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NOVEMBER–DECEMBER 2016

ARMY SUSTAINMENT

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Enterprise Data Systems and Sustainment Estimates

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KEYS TO A SUCCE CONVERSION

PB 700–16–06 Headquarters, Department of the Army • Approved for public release; distribution is unlimited.

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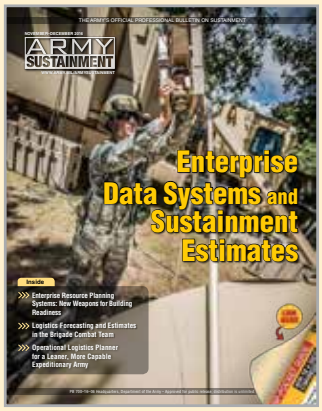

Spc. Josh Ingram, with the 89th Sustainment Brigade, works on a very small aperture terminal during a combat support training exercise at Fort McCoy, Wisconsin, on August 13, 2016. The multicomponent, joint exercise is aligned with other reserve component exercises. (Photo by Spc. John Russell)

"The key for the Army to successfully finish fielding GCSS–Army to 100,000 more users is for all leaders to demonstrate that GCSS–Army is important. It should be at the top of your list."

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By Order of the Secretary of the Army:

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1620802

Enterprise Resource Planning Systems: New Weapons for Building Readiness

■ By Lt. Gen. Gustave "Gus" Perna

"What am I doing that I should not be doing, and what am I not doing that I should be doing?" When I face new challenges, these are the questions I often ask myself. I learned this from the legendary retired Lt. Gen. Harold Moore, who as a battalion commander in Vietnam led his troops in the war's first major battle in the Ia Drang Valley.

Moore explains that over the course of two nights and three days he would regularly take a few seconds to detach himself mentally from the chaos and the intensity of it all to ask himself what he could do next to influence things in his favor. In my opinion, he was looking for greater visibility.

I use this analogy because, thanks to the introduction of our logistics enterprise resource planning systems, today's sustainers and warfighters have more visibility than they have had at any time in history. And we are just getting started.

The Global Combat Support System–Army (GCSS–Army) now has 40,000 users, and by December 2017, when the Increment 1 fielding (Waves 1 and 2) is complete, it will have 140,000 users. The whole Army, not just sustainers, will feel its positive impact as more functions go online.

I am not concerned about our young Soldiers learning our new information systems; they know how to learn systems like they learn to use the mobile phones in their pockets. The more buttons they push, the more they get from the user experience.

My focus is on commanders. Will they push all the buttons to take full advantage of the systems' new capabilities? Will they take sustainment estimates and other new data that these systems produce and then utilize, synchronize, and integrate them into operations to improve echeloning of commodities and materiel in support of the maneuver commanders?

Here are some issues we all should be thinking about as we make enterprise resource planning systems our new weapon for building readiness.

Leaders Need to Be Engaged

As a commander, if you want to demonstrate to all your Soldiers that something is important, you need to own it and not delegate it. Soldiers do what the commander monitors, right?

The key for the Army to successfully finish fielding GCSS–Army to 100,000 more users is for all leaders to demonstrate that GCSS–Army is important. It should be at the top of your list. You will not be expected to be the technical expert, but you need to clearly understand how it works and what information it provides. I know it will be an uphill climb to learn to use the information for the benefit of your unit, but until you do, the Army will not get the most out of the systems.

Start by setting standards, and keep questioning how the information will affect your readiness. You will get many reports from the information systems, but if you wait for the reports you will be too late. Waiting means that you are being reactive, not proactive. You need to get ahead of the data. So set your standards and use the information as validation that your standards are right and that your training is getting your unit ready for expeditionary operations.

Remember, we cannot slack off on improving our craft, doctrine, capabilities, and requirements. Without the fundamentals, the reports will not help you. And do not get overwhelmed by the information.

Employ GCSS–Army Tactically

Being able to operate GCSS–Army plugged into the wall at your desk is a good first step, but that does not make you ready to log in on a battlefield. In theater, you will depend on one of the Army's 4,500 very small aperture terminals (VSATs), which are portable satellites, to get into the system. The VSATs performed well during the wars in Iraq and Afghanistan and gave us the ability to connect to our supply system through the internet. But they will be challenged by GCSS–Army since it consumes more bandwidth.

We have been running tests to prove that VSATs will work, and the results are positive. But if the VSATs are not updated with the latest software, or if not all of the certificates are in order, the system will not perform responsively. You cannot take these things lightly; this is the standard, and you need the discipline to enforce it.

Experts tell me that right now

many of the Army's VSATs are not actively being used, and that tells me we are not doing enough training with GCSS–Army in the field. Take GCSS–Army with you every time you train in a tactical environment, or just set it up in the motor pool.

This issue's hip-pocket guide outlines the best practices for operating GCSS–Army and keeping your VSATs and Combat Service Support Automated Information System Interface updated. I encourage you to read it, share it, and keep it handy.

Ask How They Improve Readiness

Keep asking yourself this question: How do the new information management systems improve my unit's readiness? The advanced capabilities in GCSS–Army provide us with decisive advantages in our logistics management process and supply chain management. You will be able to see your unit's readiness in real time. You will know what parts are available in the supply chain right now and whether vehicles are operationally ready at any given time.

Now every vehicle will have a record that shows its entire history—whether or not it is still under warranty, how many times it has leaked or experienced component failures, and if and when it has been damaged and repaired. That is incredibly valuable information, whether you are a maintainer at a depot or a property book officer laterally transferring a vehicle to your unit.

The possibilities of what we can do with these systems are just starting to emerge. New capabilities will dramatically improve sustainment management. For example, if you are a planner preparing your command to go on the offense, you can better see what commodities and materiel you have. You can estimate what you need based on visibility and usage trends. If you can query the system and find out your vehicle fleet goes through a starter every six days, you will know whether or not you are ordering and stocking enough.

This is enterprise visibility that the Army has never had before. We need to work on our ability to convert all of this new data into a comprehensive, analytically complete picture that drives sustainment decision-making through such integrating systems as the Materiel Common Operating Picture (the interim enterprise Business Information Warehouse functionality).

All of our enterprise resource planning systems will allow users to manage their specific areas of sustainment better than before, as long as leaders have the foresight and sound decision-making to hold people to a high standard. On the pages that follow, you will see many examples of this already happening.

Retired Lt. Gen. Mitchell H. Stevenson, one of the champions of the system, summed it up best in his interview with *Army Sustainment*. "Managing readiness is all about information," he said. "The more accurate and the more timely that information can be provided to decision-makers, the better the Army is going to be at managing readiness."

Lt. Gen. Gustave "Gus" Perna is the Army deputy chief of staff, G-4. He oversees policies and procedures used by 270,000 Army logisticians throughout the world.

Total Force Integration Requires Integrated Training

■ By Maj. Gen. Darrell K. Williams, Brig. Gen. Sylvester Cannon, and Brig. Gen. Hector Lopez

Future successful unified land operations will depend directly on the Army's ability to leverage readiness potential from all components. To maximize these collective capabilities, training integration must significantly improve.

On behalf of the Training and Doctrine Command (TRADOC), the Combined Arms Support Command (CASCOM) has initiated an aggressive Total Force integration effort to enable the training readiness of sustainment units. The Army Total Force Policy, signed in September 2012, directs the Army to organize, man, train, sustain, and equip the Total Force in support of combatant commander requirements.

In a recent address to a group of senior Army National Guard (ARNG) leaders, Chief of Staff of the Army Gen. Mark A. Milley further emphasized the importance of the Total Force Policy.

Milley said, "There is only one Army. We are not 10 divisions; we are 18 divisions. We are not 32 brigades; we are 60 brigades. And we are not 490,000 Soldiers; we are 980,000 Soldiers."

The past 15 years of war in Iraq and Afghanistan have proved the value and effectiveness of integrated active component (AC) and reserve component (RC) sustainment formations. In many instances, most of the forces assigned to echelons-above-brigade sustainment organizations in Iraq and Afghanistan were RC units.

Future sustainment commanders will need to continue to leverage the capabilities of the Total Force to support ongoing combat operations, contingencies, ever-changing global commitments, domestic missions, and disaster response operations. The Army must rely on both AC and RC sustainment capabilities to meet future worldwide combatant commander mission requirements.

Sustainment Integration

More than 73 percent of the Army's echelons-above-brigade sustainment capability resides in the ARNG and Army Reserve (AR). Although the 27 percent of the sustainment force that resides in the AC can provide much of the required early-entry contingency support, the RC capability is critical to sustaining operations over time.

The following percentages of units that are in the RC highlight how much the AC relies on the RC for sustainment:

- Support maintenance companies: 98 percent (72 percent in the ARNG and 26 percent in the AR).
- Petroleum support companies: 89 percent (in the AR).
- Truck companies: 88 percent (55 percent in the ARNG and 33 percent in the AR).
- Combat sustainment support battalions: 81 percent (46 percent in the ARNG and 35 percent in the AR).
- Expeditionary sustainment commands: 71 percent (14 percent in the ARNG and 57 percent in the AR).
- Human resources companies: 65 percent (17 percent in the ARNG and 48 percent in the AR).
- Sustainment brigades: 61 percent (32 percent in the ARNG and 29 percent in the AR).
- Financial management companies: 57 percent (38 percent in the ARNG and 19 percent in the AR).
- Theater sustainment commands: 50 percent (17 percent in the ARNG and 33 percent in the AR).

Future successful unified land operations will depend directly on the Army's ability to leverage readiness potential from all components. To maximize these collective capabilities, training integration must significantly improve.

