources, or requirements.

Process visibility provides process owners and decisionmakers with the ability to evaluate the effectiveness of a particular process. They must be able to answer the question, "Are we delivering what is expected?" The deployment and redeployment processes, the force reception process at a major port, or the depot repair process are all parts of a system that relies on visibility. Joint logisticians and process owners need visibility to control and optimize the outcomes of processes.

Resources must be visible by item, person, or unit, individually or as a group. In some cases, visibility by a unique identifier, such as a serial number, lot number, national stock number, Social Security number, or unit identification code, is required. Some individuals or items are so important—politically, operationally, or tactically—that, by their very nature, they require real-time, 100-percent visibility across the logistics enterprise. Examples of such items include fissionable material, human remains, and vaccines. In other cases, visibility of *groups* of items, persons, or units is needed to determine the status of a particular capability and its ability to achieve the JFC's mission; for example, a specific force module, a port-opening capability, or a medical treatment capability.

Requirements must also be visible by item, person, or unit, individually or as a group. Ultimately, visibility of requirements—which are usually designated by the JFC—is necessary to initiate support efforts across the JLE. The services, supporting combatant commands, and Defense agencies require visibility of those requirements to better support the JFC's mission. DOD must have visibility over those requirements to ensure the effective and efficient use of DOD resources.

Where is Visibility Needed?

Where visibility is needed depends on where you sit. End users will mainly want to know when they will receive their items and will be less concerned about every step along the way to final delivery. Visibility is needed while elements are in transit, in storage, in process, or in use. These terms broadly describe visibility needs based on the item's location in the JLE. When an item is in transit, it is being shipped or moved from its point of origin (commercial vendor, unit, storage activity, or maintenance facility) to a destination (unit, storage activity, or maintenance facility). When an item is in storage, it is being stored at a unit, DOD site,

commercial site, or disposal activity. When an item is in process, it has been acquired from a source of supply but has not yet been shipped or is being repaired at an intermediate- or depot-level organic or commercial maintenance facility. When an item is in use, it is being used for its intended purpose. These terms help us define where visibility is needed.

Visibility priorities and needs may change over time or across the phases of an operation. For example, planners might see joint force requirements as their most critical need, while available resources might take precedence during the sustainment phase of an operation. During the initial phases of expeditionary operations, visibility of processes might be most important to ensure that limited resources are being optimized as planned. That said, each of the three elements of visibility—processes, resources, and requirements—is needed to make effective decisions.

Several barriers inhibit DOD efforts to enhance and share visibility. First, authoritative data are not always available to the joint logistician. The only thing worse than not having data is having two different sets of data. The inability to provide trustworthy data impedes quality decisionmaking. Second, it is unlikely that DOD will have unity of command over the entire spectrum of joint logistics. So, one of our major challenges is to achieve unity of effort without unity of command. This is particularly an issue as logisticians share information across different commands, agencies, systems, and processes to develop a common operating picture.

Another major dilemma is how to ensure adequate security for sensitive information while simultaneously offering the maximum possible ease of access to all members of the community. Operational partners, both inside and outside DOD, including international friends and allies, need to have confidence that their information will be handled properly by our systems. Finally, the desire for information often drives users to want to see everything all the time. However, no one in the JLE needs to see everything all the time. Knowing what is really needed becomes the key to an information environment that effectively supports quality decisions.

What is the Way Ahead?

Senior logistics managers, planners, and system developers must enhance visibility for everyone within the JLE and must allocate resources and focus efforts to achieve that effect. From the senior level, four initiatives can improve visibility in the months and years ahead.

Map the processes. Joint logisticians must understand, define, and document the processes within the JLE, leveraging the ongoing work of the Joint Logistics Portfolio Management Test Case and the U.S. Transportation Command Distribution Process Owner (DPO). The joint logistics community also must use the base realignment and closure initiative to further our understanding of the defense supply chain and develop an integrated process as an outcome of that initiative.

Identify existing visibility capabilities. The joint logistics community should continue to capitalize on efforts already underway within the DPO and other activities. Those existing or emerging efforts that contribute to increased logistics visibility must be integrated, and visibility requirements must be aligned with process mapping to eliminate redundancies and gaps.

Develop a JLE data architecture. With the Defense Information Systems Agency as the lead, DOD must define the data framework, identify authoritative data sources, and influence and guide the joint logistics community's network-centric data strategy. The goal is to develop a JLE data architecture campaign plan.

Deliver a joint logistics software application. The joint logistics community should successfully employ a program that enables visibility for the joint logistician, such as the Global Combat Support System-Joint (GCSS–J). DOD must ensure that GCSS–J turns data into information and enhances the joint logistician's ability to effectively plan and execute joint logistics operations.

Visibility is not an end in and of itself but a means to make better decisions, gain efficiencies, and improve effectiveness across the JLE. As the logistics environment continues to change, there will always be additional information requirements or demands for enhanced timeliness and accuracy. Joint logisticians will continually strive to improve the quality of their decisions and optimize the logistics readiness of the joint force. Enhanced visibility will lead to increased logistics readiness and improved user confidence.

All joint logisticians are partners in delivering visibility across the JLE, and each has a critical role to play in helping to deliver sustained logistics readiness to the JFC. The logistics community and its partners must all work together to develop this capability to enhance support to the JFC and, above all, to the service men and women who depend on us. **ALOG**

Lieutenant General C. V. (Chris) Christianson has been the Director for Logistics, J–4, on the Joint Staff since October 2005. He previously served for 2 years as the Deputy Chief of Staff, G–4, at the Department of the Army. Lieutenant General Christianson has a bachelor's degree in industrial engineering from North Dakota State University. He is a graduate of the Infantry Officer Basic Course, the Ordnance Officer Advanced Course, the Armed Forces Staff College, and the Army War College.

The Acquisition, Logistics, and Technology Contracting NCO

BY SERGEANT MAJOR ETHAN A. JONES

Noncommissioned officers in a new military occupational specialty will support the Army's increasing need for contingency contracting capability in the modular force.

The way ahead for the Army Acquisition Corps (AAC) and the U.S. Army Acquisition Support Center (USAASC) includes training and educating members of the Army's newest military occupational specialty (MOS)—51C, Acquisition, Logistics, and Technology (AL&T) Contracting Noncommissioned Officer (NCO)—and integrating them into the Army's force pool.

The MOS 51C AL&T Contracting NCOs will be assigned to the Army Sustainment Command (ASC)—formerly the Army Field Support Command—at Rock Island Arsenal, Illinois. ASC became operational on 1 October 2006 as a subordinate command of the Army Materiel Command. AL&T Contracting NCOs will perform their contingency contracting mission while assigned to modular contracting units, including contracting support brigades, contingency contracting battalions, senior contingency contracting teams, and contingency contracting teams. USAASC will be the proponent for MOS 51C and will be responsible for the life-cycle management process of the Army's new Contracting NCO Corps. The life-cycle management process consists of recruitment, retention, individual training and education, distribution, sustainment, professional development, and separation. AL&T Contracting NCOs will receive the same Defense Acquisition University (DAU) training opportunities in the contracting field that are available to the Army's acquisition officers and civilians.

Commands and agencies that play a vital role in supporting, training, assigning, providing doctrine for, deploying, and developing the AL&T NCO Corps, in addition to USAASC and DAU, include the—

- Office of the Assistant Secretary of the Army for Acquisition, Logistics, and Technology.
- Army Materiel Command.
- Army Special Operations Command.
- Department of the Army G–3/5/7 (Training).
- Army Training and Doctrine Command (TRADOC).
- Army Combined Arms Support Command.
- Army Combined Arms Center.
- Acquisition, Logistics, and Technology Futures Office.
- Army Logistics Management College.
- Air Force Contracting, Training, and Flight Academy.
- Army Contracting Agency.
- Army Human Resources Command (HRC).
- Contracting community.

Who is Eligible?

NCOs in any career management field (CMF), in both the Active and Reserve components, who meet reclassification prerequisites for MOS 51C are eligible. They must be in the ranks of staff sergeant or sergeant first class with less than 10 years of active Federal service. They must submit a recommendation letter signed by a battalion commander (lieutenant colonel or higher), copies of college transcripts or a diploma from an accredited institution, and copies of training certification related to contract training, if applicable. Each NCO must submit verification of a security clearance; meet height and weight standards in accordance with AR 600–9, The Army Weight Control Program; exhibit stability in personal affairs in accordance with AR 600–20, Army Command Policy; be competitive for promotion; and have had a successful tour in a leadership role and no derogatory information in their Official Military Personnel File.

The official retention criteria for MOS 51C will be published and announced through HRC's Office of the Deputy Chief of Staff for Operations Notifications of Future Changes and sent out through command retention channels.

How Are 51C Soldiers Trained?

The DAU contracting curriculum for level I contracting certification (obtained through distance learning) serves as the advanced individual training (AIT) and MOS 51C award-producing training. An NCO who meets reclassification prerequisites for MOS 51C is given a contracting assignment and placed in a

Contingency Contracting is the deployed commander's force multiplier. As a force enabler, Contingency Contracting Officers, AL&T Contracting NCOs and Emergency Essential DA Civilians locate and acquire vital commercial sources of support thereby providing commanders operational flexibility to conduct their combat mission.

—The Honorable Claude M. Bolton, Jr.
Assistant Secretary of the Army
for Acquisition, Logistics, and Technology

nondeployable status for 120 days so he can complete the following DAU level I contracting courses—

- CON 110, Mission Support Planning.
- CON 111, Mission Support Execution.
- CON 112, Mission Performance Assessment.

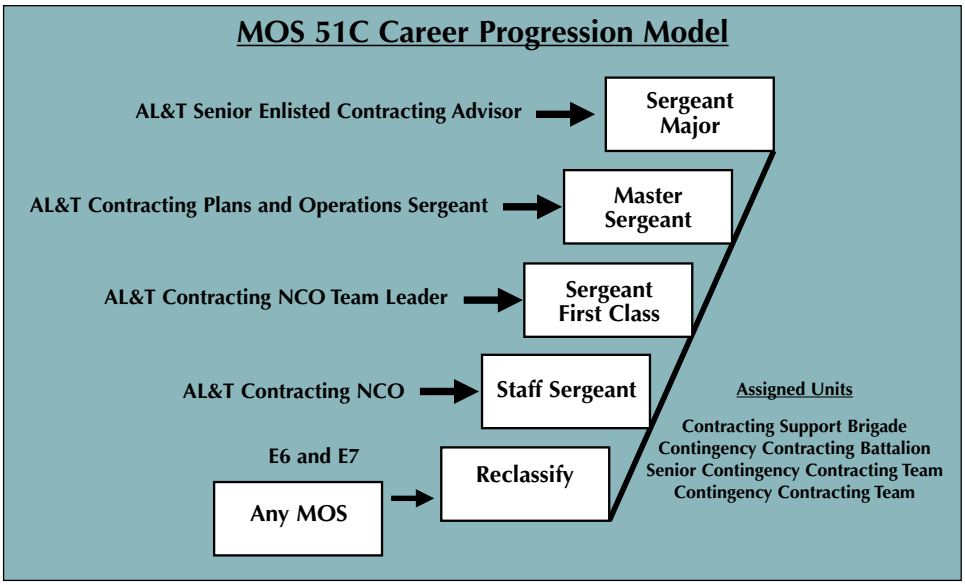
After being awarded MOS 51C, the Soldier will be required to successfully complete CON 234, Contingency Contracting (through resident training), and other contracting resident courses as part of mission requirements and certification.

Once the AL&T contracting NCO (E–6 or E–7) has successfully completed at least a 1- to 2-year tour in contracting, he will attend the Air Force's Mission Airmen Ready Contract Apprentice Course (MARCAC) at Lackland Air Force Base, Texas. This 8-week course is the equivalent of the Army's Basic NCO Course (BNCOC). The MARCAC provides the Soldier with refresher technical training and computer lab-based training.

After completing tours in contracting, the staff sergeant (promotable) or sergeant first class AL&T contracting NCO will attend the Army Logistics Management College's Army Intermediate Contracting Course (AICC) in Huntsville, Alabama. This is equivalent to the Army's Advanced NCO Course (ANCOC). Those NCOs who have successfully completed BNCOCs or ANCOCs in their respective branches before they are selected for reclassification also will be afforded the opportunity to attend MARCAC or AICC or take DAU contracting courses. All AL&T Contracting NCOs will meet contracting commanders' and proponents' requirements for training, certification, career development, and mission.

All AL&T Contracting NCOs in all Army components are eligible to receive DAU contracting certifications in contracting at levels I, II, and III. All Department of Defense personnel must meet the experience and training requirements set forth by DAU and the Defense Acquisition Workforce Improvement Act before they can become certified in any acquisition discipline.

TRADOC and the Army Sergeants Major Academy establish educational and training standards for the Army's enlisted force. They identify core courses and training that complement and supplement institutional instruction. USAASC has developed and will implement career progression standards and a professional development model for AL&T contracting NCOs. These professional development programs are designed to train, support professional growth, provide operational experience, and enhance leadership competencies throughout the Soldiers' careers. This includes professional certification, credentialing, and degree-related training for the AL&T contracting NCO and other acquisition disciplines. As the CMF 51 series matures and future concept plans for force structure are developed and supported, AL&T Contracting NCOs may become service school instructors, Chief Personnel Proponent NCO, HRC Career Development and Training Managers, Command Sergeant Major of the Army Acquisition Corps, and even Senior Enlisted Advisor at the Defense Contract Management Agency.



Army Acquisition Corps Professional Development Model Acquisition, Logistics, and Technology (AL&T) Contracting Noncommissioned Officer (NCO) (MOS 51C)					
Years	**7—9**	**10—15**	**16—19**	**20—30**	
Rank Skill Level	SSG - SFC Skill level 30/40	SFC Skill level 40	MSG Skill level 50	At SGM, Becomes MOS 51Z	
Professional Military Education	Basic NCO Course	Advanced NCO Course	Army Sergeants Major Academy		
Functional/ Additional Training	Support Operations Course → Battle Staff Course → Airborne Course → Air Assault Course → Ranger School →				
Operating Force	AL&T Contracting NCO/Team Leader	AL&T Contracting NCO Team Leader	AL&T Contracting Plans/Ops Sergeant	Senior Enlisted Contracting Adviser	
Generating Force	N/A	Instructor/Writer Professional Dev NCO (HRC)	Chief, Personnel Proponent NCO	Command Sergeant Major, AAC Senior Enlisted Advisor, DCMA	
Self Development	Technical Certification Associate's Degree Bachelor's Degree Correspondence Studies DAU and ALMC Courses Military Reading List (Reimer Library)		Technical Certification Bachelor's Degree Master's Degree Correspondence Studies DAU and ALMC Courses Military Reading List (Reimer Library)		Technical Certification Bachelor's Degree Master's Degree DAU and ALMC Courses SBLM Training Acquisition Sr Leader Trng
Links	**https://www.us.army.mil/suite/login/welcom.html** (Army Knowledge Online) **https://www.asc.army.mil/career/programs/nco/default.cfm** (Army Acquisition Support Center)				
Promotion Eligibility	Determined by Centralized Promotion Board Guidance				

Legend

AAC = Army Acquisition Corps
ALMC = Army Logistics Management College
DAU = Defense Acquisition University
DCMA = Defense Contract Management Agency
Dev = Development
HRC = Human Resources Command
MOS = Military occupational specialty
MSG = Master sergeant
Ops = Operations
SBLM = Sustaining Base Leadership and Management Course
SFC = Sergeant first class
SGM = Sergeant major
Sr = Senior
SSG = Staff sergeant
Trng = Training

As MOS 51C matures, AL&T Contracting NCOs will provide continuity and stability for the Army's military contingency contracting workforce. They will become contingency contracting technical experts and trainers for newly accessed acquisition officers (area of concentration 51C) and Soldiers who reclassify into MOS 51C. In the first 4 to 5 years of their careers, AL&T contracting NCOs will require more technical training than leadership training because their focus will be on mission support, deployments, and contracting statutes, laws, and regulations.

The AL&T Contracting NCO personnel force structure was developed to support the Army's modular force and design. Contracting units and teams are modular and are a part of the Army Force Generation cycle and will be evaluated and assessed during joint exercises and National Training Center, Joint Readiness Training Center, and Joint Maneuver Training Center rotations.

Army contracting activities acquire technology, supplies, and services for our warfighters and our Nation through responsive and innovative support. Training and leadership are required to create strong, viable, and competent acquisition teams. The NCO Corps is, and always will be, the backbone of the Army, and now the Army Acquisition Corps and the Army Materiel Command will bring AL&T modular capabilities holistically to the battlefield through the Army Acquisition NCO Corps. **ALOG**

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Logistics Contracts: Tips for Maximizing an Awesome Capability

BY LIEUTENANT COLONEL REBECCA FREEZE AND SARI BERMAN

A commander must know what to expect from the contractors supporting his organization to make the best use of what they have to offer.

A good commander can command anything. But how well does he use his contractors? Commanders in Operations Iraqi Freedom and Enduring Freedom are finding the answer to this question because an ever-increasing amount of logistics capabilities and the preponderance of base operations functions lie with contractors.

During Operations Desert Shield and Desert Storm, almost the only contractors found within the corps area of operations ran a few rear dining facilities, some buses, and the ever-reliable "gypsy" trucks. Even when Operation Iraqi Freedom I began in March 2003, the Logistics Civil Augmentation Program (LOGCAP) support contract was only requested to support approximately 50,000 troops for 180 days. Today, with LOGCAP supporting and sustaining a force of more than 200,000 personnel, almost every base in Iraq benefits from the LOGCAP contract. From housing Soldiers, maintaining unit vehicles, and transporting fuel, to manifesting Soldiers for R&R (rest and relaxation), almost every logistics function is performed or augmented by a contractor. Given the extensive presence of contractors on the battlefield, it is imperative that logisticians learn how best to manage the awesome capabilities that contractors bring to the fight.

A Kellogg, Brown, and Root contractor employee welcomes Soldiers to the housing area at Logistics Support Area Anaconda.

Identifying the Major Players

To obtain the maximum benefit from LOGCAP or any support contractor, logisticians need to understand the roles, responsibilities, and duties of the parties involved: the Defense Contract Management Agency (DCMA), the Army Materiel Command (AMC), the military unit (the user), and the contractor.

DCMA provides contract administration and oversight. This oversight normally is accomplished on site by an administrative contracting officer (ACO). To assist the ACO in providing oversight, DCMA also will assign a quality assurance representative (QAR) to evaluate the contractor's performance and interact with both the contractor and the end user. The ACO is the only individual authorized to direct the contractor to perform specific work.

AMC is the primary client for the LOGCAP contractor. AMC's main responsibility is to be the honest broker and ensure that the taxpayers' money is spent wisely. All LOGCAP support requirements are vetted and adjudicated by the onsite AMC personnel who are known as the LOGCAP support officers (LSOs). The LSO is the face of LOGCAP and the person whom the commander will deal with most often.

The end user, or customer, is a military unit that is augmented by contractor capability. It is the end user's responsibility to provide day-to-day management of the contractor in a specific area or function.

The last major player on the LOGCAP team is the contractor. Each contractor's job is to perform the funded functions outlined in the performance work statement (PWS) to the standards specified.

Understanding the PWS

Over several Operation Iraqi Freedom rotations, a pattern of friction and frustration has evolved between the contractor and service members, keeping units from experiencing the maximum benefits of the contract. Some of the frustration is due to the service member's failure to understand the PWS and how funding affects it. The PWS outlines the tasks that a contractor is to perform; it is comparable to a unit's modification table of organization and equipment (MTOE) capability. However, just as units often cannot perform some missions because of MTOE shortages, the contractor may not be able to perform a function because the Government never "turned on," or paid for, that part of the contract. So, just as a commander has to understand the real-world capabilities of his units, he also must understand the contractor's PWS and what is funded so that he knows exactly what services to expect the contractor to provide.

A commander's natural tendency to lead people also can cause frustration and friction. Realizing that you, the end user, cannot "direct" contractors as you would another service member reduces tension. Contracts are often "performance based." This means that the Army cannot tell a contractor how to perform the task but merely what the end state of the task needs to be and, more importantly, to what standard. That is how the contractor will be evaluated and held accountable.

If you identify a new task that you would like the contractor to do, unlike a Soldier, you cannot just tell them to do it. If the task is not a part of the PWS, you have to identify exactly what you want the contractor to perform and the standards by which the contractor will be measured. These changes then are sent up the chain of command and LSO channels for additional vetting and funding allocation. Once the PWS is finalized and agreed on by both the Government and the contractor and the funding is approved, the contractor can begin the new work. This is not a quick process, and funding is often very hard to justify.

You also cannot direct the contractor to do something that is not a funded part of the PWS. Funding has to be allocated, and a notice to proceed must be issued by the ACO in order to "turn on" portions of the contract. You can best influence funding by justifying to your chain of command why the Government is getting the best bang for the buck by funding that part of the contract. In the case of either new work or unfunded work, remember that, once approved, the contractor will need time to ramp up capability just as units need time to generate combat power.

Providing Feedback

A lack of knowledge on how and when to provide feedback also produces friction between contractors and users. Soldiers understand how the Army's evaluation system is supposed to work with Noncommissioned Officer Evaluation Reports (NCOERs) and Officer Evaluation Reports (OERs). The NCOER and OER processes include counseling statements to identify and improve behavior that is not to standard or to recognize and reinforce good performance. The same capability exists within the contracting world, and, just as with Soldiers, timeliness of feedback is critical.

The key contributor to the feedback process is the contracting officer's representative (COR) or contracting officer's technical representative (COTR). CORs and COTRs are the Soldiers who work daily with the contractors; they are the eyes and ears of the Government who ensure that the work is being performed to the standards outlined in the PWS. The CORs and COTRs provide the ACO with monthly feedback, which is used at the monthly performance evaluation board (PEB) meeting. Accuracy and level of detail are important for good feedback. This will identify strengths that should be maintained or give insight into weaknesses that should be improved.

Just as you should not wait until OER or NCOER time to tell Soldiers that they are not performing to speed, you should not wait until the PEB to identify substandard performance. Contractors have a structure similar to the chain of command; use it. Bring the concern to the attention of the contractor's management and LSO before the issue becomes any larger. Do your homework ahead of time. Make sure that what you expected was a funded part of the PWS. Then be able to articulate how the contractor failed to meet the established standard in the contract. Much of the contractor's profit results from recognition of good performance, so the contractor has a vital interest in performing to standard.

It is also important to identify good performance. Just as Soldiers like to receive recognition for actions "above and beyond the call of duty," it is important to recognize contractors for their performance. Only by identifying real strengths and weaknesses can you fairly assess the service and provide the contractor with the means to improve that service. The key point is to participate in the review process with quality, timely, and factual feedback that will result not only in improved dialog among all participants but, more importantly, in higher quality of service for the warfighter.

Train As You Fight

"Train as you fight." How many times have you heard that? Then why don't we do it? The Army conducts joint and coalition exercises to hone skills needed for working with different partners, but we do not have the same training for interfacing with contractors. The simulation trainups before deployment have coalition and sister service representation, but where are the contractors and why don't the trainups include a contractor response cell?

Contractors need to be part of simulation training. Having contractor icons in the simulation would more accurately prepare logistics commanders for the environment they will face. The scenario or master scenario events list injects should include contractor-related issues to exercise Soldiers' knowledge and expand their experience of interfacing with contractors.

In the 3d Corps Support Command (COSCOM), we have found that including representation of the contractor's capability in our task organization has helped us to visualize the capabilities that the contractor brings to the fight by location and subordinate command. Since the LOGCAP contract is performance based, we care about the capability, not the exact number of contractors. For example, at Logistics Support Area Anaconda, the contractor augments the ammunition supply point with the equivalent of a platoon. This is shown on the task organization chart as a medium lift platoon, but it is colored differently to show that it is a contractor capability. But, you cannot just integrate the contractors on paper; you have to incorporate them into your operations and planning. The 3d COSCOM established a position within the COSCOM headquarters for a LOGCAP contract senior logistics planner. Another contractor representative provides the Prime Vendor program and has a seat next to the class I section of the corps distribution center.