Recent Total Force Operations

To further illustrate the importance of AC and RC sustainment interdependency, CASCOM recently hosted a reverse collection and analysis team (R-CAAT) event for the AC's 1st Theater Sustainment Command (TSC) and the AR's 4th Expeditionary Sustainment Command (ESC). The units' historic U.S. Central Command deployment was the first time in 15 years of conducting operations in Iraq and Afghanistan in which the ESC and both sustainment brigades under the 1st TSC were exclusively RC organizations.

The Army is rapidly moving toward sourcing sustainment units for specified operations without regard to component. This is a testimony to the operational capability and effectiveness of Total Force integration. However, training integration presently lags behind this coming reality.

The Greatest Challenge

Although the sustainment community provides excellent support across the full range of military operations, AC and RC training integration leaves much to be desired. The recent 1st TSC and 4th ESC R-CAAT identified training as the greatest Total Force integration sustainment challenge.

Top sustainment training challenges include a lack of a standardized and synchronized training event time line, a need for a suitable culminating training event for a deploying sustainment headquarters, unresourced 1st TSC training exercise support requirements, and a rigid AR 12-month traditional, noncontiguous, inactive duty training model.

Sustainment forces also lack a standardized and resourced Total Force sustainment multi-echelon culminating training event. Such an event is needed to build and evaluate the future readiness of TSCs, ESCs, sustainment brigades, combat sustainment support battalions, and other theater-level functional battalions and companies for future deployments. Overcoming this challenge would significantly improve Total Force training and readiness.

Efforts to Improve Training

In coordination with Forces Command, TRADOC, the Army Materiel Command, the Army G-4, the Combined Arms Center, First Army, the Army Reserve Command, and the ARNG, CASCOM spearheaded several Total Force initiatives to improve AC and RC sustainment training.

In December 2015, CASCOM held its first TRADOC Total Force Sustainment Forum. This was followed by another forum in June 2016, and a future forum is planned for the third quarter of fiscal year 2017.

The first forum produced 27 rec-

The Combined Arms Support Command's commander Maj. Gen. Darrell K. Williams and Brig. Gen. Hector Lopez discuss ammunition training with 1st Lt. Jessica Marsh of the 261st Ordnance Company at Fort McCoy, Wisconsin, during a training exercise in August 2016.

ommendations for enhancing future training and readiness. Currently, more than 14 of the original recommendations either have been fulfilled or are in some phase of development.

In addition, CASCOM representatives have visited the ARNG's Sustainment Training Center at Camp Dodge, Iowa, and the AR Training Installation at Fort McCoy, Wisconsin. These RC resources are available to support AC sustainment units. Army leaders must expand their understanding of the training resources and sites that are available.

Future Training Actions

CASCOM is revising the Sustainment Training Strategy and Guide, completing the Sustainment Leader Development Implementation Plan, and developing the Operational Contract Support Training Strategy. Sustainment senior leaders are currently considering the top five training actions for the next TRADOC Total Force Sustainment Forum.

After the recent AR combat support training exercise site visit at Fort McCoy, CASCOM leaders began to determine the feasibility of conducting a pilot Total Force sustainment collective training exercise.

This future pilot exercise would focus on measuring "objective T" proficiency for TSCs, ESCs, sustainment brigades, combat sustainment support battalions, and other theater-level functional battalions and companies. Significant collaboration, coordination, and planning would be required from all key sustainment stakeholders in order to accomplish this pilot.

Existing budget constraints, force structure changes, limited availability of training resources, and reduced predeployment preparation times are forcing Soldiers to look for ways to become better, stronger, and more effective. The best way to mitigate the sustainment impacts of all these challenges is to fully leverage the power and capability that resides within both the AC and RC.

Sustainers must embrace future support solutions that depend on Total Force integration and resolve existing training challenges by maximizing the use of all available training resources. Sustainment leaders need to double their efforts to fully realize the potential power of Total Force integration and to ensure the Total Force has what it needs to build future readiness.

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Writing for *Army Sustainment*

We are always looking for quality articles to share with the Army sustainment community. If you are interested in submitting an article to *Army Sustainment*, please follow these guidelines:

- ☐ Ensure your article is appropriate to the magazine's subjects, which include Army logistics, human resources, and financial management.
- ☐ Ensure that the article's information is technically accurate.
- ☐ Do not assume that those reading your article are Soldiers or that they have background knowledge of your subject; *Army Sustainment*'s readership is broad.
- ☐ Write your article specifically for *Army Sustainment*. If you have submitted your article to other publications, please let us know at the time of submission.
- ☐ Keep your writing simple and straightforward.
- ☐ Attribute all quotes to their correct sources.
- ☐ Identify all acronyms, technical terms, and publications.
- ☐ Review a past issue of the magazine; it will be your best guide as you develop your article.

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Images of the Joint Logistics Enterprise: A Brain

■ By Christopher R. Paparone, Ph.D., and George L. Topic Jr.

We have tried over the last several columns to offer the idea that there is not a single answer to the question, "What is the joint logistics enterprise (JLEnt)?" The JLEnt is perceived best through a number of different, sometimes incommensurate lenses. Thinking about the JLEnt from multiple perspectives not only offers more insightful ways of understanding the JLEnt but also helps to explain its complexity.

No single, definitive authority controls the development of and actions inside of the JLEnt. Like the "invisible hand" that political economist Adam Smith uses to describe how capitalist markets operate, complex logic and probabilistic and opportunistic forces guide enterprise learning. Such learning is a dynamic process that requires logisticians to constantly assess and communicate changes in order to adapt quickly and effectively.

In his book *Images of Organization*, Gareth Morgan discusses the concept of an organization as a "brain," in other words, a learning system. Morgan states that when organizations face complex and uncertain situations, they can use the brain perspective and these four guidelines to gain an advantage.

First, embrace complex and uncertain situations as normal. Second, permit varying points of view among the members of the enterprise in dealing with these situations. Third, recognize that open-ended inquiry enhances the continual creation and testing of knowledge. Lastly, enhance linkages among members to enhance collaboration and understanding.

The defense logistics community is not always inclined toward these kinds of actions. One way we believe that logisticians can help the JLEnt improve its "brainpower" is by regularly contributing to the body of knowledge in our field.

Important and insightful books and articles on military logistics have been written, but new ones have become quite scarce in recent years. In "Logistics Evolution: A Comparison of Military and Commercial Logistics Thought," published in *The International Journal of Logistics Management* in 2012, Stephen M. Rutner, Maria Aviles, and Scott Cox assert that the knowledge discipline has been overtaken by commercial writers in recent years. (See figure 1.)

In a 2013 article published in the *International Journal of Physical Distribution & Logistics Management*, Keenan D. Yoho, Sebastiaan Rietjens, and Peter Tatham report that of 1,150 articles published in the top five logistics journals, only nine were defense related.

Increasingly, the military logistics community is using business-derived logistics science and associated technologies as a source of best practices. Our concern is that business science analogies (borrowed terms, concepts, advanced information technologies, and so forth) only go so far in helping national security logistics, especially as we pay billions for business solutions to meet military logistics requirements.

We see little influence of thought and education involving the nexus between commercial activities and the Department of Defense's concerns about access to strategic raw materials, military industrial base readiness, defense-unique items, and the security of intercontinental lines of communication. As part of the JLEnt's brain, logisticians need to contribute more to the science of logistics.

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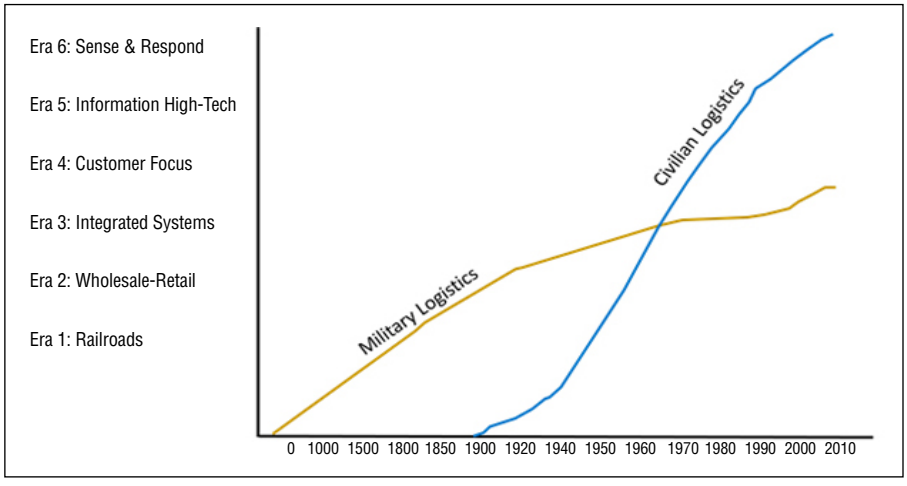

Figure 1. The relative dominance of thought-leading with respect to "eras of logistics." (Adapted from "Logistics Evolution: A Comparison of Military and Commercial Logistics Thought," by Stephen M. Rutner, Maria Aviles, and Scott Cox)

Spc. Christopher Carmona, a small-arms and artillery repairer for G Forward Support Company, 4th Battalion, 9th Infantry Regiment, 1st Stryker Brigade Combat Team, 4th Infantry Division, talks about weapons used in local security for support platoons at Fort Carson, Colorado, on March 24, 2016.

BCT 2020 Logistics: Where the Rubber Meets the Road

■ By Capt. Bridget I. Day

Gone are the days of a robust, fully mission capable forward support company (FSC) that can provide extensive support to a maneuver battalion. The Brigade Combat Team (BCT) 2020 initiative modified the Army's overall strength and structure to meet future requirements and missions, but unfortunately, the modifications included significant reductions to the FSC.

Under the BCT 2020 organizational structure, assets such as an additional maneuver battalion and a brigade engineer battalion were added to the brigade to increase its autonomy and meet future requirements. These changes affected both maneuver units and logistics capabilities within BCTs.

Changes to FSCs and BSBs

The BCT 2020 sustainment structure is intended to provide globally responsive sustainment that is relevant, affordable, and synchronized. But the structural changes affected FSCs by decreasing or completely removing a number of their capabilities, such as troop transportation, distribution, maintenance, and welding.

The brigade support battalion (BSB) also experienced an overall reduction in its capability set, while the sustainment brigade and echelons-above-brigade (EAB) units saw an

increase in their capabilities. Many of the FSC's capabilities were passed back to the BSB and the sustainment brigade. In the new support structure, the FSC depends on reachback support to meet the supported unit's requirements.

In an FSC, which is the heart of tactical logistics and where the rubber meets the road, the BCT 2020 sustainment structure has missed its mark. For the past 10 years, logisticians at the tactical level have taken great pride in being self-sufficient, and they had the necessary capabilities at their disposal. BCT 2020 has changed this paradigm and has forced FSCs to rely heavily on BSBs and EAB units to support their missions.

However, as Peter Drucker famously said, "Culture eats strategy for breakfast." The "we can do it all" culture at the FSC level and the precedent of allowing the FSC to be self-sufficient at the BSB and sustainment brigade levels have made the implementation of BCT 2020 nearly impossible.

The BCT 2020 modified table of organization and equipment (MTOE) should be changed to be based on the tactical application and existing culture of FSCs. The BCT 2020 concept of support, which increases the number of personnel at EAB units and reduces it in the FSC, hinders maneuver units. BCT 2020 is neither effective nor efficient.

Juliet Company

The 1st Brigade, 82nd Airborne Division, was one of the first brigades to transition to this new structure. The brigade's Juliet Company, 2nd Battalion, 501st Infantry Regiment, is an FSC that was restructured under the BCT 2020 model.

Juliet Company supported two Joint Readiness Training Center (JRTC) rotations, multiple joint forcible-entry exercises, and platoon, company, and battalion live-fire exercises. It also supported an outload support battalion for the global response force and a U.S. European Command exercise.

The recent training exercises that Juliet Company supported demonstrate that the rationale behind the concept of support of BCT 2020 can be disputed and is arguably more detrimental than successful. Ideally, the FSC MTOE should be adjusted to meet transportation, fuel, water, security, maintenance, and communication requirements in both garrison and tactical environments.

Distribution Platoon Problems

The MTOE changes that were implemented because of BCT 2020 caused personnel problems in the FSC. The number of personnel in an FSC's distribution platoon was cut to one-third of its original strength. In the BCT 2020 MTOE, the class III (petroleum, oils, and lubricants), general supply, class V (ammunition), and truck squads no longer exist. What is left is essentially two squads consisting of a total of 14 personnel of various military occupational specialties (MOSs).

The 2nd Battalion, 501st Infantry Regiment, training missions required a great deal of sustainment support. For instance, to train for the requirements that it was tasked to execute, the battalion used a brigade's worth of ammunition in just eight months.

In all, Juliet Company supported more than 100 ammunition draws and turn-ins with only one ammunition specialist, over 200 transportation missions with only eight motor transport operators, and more than 50 fuel and water missions with only four petroleum supply specialists and no water purification specialists.

Although the support missions were accomplished, the lack of personnel did not enable proper rest cycles or the ability to multitask and support multiple missions at once.

A risk reduction gained from not having as many transportation assets on the road was one of the purported benefits of the BCT 2020 structure. However, the FSC conducted the same number of transportation missions as before but with far fewer personnel and while experiencing rest cycles that were inadequate for 24-hour operations.

The 2nd Battalion and Juliet Company made several modifications to support the significant logistics requirements. The battalion's leaders understood that forward support personnel should be the last to be tasked with non-MOS-specific duties, such as traffic control point guarding, so they instead gave these duties to infantrymen (MOS 11B).

A second modification that the battalion made was assigning infantry Soldiers to augment the distribution platoon. The FSC had as many as seven 11Bs at a time augmenting the platoon. At first this seemed like a great solution to the personnel shortage, but it ended up creating a different set of issues.

The biggest issue was that the 11B personnel did not join the Army to be truck drivers. Many of the 11Bs in the FSC formation loved being infantrymen and did not wish to be in an FSC. These personnel were forced to do a job they did not sign up for, and the FSC leaders had the added challenge of motivating them to fill support positions and watch their peers from the sidelines.

BCT 2020 forces units to modify the structures set by their MTOEs in order to accomplish their missions. FSC distribution platoons will inadvertently change themselves back into support and transportation platoons if they are not given adequate support and capabilities on their MTOEs.

Tactical-level requirements will not decrease, and may even increase, in the near future; therefore, the capabilities of the direct-support unit should remain constant or even increase to ensure the greatest success.

Maintenance Platoon Problems

The pre-BCT 2020 FSC maintenance platoon MTOE had 43 paratroopers and today it has 34, which may not seem like a big difference, but it is noncommissioned officers

(NCOs) that the new MTOE lacks.

The 2nd Battalion, 501st Infantry Regiment, like many other units across the Army, struggles with not-mission-capable equipment and having multiple, complex maintenance deadlines. Even an experienced mechanic sometimes takes days to conduct an accurate and thorough inspection, and the maintenance team is often stretched thin with the two tasks of identifying faults and installing parts received.

Without the proper NCO leadership, it is difficult to plan a sensible preventive maintenance schedule and keep up with unscheduled services. The majority of mechanics are simply too inexperienced to conduct some of the complex repairs that the battalion's equipment requires. These types of repairs often need two or three mechanics and the supervision of an NCO.

The 2nd Battalion, like many units that have transformed to BCT 2020, kept many of its unauthorized vehicles. The units are either in the long, laborious process of turning in their unauthorized vehicles or they are holding on to the vehicles to better sustain themselves.

Having more vehicles than what is authorized on the MTOE creates a huge gap in maintenance capabilities versus requirements. The BCT 2020 maintenance platoon MTOE will be successful only if units strictly adhere to their authorizations, even if the additional equipment is needed to support the unit's mission.

Pvt. Brian Jackson, a system maintainer with E Forward Support Company, 16th Engineer Battalion, 1st Stryker Brigade Combat Team, 1st Armored Division, guards the perimeter of his base at the Joint Readiness Training Center at Fort Polk, Louisiana, on Jan. 21, 2016.

Headquarters Problems

Before BCT 2020, an FSC's headquarters was authorized an E-6 supply sergeant as well as an E-4 supply clerk. It was also authorized an E-4 chemical, biological, radiological, and nuclear (CBRN) specialist.

With the BCT 2020 MTOE, the FSC is now authorized an E-5 supply sergeant and an E-4 supply clerk, despite having the largest and most complex property book in the battalion.

The FSC is not authorized a CBRN specialist or a communications specialist. This forces the FSC to pull personnel from other sections to operate its training room, learn communications equipment, and oversee the CBRN equipment.

Equipment Problems

Under the BCT 2020 MTOE, an infantry battalion FSC suffers from several equipment reductions.

Transportation. FSC troop transportation assets are drastically decreased, leaving only nine family of medium tactical vehicle (FMTV) trucks. The original 35 FMTVs should be maintained on the MTOE in order to support troop transportation and other distribution missions simultaneously.

Class I (subsistence). Neither the pre- nor post-BCT 2020 MTOEs have authorizations for a 2,000-gallon load handling system compatible water tank rack (hippo), but both have authorizations for three 400-gallon water trailers (buffaloes). The FSC should be authorized two hippos to allow the FSC flexibility in its support of combat trains.

Class III. The FSC fuel truck authorization decreased from two to zero; however, the FSC is still authorized four petroleum supply specialists. The authorization should be increased to two fuel trucks, which again will allow the FSC flexibility in supporting combat trains.

Welding. The FSC lost its welding capability; however, this did not significantly decrease the FSC's ability to accomplish the mission.

Vehicle recovery and combat maintenance. On the new MTOE, the wrecker authorization remained the same, while the recovery vehicle operator authorization changed from six personnel to three.

The problem with the wrecker authorization is that the FSC is authorized one heavy expanded-mobility tactical truck (HEMTT) wrecker and two FMTV wreckers. The HEMTT wrecker has a 24,000-pound crane capacity and a 60,000-pound recovery winch capacity, while an FMTV wrecker has only an 11,000-pound crane capacity and a 30,000-pound recovery winch capacity.

This means that the FMTV wreckers do not have the ability to recover a load handling system, a HEMTT, or any vehicle weighing more than 36,678 pounds. The FSC authorization should be changed to three HEMTT wreckers to give the wrecker teams the freedom to support multiple recovery missions and not be limited by the type of vehicle that needs to be recovered.

Other Recommendations

The FSC's lack of necessary personnel and equipment hinders its capabilities in the garrison environment and during unified land operations.

During the two JRTC rotations and the multiple joint forcible-entry exercises that Juliet Company supported, it had to use the field trains command post and unit maintenance collection points to support as far forward as possible. Juliet Company did not support the battalion from the brigade support area and was sometimes a two-hour convoy away from it.