Contractor and military drivers are briefed before departing on a convoy.

At the subordinate levels, dedicated liaison officers help bridge the interface between contractors and using units. This helps to integrate the contractors from the planning through the execution levels and has led to an increase in the 3d COSCOM's ability to leverage the contractors' capabilities.

Using contractors on the battlefield is not new. It is just that the extent to which they are integrated is unprecedented. So, if you are heading down range or just want to increase your abilities as a logistician, learning how to take full advantage of contractor capabilities will help you bring more to the fight. **ALOG**

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Sari Berman is the LOGCAP contractor senior logistics planner embedded with the 3d COSCOM staff. She retired from the Army in 2003 after over 25 years of service. Having been in Iraq since her retirement, she has seen the development and growth of the LOGCAP contract and its interface with the COSCOMs over the years.

Stockage Determination Made Easy

BY DR. KENNETH GIRARDINI, CHIEF WARRANT OFFICER (W–5) ARTHUR W. LACKEY, USA (RET.), AND ERIC PELTZ

Every brigade combat team (BCT) and support brigade in the Army has a mobile minidistribution center that stocks repair parts and perhaps also class II (clothing and individual equipment), IIIP (packaged petroleum, oils, and lubricants), and IV (construction and barrier materials) items with national stock numbers (NSNs) in its authorized stockage list (ASL). This minidistribution center, called the supply support activity (SSA), is *the* key to high equipment readiness. When equipment fails and becomes not mission capable (NMC), but the needed parts are on hand in the SSA, that equipment can be returned to action very quickly. However, when the parts are not available in the supporting SSA, it can sometimes take awhile to get them, which only delays returning equipment to a mission capable status.

In operations in Iraq, getting the part from the United States by air (if the part is well positioned for quick shipment) or from theater stocks in Kuwait takes an average of a little more than 10 days, with some shipments taking longer. If the item is in short supply at U.S. distribution centers, the wait can be much longer. Not having parts in the ASL sometimes leads units to take extraordinary actions, such as controlled exchanges, to get equipment back on line rather than accept lengthy downtimes on critical end items.

Studies by RAND Arroyo Center have confirmed that high-performing ASLs have the greatest direct affect on equipment readiness through their impact on supply chain processes and resources. (Reliability, of course, is the other central factor affecting equipment readiness.) For example, a RAND Arroyo study at the National Training Center at Fort Irwin, California found that a 10-point swing in the ASL fill rate changed the equipment readiness rate by 4 percentage points. However, Army ASL fill rates were often under 20 percent in the late 1990s because of very limited breadths of parts and some issues concerning how depths were computed. ("Breadth" refers to the number of different parts stocked. "Depth" refers to the number of each part stocked.)

Development of Dollar Cost Banding

To address the low ASL fill rates, RAND Arroyo developed Dollar Cost Banding (DCB). Piloted in 1998, DCB introduced three things to ASL management: tying the decision of what and how much to stock to both the benefits produced and the resources required, emphasizing the need to deal with highly variable demand, and using automated exclusion criteria.

The hypothesis underlying DCB development was that, even if the benefit of adding a part is relatively low, if the part's cost and size are minimal and its absence can affect readiness, it may be worth stocking. The DCB concept was introduced using heuristics that adjusted add-and-retain thresholds in terms of the number of demands based on item cost (inventory investment) and size (storage space). Basically, the DCB rules said that the smaller and less expensive an item is, and if it is coded essential or has had high-priority demands, the threshold for stocking it should be lessened. The add-and-retain criteria for big, expensive items that are often critical to readiness were not changed. This change increased the breadth of ASLs by adding more of the small, inexpensive items that are often needed in conjunction with the more expensive items to correct NMC or deadlining faults.

The second, and less well known, aspect of DCB was a complete change in how inventory depth is computed. Inventory levels with DCB are set by using iterative simulations of the demand streams at the national item identification number (NIIN) level to achieve customer-wait-time goals that vary based on the investment and storage resources associated with the NIIN. This contrasts greatly with the former "days of supply" method, which used only the mean demand rate and thus did not compensate for the variability or timing of demands. (Demands during peak training periods were averaged or were smoothed out with zero or low demands during periods in garrison.)

The third aspect of DCB was a set of parameters that automatically exclude certain NIINs that are not desirable to stock in SSAs in order to reduce the ASL review workload. Examples of the criteria used are acquisition advice code, nomenclature, class of supply, and Federal supply class. The parameters have been continually updated based on feedback from the field. The central idea behind exclusions was to keep items from being recommended for ASL stockage that were not critical to warfighting or that the unit could otherwise wait to obtain through an order-ship cycle.

Initially, DCB was implemented by having a central team at RAND develop the ASL recommendations. The central team also assisted in reconfiguring warehouse storage and participated in the SSAs' review of the recommendations. After successful pilots, this led to the incorporation of DCB into Army policy in 2000 and a rapid, successful rollout through about half the SSAs in the Army. Fill rates increased by about 10 percent

in those SSAs that adopted DCB. In 2001, DCB became available in the Integrated Logistics Analysis Program (ILAP), which allowed SSAs to initiate and run their own ASL reviews. However, without the role played by the central team, the results became less consistent as inventory expertise varied among SSAs and other demands on personnel time sometimes impeded effective implementation of the recommendations.

Introduction of Enhanced DCB

At about this time, RAND Arroyo Center developed the Equipment Downtime Analyzer (EDA), which also was added as a module within ILAP. The EDA archives daily NMC equipment reports. This information is very valuable because it identifies all of the parts ordered to return a system to mission capable status. With EDA data, it is now possible to develop a critical parts list of those parts that consistently deadline Army equipment.

The EDA critical parts list was used to develop Enhanced DCB (EDCB), which, initially, simply changed the criticality criteria. In DCB, a part was considered "critical" based on the essentiality code or the use of high-priority requisitions for the part. The problem was that, with these rules, most parts (85 percent) are deemed "critical." Using the EDA critical parts list, we have found that the list of true readiness drivers is much narrower—now only 35 percent of demanded items. Therefore, EDCB allows us to concentrate the allocation of limited SSA storage capacity and inventory investment on these more critical parts.

EDCB was piloted with two BCTs at Fort Riley, Kansas, in 2002. This pilot targeted three key systems—the M1A1 Abrams tank, the M88A1 recovery vehicle, and the M9 armored combat earthmover—with great success. The readiness-driver fill rates for targeted systems improved considerably. Consequently, awaiting parts time, and, thus, overall time for deadlining repairs, fell dramatically, thereby increasing readiness for each BCT.

Impact of Operation Iraqi Freedom

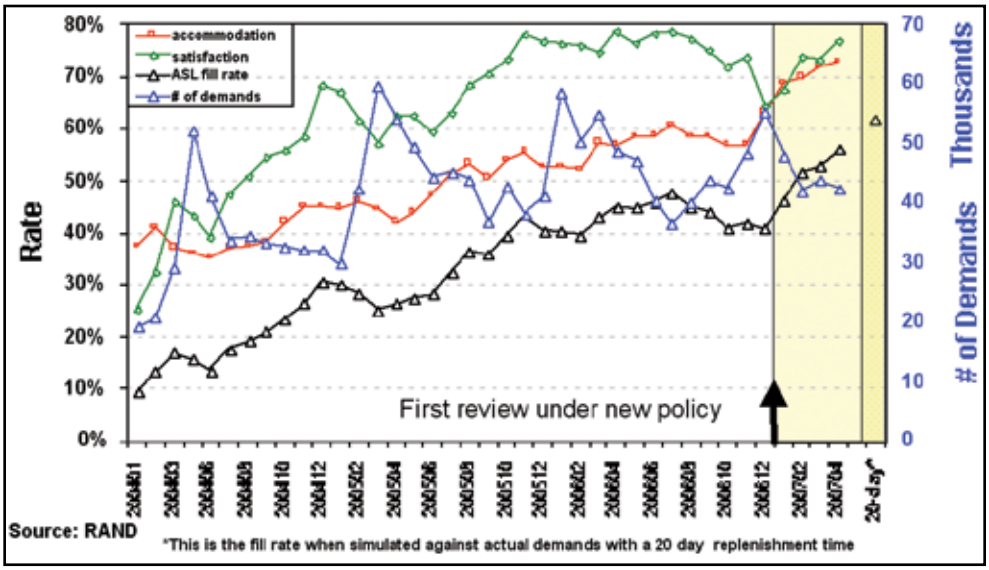
Before implementation of EDCB could be expanded, Operation Iraqi Freedom (OIF) began. This put further rollout of EDCB on hold as units that were to prototype the new algorithm turned their attention to deployment preparations and then combat operations. When units initially deployed to OIF, they generally took the ASLs they had at home with little change (or they fell in on ASLs from Army pre-positioned stocks). Units that had been involved in the DCB rollout found that their home-station ASLs were relatively effective, at least initially. For most units, the breadth of parts demanded in OIF was similar to what they experienced when training at home station, so accommodation rates held up.

However, a lack of connectivity with Standard Army Management Information Systems (STAMIS), combined with severe distribution challenges in 2003, significantly hampered replenishment and quickly depleted those deployed ASLs. Without reliable replenishment, ASL satisfaction rates fell to less than 10 percent, making the ASLs ineffective. Another factor hampering the recovery of satisfaction rates was that depth in the home-station ASLs that units deployed with had been calculated using the actual replenishment times for each NIIN at home station (a minimum of 10 days was enforced); but those replenishment times had not yet been achieved in OIF.

Realizing the need to better match ASLs with growing demands, theater logisticians began ASL reviews using DCB (in ILAP), which did lead to improvements in depth by using actual replenishment lead times and demand rates for OIF. Combined with improved distribution, these enabled ASLs to recover to about 30-percent fill rates. However, additional problems hampered the effectiveness of ASL reviews: Deployed demand histories were limited in duration to less than the 2 years used in DCB; as rotations began, many units were task organized, and so deployed SSAs were used to support different types of units; and equipment changes sometimes occurred (such as the addition of up-armored high-mobility, multipurpose, wheeled vehicles). All of these factors rendered the use of deployed SSA demand histories only partially effective for forecasting future demands and setting inventory levels.

To tackle these issues, RAND began to assist in building virtual demand histories for units. These histories were based on moving unit demand streams at the company level, making adjustments to account for limited demand histories, and using the demand histories of proxy units to model requirements for equipment new to a unit. Using these demand streams, EDCB was applied, with recommendations passed to SSAs in Iraq, Kuwait, and Afghanistan.

Between late 2004 and the middle of 2006, acceptance and implementation of the recommendations was mixed. Those SSAs that implemented EDCB experienced dramatic ASL improvements; those that did not saw stagnant performance. This led to 20- to 30-point gaps in fill rates among SSAs supporting similar units. ASL reviews also often took a long time, which impeded performance improvement during a significant portion of year-long rotations. However, where the recommendations were implemented, readiness-driver fill rates climbed significantly above those of non-readiness drivers. Despite variations by SSAs in the adoption of EDCB recommendations, the overall readiness-driver fill rate for OIF had climbed to almost 50 percent by late 2006.



Authorized stockage list (ASL) performance metrics for readiness drivers.

One issue that sometimes created delays was the sheer time needed to review the thousands of recommendations that came from DCB and EDCB. This problem was aggravated if the recommendations did not fit within the existing storage configuration of an SSA. Another challenge was that the large numbers of ASL changes required to implement the recommended "adds," "deletes," and requisition objective (RO) changes created a greater workload than some SSAs could handle given their daily ongoing work.

Enhancement of ASL Management With IROC

Based on these OIF issues, and other lessons learned from this body of ASL research, RAND Arroyo Center has developed a new model for computing ASL recommendations called the Inventory Readiness Optimizer with Constraints (IROC).

IROC is essentially a product improvement of the EDCB algorithm. It is based on a mixed-integer programming formulation that is intended to optimize the readiness contribution of the ASL, subject to constraints on inventory investment, transition workload, and the number and volume of storage locations by type (such as small bin, medium bin, shelf, rack, and bulk). A weighting derived from the EDA database indicates the relative criticality of parts, rather than simply considering parts as critical or not. The recommendations from this process were then input into a simulation to determine the resulting readiness (down days) and to establish curves of ASL performance and readiness impacts versus resources.

IROC was prototyped among units undergoing modularity transformation and led to many insights on how to overcome the OIF ASL issues (particularly storage feasibility and transition workload issues) affecting the implementation of ASL recommendations.

RAND Arroyo Center uses IROC results to fine-tune EDCB and improve the recommendations provided to deployed units by—

- Incorporating tighter storage constraints that are generally feasible for storage locations.
- Reducing the recommended changes in ways that produce the most potential benefit while limiting the transition workload. This is done by limiting "adds" to faster moving readiness-drivers; "increases" to fast movers that exhibit poor satisfaction rates; "deletes" to items with no demand or that are no longer applicable; "decreases" to items that can be decreased if there is a change in bin size and performance remains high; and "no change" to calculated recommendations that would not significantly affect inventory investment and storage and would produce only a marginal change in performance. (Most of the recommendations for high-performing ASLs are now "no change.")

Institution of a New ASL Policy

Observing the variation of ASL performance among SSAs of similar type, and recognizing that EDCB produced effective solutions that could be readily implemented, the Army's Deputy Chief of Staff, G–4, released a pilot ASL policy for Southwest Asia in November 2006 after coordination with the Army Materiel Command, the Army Combined Arms Support Command, and the Coalition Forces Land Component Command of U.S. Central Command. Previously, Army supply policy had dealt with the percentage of lines not recommended for the ASL that commanders could add in the ASL review process. However, Army policy did not mandate the percentage of recommendations for demand-supported lines that had to be accepted.

To address this gap, the fundamental change introduced by the new ASL policy is to provide only a summary (such as number of changes and new storage requirements by storage category) of the majority of recommendations that involve only small changes to the overall cost and volume, or cube, of the ASL. If the summary is acceptable, the bulk of the recommendations can be implemented without the need for a line-by-line review. SSAs only review lines that satisfy one of the following criteria—

- Increases (which could be the result of adding a new ASL line) or decreases (which could be the result of deleting an existing ASL line) in cube greater than 8 cubic feet.
- Increases or decreases of RO value of more than $10,000.

• All items—even if no change is recommended—that have an RO value of more than $100,000 or a cube greater than 100 cubic feet.

• Items that have an RO greater than 500 and all operation and maintenance Army-funded NIINs.

Thus, beyond targeting improved performance, this new pilot ASL greatly reduces the work associated with making ASL review decisions while still allowing units to do detailed reviews of the lines that account for 85 to 90 percent of the ASL cube and dollar value. This new ASL policy also sets forth a 2-week review time limit on this subset of items. Finally, it calls for ASL updates every 3 to 4 months rather than on an annual basis. The intent of the updates is to implement a small number of adjustments to the ASL that could make a significant performance difference. In a dynamic environment such as OIF and Operation Enduring Freedom, this is particularly important.

This policy was first implemented for SSAs in Iraq in December 2006. All 24 SSAs were changed in a 40-day time period, with an average of 17 days per SSA—a much improved performance over the weeks and even months that the process was taking previously. The numbers of lines that had to be reviewed by SSAs were approximately—

• 150 to 200 for an infantry BCT.

• 300 for a heavy BCT.

• 400 for a combat aviation brigade.

The first quarterly ASL update of these SSAs was made over justa few days in late March 2007 and typically involved 30 to 60 recommendations for each SSA that had to be reviewed under the new Army policy.

Best of all, performance has risen to an all-time high. As shown in the chart at left, the readiness-driver accommodation rate for SSAs in Iraq has jumped from the high 50-percent range to about 73 percent. This is about the limit achievable without adding very low demand items that are very difficult to accurately forecast and often do not recur from year to year at the SSA level. Satisfaction is at about 77 percent, but that should climb as stocks continue to arrive to fill the new inventory levels.

Some recent distribution problems have caused replenishment times to exceed the 20-day replenishment wait time (RWT) planning factor; these problems are in the process of being corrected. Still, the readiness-driver fill rate has reached 56 percent. Replaying demands with the 20-day RWT indicates that the fill rate would have increased to 63 percent, getting close to the feasible limit given current storage constraints and the large number of very low demand parts.

The G–4 staff is also in the process of implementing a companion change. In this article, we have been referring to the readiness-driver fill rate and associated diagnostic accommodation and satisfaction metrics. Currently, these are not Army metrics in the Logistics Integrated Warehouse (LIW), which only provides these metrics by supply class. However, the purpose of ASLs is to stock readiness drivers as well as other small parts that are very fast moving in order to reduce receipt workload. Thus, the Army's metrics should be aligned to focus on readiness drivers in order to measure whether or not ASL policies are having the intended effect. For example, the overall repair parts fill rate in Iraq has only increased to 40 percent because non-readiness drivers are in the low 30-percent range. In this light, the G–4 staff is pursuing the implementation of ASL metrics in LIW that are limited to readiness drivers in order to align the metrics and the ASL review process.

This successful experience in Southwest Asia provides impetus for changing the ASL requirements determination process across the Army. Accordingly, the G–4 policy for Southwest Asia will potentially be expanded to all ASL reviews as the Army continues to build on the central-expert ASL review team concept implemented by the Army Materiel Command. All this effort should result in significantly better performing ASLs across the Army, which will, in turn, result in improved Army readiness rates and help get repair parts into the hands of maintenance personnel more quickly. **ALOG**

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Closing the Loop on Property Accountability

BY CHIEF WARRANT OFFICER (W–2) GREGORY W. BESAW

As equipment in the Army inventory travels through its life cycle, the data associated with a single item affect several interconnected processes. Financial asset reporting, spare parts forecasting, force readiness, force development, future procurement, and even recruiting and training are all based on accurate visibility of the Army's property.

Early Standard Army Management Information Systems (STAMIS) were specially designed to perform transactions, collect data, and generate reports for one process, such as maintenance, property accountability, financial reporting, or distribution management. These systems were often based on specific hardware or software applications, and they had difficulty interfacing with other systems.

As technology improves and the Army takes advantage of readily available commercial systems, the STAMIS we have used for over a decade are finally being integrated into the Single Army Logistics Enterprise (SALE). SALE is an enterprise resource planning (ERP) system, a software suite designed to integrate all data and processes of an organization into a unified system. Each process has a module tailored to its specific needs, but a single database records all transactions from all processes, and every activity is able to view the same data. The SALE will eventually consolidate all data associated with an item into a single database that is accessible through modules. The modules are each designed around a specific business process, such as maintenance, property accountability, and finance.

Challenges of Implementing the SALE

Migrating data from the legacy STAMIS is one of the major hurdles in implementing the SALE. Since the early 1990s, the Army has had separate maintenance and property accountability databases, both of which feed data into the distribution and financial management systems. Maintenance data, such as mileage, spare parts demands, and repair man-hours, are generated from Unit Level Logistics System-Ground/Air (ULLS–G/A) input through the Standard Army Maintenance System (SAMS) and the Standard Army Retail Supply System (SARSS). Property accountability data are generated from the Standard Property Book System-Redesigned (SPBS–R) and reported to the Army Material Command's Logistics Support Activity (LOGSA) through the Continuing Balance System-Expanded (CBS–X). Financial and asset managers collect reports of assets on hand through CBS–X reports and forecast spare parts requirements from SARSS.

ULLS–G/A, ULLS–S4 (for unit supply), and SPBS–R do not interface with other user-level systems until the data reach LOGSA, and none of the software is effective at validating the data when they are entered because the systems are too different. Using ULLS–G/A, the maintenance activity enters a vehicle's serial number first and then its registration number (serial/registration). On the other hand, a SPBS–R user enters the registration number first and then the serial number (registration/serial). Both systems can accept the letters *O* and *I*, which are not used in LOGSA's registration numbers in order to avoid confusion with the numbers *1* and *0*. Exact duplicates are also a possibility between two SPBS–R users or two ULLS–G/A users since data validation does not take place below the LOGSA level.

The key to any successful ERP is having a comprehensive database, which the Army does not have yet. SPBS–R and ULLS–S4 users are in the process of migrating more than a decade of data into an Internet-accessible, centralized database called Property Book Unit Supply Enhanced (PBUSE). Premigration data validation tools allow the users to correct possible errors, such as serial number formats or duplicates with other items in the PBUSE database, before migrating. In the next few years, ULLS–G/A users will complete a similar migration of maintenance data to SAMS–E. As the two databases are combined and data errors or duplications are corrected, the Army will finally have a single database containing all relevant equipment data.

Tracking Equipment

Data integrity is an important part of the consolidated database. Ideally, a permanent database record will be generated for each new piece of equipment as it enters the Army inventory. As the equipment is accepted from the manufacturer at the depot, the program manager for standard items will enter the equipment into the database and build the initial equipment identification records.

With the current property accountability and maintenance records, asset visibility for a specific item is often difficult to maintain. For example, an item enters the inventory and is issued to the first using unit. If the equipment is shipped through the distribution system, it will be entered into SARSS, but not by serial number or any other information that is unique to that particular item. Until the gaining unit receives the item at the supply support activity (SSA) and the

We have envied the UPS [United Parcel Service] bubba and his high-speed-clipboard that customers sign upon receipt of their requested item, which, in turn, automatically updates their UPS inventory/tracking database. Why can't we do that?! It's time to approach revising our logistical battlefield systems as quickly as we are purchasing new equipment, i.e. RFI [Rapid Fielding Initiative] and REF [Rapid Equipment Fielding]. The Warfighter deserves nothing less.

—Chief Warrant Officer (W–4) Joel Lockhart

supporting property book officer (PBO) processes the receipt in PBUSE, there is no visibility based on the serial number of the equipment.

Once the initial unit receives the equipment, the information—including the serial number—is recorded into PBUSE. Before performing maintenance on the equipment, the owning unit must hand over the equipment's data to its supporting maintenance activity, which manually enters the data into ULLS–G/A. Manual data entry is frequently a source of conflicting data between the property accountability and maintenance databases. The receipt provided to the PBO may have contained errors, or the equipment data plate may contain additional characters that were left off the receipt.

If the owning unit laterally transfers the equipment to a unit at another installation, line-haul transportation is frequently used to deliver the item. Normally, the losing unit still retains accountability for the item in PBUSE until the gaining unit accepts the equipment. Although the transportation officer entrusted with the equipment is designated as an accountable officer by Army Regulation 710–2, Supply Policy Below the National Level, no method currently exists for transferring formal accountability of property. If property is lost during transit, the bill of lading may serve as a receipt for the losing unit; but, it remains the losing unit's responsibility to initiate property adjustment actions since the unit commander retains formal accountability.

Equipment in transit is normally tracked through the in-transit visibility system using radio-frequency identification (RFID) tags that contain a unique number for each item. RFID tags have been used very successfully for years, but malfunctions, improper tagging, and damage still occur. The losing unit still has formal accountability while the equipment is transported to the gaining unit.

The Future of Equipment Visibility

With a single database containing all relevant data for each item in the inventory, the Army could finally have a way to identify the location of property from acquisition, through operation, and to disposal. Each program manager and transportation activity could be assigned a unit identification code (UIC) for accountability. The database could use the UICs to identify the accountability and location of items that are waiting to be issued. In the database, these items may be labeled "awaiting fielding." For equipment en route through the national supply system or as part of a lateral transfer, the database would note the equipment's destination with a designation of "in transit to [gaining unit]," and then, "issued to [gaining unit]" once it is accepted.

The final piece in the system is the elimination of paper forms and translation errors that often result when data are manually entered. Route-delivery management systems using handheld computers or tablets with digital signature capability have dramatically improved the efficiency and accountability of commercial carriers. The Army could easily adapt those systems to close the accountability gaps that currently exist between the program manager or SSA and the using units.