Based on these experiences, it would be beneficial and arguably crucial that FSCs have the capability to support their battalions with three days of supply for classes I, III, and V, as opposed to the one day of supply that BCT 2020 supports. The FSC needs the flexibility to support its battalion using the combat trains model and to deploy multiple combat maintenance teams, employ tactical convoy operations, and use logistics release points while maintaining a command post.

During unified land operations, FSC leaders play a vital tactical role. They need to understand the tactical plan, integrate themselves tactically, and provide the best logistics support.

To do so, communication is vital. An FSC should be authorized the same communication equipment as the maneuver companies they support. Eight AN/PRC-148 multiband inter/intra team radios should be authorized on the MTOE to support flexible communication.

The greatest disservice done to FSCs is the lack of security vehicle authorizations. FSCs are authorized the heavy machine guns to arm gun trucks but have never been authorized the trucks. FSCs must conduct countless tactical convoy operations during unified land operations but must do so unsecured or with the assistance of an antitank company, which strains the battalion.

Adding security elements to FSCs would allow the maneuver battalion commander the freedom to employ an antitank company without having to work around the added duty of escorting resupply missions. It also would add one more security element to the battalion to assist with battalion security or casualty evacuation missions.

This article outlines how BCT 2020 affects a light airborne infantry FSC, but these challenges are not unique to Juliet Company or other infantry FSCs; the BCT 2020 MTOE has had or will have the same effects on heavy and Stryker BCT units.

In an Army that is moving toward Force 2025 and Beyond and focusing on unified land operations, we must empower our support units with the capabilities that ensure mission success.

Logisticians owe supported units timely and accurate support; units cannot afford to wait for an approval process to get the support that they need to accomplish their missions.

Success in a combat arms battalion relies heavily on trust between the maneuver and support units. The supported unit must trust that the FSC will be there with their ammunition, water, food, and fuel. They must trust that their FSC will do whatever it takes to be in the right place at the right time with their support.

The FSC has its finger on the pulse of the maneuver unit's priorities and mission. Considering the principles of logistics (responsiveness, simplicity, flexibility, economy, attainability, sustainability, and survivability), the FSC BCT 2020 MTOE satisfies only the principle of economy. As sustainment moves into a future of expeditionary logistics and unified land operations, the best solution is to place our resources and capabilities as far forward as possible.

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A Soldier presents property to Wayne Willis (center), from DLA Disposition Services, while Peter Bechtel (right), from the Army's Office of Supply Policy and Programs, observes the process on Aug. 2, 2016, at Fort Hood, Texas. Army officials are depending on the Defense Logistics Agency's disposal and distribution experts to help remove more than 1.2 million pieces of excess equipment from unit inventories over the next two to three years. (Photo by Joe Arnold)

Changing Times and Methods at the Defense Logistics Agency

■ By Col. Michael J. Arnold

The Defense Logistics Agency (DLA) has to thoroughly understand the requirements of its customers wherever they are in the world. It must understand what the 80,000 Soldiers who make up U.S. Army Pacific need and how those needs differ from those of Soldiers who serve under U.S. Army Central.

DLA's Army national account manager team works to deliver the right solution on time, every time. The team acts as an interface for the Army between DLA and private industries.

The Army national account manager team is the Army's jack of all trades. It must understand just enough about every piece of the DLA enterprise so that when the Army asks a question—whether it is about the availability of operational camouflage pattern uniforms or spare parts for an Abrams tank—it can find the answer. The team connects the Army with the right subject matter experts who can leverage DLA capabilities and provide what it needs.

Responding to Change

The Department of Defense and the Army are in a time of massive change. Funding is decreasing, and the armed services have to stretch every dollar.

Manpower is also decreasing, and units are casing their colors. At the same time, the Army has to maintain its readiness to fight and win the nation's wars, conduct contingency operations, and support humanitarian assistance and disaster relief operations at home and abroad.

The Army counts on DLA to enhance its ability to complete those missions. That means DLA must look at things differently and offer support beyond what is typical. That also means that the Army national account manager team must ensure that DLA is tracking the right metrics to support the Army fleet's operational readiness, finding new ways to support the Army's weapon systems, and helping the Army shed a massive amount of excess equipment.

Critical Weapon Systems

The DLA director has made it clear that DLA must do its best to give its customers what they need. It has to look at how it does things, whether it has been that way since 1962 or since last week, and determine if those processes are the best way. DLA attempts to have available at least 90 percent of all the spare parts that the Army needs. This is called 90-percent materiel availability. While striving to meet this goal might be a good way to examine every widget in the supply chain, does it answer the Army's needs?

The Army G-4 says that what the Army needs is operational readiness for its key weapons systems, such as Apache helicopters, Abrams tanks, and Stryker vehicles. Maybe 90 percent is not the right materiel availability goal for these critical fleets. That number generally works in the industrial environment and at locations in the continental United States, but warfighters in deployed and training environments have different needs. When a tank needs tread, it needs it 100 percent.

The Army national account manager team is working with the Army to identify the key weapon systems that should be closer to the 100-percent materiel availability mark and the systems that do not necessarily require 90-percent materiel availability. There will have to be tradeoffs to support the Army's higher priority fleets, and DLA must know what the Army wants those tradeoffs to be.

It is also necessary to be fiscally responsible because DLA still needs to provide spare parts for the lower priority fleets. One way DLA can ensure higher readiness and stay fiscally responsible during this effort is to clarify which national item identification numbers associated with key weapon systems are not accurately cataloged.

The DLA director has made it clear that DLA must do its best to give its customers what they need.

Performance-Based Logistics

Another way the Army national account manager team is helping the Army maintain its operational readiness is by seeking performance-based logistics (PBL) agreements between the Army and industry. PBL is a key part of the Department of Defense's Better Buying Power initiative. Through PBL contracts, DLA is transitioning from its traditional role of managing supplies and suppliers to providing performance outcomes for the weapon systems that the contracts support.

DLA already has several contract arrangements that contain PBL-like features to support a wide range of weapon system components, from tires to depot-level consumables. This represents a big change in the way DLA does business.

Which is more important to a commander: knowing that DLA has Bradley parts readily available or knowing that those Bradleys are ready to go any time they are needed? DLA and the Army can be valuable partners as they learn where this paradigm shift will take them.

All-Army Divestiture

Another way the team is supporting the Army during a time of rapid change is by assisting with the All-Army Divestiture. As troop levels decrease and excess equipment is identified, the Army has asked DLA to help it shed literally tons of excess equipment.

DLA Disposition Services and DLA Distribution are helping Army installations reallocate needed equipment and divest themselves of the things they do not need, such as computers, printers, canvas items, communications equipment, and rolling stock.

DLA has had deployable teams on the ground ensuring that Soldiers are able to turn in equipment to be properly transferred, disposed of, stored, or sold off by DLA Disposition Services. Commanders no longer have to go out and look for help; DLA is coming to them. This is a massive, ongoing effort that is taking place at multiple installations at a time.

These are just a few ways that DLA and its Army national account manager team are looking to support the nation's oldest military service as it moves into the future. The team is engaged with Army leaders at multiple levels and listening to what they need from DLA to manage assets and ensure the Army can shoot, move, and communicate whenever the nation calls.

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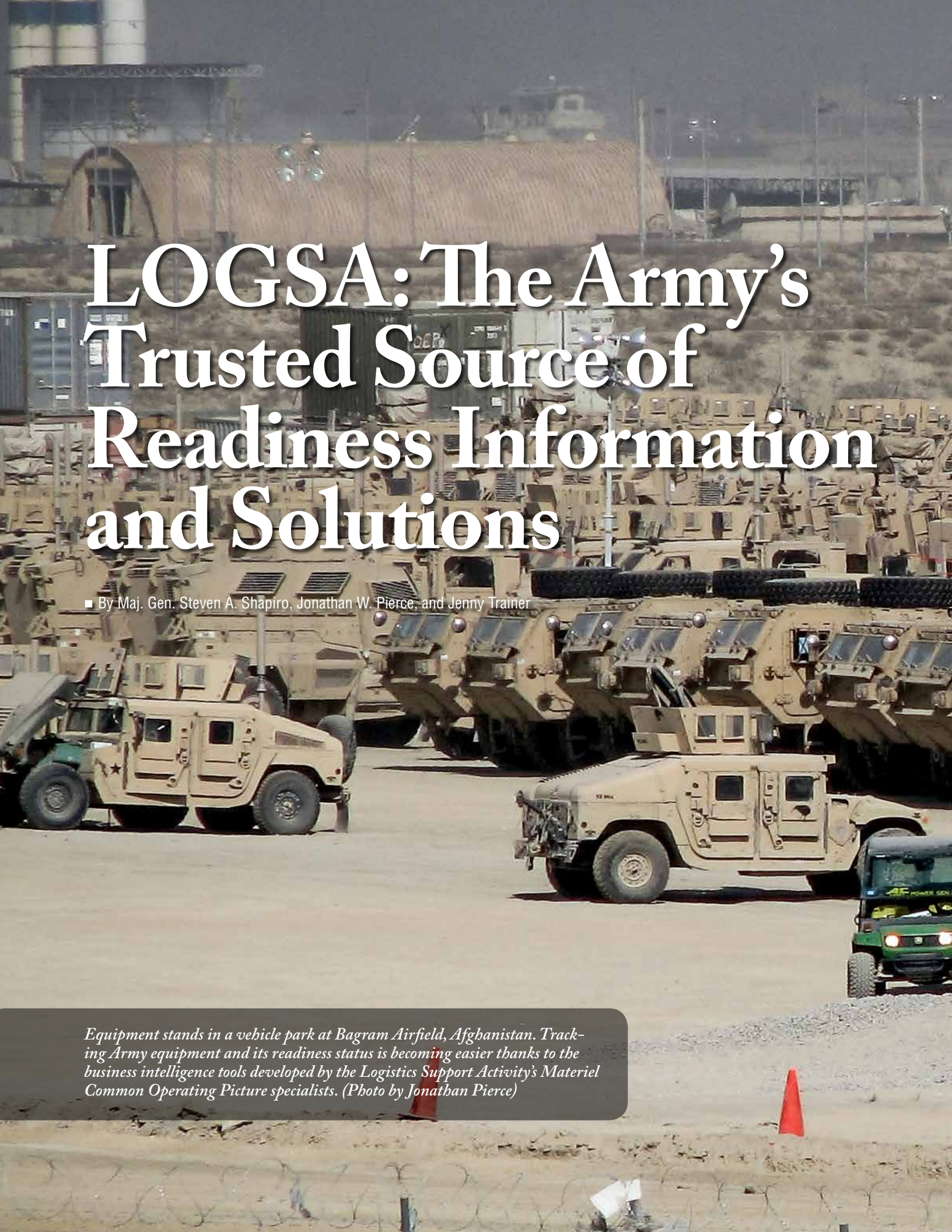
LOGSA: The Army's Trusted Source of Readiness Information and Solutions