With the implementation of the SALE and integration of a route delivery tablet computer system, data entry errors could be dramatically reduced. Successive owning units will not recreate and manually enter data with each transaction because new equipment will already have a permanent record in the database before it is issued to a unit. The gaining unit will sign the digital receipt on the program manager's or SSA's tablet, and, once the transaction data are uploaded to the database, both the losing and gaining units' PBOs will receive a notice of the pending transaction. When the two PBOs validate and approve the transaction, the property will be transferred to the gaining unit. If a paper receipt is required, the unit can simply print it out on a standard printer. Since the database also will provide the maintenance module's data, all associated maintenance records will automatically transfer to the gaining unit's supporting maintenance activity and a notice will be sent to the maintenance officer.

Transportation activities will perform a similar transaction when accepting property items for an unaccompanied shipment. The unit shipping the item will create a transfer document on the tablet, the transportation representative will sign for the property, and the database will show the item as "in transit through [UIC]."

This concept easily could be extended to the unit level as well. For face-to-face lateral transfers between units, the losing unit's supply sergeant would prepare the electronic transfer, both parties would digitally sign, and the property records would be uploaded to the database and transferred to the gaining unit's PBO for approval.

The following are examples of what a typical equipment transaction with a single database for all activities could look like for new equipment, a transportation shipment of existing equipment, and a unit-to-unit transfer of existing equipment.

New equipment. The new high-mobility, multipurpose, wheeled vehicle (HMMWV) replacements come on line and are cataloged. As each vehicle is shipped from the factory and accepted into the Army inventory for fielding, its data—the national stock number and serial/registration number—are entered into the system under "distribution." The HMMWVs are visible to asset managers and planners but not yet assigned to a unit.

If a HMMWV is en route to unit WAAAA0, the database will list the vehicle under the program manager's UIC as "in transit, gaining unit: WAAAA0." WAAAA0's clerks will sign for the vehicle at the supply support activity. Using a route-delivery tablet computer to capture the receipt and signature, the equipment is automatically accepted into the unit's property account and unit maintenance records. Usage reporting begins in the maintenance system.

This process eliminates the problem we currently have with property book items at the SSA, where paper copies may be lost before they reach the PBO or where accountability can be lost between fieldings. The automatic transfer of maintenance and accountability will also eliminate the current need for DA Form 2408–9, Equipment Control Records, since maintenance ownership is captured from the initial receipt through every transfer.

Transportation shipment of existing equipment. The transportation system can be improved to track the shipment of equipment to another unit and to have the transportation unit accept formal accountability during transit.

Let's say that unit WAAAA0 receives a vehicle at the initial fielding, and, 2 years later, it receives a directive to transfer the equipment to unit WBBBB0.

The losing unit, WAAAA0, prepares the vehicle for shipment and uses an RFID tag for identification. The transportation officer's representative signs for the transfer on the tablet and accepts the equipment for movement. The equipment is dropped from the losing unit's accountability and transferred to the transportation activity's UIC, so the database now shows the vehicle under the transportation unit's UIC as "in-transit transfer from WAAAA0 to WBBBB0." The shipment arrives at the gaining unit or the depot, and transportation personnel process the receipt on the tablet. The gaining unit accepts the shipment, and the tablet's data form is uploaded to the database. The gaining PBO posts the transaction, and the accountability and maintenance data are transferred to the gaining unit.

Unit-to-unit transfer of existing equipment. Face-to-face lateral transfers can use the same method, but without the transportation unit as a middle man. The losing unit, WAAAA0, prepares the equipment and the electronic transfer document and coordinates the transfer of property with the gaining unit, WBBBB0. WAAAA0 accepts the equipment and signs the electronic document, and WBBBB0 uploads the transaction to the database. The losing and gaining PBOs post the transaction, which moves the accountability and maintenance records to WBBBB0.

The key to success with a system like this is establishing a single database that contains permanent records for each item in the inventory. Implementing a tablet computer system to accept signatures will require additional training for supply personnel, but the hardware can easily replace the laptop computers that are already in use. Transferring formal accountability to transportation companies during transfer may prove to be the biggest obstacle. Transportation managers are more concerned with rapidly moving tonnage than with tracking specific items, and rightly so. Permanently affixed passive RFID tags or barcodes are one possible solution, allowing transportation personnel to process entire pallets of items with a scanner rather than physically inventorying items that they may not recognize.

The Department of Defense's acquisition policy mandates total life-cycle management from the time an item is developed through its use and final disposal. The current system does not capture accountability or provide asset visibility until the item has already been fielded. As an item passes from user to user, an enormous potential exists for accountability gaps. By implementing a system to capture accountability at the time of transfer, tracking equipment with a permanent database record that is accessible by all related activities, and providing a route-delivery receipt system to record transfers of equipment between users, we can finally close the loop on property accountability.

ALOG

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An Army Revolution in Military Logistics?

BY DR. DAVID A. ANDERSON AND MAJOR DALE L. FARRAND

In recent years, the Army has been continuously transforming logistics in support of Soldiers. This transformation has been driven by technological innovations, changes in the conduct of warfare, lessons learned, and the ever-expanding roles and functions of the military. But has this transformation been evolutionary, or has it been revolutionary, as advertised? Furthermore, is the Army's Revolution in Military Logistics (RML) truly a revolution in military affairs (RMA)?

According to the last three Chiefs of Staff of the Army (CSAs), a revolution or transformation in military logistics is an integral and necessary part of an RMA, and the Army has been undergoing a self-proclaimed revolution of one form or another since 1999. MacGregor Knox and Williamson Murray, in their book, *Dynamics of Military Revolution,* define an RMA as follows: "Revolutions in military affairs require the assembly of a complex mix of tactical, organizational, doctrinal, and technological innovations to implement a new conceptual approach to warfare or to a specialized sub-branch of warfare." They also posit that there have been five RMAs in modern times: the early modern revolution, the French Revolution, the Industrial Revolution, World War I, and the genesis of nuclear weapons.

The Department of Defense concurs with their definition of an RMA. According to the Secretary of Defense's Office of Net Assessment, "A revolution in military affairs is a major change in the nature of warfare brought about by the innovative application of new technologies which, combined with dramatic changes in military doctrine and operational and organizational concepts, fundamentally alters the character and conduct of military operations." Has the progress or planned progress in the above-mentioned tenets combined been enough to say that the changes being made to logistics are revolutionary, or are they just evolutionary? Is the Army's RML truly an RMA?

Goals of the Revolution in Military Logistics

To understand Army logistics transformation to date, it is first necessary to examine its stated goals. In 1996, the Chairman of the Joint Chiefs of Staff published Joint Vision 2010, outlining his thoughts on how the U.S. military needed to prepare to meet challenges and adversaries in 2010. Joint Vision 2010 named key tenets required to achieve a level of full spectrum dominance over adversaries, and one of these tenets was focused logistics. The CSA published the corresponding Army Vision 2010 in 1997. This document defined focused logistics as "the fusion of information, logistics, and transportation technologies to provide rapid crisis response, to track and shift assets even while en route, and to deliver tailored logistics packages and sustainment directly at the strategic, operational, and tactical level of operations." At that time, the Army listed eight concepts that it would pursue in the development of focused logistics: anticipatory logistics and personnel support, split-based operations, sustained tempo, enhanced throughput operations, velocity management, battlefield distribution system, total asset visibility, and objective supply capability.

> As I have said many times, there can be no revolution in military affairs without having a revolution in military logistics.
>
> —General Dennis J. Reimer,
> Chief of Staff of the Army, 1995–1999

In 1997, the Joint Staff Logistics Directorate (J–4) published "Focused Logistics, the Joint Logistics Roadmap to Joint Vision 2010" as an addendum to Joint Vision 2010. This was an action plan for identifying and integrating joint logistics issues and initiatives. A key to this plan was the designation of six tenets, or areas of focus, as the framework for the logistics required to support joint warfighting: joint theater logistics command and control, joint deployment and rapid distribution, information fusion, multinational logistics, joint health services support, and agile infrastructure. Although concepts such as technological innovation and leveraging key enablers to achieve information superiority were referred to as something desired, the lack of specifics meant that this document served as a general direction of effort rather than a series of steps to achieve the end state described.

In 1999, the Army Deputy Chief of Staff for Logistics (the Army G–4), the Army Combined Arms Support Command (CASCOM) Commander, and the Commander of the Army Materiel Command published an article in the January–February issue of *Army Logistician* that clearly laid out the way ahead for logistics transformation. For the first time, the Army's three senior logisticians addressed the logistics community in a unified voice. The CSA and the Commander of the Defense Logistics Agency wrote complimentary articles in the same issue of the magazine.

These articles identified the Army's focus areas for the next 10 years of transformation and designated them as the first wave of the RML. The Army's logistics transformation would focus on exploiting improvements in automation, communications, and business practices; reshaping command and control relationships to provide better unity of command; and purchasing distribution technologies that facilitated rapid throughput and follow-on sustainment. The second wave of logistics transformation, from 2010 and beyond, would focus on maximizing emerging technologies that could be used to lighten support requirements, enable those requirements to be projected faster, and reduce the overall demand for logistics as a whole. The Army also named the tenets needed to frame its efforts to achieve focused logistics: a seamless logistics system, distribution-based logistics, total asset visibility, agile infrastructure, rapid force projection, and an adequate logistics footprint.

The Army did not completely mirror the concept of focused logistics as defined by the Joint Vision 2010 addendum's six tenets. The Army neglected to include joint theater logistics command and control, multinational logistics, and joint health services support. This is significant as it reveals that the alignment of priorities at the Army and joint levels were not always synchronized.

At right is a chronological order of the Army's published tenets or focus areas of RML and their links to joint doctrine.

Relating RML to DOTMLPF

The following is an analysis of the logistics-related changes made to doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF) since the establishment of the RML in 1999. The question is whether these changes are revolutionary or evolutionary.

Doctrine. The changes to doctrine have been evolutionary in nature. The Army learned lessons from past operations and, as a result, adjusted the characteristics and functions of combat service support (CSS) doctrine. It recognized the requirement to operate as part of a coalition and addressed joint and multinational support in its doctrine. The Army also changed its field manual numbering system to mirror the joint doctrine numbering system. It realized that successful logistics support of an operation cannot be left in the hands of capable individuals unless they have the appropriate resources. Finally, the Army realized that logistics is broad in scope and simplified its doctrine at the tactical level accordingly. These changes all mark a natural and logical progression.

Organization. The very basis of the Army's transformation causes a revolutionary shift in the logistics organization structures. The key to the transformation is the shift from a division-centric force, focused on the employment of 10 divisions, to a brigade-centric force, focused on the employment of 70 brigades, including 42 active component and 28 reserve component brigades. It has taken what used to be an organization formed only for deployment, the brigade combat team (BCT), and made it a permanent, fixed organization. However, it has done the polar opposite with logistics units, eliminating most fixed structures above the brigade support battalion (BSB) level, particularly at the division level. While joint force commanders can select from a fixed menu at the brigade level, they have to order logistics a la carte. This seems like a logical way to support forces with a more capable BSB, and it may seem evolutionary in nature. However, making the leap to multifunctional logistics down to the company level and relying on the ability of logistics organizations to form to meet a specific mission set and deploy in a relatively short period of time requires revolutionary thought and quite a bit of faith.

Training. Training has experienced four fundamental changes, and they are essentially evolutionary. First, company- and field-grade logistics officers are benefiting from four initiatives to increase their operational competence. The first is the creation of the Basic Officer Leadership Course. The second initiative is the decision to allow CSS officers to attend the 61-day Ranger School once again. The result of the first two initiatives is that more tactically proficient officers will now be leading soldiers into combat. The third officer initiative is the decision to send all majors in the Operations Career Field (predominantly working in deployable units) to the year-long Intermediate Level Education (ILE) course at the Army Command and General Staff College at Fort Leavenworth, Kansas. In the past, only 50 percent of majors in the Army were allowed to attend the resident phase of this school. The fourth officer initiative is the creation of a multifunctional logistician functional area.

A second fundamental change in training is the change to the Army's standards in weapons training. Now, CSS units are required to perform live fire training and are given the resources to do so as much as combat arms units. That change means that CSS units, already led by more tactically proficient leaders, are now entering combat with better training at the individual and collective levels.

A third fundamental change in training is the emphasis by CASCOM and the Army Training and Doctrine Command on producing tactics, techniques, and procedures to conduct convoy and base defense live fires. Finally, the Army is also building facilities at all three combined training centers for conducting convoy and base defense training events, which are vital to the execution of logistics.

1996–2004 Published Tenets and Focus Areas of Logistics	
1996–1997	
Army Vision 2010	**Joint Vision 2010**
Anticipatory Logistics and Personnel Support	Joint Theater Logistics Command and Control
Split-Based Operations	Joint Deployment and Rapid Distribution
Sustained Tempo	Information Fusion
Enhanced Throughput Operations	Multinational Logistics
Velocity Management	Joint Health Services Support
Battlefield Distribution System	Agile Infrastructure
Total Asset Visibility	
Objective Supply Capability	
1999–2002	
Revolution in Military Logistics	**Joint Vision 2020**
Seamless Logistics System	Customer Wait Time
Distribution-Based Logistics	Time Definite Delivery
Total Asset Visibility	Total Asset Visibility
Agile Infrastructure	Web-Based, Shared-Data Environment
Rapid Force Projection	Total Life-Cycle System Management
Maintaining an Adequate Logistics Footprint	Condition-Based Maintenance
	Depot Maintenance Partnerships
	End-to-End Distribution
	Executive Agents
	Enterprise Integration
2004	
Army Transformation Roadmap	**Army Logistics White Paper**
Logistics Data Network	Connect Army Logisticians
Responsive Distribution System	Modernize Theater Distribution
Robust Modular Force Reception Capability	Improve Force Reception
Integrated Supply Chain	Integrate the Supply Chain

To call this focus in training revolutionary would be wrong. It appears more like a reaction to the Army's current operations. Perhaps the revolutionary aspect is that the Army is not only retaining but also expanding its institutional training as it continues to execute the Global War on Terrorism. However, note the absence of any significant training initiatives specific to noncommissioned officers or enlisted personnel.

Materiel. Two significant changes to materiel for the Army have affected the RML. The first is the change in the Army's acquisition process, and the second is the Army's expectations for unit readiness. Two outstanding programs that epitomize the acquisition process improvements are the Rapid Fielding Initiative and the Rapid Equipping Force. In October 2005, the Army also introduced what it calls the Army Force Generation model for manning, equipping, and training units. Rather than being tied to static units, now units are given priorities based on the likelihood that they will deploy. As impressive as these changes in materiel solutions are, they are merely evolutionary improvements, not revolutionary. They are simply enhancements to increase visibility, reduce response time, and ensure unit readiness.

Leadership and education. Part of the Army's overarching RMA is a movement from a division-centric Army to a brigade-centric Army. While this, again, is not a new concept (regimental combat teams fought regularly in World War II), it does mean that brigade commanders now have more responsibility and thus require more assets. Now that the division support command (DISCOM) no longer exists, the BCT is the first organization in which a logistician works for a warfighter. Support battalions that used to report to a DISCOM commander now report to the supported brigade commander. The Army has given complete control of logistics to the supported brigade, focusing on customer satisfaction at the brigade level.

In contrast to this, the next level in which a logistician will typically work for a warfighter is at the Army Forces level (a one-star command or higher). With the focus on brigade-sized organizations and division- and corps-sized headquarters commanding them, sustainment brigades do not report to those warfighting commands. Instead, they report to the theater sustainment command (TSC) in theater. Although this may seem like a departure from the brigade-level focus, it actually gives the TSC commander the ability to flex assets across the battlefield to support the maneuver plan.

The only reason this represents a revolutionary change is that aligning all logistics organizations under a single logistician in a theater is the opposite of placing the BSB commander under the control of the BCT commander. The bottom line is that this supports centralized control (TSC and BCT commanders) and decentralized execution (sustainment brigades and forward support companies). What makes it revolutionary is that the Army could have picked any level at which to centralize command and control, and it selected the lowest and highest echelons.

Personnel. Although the concept predates the RML, because of the time necessary to realize the effects of the change, creation of the multifunctional logistician is perhaps the most revolutionary change in logistics.

The multifunctional logistician (functional area 90) is competent in planning and directing logistics operations from the factory to the foxhole, across the entire spectrum of logistics functions. The multifunctional logistician must have experience in synchronizing and integrating the functions of supply and services, transportation, maintenance, aviation logistics, and medical service. In a time when the Army is rapidly fielding and equipping units with highly technical materiel solutions, it is demanding that its personnel become more generalists than specialists. One could argue that this is really being forced on the Army based on its current operating tempo. By creating a multibranch Logistics Corps, the Army is essentially stating that it has provided the resources and trusts that its quality personnel, provided with first-class training, can execute all of the logistics functions adequately. This is a significant change to branch parochialism.

Facilities. There has been only one significant change to facilities that affects logistics transformation. This change, like others mentioned, is inexorably linked to other DOTMLPF domains, like training and personnel. As a result of the 2005 Base Realignment and Closure Commission's report, the Ordnance Center and School at Aberdeen Proving Ground, Maryland, and the Transportation Center and School at Fort Eustis, Virginia, will relocate to Fort Lee, Virginia. There, they will merge with CASCOM, the Quartermaster Center and School, and the Army Logistics Management College to form the Army's Sustainment Center of Excellence. This will, for the most part, consolidate logistics training and doctrine development at one installation. While this change is linked to a revolutionary process, the need to consolidate installations is really an evolutionary response to the new Logistics Corps, coupled with the consolidation of officer training, and is based on the need to reduce redundance in combat developments and training.

Without a transformation in logistics, there will be no transformation in the Army.

—General Eric K. Shinseki,
Chief of Staff of the Army, 1999–2003

By applying the DOTMLPF domains to specific changes the Army has made since 1999 to its logistics construct, three were determined to have made revolutionary changes and four were not. With all of the aspects weighted equally, the answer is simply no: the Army has not revolutionized logistics to date.

Analyzing Logistics Changes Based on RMA

After qualitative analysis of the RML in relation to each of the seven DOTMLPF domains, it is logical to look at the overall changes to Army logistics and analyze them according to the innovations required for an RMA. The four innovations—tactical, doctrinal, organizational, and technological—required for an RMA will be discussed to determine if they reach a different conclusion than the DOTMLPF analysis.

First, tactical innovations are conspicuously absent during the RML's time period. Tactical logistics is performed in essentially the same manner now as in 1999. Combat forces are supported by an echelon of logistics that requires stocks of supplies and distribution assets. That echelon of logistics is supported by another echelon that accomplishes the same mission on a broader scale. Although the Army is attempting to streamline this process through materiel solutions (technological innovations) and organizational changes, the process remains the same.

Doctrinal innovations, albeit not revolutionary in nature, have occurred. The Army has learned from its past lessons and made appropriate adjustments to its doctrine. However, the doctrine, which is broad in nature, has not generally changed the way logistics is conducted in support of operations. Any revolutionary change will likely come from organizational and technical innovations.

Organizational innovations have occurred and have already been deemed revolutionary. First, the Army now has only three echelons of logistics, whereas previously it had at least five. Second, the organization supporting the BCT has become more capable. Third, the decision to create organizations capable of task organizing to meet a specific mission and placing them under the control of a single commander gives logisticians greater flexibility than ever before.

Finally, technological innovations seem to be one of the areas in which the Army will make great strides in achieving its RML. In addition to systems such as the Battle Command Sustainment Support System (BCS3), the Army is developing systems that will improve distribution on a three-dimensional battlefield: Joint Precision Airdrop System (JPADS) and joint heavy-lift aircraft, which will allow more efficient distribution of fuel and water; the theater support vessel, which will enable quicker deployment of forces; and the armored security vehicle, which will permit logistics units to protect themselves.

Although innovations have occurred with varying degrees of success, there has been no fundamental change to the way logistics is conducted. However, that being said, the Army has accomplished an enormous amount since 1999 in improving its logistics capabilities.

The Army's Report Card

How do logistics changes made thus far stack up against the tenets of the RML? In 2004, the Army stated that it had four areas that it would focus on for the next 2

years: a logistics data network, a responsive distribution system, a robust modular force reception capability, and an integrated supply chain.

Logistics data network. The Army's intent was for logisticians to be an integral part of a joint, satellite-based communications network that is capable of providing full-time connectivity from the battlefield to the industrial base. Implementation of BCS3, which will be fielded to all active duty units by the end of fiscal year 2007, will make great strides towards achieving this tenet if it provides everything it promises. However, two key hurdles need to be overcome for this tenet to be realized. First, BCS3 needs to provide not only in-transit visibility but also total asset visibility. Second, BCS3 needs to be able to provide the appropriate level of asset visibility continuously to everyone in the logistics chain, from the operator of a truck to the TSC commander. Without that capability, it will be impossible to achieve a responsive distribution system.

Responsive distribution system. The Army's intent was to develop a distribution-based logistics system, reaching from the source of support to the Soldier, focused on guaranteeing on-time delivery. The Army has taken steps required to achieve this tenet by providing resources for its organizations. Distribution exists at the brigade level, and sustainment brigades can task organize distribution assets to meet requirements. Distribution must now focus on two things: seamless integration with the capabilities of the other services and the use of technological innovations to mitigate the risk associated with time and distance on the battlefield. BCS3 must provide in-transit and total asset visibility in real time. This will allow commanders to adjust resupply operations while en route, determine supply and maintenance requirements and act appropriately before the critical time, and make the current distribution system truly responsive.

Robust modular force reception capability. The Army's intent was to design an integrated theater- opening capability that responds on extremely short notice and executes crucial sustainment tasks immediately upon arrival in theater. Two specific changes in the Army's organizational structure have been made to achieve this capability. The first is the creation of the expeditionary sustainment command, which can deploy rapidly and provide command and control of a theater logistics network indefinitely or until relieved by a TSC. The second is the identification of a sustainment brigade (theater opening). Although, as mentioned previously, sustainment brigades are not fixed organizations, the Army has identified the resources required for a theater-opening capability and embedded them into emerging doctrine as a template for an organization to meet this requirement.

Integrated supply chain. The Army's intent was to develop an end-to-end view of the supply chain and integrate service and agency processes, information, and responsibilities by providing joint logistics data freely and automatically among the strategic, operational, and tactical levels. Progress in this tenet still suffers from parochialism in the military. End-to-end distribution requires the collective efforts of all services; however, the services still have issues regarding to interoperability, culture, and communications. The development of joint systems such as BCS3, JPADS, and joint heavy-lift aircraft is helping to mitigate this problem. Another innovation that may help realize this issue is the development of a Joint Logistics Corps.

Logistics transformation is critical as the Army adapts to the new realities.

—General Peter J. Schoomaker,
Chief of Staff of the Army, 2003–2007

The Army is not in the midst of a revolution in military logistics. Although the Army has revolutionized specific processes, logistics transformation generally has been characterized by one of three terms: logistics evolution, logistics reaction, or logistics adaptation. Logistics evolution is a gradual process in which something changes into a different and usually more complex or better form by recognizing shortfalls and evolving to overcome them. Logistics reaction is a change in response to immediate and significant requirements, such as the Global War on Terrorism. Finally, logistics adaptation is recognizing better procedures that are being used by sister services or commercial businesses and applying them to Army systems.

Since the Goldwater-Nichols Department of Defense Reorganization Act of 1986, the services have been actively pursuing better cooperation with each other. Successful operations in the Persian Gulf and the Balkans are testaments to the effort. In achieving that goal, perhaps logistics can be truly revolutionized, which may ultimately lead to a revolution in multinational logistics. **ALOG**

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Preparing for a Transition Team Assignment in Iraq

BY CAPTAIN JOSHUA B. JORDAN

At Fort Lee, Virginia, the new Ordnance captains assignments officer stood in front of my classmates and me. She was responsible for determining where each of us would be assigned after finishing the Combined Logistics Captains Career Course. Her news was not well received. After a week of waiting for our assignments, many of us were not surprised when we were told where we were needed: on transition teams in Iraq. As part of the transition teams, we would be serving as logistics advisors to the Iraqi Army. Many were angry about a second or third deployment; some were unaffected. I had many questions, as did my classmates, so I set out to learn more about my new assignment as a logistics advisor to Iraqi soldiers.