■ By Maj. Gen. Steven A. Shapiro, Jonathan W. Pierce, and Jenny Trainer



Equipment stands in a vehicle park at Bagram Airfield, Afghanistan. Tracking Army equipment and its readiness status is becoming easier thanks to the business intelligence tools developed by the Logistics Support Activity's Materiel Common Operating Picture specialists. (Photo by Jonathan Pierce)

After years of combat operations and decades of using standard Army information management systems to sustain readiness, the Army has taken the initiative to leverage enterprise resource planning (ERP) systems and technology to improve and condense sustainment operations and processes. The Army is fielding ERP systems that modernize automated logistics at both the national and field levels.

At the national level, the Logistics Modernization Program (LMP) is being used by all the Army Materiel Command (AMC) life cycle management commands and their supporting depots and arsenals. At the field level, the Army is in the process of fielding the Global Combat Support System–Army (GCSS–Army) to its tactical formations.

LMP and GCSS–Army will improve supply and maintenance business processes with the intent of making the logistics tail more efficient and effective from the factory to the foxhole. The ultimate goal of this effort is to improve sustainment and reduce the cost of supporting readiness.

Data Management at LOGSA

This ERP effort includes the creation of new business intelligence tools to synthesize the data that the Army stores, making it more useful to senior Army leaders and com-

The Army Materiel Command's Logistics Support Agency turns data into information that leaders can use to make decisions at all levels.

manders. This is the business of "big data," which are data sets that are too complex for traditional data processing applications. Turning this big data into information that leaders can use to make the right decisions at the tactical, operational, and strategic levels is the role of AMC's Logistics Support Activity (LOGSA).

Some Soldiers think of LOGSA as the home of the Logistics Information Warehouse (LIW), where more than 65,000 users get asset visibility, equipment readiness information, and technical manuals. LOGSA's value goes well beyond the data in LIW. At its core, LOGSA's true value lies not with the data but with the Soldier and civilian experts who work on supply, maintenance, and transportation business processes.

At LOGSA, data is treated as a precious commodity that is just as important as any weapon system. Thanks to the multibillion-dollar acquisition effort that the Army has undertaken to field LMP and GCSS–Army, the resulting information, which is portrayed through a business intelligence capability, helps the Army see its readiness posture in ways that were never before possible.

These business intelligence tools enable commanders at all levels to make the proper decisions to improve Army readiness. Improving readiness adds to the combat power of the Army.

LMI DST

In 2011, LOGSA developed the Lead Materiel Integrator Decision Support Tool (LMI DST) to enable commanders to more effectively and efficiently maintain and increase equipment-on-hand percentages.

LMI DST is an unclassified, web-based materiel management tool that uses LIW data to enable stakeholder collaboration on the distribution and redistribution of Army materiel. With this tool, leaders can identify shortages and surpluses of property across all commands. DST streamlines property disposition among units.

LMI DST's predictive features help leaders to visualize equipment demand and supply sources. This enables leaders to make the best use of equipment by analyzing the second- and third-order effects of the decision plans.

The tool considers factors such as location and transportation costs that would result from a pending decision. When equipment movement is directed, DST allows automatic tracking of lateral transfers and turn-ins. Finally, with a feature called Blue Sky Planning, DST provides the capability to create and modify force structure and authorizations in order to run what-if scenarios and analyze the effects.

M-COP

LOGSA is delivering tools that will enable Army leaders to make more influential decisions to support readiness. These tools affect equipment readiness because leaders at all levels gain visibility of equipment and performance in ways never before possible. The most recently introduced is the Materiel Common Operating Picture (M-COP).

Through M-COP, LOGSA provides and maintains dashboards for an array of logistics activities, to include maintenance and supply statuses, asset statuses, and logistics services.

M-COP can provide decision support from an organizational perspective (build, sustain, reorganize, and reduce), from an operational perspective (sustain, deploy, shape operations, and retrograde), and from a life-cycle management perspective (field, sustain, modernize, and divest). Actionable logistics information helps users at the tactical, operational, and strategic levels.

M-COP provides timely data to support critical decisions and integrates data from the Army's ERP systems, such as LMP, GCSS–Army, and the Army Enterprise Systems Integration Program, with data from ERP-enabling systems because not all logistics business

processes are scheduled to migrate to the ERP systems.

LOGSA's M-COP serves as a functional integrator to provide a holistic picture across the enterprise. M-COP dashboards offer descriptive and diagnostic capabilities and inform leaders of current equipment statuses. Future enhancements to the system will offer predictive and prescriptive information that will forecast readiness issues and offer leaders solutions to improve readiness.

Readiness Enablers

Through the use of readiness enablers, LOGSA has achieved great success in supporting the Army's readiness posture. Readiness enablers provide unique capabilities that ERP systems, the Army, and joint forces cannot. These enablers are the Army Oil Analysis Program (AOAP); the Army Airlift Clearance Authority (AACA); *PS, The Preventive Maintenance Monthly* magazine and technical manuals; the Packaging, Storage, and Containerization Center (PSCC); the Expert Authorized Stockage List (ASL) Team; and acquisition logistics tools.

AOAP. The AOAP supports unit maintenance readiness. It is part of an effort across the Department of Defense (DOD) to determine impending component failures and lubricant conditions through periodic laboratory evaluation of used oil samples. Currently LOGSA's AOAP labs process more than 300,000 samples annually.

AACA. The AACA validates all Army-sponsored air eligible cargo, helping to ensure prudent use of second destination transportation funds. AACA determines modal requirements based on cost, weight, national stock number, class of supply, and other transportation characteristics as defined in the Defense Transportation Regulation. As of August 2016, the AACA provided a cost avoidance of $83.7 million for the Army second destination transportation funding.

PS *and technical manuals*. *PS* is a Department of the Army technical bulletin that provides information for equipment operators, unit maintainers, and supply personnel. It is a commander's tool for enhancing the combat and materiel readiness of equipment.

LOGSA also manages and maintains Electronic Technical Manuals Online, the Army's official electronic technical manual repository. More than 12,500 electronic technical manual files are updated periodically and maintained in the repository.

PSCC. The PSCC provides worldwide logistics and engineering assistance for packaging, storage, hazardous materials, automatic identification technology, distribution facilities modernization, standardization, and packaging applications testing. PSCC provides its services to AMC, other Army commands, DOD components, and other federal agencies.

Expert ASL Team. The Expert ASL Team is the sole source of retail-level stockage determination products. It provides responsive, specifically tailored or ad hoc ASL recommendations, professional assistance and site visits, web-based information repositories, and other products for improving demand- or consumption-supported supply performance.

Acquisition logistics tools. LOGSA supports the acquisition domain by developing and maintaining Product Support Analysis standards, guidance handbooks, and tools that ensure the DOD acquisition community implements consistent processes during development.

LOGSA has led the way in managing big data and providing actionable information management through the development of business intelligence and decision support capabilities. LOGSA uses institutional knowledge to deliver readiness enablers that fill ERP gaps.

Army service component commands, Army commands, the Program Executive Office for Enterprise Information Systems, and the Office of the Assistant Secretary of the Army for Acquisition, Logistics, and Technology have entrusted LOGSA to deliver readiness solutions.

Through the use of readiness enablers, LOGSA has achieved great success in supporting the Army's readiness posture.

As the Army's trusted source of logistics readiness solutions for tactical, operational, and strategic customers, LOGSA will ensure that logistics commanders and Soldiers have the tools and readiness enablers to sustain warfighters today and well into the future.

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Leveraging Enterprise Data Systems to Estimate Sustainment Requirements in Europe

■ By Maj. Gen. Duane A. Gamble and Capt. James A. Broadie

An M1A2 Abrams is loaded onto a railcar at the port of Constanta in Romania on July 1 headed for Exercise Saber Guardian 2016 in Cincu, Romania. The multinational military exercise involves military personnel from Armenia, Azerbaijan, Bulgaria, Canada, Georgia, Moldova, Poland, Romania, Ukraine, and the United States. (Photo by Sgt. Cory Grogan)

U.S. Army Europe (USAREUR) Soldiers and leaders live and operate in an increasingly dynamic and volatile theater where operating tempo and troop concentration matter. Across the European Command (EUCOM) area of responsibility (AOR), the 21st Theater Sustainment Command (TSC) leverages a wide array of enterprise data systems to anticipate requirements and enable its core missions of theater opening, theater distribution, and sustaining the EUCOM AOR.