The term "advisor" immediately conjured up the image of retired general and former Secretary of State Colin Powell standing in front of his hooch in Vietnam circa 1963. Then Captain Powell, newly arrived in Vietnam, sat in a room with other officers and listened to a major general say that their assignment as advisors was essential to stopping the spread of communism and helping the South Vietnamese save their country. After this speech, Powell was fired up to get to the field and train the South Vietnamese soldiers. He served his tour of duty and returned disappointed. Powell left Vietnam frustrated over the Army's attitude of "if it ain't working, pretend it is, and maybe it will fix itself," and his own attitude that "the ends were justified, even if the means were flawed." Powell's dissatisfaction with his experience as an advisor was due in part to flawed notions of what was expected and what could be accomplished by training an indigenous force.

I asked myself: How could I avoid returning with the same frustrations? How could I best prepare myself for an assignment that, although done in the past across many countries, was not a specialty or career path in the Army inventory? I had not been specifically educated to train foreign soldiers. I knew I needed to prepare myself before my 3-month advisor training at Fort Riley, Kansas.

My first task was to get my hands on as many sources of information as I could. I obtained Combat Studies Institute Occasional Papers 18 and 19, which contain numerous articles by authors ranging from T.E. Lawrence (also known as Lawrence of Arabia) to officers just returning from serving as advisors in Iraq and Afghanistan. For me, the information merged into three broad focus areas: societal awareness, including language, history, customs, work ethic, and thought processes; basic soldier skills, including weapons training, convoy procedures, medical knowledge and skills, and doctrine; and psychological awareness, including mental toughness, spiritual fitness, physical fitness, and focus.

Societal Awareness

Societal awareness encompasses more than just knowing the language; it is the ability to behave in any situation without being offensive to those you are trying to train. Societal awareness is also familiarity with a society's nuances, which, if I could imitate them, would allow me to gain the trust and confidence of the individuals I would be training.

Language. A working knowledge of the local language is the most important aspect of societal awareness. I took 3 years of German in high school and lived in Germany for 3 years; however, in college, I froze when the time came to take a German oral exam. I was embarrassed because I knew that, to a native speaker, I would sound like a 6-year-old. Speaking a foreign language is a phobia that many people have and one that needs to disappear. Marine Corps Lieutenant Colonel Andrew Milburn and Major Mark Lombard, who served as advisors to the Iraqi Army, state that "the usefulness of language skills is obvious. The intent should not be to bring the advisor up to the standards of a foreign area advisor." So why bother learning the language at all? Learning the native language elevates the advisor's status and credibility. Although I would learn some Arabic at Fort Riley, I could begin before I left for the training. The Army has the Rosetta Stone foreign language software available through Army Knowledge Online, and the Georgetown University Press website also offers resources to learn Arabic and even the Iraqi dialect.

History. Historical knowledge of my future counterparts' culture and nation could help me understand why they do the things they do. Knowledge of a nation's history provides an understanding of customs, prejudices, and local work ethic. This

understanding could help me deal with and motivate my counterparts.

Customs. Learning the customs of another country is often difficult for Americans. The fact that Iraq has three different cultures—Shia Muslim, Sunni Muslim, and Kurd—makes this task proportionately difficult. Major Mike Sullivan, who, with his team, built and trained the 6th Iraqi Infantry Battalion, brings this point home by stating that the "Iraqi army is set up to mimic the societal breakdown of ethnic backgrounds," meaning that the Iraqi Army contains the same ethnic groups, and the cultures and biases that come with them, as the Iraqi society. I needed to have knowledge of general Middle Eastern customs and also the customs of the three cultures within the country. Ignorance of this could destroy my working relationship with my counterparts. By understanding the differences, I would also understand why my counterparts feel one way or another about their fellow countrymen.

Work ethic. The American approach to a problem is often head-on and direct. When training a task, U.S. advisors have a tendency to take over and do the task for a person who is having difficulty. This is wrong. T.E. Lawrence said, "Better the Arabs do it tolerably than you do it perfectly. It is their war, and you are to help them, not to win it for them." I should not expect the same kind of results from the ranks of the Iraqi Army that I expect from my Soldiers.

Thought processes. The thought processes I would encounter while working with Iraqi soldiers would be different than anything I encountered previously in my career. I had to understand that Iraqis do not view timelines and tactical continuing actions with the same degree of urgency that the U.S. Army does. T.E. Lawrence observed that Arab "minds work just as ours do, but on different premises. There is nothing unreasonable, incomprehensible, or inscrutable in the Arab . . . Allusion is more effective than logical expression: they dislike concise expression."

T.E. Lawrence weaves the final unifying thread of how language, customs, history, work ethic, and thought process come together under the umbrella of societal awareness by saying, "Experience of [Arabs] and knowledge of their prejudices will enable you to foresee their attitude and possible course of action in nearly every case."

Basic Soldier Skills

To ensure that I would be able to train my counterparts, I needed to focus on my basic soldier skills.

Weapons training. Weapons training is more than going to the range with an assigned weapon, zeroing, qualifying, and cleaning up when through. Lieutenant Colonel Milburn and Major Lombard remind Army advisors that all advisors of a team will regularly have to man a mounted crew-served weapon, so advisors should receive refresher training on the M2 .50-caliber machinegun, the M249G squad automatic weapon, and the MK19 40-millimeter machinegun. Reading the field manuals (FMs) for these weapons and becoming familiar with the systems before leaving for Fort Riley would help me make the most of my training and would better prepare me for the transition team.

Convoy procedures. Convoy training is not only doing convoy live-fire exercises in Kansas, or in Kuwait, or both. It is also about training for convoy operations from start to finish. Convoy operations include the whole process, from the first warning order that the convoy commander receives to the final closeout when the mission is complete. So, I needed to be familiar with the unit movement operations covered in FM 4–01.011, Unit Movement Operations; troop leading procedures in FM 7–8, Infantry Rifle Platoon and Squad; and the military decisionmaking process in FM 5–0, Army Planning and Orders Production. Understanding that the convoy process is more than just driving is key, but driving skills are also important. More often than not, advisors in Iraq will find themselves maneuvering vehicles at speeds of 50 to 60 miles per hour in heavy traffic while watching for improvised explosive devices (IEDs) left by the enemy.

Medical knowledge and skills. Lieutenant Colonel Milburn and Major Lombard stated that the "absence of indigenous medical personnel means that the advisor is almost invariably the first responder in the event of casualties." Advisors should not wait until the first casualties arrive at triage to remember the ABCs of first aid. Numerous websites, such as www.WebMD.com, can provide the basics of emergency first aid. In addition to the combat lifesaver training that I would receive before deployment, I needed to review medical FMs like FM 4–25.11, First Aid, or FM 8–10–9, Combat Health Logistics in a Theater of Operations Tactics, Techniques, and Procedures.

Doctrine. Deviations from doctrine have been a common feature of operations in Iraq since the start of the war. We Americans have the ability to think outside of the box. However, one must understand the doctrine that is inside the box before jumping out of it. Dr. Peter Kindsvatter, the Ordnance Corps Historian, interviewed three Ordnance captains who were assigned to three different special police transition teams in Iraq. Since they were the only Ordnance officers on their teams, the captains handled many ammunition and maintenance issues for their teams and their Iraqi counterparts. However, a majority of their time was spent performing duties not normally

associated with Ordnance or even logistics in general. These other duties involved infantry tasks and training the Iraqis in the infantry skill set. To prepare for training and employing infantry tasks, I needed to review FM 7–8. Previous advisors assigned to transition teams found it important for advisors to review military operations in an urban environment, cordon and search operations, patrolling, raids, detainee techniques, and checkpoint operations.

To avoid misunderstanding, I am not saying that an advisor will or should always perform these operations personally—the Iraqis should fight their own battles. However, I needed to be able to teach these tasks. Book knowledge, when combined with the training and experience garnered at Fort Riley, would pay dividends.

Psychological Awareness

Psychological awareness is the ability to sustain oneself in the contemporary operating environment by maturing one's spiritual, physical, and mental fitness. Societal awareness would help me behave appropriately in Iraqi culture. Basic soldier skills would help me train my Iraqi counterparts. Psychological awareness would be required for both.

Mental toughness. Picture yourself on an advisory team. You are training your Iraqi company on maintenance procedures. The company is 40 percent Shiite, 40 percent Sunni, and 20 percent Kurdish. The Kurdish soldiers do not read, write, or speak Arabic, so how do you teach them maintenance? Enter mental toughness. As Lawrence said, the advisor cannot do everything for the counterpart; your patience will be taxed to no limit. One way to train for mental toughness is to study the lessons learned by other advisors. Examining how others have dealt with issues helps build "muscle memory" in the brain. For example, the 1st Marine Division trained Iraqis in a special commando school, and those few trainees later formed the cadre of a commando school that trained other Iraqis. The Iraqis being trained by the first group of commando school graduates were angry and jealous toward their trainers, who wore berets and carried 9-millimeter pistols. "Precedence is a serious matter among the Arabs," T.E. Lawrence said. The pistols and berets were status symbols, and status is paramount in Middle Eastern culture. Learning from experiences like the 1st Marine Division's and being prepared for similar cultural issues would help me build mental toughness.

Spiritual fitness. On the television show "M*A*S*H," the general yelled to Father Mulcahy, "There are no atheists in foxholes!" With the possibility of an IED harming or killing Soldiers everyday, I would have to prepare spiritually before leaving for my mission. Not everyone in the Army has the same religious beliefs, and the same is true of our Iraqi counterparts, but the Army's Chaplain Corps is a great asset. Those unarmed professionals' sole mission is taking care of Soldiers' spiritual fitness.

Physical fitness. Getting up for a run at 0600 is hard enough for some. Going for a run at 0600 when the temperature is over 100 degrees Fahrenheit is even more challenging, so I would have to prepare physically before arriving in country. The Iraqis would follow my lead if they saw me running, eating healthfully, and taking care of myself. The Marine advisors offer a quick leadership lesson: "An effective advisor is not . . . merely a giver of advice; he is a leader." Just as leaders in the U.S. Army set standards by their own behavior, I would be an example for my Iraqi counterparts. Staying physically fit also contributes to mental fitness. As the old adage says, "If you look good, you feel good!"

Focus. Focus comes from mental toughness and spiritual fitness and is aided by physical fitness. Keeping focused at all times is difficult during a normal duty day in the United States, and it is even harder when dealing with a culture that does not share the Western social norm of getting down to business right away. Regular azimuth checks are necessary to maintain focus. You cannot stay focused if you are not being objective or if you are taking yourself too seriously. Lawrence said to "cling tight to your sense of humor. You will need it every day." As my battalion commander daily reminded my fellow commanders and me in Iraq during Operation Iraqi Freedom, "This is a marathon, not a sprint!"

Information on advising indigenous forces is abundantly available online. Although I researched and prepared myself for the Middle Eastern culture, plenty of lessons can be learned from advisory tours in Korea, Vietnam, and El Salvador. The better prepared an advisor is before his 3 months at Fort Riley, the more he will absorb during training, and the better he will perform as an advisor. **ALOG**

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Design for Six Sigma

BY STAFF SERGEANT MICHAEL P. WINKLER, USAR

One of the most successful business practices used in the corporate world today is Six Sigma, which is a data-driven methodology for eliminating defects. During the development of new products or services, a process called Design for Six Sigma (DFSS) can be used to help ensure that the product or service can be manufactured or can operate at Six Sigma standards. DFSS can be described more simply as "design for reliability." No matter what terminology is used to describe process control and improvement, the desired end state is usually the same.

To begin a study of DFSS and process improvement, you need an understanding of the goal of Six Sigma. So, what is the goal of Six Sigma? Simply put, the goal of Six Sigma is no more than 3.4 defects per 1 million opportunities.

You do not have to understand all of the internal devices of DFSS, nor do you have to be particularly well versed at statistical methodology, to understand the need to apply the principles of Six Sigma. Basically, DFSS is building a better mousetrap by refining all the processes used to build it until the failure rate of the mousetrap falls to an acceptable level. If you are among those people who are familiar with buzzwords, you may recall that the military has long benefited from "reliability and maintainability analysis." But the working aspects of these disciplines often have been hidden as procurement policy has vacillated, so the product itself simply failed to improve further. Historically, failure mode and effects analysis is associated with component failure rates. However, a manufacturing operation could be considered a component, if loosely interpreted. Any process that adds value is a potential DFSS candidate.

The importance of accepting process improvement at all levels has been documented. Without it, corporations have found that resistance to change and simple defiance can derail the entire effort. Perhaps the biggest issue in any systemic change is cultural resistance. This is certainly true in the military, except in turbulent times. Then, the end state will be dramatically different from the beginning state because the operational necessity driving change is stronger than the notional resistance that is maintaining the status quo.

Processes can be improved at any level. However, lower-level changes in industry are typically forfeited in favor of those that will produce a larger cost reduction and, therefore, more profit for the company. A stepping stone to DFSS is "Lean" thinking. This means establishing smoother process flows, doing only those activities that add customer value, and eliminating all activities that do not. In short, all levels in an organization can benefit from Lean thinking.

Think about the processes or issues that have the biggest impact and thus stand to earn the biggest profit when improved. For instance, an analysis of zero-balance line items on a stockage list would be an ideal candidate for improvement. One principle of DFSS (and of Lean) is to pick the "low hanging fruit" first. Gather data, chart the trends, and draw conclusions. Before you know it, you have applied some of Six Sigma's fundamental methodologies: define, measure, analyze, improve, and control (DMAIC).

Benchmarking data is key in any improvement effort. You might find that you are not using the right measurables. Consider the list of zero-balance items on our example stockage list. Is a low zero balance an important measurable, or is it an indicator that the regulatory review periods for stockage need to be revised? Is unused inventory kept on hand too long before it is removed? If the zero balance is high—perhaps greater than 50 percent—would you reach an appropriate stockage level with use or a slower than acceptable resupply? The answer lies in process analysis.

Basically, DFSS is building a better mousetrap by refining all the processes used to build it until the failure rate of the mousetrap falls to an acceptable level.

The Army Materiel Command (AMC) has embarked on a business transformation program to implement DFSS and Six Sigma. Although this program is still in relative infancy, it has been presented to AMC's managers, some of whom are responsible for instilling the importance of process control in the rest of the Army. Process control will drive the business transformation that the Army has begun. **ALOG**

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Battlefield Vision:
Eyeglasses for the Soldier

BY CAPTAIN JOY A. SCHMALZLE

Have you ever wondered how a Soldier gets a new pair of eyeglasses if his become scratched, broken, or lost during a deployment? Well, wonder no more! Soldiers can order glasses in theater and, on some occasions, have them fabricated within 24 hours.

In Iraq, the optical fabrication mission is to maintain the optical readiness of all supported units by providing efficient and timely optical fabrication services, assisting commanders in ordering and procuring all required spectacle devices (including ballistic eyewear), and sustaining vision readiness and unit mission capability.

The optical fabrication mission started in Operation Iraqi Freedom (OIF) 1 with the deployment of the 172d Medical Logistics Battalion, an Army Reserve unit from Ogden, Utah, that filled roughly 1,700 orders. During OIF 2, the 226th Medical Logistics Battalion from Miseau, Germany, picked up the mission and produced nearly 5,000 orders in theater.

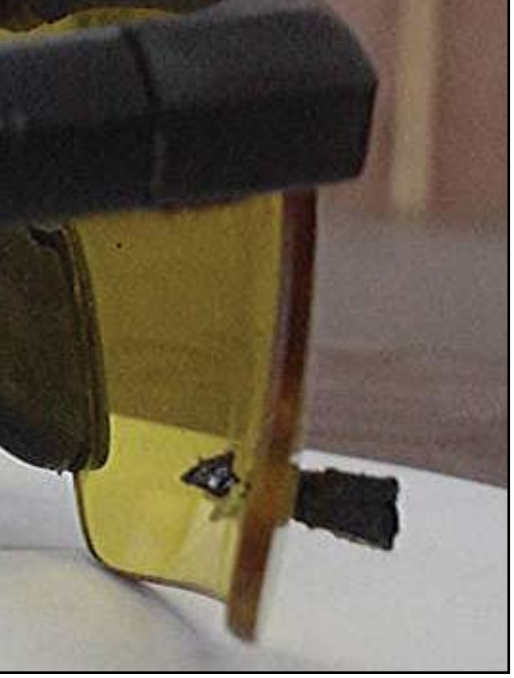
The 32d Medical Logistics Battalion, an Active Army unit under the 44th Medical Command at Fort Bragg, North Carolina, deployed in support of OIF 04–06 and filled a record 22,337 orders. The 226th Medical Logistics Battalion returned for OIF 05–07 as the 226th Multifunctional Medical Battalion (MMB) and continued the mission by producing 14,693 pairs of spectacles. The 32d Medical Logistics Battalion is now an MMB and is back for OIF 06–08 as part of Task Force 3 Medical Command, which provides the full spectrum of healthcare services to military personnel in Iraq.

Lens Prescriptions and Frames

To have a pair of glasses fabricated, a Soldier needs a copy of his spectacle prescription. A spectacle prescription that is dated within the past year is best, but, if a Soldier is in theater and he needs glasses critically, any personal prescription will suffice. The prescription should include the pupillary distance, which is the distance between the centers of the pupils of each eye. Having the correct pupillary distance ensures that the optical centers of the lenses will line up properly over the Soldier's pupils. Glasses made without the individual's correct pupillary distance may be less comfortable. When the spectacle prescription is small, Soldiers who wear a pair of glasses fabricated with an incorrect pupillary distance may or may not notice a difference; with larger prescriptions, glasses without the correct pupillary distance may cause eye strain. If glasses are very poorly aligned, they may induce discomfort, distortion, or headaches.

If a Soldier does not have an actual prescription handy, he has several options. He can go to 1 of the 12 optometrists who currently are deployed in theater to have a refraction done to determine his prescription. Or he may bring an old pair of spectacles to an optometry clinic or the fabrication lab to have the prescription read by a special optical device, the lensometer. If he has already ordered glasses while deployed, he may go back to that clinic and have that prescription looked up in the Spectacle Request Transmittal System. A fourth option is on its way: the Army is currently working on a system that will allow Soldiers to request their past military prescriptions on a website and order the needed eyewear with the click of a mouse. This initiative will eliminate the need for lengthy and time-consuming round-trip visits to the nearest optometry asset in theater just to obtain a spectacle prescription.

Once the Soldier has determined his prescription, he needs to select a frame. Within theater, the optical laboratories are limited to the following frames: the frame of choice (FOC) model number 350 LO (Land Operations) in black or silver, 801 LO in silver and copper, and flight goggle LO in black and silver. [The Army FOC program allows Soldiers to select a civilian-style frame for one of their two pairs of military-issue glasses.] These frames were selected specifically because they fit underneath



This view vividly illustrates the value of combat eye protection.

the land operations goggles, thus allowing Soldiers with eyeglass prescriptions to wear combat eye protection (CEP). Also available are the standard MS9 and FS9 military and flight spectacles (otherwise known as birth control glasses, or BCGs, because of their high durability but nonexistent aesthetic value), the MCU2 or MAG1 (Ranger) glasses, the BLPS (ballistic/laser protective spectacles) M40 pro-mask insert, and a prescription lens carrier for the Uvex XC, ESS [Eye Safety Systems, Inc.] ICE [interchangeable component eyeshield] II, Revision Sawfly, or Body Specs pistol combat eye protection.

Combat Eye Protection

Lessons learned from recent conflicts have demonstrated that 10 percent of casualties can be expected to incur eye injuries and that 90 percent of eye injuries are preventable. In a war in which improvised explosive devices, mortars, sand, wind, and dust are encountered on a daily basis, it is imperative that a Soldier be outfitted with individual ballistic and ultraviolet A and B radiation eye protection.

Several protective eyewear systems are currently approved for Army use. Some of these systems can be worn only by individuals who do not require prescription lenses, while others can be worn by both prescription and non-prescription eyewear users.

For Soldiers who require a prescription, the Uvex XC, ESS ICE II, Revision Sawfly, and Body Specs Pistol eyewear are authorized options. For non-prescription wearers, the Wiley X SG–1 and PT–1 and the Oakley SI Military M frame are additional options. All Soldiers also are authorized to wear the ESS LO goggle, the ESS vehicle operations goggle, and the ESS low profile NVG goggle. The arena flakjak goggle is only for Soldiers who do not require optical correction.

All CEP must pass extraordinary tests that challenge the item's ballistic protection, flame retardance, and other elements of safety. At this time, five CEP items accept an optical insert. The CEP items that hold an insert must pass additional safety tests to ensure that the insert is securely fastened within the CEP and does not create a hazard of its own. Combining a CEP item with an insert can also challenge the optics of the system. In poorly designed systems, Soldiers with higher prescriptions could find the optics distorted or uncomfortable.

Ordering

The ideal way to order spectacles from the lab is through the Spectacle Request Transmittal System (SRTS). This method is possible only if units are collocated with, or have access to, optometry assets within the theater. For units without access to SRTS, the optical fabrication lab has established an online account to receive orders electronically. Orders can be submitted in the form of a scanned prescription, a DD Form 771 (Eyewear Prescription), or an email containing the pertinent information.

The following items are the minimum information required to process an order—

- The patient's name, rank, and Social Security number.
- The patient's address, to include unit and Army post office (APO).
- A current spectacle prescription.
- The patient's pupillary distance.
- The frame type and quantity.

A technician pulls lens blanks (which correlate to the power of the patient's prescription) that will be used to fabricate lenses.

A lensometer is used to measure the power and cylindrical axis of a lens.

A lens is placed on a block to properly align the lens.

A technician edges a lens to fit into the frame.

To create sunglasses, lenses are placed into a tint bath until they reach the desired darkness.

The OptiCast system is used to fabricate bifocals.

Some information is not required, but it is helpful in ensuring that the Soldier receives properly fitted spectacles. This information can be found on a previous DD 771. If not supplied, the lab will substitute information as needed. This information includes—

- Frame model number.
- Frame eye and bridge size. [The bridge is the piece of eyewear that connects the lenses over the nose.]
- Frame color.
- Frame temple length and type. [Temples are the arms of eyewear, running from the lenses to the ears.]
- Segment height (for multifocal prescriptions only).

Fabrication

For prescriptions that are transmitted through SRTS, the optical lab prints out a DD 771 that lists all of the information needed to fabricate the spectacles. The technician looks at the prescription, makes sure it falls within the lab's capabilities, edits the prescription, and pulls the lens blanks that will be used to fabricate the lenses and places them in a tray. The lenses then are taken to the lensometer, and the optical centers are dotted for proper placement of the "block." The lenses then are "edged" and safety-beveled to prevent flaking and sharp edges.

If the lenses will be used as sunlenses, they are placed in a tint bath until they reach the desired darkness, then cleaned, placed into the frame, and inspected. The finished eyewear then is wrapped and packaged for shipping through the Military Postal Service (MPS).

The optical fabrication lab also is outfitted with an OptiCast System, which is used to fabricate bifocal lenses. A liquid monomer is injected between two molds and a specially designed gasket. The mold assembly then is placed in a light-curing chamber and allowed to harden overnight. The next day, the lenses are ready to be edged and inserted into the frame.

Turn-Around Time

The estimated time needed to complete an order depends on the lab's workload, though most glasses are generally shipped within 48 hours of an order's receipt. Emergency orders can be processed in as little as 1 hour for single-vision glasses and 24 hours for bifocals if the lenses are in stock. If the lenses are out of stock or out of the lab's range of capability, the orders are forwarded to the labs at the U.S. Army Medical Materiel Center-Europe in Pirmasens, Germany, or the Naval Ophthalmic Support and Training Activity at Yorktown, Virginia. Turn-around time for orders sent to Germany or Virginia may vary from 2 to 6 weeks.

Once the glasses are made, they are packaged for shipment and dropped off at the post office and shipped via MPS. Orders are sent directly to the address provided by the unit, clinic, or individual Soldier. The class VIII (medical materiel) supply system is also used to deliver to locations with optical forward distribution teams.

Optical fabrication is an asset that is a force multiplier. It allows for quick, efficient delivery of eyewear that keeps our troops vision ready and, therefore, mission ready. **ALOG**

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Tiedown for Safety and Mission Accomplishment

by Colonel Neal H. Bralley, USA (Ret.)

Sir Isaac Newton's First Law of Motion states that an object at rest tends to stay at rest and that an object in motion tends to stay in motion with the same speed and in the same direction unless acted upon by an unbalanced force. During a mission rehearsal exercise at the Joint Multinational Readiness Center in Hohenfels, Germany, I observed that Soldiers did not adequately secure vehicle loads to accommodate Newton's First Law of Motion.

This article is not intended to replace existing technical manuals as a source of information for securing vehicles but to provide leaders and drivers with basic, science-based information and to direct them to examples of proper vehicle tiedowns using chain and ratchet load-binders. This article will look at securing one specific item of equipment, the All Terrain Lifter Army System (ATLAS), a variable-reach, rough-terrain, 10,000-pound lift-capacity forklift (VRRTFL), with a gross vehicle weight of 33,500 pounds.

Why Does It Matter?

In science, laws are events that do not vary; they remain constantly true. Such physical laws are important for us to know so that we do not damage equipment and, more importantly, so that we do not injure or kill Soldiers.

Army equipment is often heavy and bulky. While military vehicles may seem to travel slowly, if we convert speeds measured in miles per hour to speeds measured in feet per second, suddenly things seem to be moving more quickly than we might have first suspected. A vehicle moving 30 miles per hour is actually traveling 44 feet every second. Couple speed with Newton's Laws, and we find that items on a moving vehicle that appear to be at rest and motionless are not motionless at all. These items move at the same speed as the vehicle moves. This factor is not so important when the driver and vehicle accelerate smoothly, but it becomes highly critical when the driver, vehicle, and load make a sudden stop. Newton more precisely stated that, when objects are in motion, they will continue to move in the same direction and at the same speed, unless some other force—friction, tiedown chains, or some similar force—acts upon them to retard or stop their movement.

So, if we have an ATLAS riding on an M172A1 low-bed trailer, we must have something very strong to hold it to the trailer in the event that the truck and trailer suddenly stop. If we do not have the forklift well secured, its 33,500 pounds of mass may continue to move forward at the speed it was traveling before the sudden stopping force acted upon the truck, the trailer, and the load. During such sudden stops, cargo loads will continue to move, and the force needed to restrain those cargo loads, depending on their speed, can be many times greater than their normal motionless weight. This force is expressed as g-force—the increasing force of gravity on an item as the item accelerates.

Visualize traveling within a convoy down a snow-covered tank trail in a 5-ton tractor towing a low-bed trailer with an ATLAS on it. The convoy speed is a modest 15 miles per hour (22 feet per second). Suddenly, you hit a patch of ice, which instantly causes you to lose control of your truck, and the truck hits a large tree, which very rapidly brings everything to an instant and grinding halt. What is happening behind the tractor on that trailer with the 33,500-pound ATLAS? A moment ago, you were moving along smoothly at a modest speed, and now you are going 0 feet per second. What speed is the forklift going? Did it stop with you? Did it continue to travel along at some speed between 22 and 0 feet per second? What is going to stop the forklift? Will it stop before it goes through the cab of your tractor? Do you have sufficiently strong chains in the proper quantities to hold the ATLAS stationary on the trailer? Do your chains have the needed excess safety capacity? The only thing that is going to stop that forklift mounted on a trailer is to have properly attached restraints of the appropriate size and strength. So, just how should you position the chain assemblies in order to tame this beast?

Chains and Load Binders

A careful examination of the current ATLAS technical manual (TM), TM 10–3930–673–10, *incorrectly* illustrates the chain used in the tiedown illustration as 0.38-inch chain (⅜-inch) having a 9,000-pound capacity working load limit (WLL). The manual's sample problem uses a ½-inch railroad-only chain having a WLL of 13,750 pounds. These chains, both the

Restraint Factors						
Restraint Directions	Obsolete TEA Highway Factors	DOT Highway Factors (2004)	Rail	USAF Aircraft	Army CH–47 Aircraft	Maritime Vessels
Forward	0.7	0.8	4.0	3.0	4.0	0.42
Aft	0.3	0.5	4.0	1.5	2.0	0.42
Lateral	0.1	0.5	1.5	1.5	1.5	0.81
Vertical	0.5	0.2	2.0	2.0	2.0	0.0

Legend
DOT = Department of Transportation
TEA = Army Transportation Engineering Agency
USAF = U.S. Air Force

⅜-inch, 9,000-pound WLL and the ½-inch, 13,750-pound WLL, are commercially available, but they are not readily identifiable as being available within the Defense Logistics Agency supply system for use with truck transportation. Both are railroad chains, and both are very expensive.

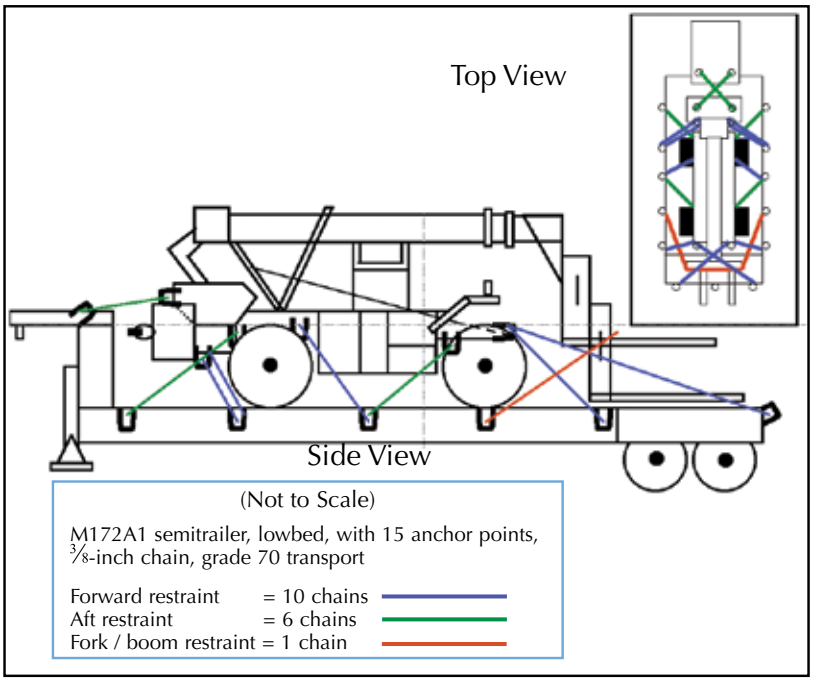
An ATLAS vehicle has 12 tiedown points, each rated at 13,300 pounds. The TM's example uses a total of eight chains, four restraining forward motion and four restraining aft motion; all chains work to restrain lateral motion and exert force to preclude vertical motion. Many methods can be used to secure a vehicle correctly, but remember that these computations do not fully consider more aggressive driving conditions that are possible in tactical or combat environments. Because the manual's authors computed the requirement using Army standards made obsolete with the implementation of 49 CFR (Code of Federal Regulations) 393.102 on 1 January 2004, their answer provides a quantity of chains that does not satisfy current restraint requirements.

To get the correct answer, use the U.S. Department of Transportation (DOT) column of the restraint table above. If you use grade 70 steel transport chains, ⅜-inch with a WLL of 6,600 pounds, you must use a minimum of 17 chains—10 to restrain forward motion, 6 to restrain aft motion, and 1 to restrain the forklift's boom and fork assembly. These quantities (less the boom-securing chain) were determined by using the TACOM Life Cycle Management Command formula with a modified rounding rule (illustrated on page 34). We will need several more chains than the TM reflects. Always round up any fractions to the next even whole number of chains, and maintain symmetry (balance) in your tiedowns. The load needs an equal number of chains on each side (left and right) of the load and the trailer.

When computing the chain requirements, you may use the relatively simple but multistep formula found in TM 10–3930–673–10. It yields good estimates that are conservatively safe. Using this formula, you can change your restraint factors, chain size, and strengths and compute the number of chains you will need for most conditions you may encounter. The formula also permits you to compute requirements based on the chains you have available for a particular load-carrying vehicle. The solution in the sidebar provides the calculation for using ⅜-inch chain with a WLL of 6,600 pounds (see table at right). It is important that you not attempt direct comparisons of the restraint factors between the various transport modes listed in the table at right because the safety factors and restraint design requirements differ between those modes.

Cautions

Chain standards vary widely within the Department of Defense and industry. To ensure that you have the correct chains on hand, you need to check the types and condition of your chains early, before it is time to move your vehicles and your cargo. If your unit receives a trailer through a lateral transfer, ensure that you have the correct size and quantity of basic issue "transport chains" and that the chains are serviceable. Otherwise, your unit may end up without the correct chains and will have to buy the correct chains with its limited mission funds. While waiting for those chains to arrive, you will not be able to perform your mission. These chains are absolutely essential to the readiness of the trailer and, in turn, your unit.



Common Transport Chains			
National Stock Number	Working Load Limit (Pounds)	Size	Trailer Applications
4010–00–443–4845	6,600	⅜ inch x 14.5 feet	M870A1
4010–00–803–8858	4,500	½ inch x 10 feet	M172A1/M872A1/2/3
4010–01–361–8378	12,000	½ inch x 7 feet	M1000
4010–01–371–5772	12,000	½ inch x 11 feet	M1000
4010–01–385–5974	12,000	½ inch x 19.5 feet	M1000
4010–00–449–6573	16,800	¾ inch x 12 feet	M747/M871A3
4010–01–361–7266	20,200	¾ inch x 10.5 feet	M1000 (phased-out)

For transportation load-securing purposes, the industry standard is grade 70 welded, high-strength, carbon-steel chain. Grade 70 chain with links of 5/16-inch and larger will, at some periodic link interval (usually one link in every 36 inches of chain), have an embossed (raised) mark of either a 7, 70, or 700, and the chain also will have a manufacturer's identification symbol or mark. Grade 80 chain has marks of 8, 80, or 800, and grade 100 chain has a mark of 10, 100, or 1,000. Grades 80 and 100 chains are both high-strength, steel-alloy chains. Some chain customers (such as the U.S. Government) may dictate specific color coding and finishing for chains of certain sizes and grades.

As a rule, use only chains you can identify by national stock number (NSN) and that match your TM's basic issue items or additional authorized item lists. If you cannot identify a chain's NSN or determine by its grade that it meets Federal specifications, do not use it unless you compute the chain's restraint factor based on grade 30 proof coil chain—a weak grade of chain.

If a chain shows signs of damage, do not use it! Turn it in to your supply room immediately, and order new chain. What constitutes a damaged chain? Any chain with bent, broken, chipped, cracked, crushed, elongated (stretched), gouged, or twisted links; links having excessively worn bearing surfaces (grooved—inside the individual links); or a chain with a knot in it is a damaged chain. If a chain has grab hooks or other devices on the end, and those items are damaged, the entire chain assembly is unserviceable.

Increasing Restraint

You can gain greater restraint in several ways. You may use more chains, stronger chains, or larger chains, or combine all three. You also can recalculate the number of chains needed by changing the number of g-forces that you believe you want to restrain and then applying the resultant number of chains. You also may apply chains at more efficient angles to gain better balance between the restraints provided in each direction and minimize the number of chains required. Never exceed the tiedown anchor capacities for either the cargo load or the tiedown anchors on the trailer or cargo bed. All chain angles should be between 30 and 45 degrees from the horizontal deck.

Securing the Chains

Each ⅜-inch restraining chain needs a load binder (NSN 3990–01–440–5975). This load binder is stronger than the ⅜-inch chain. Always ensure that the strength of the load binder and its attached chains and grab hooks is equal to or greater than the strength of the rest of your securement system. Two of the forward and two of the aft restraining chains must crisscross. Those chains must go from tiedown anchors on the left side of the forklift to the right side of the trailer and from the right side of the forklift to the left side of the trailer. This provides adequate lateral restraint.

The remaining forward restraining chains go from the ATLAS's tiedown anchors directly to a side anchor point on the trailer at a 30- to 45-degree angle. You want to form two 30- to 45-degree angles. The first should be between the longitudinal axis (the forward and aft line) of the vehicle and the tied-down vehicle's anchor point. The second should be between the tied down vehicle's tiedown anchor and the (imaginary) perpendicular (90-degree) angle to the side of the bed on the cargo-carrying vehicle's side. (This is the lateral component.) These tiedowns provide restraint in the longitudinal, lateral, and vertical dimensions. (See drawing at left.)

When combined, the two 45-degree angles reduce the effective restraint provided by any chain by half its rated WLL in any of the three directions. With ⅜-inch chain, each 6,600-pound chain's effective restraint becomes only 3,300 pounds. That is quite a decrease! As we change a chain's angle, the effective restraint ability of the chain changes as well. (These angular changes have no effect on the actual WLL of the chain.) The technical manual for the ATLAS tells us to assume 45-degree angles.

Although these numbers sound large and impressive, this tiedown plan is only designed to restrain the secured vehicle in the event of "heavy or panic braking" by the load-carrying vehicle. It includes no substantial restraint buffer to guarantee the load will stay on the trailer under more violent conditions. (Granted, although there is a difference between the WLL of a chain or load binder, its proof test, and the minimum breaking strength of a chain, you are not permitted to use any factors except the WLL when planning and physically securing your load according to the criteria of the table on page 32). However, by rounding up to the nearest even whole number of chains, we add more

security to our load. The 17th chain serves only to secure the boom and forks from telescoping out under severe acceleration.

Selecting Equipment

Drivers, noncommissioned officers (NCOs), and officers must make responsible, informed risk assessments to mitigate the risks posed by moving heavy loads on wheeled vehicles. They must continuously consider road and weather conditions, convoy speeds, and drivers' experience. Fewer ⅜-inch, grade 70 transport chains may hold an ATLAS while panic breaking under otherwise ideal driving conditions to the satisfaction of the DOT or the Army's Transportation Engineering Agency (TEA). However, fewer chains may not completely secure the load under more adverse field conditions or during even a minor accident.

Load binders apply tension to the chains. Tension is critical to maximizing the available strength of a chain. Loose chains do not secure a load; they permit the load to shift, which is something you definitely do not want to happen. Further, when a loose chain suddenly becomes taught under extreme acceleration, the tension may exceed the chains' and the load binders' WLLs and, quite possibly, even their minimum breaking limits. Drivers must ensure that each load binder closely matches the strength and size of its chain. Any load's stability will only have the strength of the weakest link among the tiedown anchors, chains, and load binders.

Transport chains are not lightweight chains. Each link is made from linked steel or steel alloy rod; the named size is the measurement of the diameter of the metal rod that forms its links. Pick up a ruler and look at how thick these chain links are. Whether ⅜-, ½-, or ¾-inch, these are not discount store bicycle-locking chains. You can find more information on what the various tiedowns and their component elements should look like in the Military Traffic Management Command Transportation Engineering Agency (MTMCTEA) Pamphlet 55–20, Tiedown Handbook for Truck Movements. However, in doing so, exercise great caution when looking at chain strengths and sizes. A chain's strength—its WLL—is a function of its size and grade rating (the type of metal and manufacturing process used in forming the metal chain). Consult the Welded Steel Chain Specifications published by the National Association of Chain Manufacturers and the Federal Specification RR–C–271D, Chains and Attachments,

Calculating the Quantity of Chains Needed

Remember: within this formula, always round up all decimals or fractions to the next higher, even, whole number of chains, and add one additional chain to restrain the forks and the boom to the trailer.

Step 1

Determine the longitudinal restraint (forward and aft) requirements.

Step 1a

Forward longitudinal restraint requirement:

Forward restraint = gross vehicle weight x load restraint factor (from the table on page 32.)

Forward restraint = 33,500 pounds x 0.8 =26,800 pounds

Step 1b

Aft (rearward) restraint requirement:

Aft restraint = gross vehicle weight x load restraint factor

Aft restraint = 33,500 pounds x 0.5 = 16,750 pounds

Step 2

Determine the number of chains needed for each direction (longitudinally, horizontally, and vertically).

Assumptions—

- The longitudinal horizontal angle component formed between the ATLAS and tiedown point to the trailer bed is 45 degrees.
- The lateral angle formed between the ATLAS's tiedown anchor and the transport vehicle's tie down anchor point is 45 degrees.
- The product of the cosines of these two angles determines the reduction in effective restraint of tiedown chains attributable to the longitudinal, lateral, and vertical components working on the load.

(**Caution:** When solving the product of the two cosines, ensure you calculate to solve for degrees and not radians. Many calculators and spreadsheet programs default to a radian solution and not a degree solution. If you do this incorrectly, you will have significant errors.)

Step 2a

Chain restraint factor = cosine (cos) 45º x cos 45º

Chain restraint factor = 0.707 x 0.707 = 0.5

Step 2b

WLL value of a particular chain =

The WLL of the chain for this problem when new, in good condition, used in a straight line, and at a constant tension (⅜-inch x 14.5 feet, national stock number (NSN): 4010–00–443–4845) is 6,600 pounds.

Step 2c

Number of chains to restrain forward motion =

$$\frac{\text{load restraining factor (fwd)}}{\text{(chain's WLL) x (chains restraint factor)}}$$

$$= \frac{26{,}800}{(6{,}600) \times (0.5)} = \frac{26{,}800}{3{,}300} = 8.12 = 10 \text{ chains}$$

Step 2d

Number of chains to restrain aft motion =

$$\frac{\text{load restraining factor (aft)}}{\text{(chain's WLL) x (chain's restraint factor)}}$$

$$= \frac{16{,}750}{(6{,}600) \times (0.5)} = \frac{16{,}750}{3{,}300} = 5.08 = 6 \text{ chains}$$

Chains required to restrain vehicle =

10 forward + 6 aft +1 forks and boom = 17 chains

Welded and Weldless, for accurate information on the standard size and strengths of chain.

> **Warning:**
>
> Personnel must know what size and grade chain and load binders they are using. They must understand the working load limit (WLL) of their chains; this is critical to life safety and mission accomplishment. Verify the strength and grade of grab hooks and their compatibility with the chain and load binders. Information found in various technical manuals, pamphlets, and even FEDLOG may be inaccurate because of changes in chain specifications, inconsistencies in terminology, and other errors of fact.

Ratchet-type load binders are preferable to levered load binders. Ratchet load binders are much safer devices for operators to use. If operators and supervisors must use levered load binders, they must ensure that all levered load binders have safety lacing wire to safety-seal all load binder levers. Drivers cannot simply wrap chain around the lever and hope the chain stays in place. Although some drivers do this in the field, it is not a correct technique for securing the levered load binder; you must use the lacing wire to secure the lever. Without using the safety lacing wire to secure the load binder, your chain could come unwrapped from around the lever and become loose while you drive down the road. You definitely do not want a load binder to come loose and release a portion of your load. Check the security of your loads on a regular basis—initially, before you leave your motor park; again, within the first 2 miles of leaving the motor park; and then check load security at every rest halt.

Improving Highway Transportation Standards

The Army's manuals have been requiring fewer chains than the newest DOT standards require for commercial vehicles driving on U.S. highways. Army manuals should be corrected to align with DOT Federal Motor Carrier Safety Administration Rules and Regulations, 49 CFR, Parts 392 and 393. The Army, at the very least, should use the minimum standards of the DOT highway factors. Yet, is this the best practice for our operators and our equipment? Is it reasonable to assume that field and tactical driving conditions may easily exceed commercial trucking conditions? Probably!

The Army needs to consider doing three things to improve highway transportation load securement. First, use no less than the DOT restraint factor standards with the TACOM formula provided in the ATLAS TM. This computation provides greater restraint than the TEA figures do, which will provide drivers with greater protection and better protect valuable equipment from coming loose in the event of accidents, even relatively minor ones. Second, change the doctrine in Field Manual 55–30, Army Transport Units and Operations, which states that the shipping units provide the tiedown devices. Units no longer do this, so it should be removed from Army doctrine. Transportation units should carry chains on board their trailers in sufficient sizes and quantities to tie down properly any load that they are authorized to move. This will be cheaper than having every unit in the Army purchase chains for all of the vehicles that they might need to move. Third, standardize the size of motor transport chains. Chains much larger than ½ inch are too difficult for many Soldiers to handle. The rail industry uses ⅜- and ½-inch chains; this would probably be smart for the Army to do. Grade 70 transport chain provides the best overall value. Although higher grades of the same sized chain are stronger, their costs rise more steeply than any corresponding increases in strength.

Unfortunately, within the Army, we continue to have accidents. If you want a greater level of security and safety, you need to consider increasing the size or the number, or both, of the chains and load binders you use to secure your loads against forward motion to levels beyond a mere 0.8 g!

Newton's First Law of Motion is a law we must understand and live with everyday. Drivers, NCOs, and commissioned officers must fully understand the realities of moving heavy cargo on Army trucks and trailers. It is virtually impossible to secure the heaviest truck loads against every conceivable crash scenario. We need to secure our loads against reasonable driving conditions and risks using the WLLs of our transportation chains, but we definitely need to exceed the minimum standards listed by both DOT and TEA. Their figures are simply too low to adequately protect Soldiers and cargo in more rigorous conditions. This is primarily because DOT regulations have changed and because the calculations are based on heavy breaking in fair weather conditions. However, we all must drive safely and securely, whether in combat, the field, or on the highway. **ALOG**

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Joint Asset Visibility: Why So Hard?

BY LIEUTENANT COLONEL JAMES C. BATES, USA (RET.)

From a Department of Defense (DOD) logistics perspective, the attainment of asset visibility at the joint level will reduce the cost of resupply significantly and have a profound effect on warfighter readiness. In the last few years, the joint logistics community has made substantial advances in improving asset visibility, but it still has a long way to go before fully achieving such a capability. This is the first in a series of articles that will explore the complexities surrounding asset visibility and offer recommendations on how to improve it.

The term "joint asset visibility" as used here refers to supplies (expendable items) and equipment (nonexpendable items)—on order, in transit, in storage, or on hand—that are owned or destined for the military services, DOD agencies, or coalition partners. It does not refer to a software system. Although the DOD definition of asset visibility includes the tracking of personnel, this discussion will focus on supplies and equipment only.

Attaining Asset Visibility

Logisticians serving on the staffs of combatant commanders are keenly interested in knowing the aggregate status of supplies on hand, in transit, and on order for the military services and agencies that make up the joint force. This is particularly true for logisticians who have been designated to focus on a

particular area of responsibility, such as a standing joint force headquarters, or those who have deployed as part of a joint task force.

Attaining asset visibility is incredibly difficult. It involves the entire DOD global supply chain (which dwarfs even Wal-Mart), binary code, the electromagnetic spectrum, worldwide telecommunications, local- and wide-area computer networks, and the integration and standardization of logistics data among the services and the domestic and international commercial sector. The architectural design of joint asset visibility should be viewed from what SOLE—the International Society of Logistics refers to as a "total system" perspective. The total system includes—

- The acquisition, supply, transportation, and financial communities.
- The wholesale level (the U.S. Transportation Command, Defense Information Systems Agency, Defense Logistics Agency (DLA), Army Materiel Command (AMC), Air Force Materiel Command, Naval Supply Systems Command, Marine Corps Materiel Command, General Services Administration, Army and Air Force Exchange Service, and Naval Exchange Service).
- The retail level (the warfighting units of the military services).