Enterprise data systems enable the 21st TSC to increase distribution velocity and anticipatory sustainment. This article details examples that demonstrate how the 21st TSC is leveraging enterprise data systems for transportation, onward movement, repair parts forecasting, and munitions management.

Transportation

Freedom of movement is crucial to speed of assembly and speed of response. Transportation routes, control factors, host-nation support, and specialized handling requirements must be coordinated to maximize the velocity of the force projection process, from the initial planning efforts to force closure.

The most critical transportation enterprise system in the coordination of intertheater movement of personnel and equipment is the Joint Operation Planning and Execution System (JOPES), which is used across all military components. Planners use JOPES to develop time-phased force deployment data that provide combatant commanders with critical movement information for deploying and allocated forces.

For example, knowing when each element of an armored brigade combat team or other units operating as part of the rotational regionally aligned forces (RAF) will be arriving at a seaport of debarkation allows the 21st TSC to anticipate the heavy lift requirements associated with moving tanks to destinations across Europe.

Onward Movement

Synchronizing the arrival of rail assets at the port and materials handling equipment at the unit's planned destination allows for effective and efficient onward movement. JOPES enables the theater to anticipate the lift assets required to support onward movement and maintain the overall velocity of the force while conserving resources and minimizing cost.

Movement data provided by JOPES is applied to more than just major end item movements in the AOR. Units designated to deploy to Eu-

The 21st Theater Sustainment Command is using enterprise data systems to make sure the European theater and its regionally aligned forces have what they need when they need it.

rope and to draw pre-positioned equipment in support of various operations will build passenger and "to accompany troops lines" of time-phased force deployment data.

Having this information allows the 21st TSC to anticipate onward movement and life support requirements for arriving forces. When JOPES is leveraged effectively, it ensures a predictable flow of forces that helps sustainers anticipate reception requirements in order to maintain the velocity of the pipeline in support of rapid unit deployments.

JOPES is a powerful combat logistics multiplier for transporters and sustainers but has limits in the EUCOM AOR because it is a system designed only for U.S. forces. All NATO movement operations in the AOR use a suite of applications that fall under the Logistics Functional Area Services (LOGFAS) software suite.

During Trident Juncture 2015, other NATO nations successfully used LOGFAS to conduct unit flow analysis and movement asset allocation. As JOPES and LOGFAS are not interoperable, improving the system so that data can be transferred from JOPES into LOGFAS would help to bridge the information gap and potentially add efficiencies to EUCOM's transportation processes.

Repair Parts Forecasting

The 21st TSC is also using an enterprise data system to anticipate repair-parts requirements in support of continental United States-based rotational units. By doing this, it is ensuring that units are able to maintain high operational readiness rates from the start of their deployment.

Rotational units participate in rigorous predeployment training to include combat training center rotations. During this training, a rotational unit consumes parts from its shop stocks list and authorized stockage list (ASL) and normally has shortages when it ships its stocks' containers to Europe. Using Global Combat Support System–Army (GCSS–Army), the 21st TSC analyzes unit shortages, leverages existing theater stocks, and readies replenishment items for when units arrive in theater.

Even though GCSS–Army has no capability to laterally search for parts between supply support activities (SSAs), enterprise data systems enable us to overcome this shortfall. One method that the 21st TSC uses is the automated process within the Logistics Modernization Program, the Army Materiel Command's pri-

Sgt. Arthur Horton, 51st Transportation Company, and Spc. Fredrita Banks, 240th Quartermaster Support Company, refuel tanks at the Cincu Training Area, Romania, railhead to prepare for exercise Saber Guardian 2016. (Photo by Sgt Jairo Cruz)

mary logistics enterprise system. For high-priority requisitions, the 21st TSC has created a search that looks across the AOR and passes requests to SSAs in the theater, rather than passing them stateside. This saves time and money.

Additionally, the 21st TSC uses a manual process to redirect stocks from one SSA to another by identifying parts on hand and directing shipments to SSAs with high-priority requirements. The 21st TSC uses the same process to redistribute excess among SSAs in order to reduce zero balances (inventory lines that are out of stock) and decrease requisition wait times.

GCSS–Army incorporates all elements of materiel readiness: supply, maintenance, and equipment. This integration gives the 21st TSC the ability to track customer wait times and to identify any systemic problems in the supply chain. With all of these elements in one system, the 21st TSC is able to easily analyze ASL requirements based on the modified table of organization and equipment authorizations or equipment on hand and determine trends.

For example, rather than researching the overall ASL performance, 21st TSC sustainers can analyze the performance of individual items. Using these combined functions empowers sustainers to anticipate requirements and prevent supply chain disruptions.

Munitions Management

Ammunition management in Europe is accomplished using the Standard Army Ammunition System–Modernization (SAAS–MOD), the National Level Ammunition Capability, and the Total Ammunition Management Information System (TAMIS). Employing these systems, the 21st TSC forecasts requirements, accesses decision support tools, monitors expenditures, and analyzes transaction history to create accurate sustainment estimates.

Most of our recurring USAREUR missions are training events distributed across the Atlantic Resolve AOR. Ongoing Atlantic Resolve rotations keep our munitions processes continually engaged at the tactical and operational levels. The 21st TSC uses SAAS–MOD and TAMIS to validate and view projected requirements and direct the movements of stocks from one ammunition supply activity (ASA) to another.

Given the distance that RAF units operate across, their limited transportation assets, and the projected increase in ammunition required for training, the 21st TSC is developing a forward ASA concept that will allow it to push anticipated ammunition requirements through to the ASA. This concept provides direct support to the RAF, minimizes retrograde after each rotation, and potentially eases transportation requirements over time.

The remainder of the Army's European operations are strategically and operationally focused to ensure that the United States is postured to reassure its allies and deter aggression. The 21st TSC continually assesses and modifies its sustainment stockage objectives to ensure it has the right types and quantities of munitions on hand to supply the ever changing composition and mix of units operating in the theater.

In close coordination with Headquarters Department of the Army and USAREUR, the 21st TSC determines requirements using SAAS–MOD in conjunction with the National Level Ammunition Capability to requisition and, when directed, retrograde stocks.

In this complex and dynamic European security environment, where NATO is faced with increased security threats from a multitude of sources, the ability to strengthen the alliance by improving NATO's sustainment capabilities is indicative of the benefits of the U.S. presence in Europe. The 21st TSC, working in unison with many other sustainment organizations and agencies throughout the theater, harnesses sustainment enterprise capabilities in order to overcome these threats.

By leveraging enterprise data systems, including JOPES, GCSS–Army, SAAS–MOD, and TAMIS, the 21st TSC has successfully increased warfighter readiness, improved the speed of supply delivery, and enabled anticipatory sustainment in support of units based in and deploying to the European AOR.

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Capt. James A. Broadie is the S-3 for the 21st Theater Sustainment Command Special Troops Battalion in Kaiserslautern, Germany. He has a bachelor's degree in computer information systems from Park University. He is a graduate of the Quartermaster Officer Basic and Advanced Courses.

Brig. Gen. R.A. Bassford, deputy commanding general of the 88th Regional Support Command (RSC), speaks with Eric Tissue, supervisor of the 88th RSC Area Maintenance Support Activity Shop 165, during a site visit to Monclova, Ohio, on Jan. 29, 2016. The 88th RSC operates 47 maintenance shops across 19 states, providing support to more than 600 Army Reserve units and performing maintenance for over 50,000 pieces of equipment. (Photo by Sgt. 1st Class Corey Beal)

Operational Logistics Planner for a Leaner, More Capable Expeditionary Army

By John Reith, Jennifer Van Drew, and Teresa Hines

Logistics planning is an art as well as a science. Logisticians from the tactical through theatre levels require access to planning factors and data so that they can develop sustainment plans and calculate estimates. The complexity of national planning tools runs the gamut from paper, pencils, and printed reference guides to highly complex, automated computer tools. Automated tools free sustainment planners from using calculators and managing large, unwieldy spreadsheets and allow more time for analysis.

The Army's potential future operational environments include a broad spectrum of operations, from decisive action to homeland defense to disaster relief and humanitarian assistance. How will the Army plan logistics for the Army of 2025, which will be leaner, expeditionary, more agile, and capable of executing a broad range of missions? Can logistics planning evolve to keep pace as the Army accelerates changes to organizational designs and technology and adapts to the new Army Operating Concept?

The Planning Data Branch

The Combined Arms Support Command's (CASCOM's) Planning Data Branch (PDB) has an answer for how logistics planning can keep pace with the Army's organizational and technological updates. The PDB has the mission to develop Army logistics planning factors and data in accordance with Army Regulation 700-8, Logistics Planning Factors and Data Management. These factors are disseminated to the Army and the joint community for planning use.

The PDB has developed specific protocols for collecting and an-

FEATURES

The Combined Arms Support Command Planning Data Branch disseminates logistics planning information to the field through the simple-to-use, standalone program, Operational Logistics (OPLOG) Planner.

alyzing data submitted by various proponents and disseminating that information to users. Also, the PDB develops current planning factors for every class of supply and is constantly looking to the future to be ready for changes.

A critical use of the PDB's data is to estimate required workloads and determine the quantity and mix of supply, transportation, and maintenance units necessary to sustain major ground campaigns. As a part of the Total Army Analysis process, these results provide information for the program objective memorandum, a key part of the Army's budget process.