It requires the integration of the thousands of diverse military and commercial-sector logistics automated information systems.

The following findings from Operation Iraqi Freedom and Operation Enduring Freedom after-action reviews illustrate the magnitude of the visibility problem—

> Continue with efforts towards data standardization to improve interoperability between Service legacy information systems. Improve the joint compatibility of communication and coordination connectivity within the Theater Support Component Command (TSCC) and other logistic planning and execution entities in the theater. Align joint theater logistics standards and cross-Service arrangements to eliminate stovepipe support of common-user items. Supply chain processes, sustainment, transportation, and force protection are all areas that should be standardized across all Services and these standards used in joint training. A joint supply and management system for common items, most notably food, fuel, and munitions, should be developed. Cross-Service agreements should be enhanced to benefit from joint theater logistical opportunities.
>
> ITV [in-transit visibility] continued to be a problem during Operation Iraqi Freedom (OIF), resulting in units having limited or no visibility of forward moving supplies and assets over extended lines of communication. As a result, cargo became frustrated, misdirected, delayed in delivery, improperly marked or lost. *[The Joint Lessons Learned Approach Package, Operation Iraqi Freedom (OIF), Major Combat Operations (MCO) Finding: Joint Theater Logistics (JTL),* 10 February 2005]

> In OIF, the inconsistency in providing each of the required preconditions meant that enterprise integration and visibility did not exist. Limited system availability, poor data capture, unreliable communications, inaccessible data, and limited information fusion provided little more than "islands" of visibility in theater. This is best seen in the breakdown of the Army's Standard Army Retail Supply System/Standard Army Maintenance System (SARSS/SAMS) and the Marines Asset Tracking Logistics and Supply System/Supported Activity Standard Supply System (ATLAS/SASSY) logistics systems . . . the most commonly cited tracking and visibility tool is Excel and e-mail. *[Objective Assessment of Logistics in Iraq, DUSD (L&MR) and Joint Staff (JSJ4) Sponsored Assessment to Review the Effectiveness and efficiency of Selected Aspects of Logistics Operations During Operation Iraqi Freedom,* March 2004]

Key Aspects of the Asset Visibility Problem

These lessons learned demonstrate that the most difficult part of supply chain management is not the physical aspect of buying, receiving, storing, transporting, or issuing items; the hard part is obtaining, managing, and sharing the related information about the chain. In reality, moving the information is

This vehicle is identified in a variety of ways, ranging from truck, utility, to high-mobility, multipurpose, wheeled vehicle. The logistician must know which term is used by the system he is using in order to locate information about this vehicle.

more complicated than moving the item itself. The following questions are keys to understanding joint asset visibility—

- What kind of information about an item do we need?
- Are the data elements standardized for computer processing?
- Where and how often do we want to capture the information?
- Whose job is it to capture the information?
- How do we capture the information?
- What logistics automated information systems are required?
- How can the information be shared electronically?

In an ideal world, any DOD-authorized individual would be able to access the Internet from a personal computer and obtain all of the pertinent information about an item. A wholesale buyer would be able to view information associated with the Material Inspection and Receiving Report (DD Form 250); a transportation coordinator would be able to view information found on the Government Bill of Lading (Standard Form 1103); and a clerk at a central receiving point would be able to view information contained on the Military Shipment Label (DD Form 1387).

As a rule, logisticians capture information about stored items daily and about items in transit whenever the items arrive at and depart from transshipment points or pass by predetermined information collection points. The term "transshipment point" refers to a place where cargo is stopped and reconfigured, such as an area where items are placed in a multipack container, onto an aluminum pallet, or into a 20- or 40-foot container. A transshipment point also refers to a location where the conveyance changes (for example, from one truck to another truck or from a truck to a plane, ship, or railcar). There are hundreds of different types of transshipment points. They can be domestic or international; they can be military or commercially run; they can be in developed areas or in austere environments; they can be under the watch of wholesale or strategic organizations, such as the U.S. Transportation Command, DLA, or the General Services Administration; or they can be managed by one of the services. They include depots, rail yards, airports and seaports, theater distribution centers, container handling areas, supply support activities, and central receiving and shipping points. They can be part of the Defense Transportation System or outside of it.

Since there is no such thing as a certified collector of asset visibility information, many different personnel are involved in capturing logistics data at the transshipment points and at more permanent storage locations. They can be Soldiers, Marines, Sailors, Airmen, or civilians. They can be employed by DOD or by commercial industry and can have supply, transportation, finance, or information technology backgrounds.

The expertise of the personnel who capture logistics data is geared toward using whatever logistics automated information system is employed where they work. Workers for the DLA use the Direct Support System or the Business System Modernization program; workers for AMC use enterprise resource planning (ERP) software developed by SAP International; workers at Air Force-managed airports use the Global Air Transportation Execution System (GATES) and Remote GATES; workers at Military Sealift Command or Military Surface Deployment and Distribution Command seaports use the Worldwide Port System and the Integrated Booking System. Army units use the Unit Level Logistics System, the Standard Army Retail Supply System, and the Standard Army Ammunition System. These are only a few of the hundreds of automated information systems that make up the feeder systems for wide-area networks, such as the Joint Operations Planning and Execution System (JOPES), the Global Transportation Network (GTN), the Defense Automatic Addressing System (DAAS), and the asset visibility application of the Global Combat Support System (GCSS).

Asset Visibility Technologies

Asset visibility-related information can be captured from the item's packaging (such as the DD Form 1387 or the accompanying packing list) by typing it into a computer. Of course, typing data is time-consuming and leads to numerous errors. An alternative is to use electronic data interchange (EDI) and automatic identification technology (AIT) that are being developed and used by the military and the commercial sector on a global scale. Examples include bar codes, smart cards, and radio frequency identification (RFID) devices. The promise of EDI and AIT is mind-boggling since logistics information processing is a multibillion-dollar endeavor. This technology is constantly advancing as some of the best minds in the world work to exploit EDI and AIT possibilities.

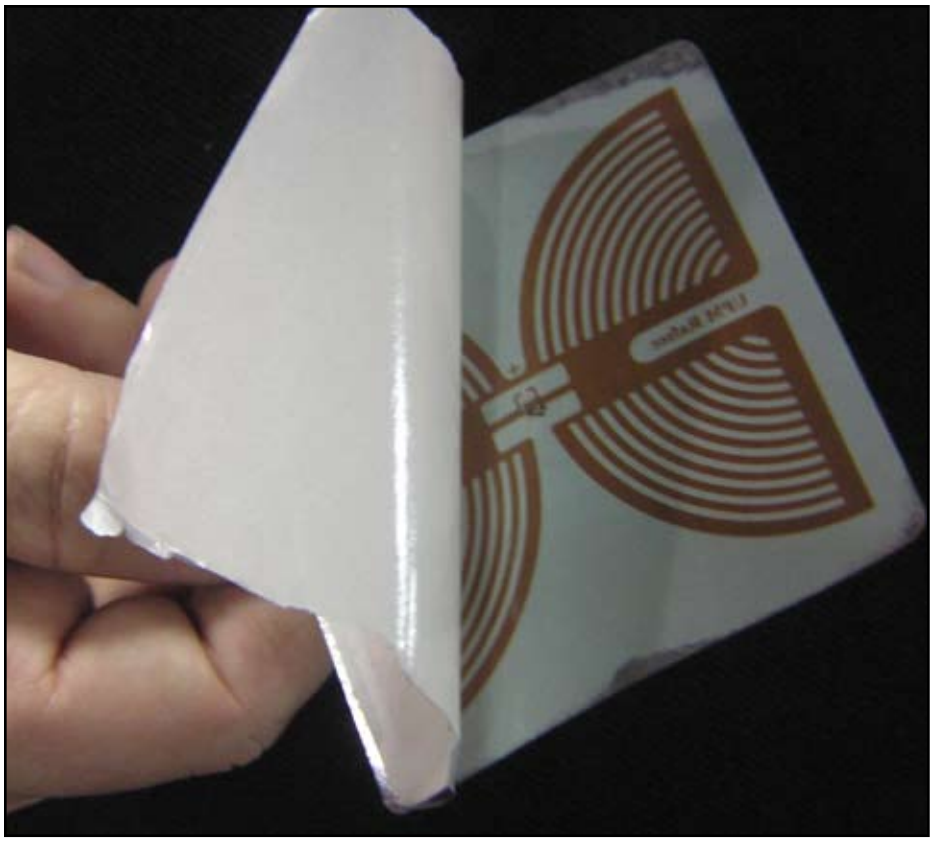
The goal of EDI is to standardize the methods of electronically transmitting logistics data elements, while the goal of AIT is to reduce substantially the amount of human interaction required to capture asset visibility information. DOD must be able to adapt quickly, whenever appropriate, to the advancements of international and domestic logistics consortiums since it depends on the commercial sector as a source of supply and as a transporter of its supplies and equipment. These consortiums include the International Organization for Standardization; EPCglobal;

the American National Standards Institute; the United Nations Electronic Data Interchange for Administration, Commerce, and Transport; GS1; and GS1 US.

Like DOD, these logistics consortiums have very lofty goals. For instance the goal of EPCglobal, which is spearheading the development of an electronic product code (EPC) for RFID, is to provide "immediate, automatic, and accurate identification of any item in the supply chain of any company, in any industry, anywhere in the world." However, the current reality is far removed from that goal. Passive RFID is in a relatively early stage of development, and many data standardization and software interoperability challenges must be overcome. Moreover, the advantages of RFID must be compared to its implementation costs and its inherent reliability. Just as important are information security factors, especially considering that, besides the typical computer attacks made by disgruntled computer "geeks," an enemy will employ its best information technology experts in attempts to disrupt DOD information systems.

Once logistics information is captured, it must be processed and stored on a computer. The type of hardware needed is becoming less and less of an issue since today's desktop computers have enormous capacities; besides, the bulk of the information is transmitted to a web-based network. However, many of our current asset visibility problems can be traced to the use of numerous automated information system software programs and applications. Most of these are legacy systems or simply revised versions of legacy systems. Some still depend on the 80-card column format developed in the 1950s. Others overly emphasize supply, transportation, acquisition, or financial information. Some automated information systems are designed to handle information on cargo moving by surface transportation, while others are designed to handle information on cargo moving by air. Some primarily capture Army information; others capture Air Force, Navy, Marine Corps, or DLA information. Some information is captured via the Secure Internet Protocol Router Network (SIPRNet), while other information is captured with the Unclassified but Sensitive Internet Protocol Router Network (NIPRNet). Some software systems are designed exclusively for the military, while others are used only by the commercial sector, which, when considered as a whole, has many more logistics-related software applications than DOD.

Once the information is captured by the software or application of a single computer device, it must be transmitted to a higher-level computer system or local-area network until the information makes its way to a web-enabled wide-area network such as JOPES, GTN, GCSS, or DAAS. If the transshipment point is in a developed area where telecommunications are available to transmit the data to the World Wide Web, then the only major decision to make is how often to send the data. Data could be sent in real-time, near-real-time (which has not been defined by DOD), or as an information batch. Real-time communication requires a constant telecommunications linkage—something that is not practical if expensive satellite communication is required. If the transshipment point is in an austere environment, establishing telecommunications with the World Wide Web becomes much more difficult and expensive.



A passive radio frequency identification (RFID) tag like this contains a microchip embedded in an antenna and enclosed within a thin label. The information contained in the microchip is transmitted through a passive RFID reader to a warehouse management system.

Like civilian industries, DOD uses the World Wide Web to access its overarching logistics management information systems. However, DOD does not have a single, all-inclusive, logistics network because a logistics-related Global Information Grid does not exist. Instead, DOD has many networks. Besides JOPES (which depicts deployment data), GTN (which depicts transportation data), and DAAS (which depicts supply data), DOD has many other high-level networks, each with its own server, software, and application system. The Army's tactical systems use the Standard Army Retail Supply System for classes I (subsistence), II (general supplies), III (petroleum, oils, and lubricants), IV (construction and barrier materials), VIII (medical supplies), and IX (repair parts) and the Standard Army Ammunition System for class V (ammunition). The wholesale element of the Army (represented by AMC) uses the Logistics Modernization Program—an ERP software system developed by SAP. DLA uses the Business System Modernization program. The Marine Corps uses SASSY and ATLAS.

These high-level networks are fed by numerous automated information systems, so, in many cases, the information available on one network is not available to other networks. Since the data elements are not standardized, logisticians must access several networks to obtain the information they need. Even if the data are available, it can take several hours for a trained logistician to retrieve a few pieces of desired information. Consequently, compiling meaningful logistics reports takes an inordinate amount of time.

Frankly, these overarching logistics management information systems are difficult to use and do not readily provide the fidelity required. Currently, many of these local-area network and wide-area network automated information systems are being subsumed by the Army, Air Force, Navy, or Marine Corps's versions of GCSS. These, in turn, will have to be interoperable with GCSS at the combatant command and joint task force (CC/JTF) level, which itself will have to be interoperable with the Global Command and Control System. Data standardization and interoperability issues associated with software applications and telecommunications are vexing problems because so many different logistics information systems are involved.

Determining What Information Is Needed

Let's revisit the first step to attaining joint asset visibility: What information do we need? The answer is that DOD's global supply-chain logistics managers need all kinds of information about an item. Moreover, although there are many common denominators, the various stakeholders, such as sellers, the acquisition community, the supply community, the transportation community, the financial community, and the chain of command of the buyers or owners of the items, require different types of information. The amount of data involved is startling.

Let's begin with the seller. The seller wants to know the purchaser and where and when to ship the item. The paper document used to capture this information is an invoice or a purchase agreement.

The acquisition community needs much of the same information. It also needs other information, such as the contract line item number, order number, acceptance point, discount terms, the name of the seller and whatever alphanumeric code is used to identify the seller, and the name of the individual accepting the item on behalf of the Government.

The supply community wants to know the name of the item; its identifying number, such as the national stock number (NSN), the contractor's part number, or the Army's line item number (LIN); and the unit of issue. The supply community also needs to know the required delivery date, the document number, the supply-related document identifier code, the quantity requested, the routing identifier code, and if there are any advice codes (which requestors use to inform supply managers of special circumstances).

The transportation community wants to know the gross weight of an item and its height, width, and length. Transporters also want information on any hazardous material, the name of the shipper, transportation modes, the freight charges, the commodity type, the seal numbers, the standard point location code, the standard carrier alpha code, the transportation control number, the transportation-related document identifier code, the aircraft mission number or the voyage number, and the number of pieces.

The financial community wants to know the transportation account code, the mailing address to which the shipping charges should be sent, the type address code 3, and the bill of lading number.

The chain of command awaiting the arrival of an item wants to know where the item is currently located and, more importantly, when it will arrive where it is needed. Logisticians would be interested in knowing if the item was under the control of a vendor, a DLA depot, a service depot, a U.S. or international airport or seaport, or some other transshipment point. They also might want to know if the item was being shipped in a multipack, pallet, or container and the mode of transportation.

The list below shows the wide scope of information required from a total-system supply-chain perspective. It is by no means all inclusive. Some of the data pertain to containers used to protect or transport the items.

Item Identification Codes

Some of the information shown on the list at right is unique to the military, while other information is similar to that used in the commercial sector. For instance, the military normally uses the NSN and the commercial and Government entity (CAGE) code, while the commercial sector refers to a stock keeping unit (SKU) and Data Universal Numbering System (DUNS). Some of the information describing the same type of data is expressed in many different ways. From a total system perspective, this is one of the major reasons that DOD data cannot be readily processed within the myriad wholesale, retail, service, and agency automated information systems. As a result, the wide-area networks that manage DOD logistics information are not as accurate, comprehensive, timely, or useful as they could be. To make a simple analogy, consider the word "pharmacy." If we were to search a database dictionary looking for "pharmacy" by starting with the letter "f" instead of the letter "p," it would take a long time to uncover information about this word—if ever.

DOD services and agencies do not use the same basic naming and numbering conventions. This means that the pertinent logistics information is not visible to or exploitable by the many military global supply-chain stakeholders. For instance, the vehicle that most military personnel call a "humvee" has no single, agreed-on name. The Federal Logistics Information System, DOD's most authoritative source, calls this item a "truck, utility." Others call it a "hummer" or a high-mobility, multipurpose, wheeled vehicle (HMMWV). It is also known as an M998A1; an armored 4x4 crew-cab pickup; a TRK UTIL M998A1; or a truck utility: cargo/troop carrier, 1½-ton, 4x4, M998. Similar to the futility of finding information about the word "pharmacy" by looking under the letter "f," the same futility would occur if logisticians conducting research on a "truck, utility" tried to access the data using the first letter of the abbreviation HMMWV.

Besides using naming conventions, the military also uses codes to identify items, which facilitates the electronic processing of information. As with item names, no single code (numeric, alphabetic, or alphanumeric) universally identifies a specific type of equipment or item of supply. The primary DOD supply code is the NSN, which is comprised of 13 numeric digits. However, the Army also uses the LIN—an alphanumeric code composed of one letter and five numerals, and the end item code—a three-character alphabetic code. DLA's Defense Logistics Information Service (DLIS) database depicts both the NSN and the LIN, but it also includes and promotes the use of an item name code—a five-digit numeric code. The Marine Corps uses a six-digit alpha-numeric code called the item

Pertinent Logistics Information About an Item of Equipment or Supply Being Moved or In Storage

- Air commodity code
- Bill of lading number
- Commercial and Government entity (CAGE) code
- Cargo category code (JOPES)
- Commodity code
- Condition code
- Container number
- Contract number
- Contractor
- Consignee
- Consignor
- Cube
- Date asset arrived (per transshipment point)
- Date asset departed (per transshipment point)
- Destination
- Discount terms
- Document identifier code
- DUNS number
- Expedite handling code (999)
- Gross weight
- Height
- Invoice number
- Item description (if nomenclature has not been assigned)
- Latitude of transshipment point
- Longitude of transshipment point
- Length
- Mark for address
- Military preservation method and date of unit preservation
- National stock number (NSN)
- Nomenclature
- Number of pieces
- Part number
- Order number
- Origin
- Pallet identification number
- Piece number
- Port of debarkation
- Port of embarkation
- Postage data (TCMD)
- Project code
- Purchase order number
- Quantity
- Required delivery date
- Routing identifier code
- Serial number
- Special handling code
- Self-life code
- Shipped from
- Shipped from date
- Standard carrier alpha code
- Standard port location code
- Supplementary address
- Time asset arrived (per transshipment point)
- Time asset departed (per transshipment point)
- Transportation account code
- Transportation control number
- Transportation priority
- Type address code
- Ultimate consignee (mark for DODAAC)
- Unit identification code
- Unit line number
- Unit of issue
- Unit price
- Voyage document number
- Vessel name
- Weight (expressed in pounds)
- Width of item

This list is not all-inclusive.

designator number. A HMMWV could also be identified by using a CAGE part number.

This lack of standardization is a huge, costly problem since effective data processing is highly dependent on exactness. For instance, because The Army Authorization Document System uses LINs instead of NSNs, this incredibly robust, web-enabled database is not compatible with those databases that rely on NSNs. Although it is possible to obtain information by converting LINs to NSNs, this process is time-consuming (especially if a large amount of data is involved) and significantly reduces the utility of automation.

The military also has several means of identifying ammunition and fuel. Along with the NSN, other codes for ammunition include the DOD identification code and the DOD ammunition code. Fuel can be identified by the NSN, a U.S. fuel code, or a NATO fuel code. For instance, aviation turbine fuel has an NSN of 9130–01–031–5816, a U.S. fuel code of JP8, and a NATO fuel code of F–34.

DOD uniquely identifies location in many ways. The commercial sector also uses several methods to identify location. Since 85 percent of military cargo is moved by the commercial sector, DOD must assimilate the methods of the commercial sector within its information processing environments.

A physical location can be identified by street address, city, state, and zip code (or some type of similar convention for international addresses). A virtual location can be identified using an email address or Internet protocol address. Similar to items of supply or equipment, an address is frequently identified by both a name and by a code (which can be numeric, alphabetic, or alphanumeric). For instance, JOPES uses a geographic name (called "GEO name") and a four-character alphabetic designator called the "geographic location code." The Defense Transportation Regulation (DTR), however, does not use the JOPES coding convention. The DTR and the GTN use three-character air terminal identifier codes and water port identifier codes to designate port locations. Some commercial activities identify airports using an alphabetic, four-character code called "ICAO," developed by the International Civil Aviation Organization. Other commercial activities use an alphabetic, three-character code called "IATA," developed by the International Air Transport Association. (See the article, "Joint Force Logistics: Keeping Track of Forces on the Move," published in the January–February 2006 issue of *Army Logistician*.)

The National Motor Freight Association uses standard point location codes, DLA uses type address codes, and the Defense Automatic Address Service Center uses both routing identifier codes (RICs) and DOD automatic address codes (DODAACs) to identify location. Ship-to addresses, mark-for addresses, supplementary addresses, plain language message identifier addresses, Army or fleet post offices, billing addresses, and in-the-clear addresses all describe location —physical or virtual.

As you can imagine, neither the military services, DOD agencies, nor the domestic and international commercial sectors have agreed on standardized conventions to identify location. However, with the emergence of the Global Positioning System and computerized maps, the concept of identifying location by latitude and longitude is gaining acceptance. Using a code that is based on the geometry of the Earth has tremendous advantage.

Unit Identification

DOD units and activities also are identified by written or spoken names and codes. JOPES and the Global Status of Resources and Training System (GSORTS) are the primary automated information systems that depict information identifying military units and DOD activities. GSORTS uses both a long unit name, which can be a maximum of 55 characters, and an abbreviated unit name, which can be a maximum of 30 characters. However, DOD has no centralized approving authority for service and agency unit names.

Because of the limits on the number of characters that can be used to describe military units and other DOD and Government agencies, many of the names are not readily comprehended by those unfamiliar with unit and agency types. For example, logisticians who are Sailors or Airmen or who work at the wholesale level may not be able to understand the abbreviated name of the Army's 11th Armored Calvary Regiment: 0011 AR RGT (AR CAV RGT). Some might wonder if the "AR" stands for Army, Army Reserve, Air, or Armored. The logistics databases within DOD use neither GSORTS abbreviated names nor GSORTS long names to identify units. Different names for the same unit have evolved as the result of the many legacy automated information systems.

Likewise, different alphanumeric codes are used within DOD to identify units; the unit identification code (UIC) is the primary one. Units that have the same generic structure are also coded using the unit type code (UTC). The Army also uses a modification table of organization and equipment (MTOE) code to identify units. Another Army code used to identify units is the standard requirements code (SRC), which is based on the authorized level of organization code and the MTOE code. The SRC and the JOPES UTC capture similar data, although the structures of the two codes are entirely different. The SRC is a 12-character alphanumeric code, while the UTC is a 5-character alphanumeric code. Unfortunately, it is difficult to

integrate the separate databases that use one or the other. Other codes that identify units or agencies include the six-character alphanumeric DODAAC, the three-character RIC, and the CAGE, which identifies non-DOD units. The standard carrier alphabetic code is used to identify commercial transportation companies.

DOD has many middleware software programs intended to reduce interoperability and standardization problems. Although middleware can bridge information-processing gaps, relying on one software system or application to perform a specific function is much better than depending on software or application systems that are linked to other systems through middleware. Determining the cause of a problem is much easier when no middleware is required because only a single hardware, software, and telecommunications system is in operation. When middleware is involved, the diagnosis of a problem is magnified threefold since problems can be caused by the software, the hardware, or the telecommunications of any one of the three systems involved. As a rule, the less middleware involved, the better the electronic processing of information will be.

Communicating With Commercial Systems

Just as the physical movement of items alternates between the Defense Transportation System and the commercial transportation sector, the information pertaining to the movement of these items must be processed alternately by both commercial and DOD automated information systems. Not only is data standardization and interoperability a problem within DOD, it is also a problem within the commercial sector. This problem are magnified even further when information is processed by several commercial and DOD automated information systems. Unless dealing specifically with the military, the commercial sector does not recognize military coding conventions such as the UIC, DODAAC, RIC, and CAGE.