For the joint community, the PDB's data is used in the logistics factors file, which feeds the Joint Operation Planning and Execution System. This data is used to monitor, plan, and execute mobilization, deployment, employment, and sustainment activities associated with joint operations.

OPLOG Planner

The major avenue that the PDB uses to disseminate the logistics planning factors and rates to the field is the Operational Logistics (OPLOG) Planner. OPLOG Planner is a simple-to-use, annually updated, standalone program that helps units estimate how many supply and transportation assets are needed to perform a mission. The program asks the user questions and, based on the answers provided, produces estimates for the logistics needed to meet mission goals.

For each class of supply, the user can determine the total weight and number of pallets required for a mission. OPLOG Planner incorporates all standard requirements codes (SRCs) and allows the user to customize the quantity and type of equipment needed.

OPLOG Planner also allows the user to build a modified table of organization and equipment (MTOE) and provides custom estimates for consumption. All reports can be easily exported in multiple formats for use in staff planning.

Background of OPLOG Planner

The information within OPLOG Planner started with data from Field Manual (FM) 101-10-1/1 and 101-10-1/2, Staff Officers' Field Manual: Organizational, Technical, and Logistical Data (Volumes 1 and 2), published in 1987. However, in 1994 the Army G-4's director of plans and operations signed a memorandum identifying the FMs as obsolete, making the planning data in them no longer approved for use.

A series of attempts to produce an automated replacement for the FMs continued through 2002. It was then that an operations research analyst in the PDB designed a Microsoft Access database with a Visual Basic for Applications user interface, resulting in the first Microsoft Windows-based version of OPLOG Planner.

By 2008, it became apparent that the capabilities of the database would soon be exhausted, so the PDB sought the assistance of the Communications-Electronics Command Software Engineering Center (SEC). With the programming support from the SEC, OPLOG Planner became a simple-to-use, fully-automated, executable, standalone program.

Factors and Data Sources

OPLOG Planner uses planning factors and methodologies that are approved by the Army G-4 and collected, developed, disseminated, and archived by the PDB. The raw data used to develop the logistics planning data and factors starts with a data call to the specific class of supply's data proponents. The raw data comes from a variety of sources—mostly from standard Army management information systems—that describe supply transactions during current operations.

For example, the PDB receives the name, nomenclature, and national item identification number of class

IX (repair parts) that are demanded daily. This information is then processed and made available in OPLOG Planner so that users can develop class IX requirements.

Inputs to planning data are not confined to standard Army management information system data. Data from other sources include the following:

- Monthly theater population data provided by the J-1 for military and Department of Defense civilians and by the J-4 for contractors.
- Equipment usage profiles (EUPs) provided by Training and Doctrine Command or command table of organization and equipment (TOE) developers, which impact class III (petroleum, oils, and lubricants usage). Each EUP is updated to reflect the total idle hours, the total hours and kilometers traveled each day, and the percentage of travel on primary, secondary, and cross-country surfaces.
- Characteristic data (weight, cube, essentiality code, subclass, and cost) provided by the Defense Logistics Agency and obtained from Federal Logistics Data or commercial sources during research.
- Center for Army Lessons Learned insights on the use of classes of supply in active theaters.
- Equipment quantity in theater provided by the U.S. Central Command and U.S. Army Central.
- Army and joint doctrinal and regulatory information on various classes of supply, the military decisionmaking process, and the development of orders.
- Force structure—a specific TOE update or consolidated TOE updates—provided by the Force Management Support Agency, Army G-3/5/7 (operations and plans), for use in developing unit specific rates.

Significant research is done to ensure that the data is as accurate as possible. The data must pass several specific checks. Additionally, there are common sense tests. For example, the data may suggest that a pair of boots weighs 50 pounds, but common sense would prompt an operator to examine that information for an error.

Missing data is also researched to complete data sets. When missing data cannot be found, such as with nonstandard or new equipment, surrogate data (from a similar existing item) is used to provide a temporary solution.

Continual coordination between the PDB and the data proponents is key to the process. Data on supply requisitions is collected throughout the year. More esoteric data such as EUPs and fully mission capable rates are collected on an annual or semiannual basis.

Once the rates are developed, the PDB does a significant amount of sensitivity analysis to ensure the integrity of the product. The PDB and the data proponents work together to analyze the data output. The resulting factors, methods, and data are approved by the Army G-4 annually.

Keeping Pace

Currently, the PDB receives and processes the consolidated TOE update annually. This captures the new organizational designs as well as any new pieces of equipment. The planning factors also reflect updates in technology, specifically with the bulk class III consumption rates.

Logistics planning factors are collected annually and processed every two years. And as the Army adapts to new operating concepts, they are captured in the EUP updates, which are currently collected and processed every two years.

OPLOG Planner is updated and a new version is released annually. However, the planner allows users to modify and customize their experience and incorporate changes to data within the program before a new release is published.

A user can also estimate for commercial off-the-shelf equipment using surrogate data already in OPLOG Planner and then modifying the EUP to reflect the commercial off-the-shelf estimates.

The OPLOG Planner is a dynamic and ever-changing tool. As the Army changes, the data behind OPLOG Planner will continue to change and support the needs of Army logisticians.

Not only is the data within the tool updated to reflect the most current factors and rates, but the tool is also modified based on future Army estimates and comments from the field. Users can contact the PDB with suggestions or requests regarding additional data that would be helpful. This constant improvement allows OPLOG Planner to remain a relevant tool for the future Army.

Users can download OPLOG Planner and other planning tools from Army Knowledge Online at https://www.us.army.mil/suite/files/38799138 (for OPLOG Planner) and https://www.us.army.mil/suite/files/39242771 (for additional tools). For more information or help with OPLOG Planner, users can contact the PDB team at usarmy.lee.tradoc.mbx.oplog@mail.mil.

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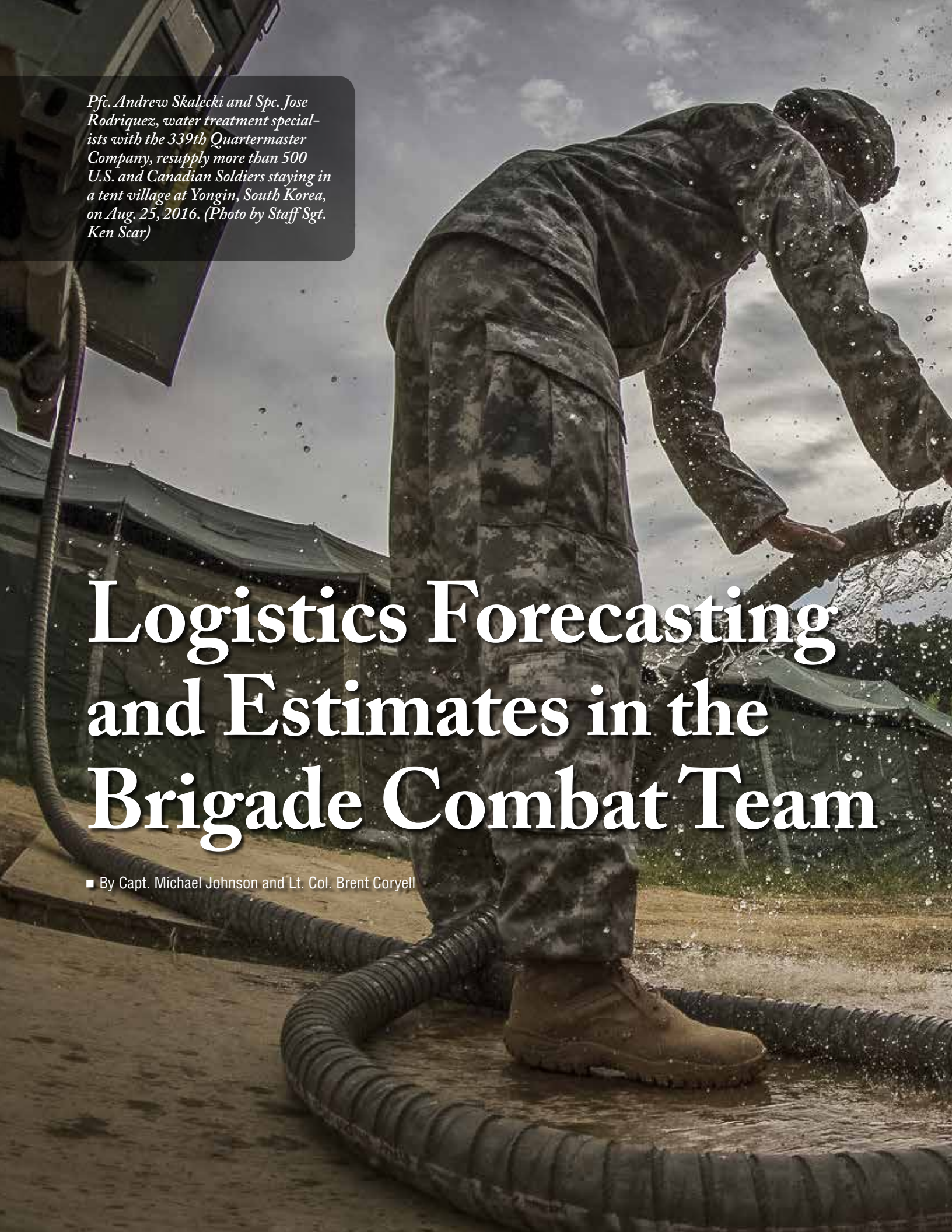

Pfc. Andrew Skalecki and Spc. Jose Rodriquez, water treatment specialists with the 339th Quartermaster Company, resupply more than 500 U.S. and Canadian Soldiers staying in a tent village at Yongin, South Korea, on Aug. 25, 2016. (Photo by Staff Sgt. Ken Scar)

Logistics Forecasting and Estimates in the Brigade Combat Team

■ By Capt. Michael Johnson and Lt. Col. Brent Coryell

Accurately forecasting logistics requirements is crucial to the mission analysis phase of the military decisionmaking process, yet it is often overlooked by brigade combat team (BCT) logistics planners. BCT logistics planners tend to submit the same daily requests instead of requesting supplies based on the future mission and factors such as requirements, consumption rates, time, and distance.