The commercial sector understands the need to standardize data and integrate computer processes. National and international organizations have been established to work toward improving EDI with the goal of reducing human manpower and error during information processing. The long-term EDI objective is to avoid the manual reentering of logistics information into subsequent systems once it has been digitized within an initial automated information system. The American National Standards Institute has chartered the Accredited Standards Committee X12 to develop uniform standards for EDI. (See "Transforming Joint Logistics Information Management" in the January–February 2005 issue of *Army Logistician*.)

The EDI products of standardized digitization are called "transaction sets." Air shipment information, vessel content data, freight receipts, invoices, purchase orders, and order status inquiries are a few examples of transaction sets. The EDI standards are globally disseminated by the United Nations Electronic Data Interchange for Administration, Commerce, and Transport. As a result, DOD must keep pace not only with its own transformational logistics initiatives but also with the revolutionary initiatives being developed in the commercial sector since DOD is a subset (albeit a very large subset) of global commerce. Consequently, DOD data elements should replicate standardized commercial data elements whenever possible and redundant data elements should be gradually removed from DOD databases. For instance, the SRC could be subsumed by the UTC; the DODAAC could be subsumed within the UIC; and the CAGE code could be subsumed within DUNS.

Here are some examples of the need for data standardization. The different automated information systems depict the day of the year and the time of day in various formats. January 31, 2006, could be displayed as follows: 31Jan06, 1/31/06, 1/31/2006, and 0316. Different countries use different methods of depicting dates. Time of day can be depicted in local time, or it can be based on Greenwich Mean Time. It can be expressed using a 24-hour clock or with the use of a.m. and p.m. Moreover, with a global supply chain, the differences between the use of the metric system of measurement and the English system of measurement can lead to confusion. Barrels, miles, and pounds may have to be converted to cubic meters, kilometers, and kilograms. Fahrenheit may have to be converted to Celsius. Simply said, the more standardized the data, the fewer mistakes will be made.

Developing and implementing a standardized logistics management information system that achieves total asset visibility is an enormous undertaking. It will require the integration of numerous data elements from both the commercial sector and within the services and DOD agencies. Consequently, the more logisticians who understand the complexities involved, the better they will be able to overcome the systemic problems associated with EDI and AIT. The next article in this series on joint asset visibility will discuss where and how information for joint asset visibility can be captured. **ALOG**

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Applying Lean Principles to Design Effective Supply Chains

BY MAJOR DAVID R. GIBSON

Lean management principles can be applied to inventory and supply chain management to reduce inventories and improve system performance.

Whether the task is managing an individual warehouse or developing an international supply chain, a few key principals can help to streamline operations, create additional capacity, reduce costs, and improve the bottom line. Businesses, nonprofit organizations, and even military supply chains often are hampered by waste in their systems that affect more than just financial costs. Waste reduces overall supply chain performance. Here are some fundamental principles that can be applied to refine any logistics operation.

Those who design, manage, or merely intend to improve supply chains can look to Lean manufacturing principles and apply a corresponding supply chain process. Lean manufacturing focuses on seven primary types of waste. These are listed in the chart on page 45 alongside their supply chain equivalents.

Organizations must conduct continual analyses and improvements in order to ensure that their operations, logistics activities, and supply chains are as effective as possible. When applying Lean management principles, the value of reducing inventory is obvious. Reducing the amount of material in storage means that less capital is tied up in inventory. If less space is required for housing inventory, then a smaller amount of property, plant space, and equipment is required to store and manage inventory. Reductions in inventory reduce the cost of storage, increase the amount of inventory turn, and can reduce overall expenses. ["Inventory turn" refers to how fast a business uses up its inventory. An increase in inventory turn means that the business is using up its inventory faster.]

Measuring Operations

This cause-and-effect relationship sounds simple enough, so how is it done? It all starts with validating current systems and getting an accurate measurement of operations. Supply chain managers must begin by mapping the chain and the processes that make up the chain. They also must establish valid performance measures in order to ensure that they have an accurate assessment of the activities they are measuring. Establishing appropriate performance measures is important enough, and complex enough, that entire books are dedicated to how they can be established and what they should entail. In fact, Robert S. Kaplan and David P. Norton have written numerous articles and books on the "Balanced Scorecard" and how metrics can be developed to measure performance and translate an organization's strategy into operation. However, measurements alone are insufficient if they only focus on individual processes or systems within an integrated supply chain.

So how can management use measurements to improve their supply chain? How is knowledge applied to increase velocity and reduce inventory? Take, for example, a simple formula for determining the amount of a given item a manager should keep in inventory. This amount usually is determined by establishing a quantity to stock that reflects other key variables. That is, how much of a given item should be maintained on hand as operational inventory (OI) to last until the item can be replenished? This quantity is determined by establishing a requisitioning objective (RO) that includes the quantity desired on hand, plus the quantity needed during the time required to receive the item, plus some amount of inventory known as safety stock (SS). The time required to receive an item after an order is placed is known as order ship time (OST). The addition of safety stock is intended to ensure that sufficient quantities of inventory remain on hand to meet customer demands in the event of changes in shipping times or in forecasted patterns of customer consumption. When expressed in an equation, the computation for a requisitioning objective is: RO = OI + OST + SS. [OST in this equation represents the quantity of the item that will needed during the OST period.]

Analyzing Reactions Within the Supply Chain

Analysis of most supply chains shows that inventory tends to be determined by successful activities within

Manufacturing Forms of Waste	Supply-Chain Equivalent
Inventory: Maintaining excess inventory of raw materials, parts in process, or finished goods.	Inventory: Excess inventory within the supply chain as a result of poor inventory visibility within the system.
Overproduction: Producing more than is needed before it is needed.	Overstockage: Stocking more materiel than is required due to insufficient, or poor, inventory management practices.
Correction: Repair of work.	Reports of discrepancy: Lost, damaged, or incorrect items shipped.
Motion: Any wasted motion to pick up, stack, or move parts.	Motion: Any wasted motion to pick, pack, consolidate, or move materiel in warehousing.
Conveyance: Wasted effort to transport materials, parts, or finished goods into or out of storage or between processes.	Transportation: Wasted effort to ship supplies, parts, or equipment into or out of storage or between supply nodes prior to consumption.
Waiting: Any non-work time waiting for tools, supplies, parts, etc.	Lead time: Procurement lead time, or time cargo is frustrated at intermediate nodes.
Processing: Doing more work than is necessary.	Processing: Doing more work than is necessary: Redundant processes, double handling, or excess supply nodes.

a variety of geographic zones and at multiple nodes of activity. These separate activities combine to make an integrated system, or an integrated supply chain. Activities that take place at one node of the chain will impact activities within other nodes and overall supply chain performance. As an integrated system, a supply chain reacts much like Soldiers running in a military formation. This is also what logisticians in commercial industry refer to as the "amplification," or "bullwhip," effect.

When the unit initiates its running movement, all participants know the direction, perceive the intended velocity, and can see the activities of those immediately to their front. Despite all this information, the results are very predictable. A runner in the front row takes off; immediately, this activity is transmitted, row by row, throughout the column, and the effect grows as it transits the column from front to rear. Runners throughout the column go through a series of sprints and shuffles attempting to damper the amplification, or bullwhip, effect. This effect can only be controlled by having the entire column act as one. Military units control this by singing a cadence. The cadence allows all participants to anticipate each step throughout the column at precisely the same time.

Commercially designed supply chains attempt this by integrating "point of sale" information throughout multitiered, or echeloned, supply chains. These supply chains continually integrate usage forecasts to better anticipate consumption, manufacturing, and distribution requirements. One of industry's most noted models is Dell Computers, which is known for updating manufacturing requirements every 2 hours. Many multitiered businesses employ practices that fall far short in forecasting supply demand and subsequently fail to synchronize requirements with production. In fact, multitiered organizations that rely exclusively on "pull" systems that operate on forecasted demand alone tend to be the most susceptible to amplification. On the contrary, Wal-Mart has integrated point-of-sale technology in which the activity of processing a sale can trigger the manufacturing of a replacement item.

Ensuring Inventory Accuracy

Decreasing the amount of time required to incorporate knowledge of demands shortens the amount of time needed to integrate that information into replenishment forecasts. Reliable information about the location of inventory in the supply chain also enables supply managers to determine accurately the status and availability of inbound replenishment items. This knowledge, coupled with shortened OSTs, can decrease the amount of safety stock required. These improvements can reduce overall inventory on hand, reduce storage space requirements, result in higher inventory turn ratios, and translate into significant cost savings. ["Inventory turn ratio" measures the number of times an organization turns its inventory in a year. This is computed as cost of goods sold divided by average inventory.] Because inventory commonly comes from a variety of vendors, through a variety of transportation nodes, and in numerous configurations, organizations must look beyond the walls of individual warehouses and validate operations throughout their respective supply chains. Of course, maintaining accuracy of inventory on hand is a fundamental prerequisite for any initiative to improve inventory management.

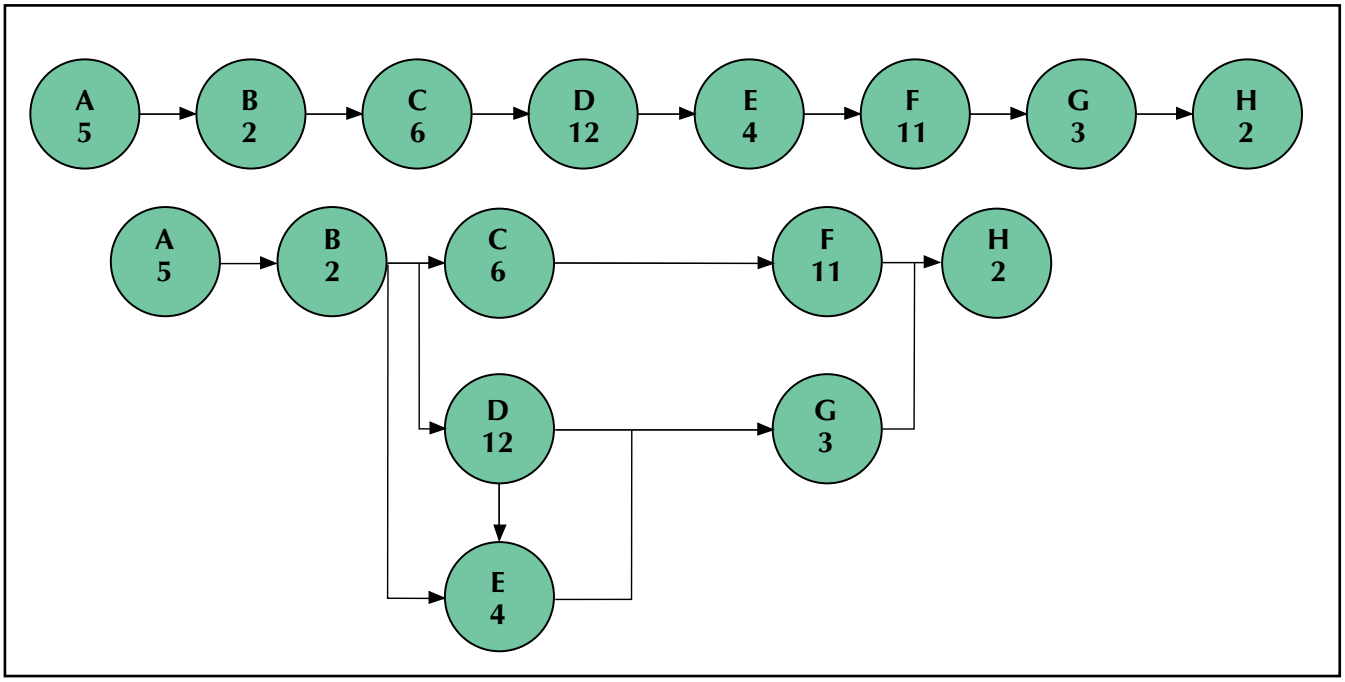
Therefore, efforts to ensure accurate on-hand balances should precede improvement initiatives to gain better in-transit visibility or to expedite the velocity at which inventory flows. Once inventory accuracy is established, tracking and measuring shipment times of inventory as it travels from node to node can reveal more than just transit times between nodes. Although accurately measuring OSTs can improve predictability, many other considerations may not be captured in that metric alone.

Focusing on only one aspect of operations often results in suboptimization—making one link in the operation more efficient without considering the effect that change might have on other links. Avoiding suboptimization requires analysis of individual processes and systems and how they all interact or affect each other. Warehouse internal issues, such as how the items move through a given warehouse, can yield opportunities for reductions in average customer wait time. For example, stock picking, consolidation, packing, and preparation for shipment can take days at a given facility. Internal warehouse improvements that increase velocity at one node may actually add time at another. Take the selection and packing of all like-items together. This may increase the velocity at which those items travel through the warehouse. However, the items may need to be separated at another location and transferred to a different means of transportation before moving on to the final destination. The initial modification of packing all like-items merely transfers the workload of separation to another location in the system and might slow down the overall process.

These challenges can be compounded by the presence of inaccurate inventories; untrained inventory managers; excessive nodes of activity; redundant operations; unnecessary or redundant processes; variance in transportation carriers, processes, or schedules; or unpredicted variance in workload volume. All of these problems contribute to supply chain inefficiency. So the underlying challenge becomes creating an integrated system to get items from point of origin to point of consumption with the least amount of time. Often, simple efficiency increases effectiveness.

Many of the factors described above combine to create requirements for additional storage at supporting nodes. For example, inefficient management of inventory close to the point of consumption will cause the supporting activity to order, receive, store, manage, pick, pack, consolidate, ship, and track unnecessary quantities of supplies. Of course, having more than one supporting node of supply will cause these redundant activities to take place at more than one location and can increase the stockage quantities of those items at each node. This amplified effect degrades overall supply chain efficiency and limits the chain's overall effectiveness by adding excess inventory. This concept demonstrates the amplified impact of higher reorder points and increased safety stocks through the chain, illustrating the mechanics of "Little's Law." This law states, "The average number of things in the system is the product of the average rate at which things leave the system and the average time each one spends in the system." This simply means that, "as velocity increases, storage requirements decrease." As velocity increases, OST decreases and, subsequently, reorder points and safety stock requirements decrease. Slower ship times, combined with the factors listed above, add waste in the system.

Eight processes (labeled "A" through "H") require a total of 45 hours to complete (top). Changing the relationships among these processes to perform some simultaneously (the line of "A" through "H") reduces the total system time to 26 hours (below).



Mapping the Supply Chain

Many opportunities exist to improve a given supply chain's velocity and performance. Some can be executed in the short term and may offer significant cost savings in terms of personnel required, quantities of inventory stored, and overall workload reduced. Other improvements may require more investment in information systems in order to convert existing pockets of data into integrated supply chain knowledge. Mapping a functioning supply chain and applying Lean manufacturing principles provide several opportunities to improve supply chain processes.

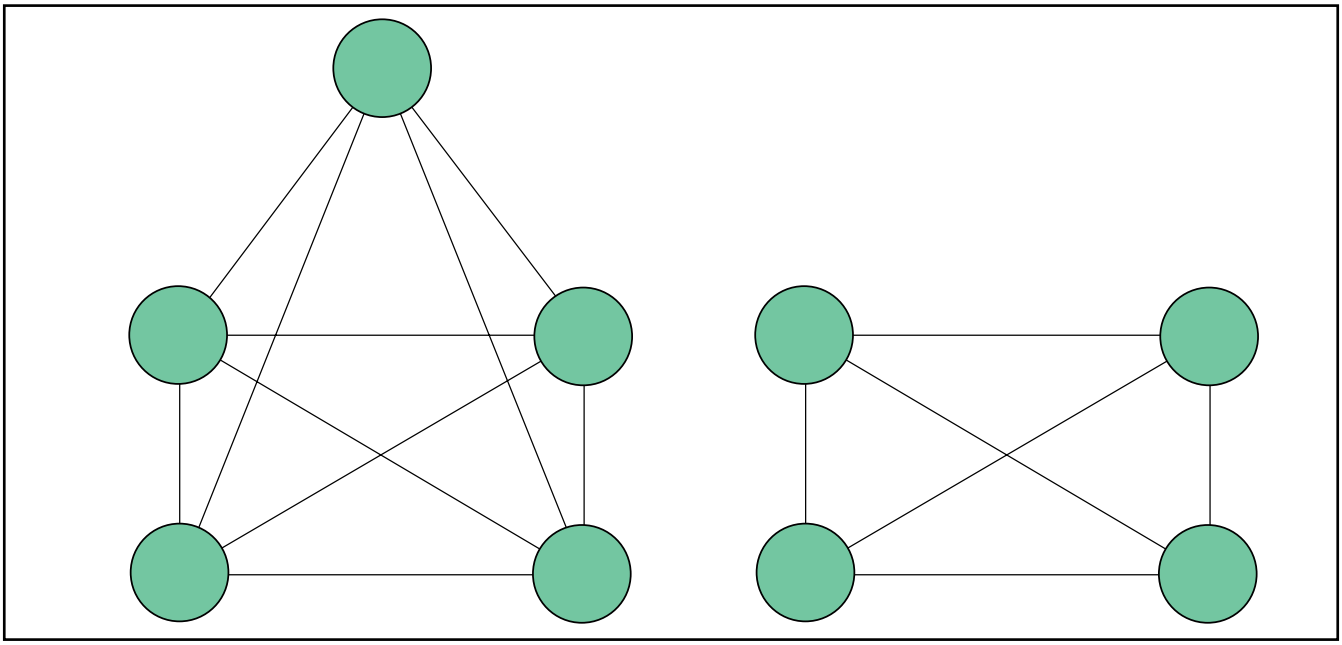
Lean manufacturing is nothing more than the compilation of various manufacturing and industrial engineering practices to systematically eliminate waste. Of course, the easiest way to eliminate waste is to eliminate unnecessary tasks or processes in the system. To do this, the process should be mapped using some form of network diagram. Once diagrammed, system designers realign processes based on their relationship to other required processes in an effort to shorten the overall system time requirement. The time associated with the overall system reflects the system's critical path or the longest path through the network diagram. For example, the chart on page 46 shows a sequence of processes performed sequentially with finish-to-start relationships. Completing these processes in the current configuration results in an overall system time of 45 hours.

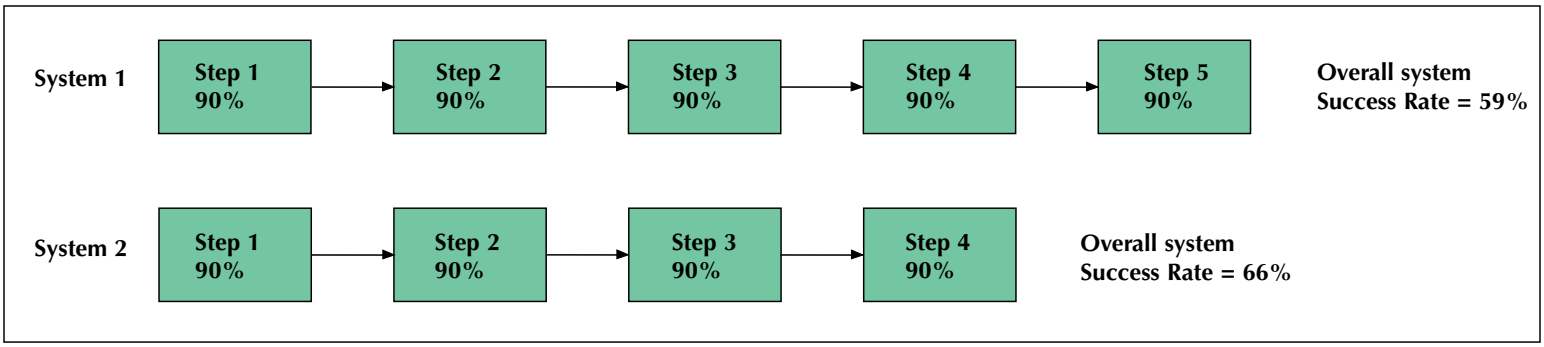
Although each system comprises eight processes ("A" through "H"), changing the relationships among these processes—so that some processes can be performed simultaneously—reduces the system time from 45 hours to 26 hours. Once the optimal sequence of processes and relationships is identified, the focus turns from critical path management to "system crashing" (reducing the process times associated with each activity along the critical path). Crashing the critical path (or reducing overall system time) generally is accomplished by combining tasks within processes or adding more resources in order to shorten process cycle time. Continued refinement of the overall system can be achieved by looking for redundant tasks within each node, lead times of precedent requirements, cycle times associated with each task, and their relationships in order to reduce the overall process time within that node. This same concept can be applied to designing large supply chains. With supply chains, eliminating a single node can save millions of dollars in unnecessary infrastructure and overhead. For many operations, this can result in freeing up critically required space for other uses, reducing manpower requirements, and creating additional system capacity.

Increasing Efficiency of Nodes Within the System

Unfortunately, most supply chains are much more complex than shown in the charts. Reducing the number of processes, tasks, or even communication channels

These figures portray the number of communication channels in a system with five or four nodes. The number of communication channels can be determined by using the formula [N x (N – 1)] / 2, where N is the number of nodes. With 5 nodes, the formula is [5 x (5 –1] / 2 = 10 channels. With 4 nodes, the formula is [4 x (4 – 1)] / 2 = 6 channels.





Reducing the number of nodes in a system can improve overall system efficiency, even if each node has the same rate of efficiency.

can have an overall positive effect on improving system effectiveness and quality. For example, if 5 people, or "nodes," are involved in a process and each must call the other to coordinate, the result will be a total of 10 communication channels. (See chart on page 47.) This result is derived by using the formula [N x (N – 1)] / 2, where N is the number of nodes in a system. If one of the 5 people involved in that process is removed, and all of the remaining parties are still capable of communicating with each other, the number of channels is reduced from 10 to 6.

Why is this important? Every additional physical, or communication, node in the supply chain makes the system exponentially more complex. Each additional node in the supply chain provides an additional opportunity to increase the amplification effect. This increased complexity also applies to each physical or virtual node, where either material transits or electronic data interchanges take place. Each of these junctures provides an opportunity for producing errors. Quality engineers refer to this as "rolled throughput yield (RTY)."

The chart above shows an example of overall quality output based on four or five process nodes. For example, system 1 has five processes in the system. Despite a relatively high rate of success at each node, combining the success rates for each process results in an overall system yield of only 59 percent (.90 x .90 x .90 x .90 x .90 = .59). The reduction of only one process node from the system increases output yield to 66 percent.

When components, supplies, or even information must transit several channels through several nodes, each activity offers an opportunity for error. The greater the number of activities means more opportunities for errors and a lower productive yield. The reduction of a single node can significantly reduce the number of system channels and activities, resulting in significant increases to productive output.

For example, for manual systems where materiel release orders are printed for stocked items to be picked, prepared, packed, documented, and shipped to a customer, numerous steps must be accomplished by human effort. Human performance is far from perfect and often results in errors during one of these functions. Often, when a customer finds errors with his order, he processes a discrepancy report. This results in a less-than-satisfied customer and creates additional workload in the system to remedy the error.

The simplicity of these principles sounds intuitive. However, supply chains often evolve at one node without consideration for what is taking place at another node. In fact, this evolution tends to be common because of the specialization of different organizations in providing a given good or service. Many hospitals, for example, focus on healthcare and rely on staff materiel managers to meet their supply requirements. These materiel managers often rely on vendors that have contracts with different storage and transportation services to provide their supplies. This pattern is also common in various industries where the entire supply chain operates in fragmented components. It is no wonder, therefore, that independent business processes generally evolve until problems arise that require crisis management or until a collaborative effort is applied to improve the interests of two or more parties.

Supply chains for most industries are extremely complex and have numerous physical and informational interfaces. In order for supply chain participants to truly realize the optimum potential of their operations, they must be willing to collaborate with other supply-chain stakeholders. When that time comes, the application of Lean manufacturing principles can be translated to supply chain fundamentals and used to simplify processes, eliminate waste, and improve overall effectiveness. **ALOG**

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Increase Officer Retention

BY JAMES T. DELISI

An appreciable number of the Quartermaster officers selected for promotion to captain in 2000 are not still on active duty. Multiple deployments to support the Global War on Terrorism and an increased operating tempo are primarily responsible for this attrition. The Quartermaster Corps is providing on-the-job training and experience for officers who, after completing their initial service obligation, will leave the Army to become future managers and executives for major retailers.

Thirty percent of the cadets who graduated from the U.S. Military Academy (USMA) at West Point, New York, between 1970 and 1980 left the military after 6 years of service, and 48 percent left after 10 years. Well-paying positions in the private sector provide incentive and opportunity for this exodus, which is not limited to the Quartermaster Corps.

Congress and the Department of Defense (DOD) should reexamine the Army's officer accession policies. I believe that no one should be allowed to become an officer without first completing a minimum of 3 years of enlisted service. However, senior military leaders and lawmakers would oppose any attempt to institute this requirement.

The most viable option is to change the current policy to allow mature, experienced enlisted personnel the opportunity to become officers. The benefits are obvious. These Soldiers already have demonstrated leadership ability; they understand the Army and see career potential. Therefore, they would be more likely to remain on active duty until retirement.

Currently, an incoming USMA cadet must be 22 years old or younger as of 1 July of the year he enters the Academy. I believe that Congress and DOD should increase the age limit to 27 years old for enlisted personnel on active duty. This would allow older, experienced individuals to attend and complete the USMA Preparatory School (if necessary) and enroll at the USMA with a wealth of military knowledge and leadership skills.

One-third of each incoming USMA class should come from the enlisted ranks. Installation commanders can conduct the initial oral interview boards, physical tests, and written examination, and corps commanders can conduct subsequent boards and submit recommendations of selected candidates to the USMA.

The Reserve Officers' Training Corps (ROTC) Green-to-Gold Program (active duty option) is a 2-year program that provides an opportunity for enlisted Soldiers to complete a bachelor's degree and earn a commission. The applicant must be under 31 years old on 31 December of the year of commissioning. The age limitation for this program should remain unchanged. This enables service members to serve a sufficient number of years as commissioned officers before retirement for the Army to recoup its investment

The age limitation for completing Officer Candidate School—no more than 29 years old at the time of enrollment—is adequate. However, some graduates will lack a bachelor's degree. A college degree, regardless of major, is regarded as a "union card" for entrance and retention in the officer corps. Career officers also are encouraged to obtain advanced degrees in addition to required military education such as the Army Command and General Staff College and the Army War College.

I am unaware of any studies that show a direct correlation between the level of education and the ability to lead people and make sound decisions under extreme pressure with limited information available. Lacking a bachelor's degree should not be a deterrent for commissioning a Soldier who has demonstrated outstanding leadership ability. These Soldiers, if commissioned, should be afforded the opportunity to take college-level courses that will enhance their performance as leaders, such as English composition, economics, accounting, statistics, and principles of management. The lack of a bachelor's degree should not be a major discriminator in the officer corps retention and promotion process.

The best way to stem the current exodus of officers is to afford outstanding enlisted Soldiers the opportunity to obtain commissions. Remember: "Every Soldier carries a field marshal's baton in his knapsack."

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Enterprise Resource Planning: The Final (Automated Logistics) Frontier

BY CHIEF WARRANT OFFICER (W–5) ANTONIO OCASIO, USA (RET.)

Recognizing the need for one logistics system that will meet the need of all units, the Army has decided to adopt an enterprise resource planning system developed by SAP. The new system will revolutionize Army logistics automation.

Throughout the history of warfare, great intellectual and monetary investments have been made to improve warfighting capability. Progress has been substantial, but it has tended to occur sporadically. For example, most advances in weaponry have been evolutionary and have involved the improvement of existing weapons. Every few decades, revolutionary advancements increased potential lethality. However, there also have been long periods during which little to no change occurred. An early example of this is the bow, which was first used late in the Stone Age. The 4- to 5-foot-long bow used in India remained essentially unchanged for about 2,200 years. Another example is gunpowder, which was invented in China in the 9th century, was known in Europe by the year 1250, yet took another 50 to 75 years before its potential for lethality could be harnessed.

The logistics arena has shared the same rate of uneven progress. Providing logistics to a fighting force has been a particularly daunting challenge to military leaders throughout history. History's most successful military commanders have always carefully considered the logistics implications whenever forming and executing an engagement plan. Conversely, several of history's greatest strategists and tacticians were soundly defeated by miscalculating the logistics requirement.

Logistics Automation

The Army began automating logistics at the depot level in the mid-20th century when computers became available. Logistics automation worked its way to the unit level as computers became smaller and computer technology became more readily available.

On the surface, logistics automation appears to be a tame enough topic. However, when one considers the readiness implications associated with ineffective logistics flow and the Army's adoption of automated logistics management platforms, it is clear that, although logistics automation has enabled great capabilities, it also is potentially a major point of failure.

The only revolutionary step taken in Army logistics in the last 30 years has been the automation of the Army's manual supply system at the unit level. Since that point, progress has been made with evolutionary improvements in business processes and technology, but nothing that can be considered revolutionary. The table below illustrates how the Army has evolved automated logistics systems by simply transferring them onto more powerful hardware platforms without addressing the major historical problems and known capability gaps.

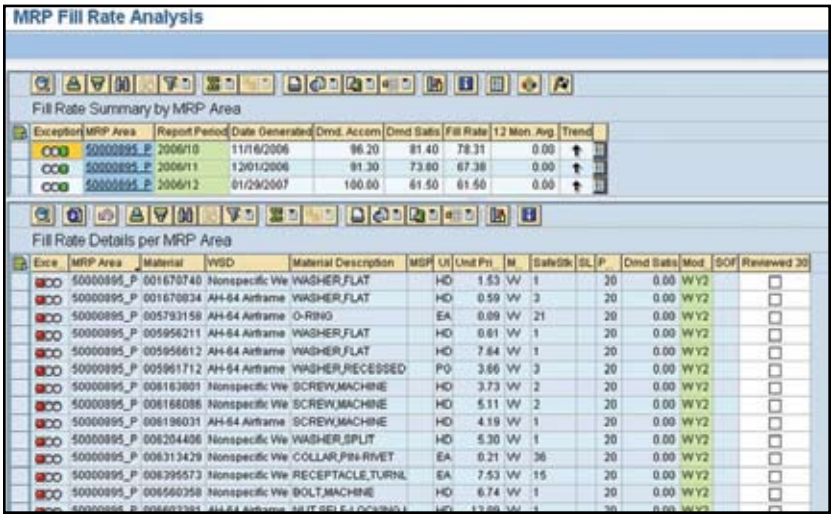
In essence, the Army's pattern has been to duplicate the limited functionality of incumbent systems onto more capable hardware platforms. To address the problems that continued with the systems, local software vendors sold installations or commands programs to use with their systems that corrected the problems. These stopgap programs are known as "local uniques." As a result, the Army-wide systems that were intended to provide continuity became a series of similar, but different, systems. The argument that local uniques are an improvement could be refuted by analyzing their data accuracy or latency response.

Migration of Historical Problems Not Addressed by Evolutionary Change

Logistics Problem	Manual	NCR 500	Phoenix	DS4	SARSS1(I)	SARSS–O
Visibility/ Data accuracy/ Data latency		Retained	Retained	Retained	Retained	Retained
Customer reconciliation		Retained	Retained	Retained	Retained	Retained
Maintenance reconciliation		Retained	Retained	Retained	Retained	Retained
Overage reparables		Retained	Retained	Retained	Retained	Retained
Annual demand analysis/ resolving nonperforming stock numbers		Retained	Retained	Retained	Retained	Retained
Unit transfer		Retained	Retained	Retained	Retained	Retained
Wait time		Retained	Retained	Retained	Retained	Retained
Reliance on other STAMIS		Retained	Retained	Retained	Retained	Retained

Legend:
DS4 = Direct Support Unit Standard Supply System
NCR 500 = National Cash Register Magnetic Automated File System
SARSS 1 = Standard Army Retail Supply System Level 1
SARSS-O = SARSS-Objective
STAMIS = Standard Army Management Information Systems

Global Combat Support System-Army Field/Tactical Solutions	
Historical Problem	**Solution in GCSS-Army (F/T)**
Visibility/data accuracy/ data latency	Provide an integrated system with one view of the truth, enabling logistics leaders to make sound support decisions based on reliable and effectively aggregated data.
Customer reconciliation	Integration of multiple Standard Army Management Information Systems (STAMIS) under one system logically links customers to supporting elements and virtually eliminates the practice of reflex reordering of repair parts.
Maintenance reconciliation	Integration of multiple STAMIS under one system will provide visibility of unserviceable reparables in maintenance and provide an accurate net asset posture.
Overage reparables	Integration of multiple STAMIS under one system and deliberate tracking tools will provide a more accurate reparables posture and complement exchange pricing.
Annual demand analysis/resolving non-performing stock numbers	Perpetual analysis of nonperforming stock numbers enables deployment forecasting and complements the Army force generation process.
Unit transfer	The Force Element tool allows for the logical decoupling and recoupling of units while reestablishing support relationships.
Wait time	Calculation of wait time by individual national item identification number allows for a more precise ordering process and facilitates closure of overdue shipments.
Reliance on other STAMIS	Integration of multiple legacy STAMIS functionality under one system logically links previously disassociated functionally.



Shown above is the Fill Rate and Demand Satisfaction Analysis view within GCSS-Army (F/T).

It can be argued that the only true advances have been system enablers such as radio frequency identification, portable data collection devices, the Combat Service Support Automated Information Systems Interface, and the Very Small Aperture Terminals tested and proven during several engagements leading up to and including Operations Enduring Freedom and Iraqi Freedom.

Some tactical logisticians would argue that the systems we have work just fine. However, it may be that our Soldiers have simply become accustomed to, and accepted, a lower standard of performance. Ample historical precedent exists to support the idea that we do not recognize what our equipment is lacking until we receive something better. For example, chariots were used to carry archers and scythes were affixed to the wheels to make them more lethal, but the chariot remained a chariot until it was replaced by the tank. It was only then that it was realized how much capability the chariot was lacking.

Enterprise Resource Planning Solution

While en route to replicating legacy systems a sixth time under the Global Combat Support System-Army (Field/Tactical) (GCSS-Army [F/T]), the project abruptly paused to receive fresh guidance from the Army's logistics leaders. The new guidance stated that Army logistics systems would move to an enterprise resource planning (ERP) solution using a SAP commercial off-the-shelf software product. An ERP system integrates all data processes of an organization into a unified system, typically using multiple components of computer hardware and software with a central database. The ERP solution allows the GCSS-Army (F/T) development team to provide for data integration and to reengineer business processes. The table (above left) illustrates how integration will resolve nagging historical problems.

At left is an illustration of one of the dynamic improvements under development. The interactive "Fill Rate and Demand Satisfaction Analysis" view allows a material requirements planning (MRP) controller (item manager) to view the current fill rate by MRP area (supply support activity) and take action on the stock numbers that are contributing negatively to the overall fill rate. This tool is only one of many developed by the GCSS-Army (F/T) development team to enable proactive and interactive materiel management.

A 4-month operational assessment of GCSS-Army is scheduled to begin in October with the Regimental Support Squadron, 11th Armored Cavalry Regiment, at Fort Irwin, California. A revolutionary step is finally being taken in the area of logistics software and business process reengineering. Coupled with Very Small Aperture Terminals, radio frequency identification, improved tracking technology, and integrated electronic technical manuals, this logistics system will deliver the vision that senior Army logistics leaders had many years ago for revolutionizing military logistics.

ALOG

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ALOG NEWS

ARMY PUBLISHES 2007 POSTURE STATEMENT

After 5 years of the Global War on Terrorism, the environment in which Soldiers work remains dangerous, and the stress that they and their Families endure is increasing. That was the message of the Secretary of the Army and the Chief of Staff of the Army in the 2007 Army Posture Statement. The statement, which is the annual summary of the Army's missions, accomplishments, and plans, was presented to the Congress in February.

According to the Army's leaders, funding and resources must increase to build the force, sustain the war effort, and provide for Soldiers and their Families. To reach these goals, the Army will focus on four overarching, interrelated strategies—

- Provide relevant and ready land power. The Army is transforming into a brigade-centric modular force, with 76 brigade combat teams and some 225 sustainment brigades in the active and reserve components.
- Train and equip soldiers and grow adaptive leaders. The Army is cultivating the Warrior Ethos among all Soldiers and Army civilians.
- Sustain an all-volunteer force. The Army is improving the quality of life for Soldiers and their Families to match the quality of service they provide.
- Provide infrastructure and support. The Army is transforming its structure, systems, processes, and facilities to sustain the full range of operations.

The Army's logistics focus will be on enhancing equipment readiness, improving logistics automation, and completing transformation. The past 5 years of combat operations have worn down Army equipment, so Congress has provided funding to continue restoration projects that are already underway through the Army Force Generation reset process. These measures are expected to aid in rebuilding unit capability. To improve accountability, the Army is implementing the Logistics Automation Governance Plan, which will improve the fielding of modern logistics automation and will retire legacy systems. These efforts have reduced the number of logistics automation systems from 850 to 320.

The Army has accelerated its rapid but deliberate transformation of logistics. Since 2004, the Army has redesigned and activated new logistics units, including three of four new theater sustainment commands, five expeditionary sustainment commands (ESCs), and 11 sustainment brigades. The 316th ESC, an Army Reserve unit, will be the first ESC to deploy and provide command and control.

For more information on the 2007 Army Posture Statement, see www.army.mil/aps.

JKO PORTAL OFFERS JOINT ONLINE TRAINING

To prepare servicemembers for joint and multinational operations, the Department of Defense has unveiled a new enterprise portal system called Joint Knowledge Online (JKO). The new system delivers online classes and learning tools, including joint task force handbooks, interactive courseware, training videos, and links to other online information. These resources are available not only to U.S. servicemembers but also to those who will be working with them in joint and multinational operations, such as personnel from government agencies, foreign militaries, and nongovernmental organizations.

JKO is aimed at reducing the amount of time service men and women spend away from their families and units while being trained for their joint missions. With JKO, Soldiers, Marines, Sailors, and Airmen can take basic portions of courses online before arriving at resident courses. The service-operated portals—Army Knowledge Online, MarineNet, Navy Knowledge Online, and Air Force Portal—will still provide service-specific training.

ARMY FINANCE SCHOOL RENAMED

The Army Finance School at Fort Jackson, South Carolina was officially redesignated as the Army Financial Management School on 26 January 2007. The Finance School was originally established on 1 September 1920. The name change was one of the first steps of a transformation that will combine the Finance branch (code 45) and Comptroller functional area (FA 45) career tracks into the Financial Management branch (code 36). The goal of the transformation is to create multifunctional Financial Management officers that can support the Modular Force. All financial management units will finish their conversions by fiscal year 2010.

DOD AWARDS DEFENSE LOGISTICS CONTRACTS

In response to a Base Realignment and Closure recommendation to privatize certain functions at Defense Supply Center Richmond (DSCR), the

Department of Defense has awarded contracts that will terminate the wholesale supply, storage, and distribution of packaged lubricants, petroleum, chemicals, and compressed gasses at DSCR. A contract worth up to $6.25 million was awarded to San Diego-based Science Applications International Corporation to handle the procurement, storage, and transportation of petroleum, oils, lubricants, and chemicals. Privatization will allow the contractor to deliver supplies directly from its stock to the warfighter. Haas Total Chemical Management of West Chester, Pennsylvania, received a $2 million contract to buy, store, fill, and transport compressed gasses and cylinders for DSCR customers. DSCR will retain the contracting function for the commodities.

CAMP ARIFJAN STUDY CHANGES SAFETY RULES FOR AMMUNITION STORAGE SITES

A review of plans for storing ammunition at the Theater Storage Area at Camp Arifjan, Kuwait, has led to a significant change in the rules for constructing safety barricades at ammunition storage sites. The review, initiated by the Army Defense Ammunition Center (DAC) at McAlester, Oklahoma, reevaluated Department of Defense (DOD) and Army explosives safety regulations that required the height of a barricade to be 2 degrees above stacks of ammunition when drawn from the rear of the stacks. Applying this rule to the 25 720-foot-long ammunition storage pads at Camp Arifjan meant that 36-foot-tall barricades would have been required. Employees at DAC's Army Technical Center for Explosives Safety questioned the need for 36-foot-high barricades to protect adjacent ammunition storage sites that were 477 feet apart.

A series of trajectory analyses using DOD-approved explosion software models showed that barricades with a height extending 1 foot above the line of sight between two ammunition stacks will protect adjacent ammunition storage sites from the spread, or propagation, of detonations at one stack. As a result, the armed services and the Department of Defense Explosives Safety Board have voted to adopt a requirement that barricade heights be 1 foot above the line of sight between ammunition stacks (1 foot above the height of the stacks).

Because of this change, an estimated $67 million will be saved over the next 3 years through reductions in the height and footprint of barricades and the amount of dirt required for barricade construction.

A barricaded ammunition storage pad at Camp Arifjan, Kuwait.

The Improved Outer Tactical Vest worn by the Soldier in this photo is being fielded to Soldiers in Afghanistan and Iraq. *(Photo courtesy of Program Executive Office Soldier)*

IMPROVED BODY ARMOR FIELDED

The Army will field the Improved Outer Tactical Vest (IOTV) to Soldiers in Afghanistan and Iraq soon. Improvements made in the design of the vest, which are based on Soldier input, reflect the Program Executive Office Soldier goal to provide Soldiers with the most advanced and comfortable protection gear available.

The IOTV has the same ballistic protection and uses the same armor plates as the OTV that Soldiers have been using. Improvements in the vest include—

- Lighter weight by 3 pounds.
- Increased area of protection.
- More comfortable integrated throat protector.
- Single quick release for emergency situations.
- Internal waistband that allows the waist, not the shoulders, to support the weight of the vest.
- Movement of the vest opening from the front to the sides.
- Additional storage pockets.
- Mesh lining for ventilation.
- Vertical adjustability of side plate carriers.
- Increased number of available sizes.

NEW ARMY OPSEC REGULATION RELEASED

A revised Army Regulation 530–1, Operations Security (OPSEC), updates policies and procedures for maintaining OPSEC in the Army. The goal of the changes is to foster a total Army approach to OPSEC.

Unlike traditional security, the purpose of OPSEC is to avoid providing the enemy with sensitive information through unclassified and open-source observations of friendly activity, such as personal blogs on the Internet or photos sent to family and friends. Such information may be pieced together to provide the enemy valuable intelligence.

Key changes to the regulation include—

- Placing a greater emphasis on commander implementation of OPSEC.
- Establishing punitive measures for violations of specific directions.
- Requiring that "For Official Use Only" be marked on any document that meets at least one exemption of the Freedom of Information Act.
- Requiring that all email messages containing sensitive information be encrypted.
- Adding civilian and contractor personnel to the OPSEC program.
- Addressing the role of Family members in OPSEC.

TRANSCOM RECEIVES SUPPLY CHAIN EXCELLENCE AWARDS

The Supply Chain Council, an international not-for-profit industry association, presented the U.S. Transportation Command (TRANSCOM) the Global Award for Supply Chain Excellence and the

Award for Supply Chain Operational Excellence in March. These awards spotlight world-class organizations that have recognized the critical role supply chain performance plays in reaching organizational goals and their commitment to optimizing supply chain performance.

The awards were presented to TRANSCOM for its commitment to design, development, and decision-making support associated with the joint deployment and distribution architecture. This was exhibited by the TRANSCOM Command, Control, Communications, and Computer Systems (J–6) Architecture Division redesign of the command's operational architecture to provide better understanding of operational processes and highlight the relationships among various organizations involved in the broader supply chain.

"Our focus is on improving the efficiency and interoperability of the Defense's distribution activities associated with deploying, sustaining, and redeploying our forces and equipment during peace and war," said TRANSCOM Commander General Norton A. Schwartz. "The application of the Supply Chain Operations Reference Model has definitely helped us effect change toward improving our warfighting capabilities."

ARMY IMPROVES UNIFORM FIRE RESISTANCE

Program Executive Office Soldier is working to provide Soldiers in theater with uniforms that protect them better from the fire threats posed by improvised explosive devices. These initiatives include NOMEX uniforms for Soldiers in convoy operations, flame-resistant coveralls for Soldiers operating combat vehicles, a fire-resistant combat shirt to be worn under the interceptor body armor, and a fire-resistant Army combat uniform (ACU).

Soldiers in Iraq and Afghanistan began receiving NOMEX uniforms in January in response to an operational needs requirement submitted in September

Employees at the Logistics Movement Coordination Center (LMCC) operated by the Army Corps of Engineers, Gulf Region Division, request permission for, register, and monitor convoy movements throughout the battlespace in Iraq. The LMCC, located in Baghdad, coordinates the movement of materials needed for reconstruction throughout Iraq with the military units that control the territory through which the convoys will move. The LMCC operates on an unusual business model—a team primarily run by contractors in a military environment that eventually will turn over its operations to the Iraqi government. The LMCC helps coalition forces maintain a better view of their operating environment and support their logistics needs while the contractors working at the LMCC receive a safer workspace, which dramatically reduces their insurance premiums. In the past 2_ years, the LMCC has guided more than 11,300 convoys. *(Photo courtesy of Army Corps of Engineers, Gulf Region Division)*

The new flame-resistant combat shirt is designed to be worn under the interceptor body armor.

2006. NOMEX, a fiber produced by DuPont Company, has proven effective in saving lives. It significantly reduces the risk of second- and third-degree burns to Soldiers who are exposed to a flash fire such as burning fuel.

An improved, fire-resistant, one-piece uniform has been developed for Soldiers riding in combat vehicles. Also made with NOMEX, the new coverall has an elastic back waist and adjustment tabs to customize fit, decrease bulk, and increase maneuverability for armored vehicle crews. The fielding date for the coverall is yet to be determined.

The fire-resistant combat shirt will be fielded late this summer. Made to wear under body armor, the shirt has fire-resistant camouflage material on the sleeves, shoulders, and in a panel under the arms. The front and back are made of body-fitting, moisture-wicking, knit fabric. Worn with flame-resistant ACU pants, the shirt provides the Soldier with head-to-toe protection against burns. Fielding for the flame-resistant ACUs begins in July.

Contributors to the Design of the Logistics Branch Insignia

The individuals list below participated in the design of the Logistics branch insignia. The final design, seen on page 1 and the cover, incorporates many similar elements found in the design suggestions that were submitted to the Army Combined Arms Support Command (CASCOM). (See the article on the design solicitation in the September-October 2006 issue of *Army Logistician* for more information on the insignia design process.) The final design therefore is the product of a group effort. All participants received a thank-you note from Major General Mitchell H. Stevenson, the Commanding General of CASCOM. Costella Alford was the primary design technician for the insignia at the Army's Institute of Heraldry at Fort Belvoir, Virginia.

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Major Mo Alsing
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Mr. Daniel Amburg
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Colonel Steve Woods
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Writing for *Army Logistician*

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

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

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

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

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

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Coming in Future Issues—

- **The 15th Sustainment Brigade in Iraq**
- **Optimum Point in a Vehicle's Life for Refurbishment**
- **Task: FRAGO/Information Management**
- **Building Iraqi Logistics**
- **Special Forces Forward Logistics Elements in Afghanistan**
- **Evolution of the Current Exchange System**
- **Modular Medical Logistics Support at JRTC**
- **CRSP Operations in Multi-National Division-Baghdad**
- **The Medical Command Officer Distribution Plan**
- **4th Sustainment Brigade Realignment**
- **Training Strategies for Sustainment Brigades**

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