Observer-coach trainers at the National Training Center (NTC) at Fort Irwin, California, have observed that many BCTs submit automated requirements with no analysis and depend on default pushes of supplies from higher echelons to satisfy requirements. This failure to forecast commits distribution assets unnecessarily and often results in backhauls of large quantities of supplies that waste man-hours and pose increased risk to Soldiers.

Not analyzing requirement submissions also results in failure to anticipate requirements for changing missions, such as when units transi-

FEATURES

Observer-coach trainers from the National Training Center provide methods for accurate, detailed logistics estimates.

tion from defensive to offensive operations. While occasionally effective in sustaining units for a short time, the method is very inefficient and is not sustainable.

This article provides demonstrated methods of forecasting logistics to create maximum operational reach, flexibility, and logistics synchronization. It is intended to assist junior logistics planners in making better estimation decisions.

Mission Analysis

Forecasting requirements begins during mission analysis and is the most important mental process for logistics planners. Mission analysis should be a focused effort in which planners define the current operational environment in terms of capabilities, requirements, assessments, and mitigation plans. Logistics planners should ask, "What do I have, what don't I have, what do I need, and how do I get what I need?"

The foundation for accurate forecasting is the use of standard logistics estimation tools that analyze distances and usage hours (derived from the scheme of maneuver) in order to provide calculated consumption rates for task-organized equipment. This produces a logistics estimate that mitigates shortfalls and eliminates unnecessary backhaul.

Historical data is a good starting point, but it should not be the primary forecasting method when estimating for a new operation. Historical data is valuable only when an operation has matured enough for the data to be applicable to the situation. For example, consumption rates for an attack in a forested, temperate environment will differ drastically from one in an arid desert.

Here are procedural estimates and examples for each class of supply except for classes VI (personal demand items) and VII (major end items). The examples are based on published consumption rates.

Class I (Subsistence)

Forecasting meals and water is crucial for sustainment planning. Since it is based primarily on population, class I is not as influenced by maneuver operations as most other supply classes are.

Meals. There are three categories of meals: meals ready-to-eat (MREs), unitized group rations (UGR)–A option, and UGR–heat and serve. Logistics planners forecast meals needed to sustain the force based on the head count (the number of Soldiers) multiplied by the ration cycle (the type of meal) multiplied by the issue cycle (how often bulk rations are delivered).

For example, if 100 Soldiers on an M-M-M (three MRE) ration cycle were on a "2" issue cycle (where they receive two days of supply at a time), the total MREs needed would be calculated like this:

Head count × *Ration cycle* × *Issue cycle* = *x meals*

100 Soldiers × *3 meals* × *2 days* = *600 meals*

When multiple ration types are used, planners account for each type individually, with the forecasted rations being the final sum.

Because meals are transported by cases or modules on pallets, the value would be converted using the information shown in figure 1. Using the example, 600 meals would equate to 50 cases or one pallet of MREs plus two additional cases.

If conducting phased operations, the issue cycle could cover each phase, so a four-day phase would be an issue of four, pending unit-haul and storage capabilities. Planners should always adjust their total values by 10 percent to account for unforeseen changes, such as an unexpected attachment of a unit. Additional meals may be required for humanitarian aid and the holding of personnel, such as detainees and enemy prisoners of war.

There are two primary considerations when transporting meals: storing perishable items and transporting cooked UGRs. Units must consider

the use of ice and multitemperature refrigerated container systems when incorporating perishable items into the ration cycle. Heat-and-serve UGRs are issued in a set of three modules. Module 3 heat-and-serve UGRs are the only meals that need cold storage in order to remain safe to consume.

Time must be considered when cooking UGRs. Once the UGR is at the correct temperature, it must be consumed within four hours. Planners must be cognizant of where a unit's assault or containerized kitchen is located in relation to the forward line of troops. Planners should add 40 to 70 minutes to the actual travel time to account for the loading and unloading of meals.

Water. Water forecasting can be categorized into bulk water, ice, and decontamination planning. During fiscal year 2015, a total of 59,800 gallons of bulk water were backhauled between forward support companies (FSCs) and brigade support battalion (BSB) units at the NTC, which resulted in the unnecessary use of personnel and equipment.

Bulk water planning consists of identifying capabilities, requirements, and shortfalls. The brigade support operations section and brigade and battalion S-4s can calculate available water capabilities based on asset availability to understand the maximum water capability of each unit. (See figure 2.)

Like meals, bulk water planning is calculated on a per-person, per-day cycle. Figure 3 on page 31 highlights planning factors for this method that are based on the climate. Planners should use this in their initial analysis for forecasting proper requirements and adjust requirements as the operation progresses.

Mortuary affairs operations are an additional planning factor to be considered at the BSB level. Processing each set of remains requires four gallons of water.

Ice. Ice is forecasted per person, per day based on the operational environment. The pounds per bag per person vary with each climate. Arid climates require 6 pounds per person; tropic, 5 pounds; temperate, 4 pounds; and arctic, 3 pounds. The bag size will determine how many bags will be on each pallet. For example, 103 20-pound bags fit on one standard pallet, and 14 pallets can fit inside one multitemperature refrigerated container system.

Decontamination. Decontamination operations require substantial water for each Soldier and vehicle. The unit decontamination crew washes off gross contamination using 100 to 150 gallons of hot, soapy water on each vehicle. Each armored combat vehicles may require 200 or more gallons of water for decontamination.

One hundred gallons of water will provide one vehicle with a two- to three-minute wash. Detailed equipment decontamination requires more water. (See figure 4 on page 31.) For troop decontamination beyond the exchange of mission-oriented protective posture equipment, water requirements are 25 gallons per person.

Class II

Successful class II (clothing and individual equipment) forecasting resides at the unit supply level, where inventories are conducted regularly to avoid shortage of critical equipment, clothing, and office supplies. Soldiers deploy with an initial load of class II and receive theater-specific equipment during the unit's reception, staging, onward movement, and integration process into theater.

Class II is difficult to forecast in relation to phases of the maneuver operation because each echelon will consume supplies at different rates. Planners should be cognizant of the need for class II and work in close coordination with the BSB supply support activity (SSA) to determine the transportation requirements for requests.

Class III

Class III (petroleum, oils, and lubricants) can affect the success or failure of any unit conducting combat operations. Class III is categorized into

Meals Ready-To-Eat	
Meals per case	12
Cases per pallet	48
Weight per case	22.7 lbs.
Weight per pallet	1,089 lbs.
Unitized Group Rations	
Servings/module	50
Modules/pallet	8 (400 servings)
Weight/module	128 lbs.
Weight/pallet	1,020 lbs.
Pallet size	40 x 48 x 40 in.

Figure 1. Transportation planning factors. (Adapted from Command and General Staff College Student Text (CGSC ST) 4-2, Theater Sustainment Battle Book)

Bulk Water Storage	
Storage Type	**Capacity in Gallons**
Buffalo	400
Blivet	500
Hippo	2,000
Camel	900
3K Semi-trailer mounted fabric tank (SMFT)	3,000
5K SMFT	5,000
Onion skin	500
20K Storage Distribution System	20,000
50K Storage Distribution System	50,000

Figure 2. Bulk water storage capacity. (Adapted from CGSC ST 4-2)

bulk fuel (class IIIB), which includes gasoline, diesel, and aviation fuel, and packaged class III (class IIIP).

Class IIIB. Forecasting class IIIB is complex because of the large variety of vehicle types, consumption rates, terrain, and hours of use. The formula used to determine bulk water carrying capacity can also be used to determine bulk fuel carrying capability. Planners should multiply available assets by their capacity. (See figure 5.) To avoid expansion and associated damage to personnel and equipment, storage assets should never be filled to their maximum capacities.

Determining class III requirements requires detailed analysis of the maneuver concept for the operation. Forecasters determine estimated fuel usage for each vehicle using the following formula: the number of vehicles multiplied by the consumption rate stated in gallons per hour (GPH), multiplied by the number of hours that the equipment is operated. (See figure 6 on page 32 for consumption rates.)

For example, an armor company comprising 14 M2 Bradley fighting vehicles is conducting a one-day operation on rugged terrain. In a 24-hour period, the Bradleys are expected to be at a tactical idle for 16 hours and traverse conditions for eight hours. Expected fuel consumption at idle would be calculated in the following way:

14 × 1.4 GPH × 16 = ~314 gallons

Expected fuel consumption during operations on rugged terrain is calculated like this:

14 × 18 GPH × 8 = 2,016 gallons

Next, we add the products to find the total amount of fuel required.

~314 gallons + 2,016 gallons = ~2,330 gallons

A 10th Brigade Engineer Battalion Soldier removes fabric from concertina wire while conducting a defensive obstacle placement mission during exercise Combined Resolve VII at the Joint Multinational Readiness Center in Hohenfels Germany, Sept. 08, 2016. (Photo by Pfc. Randy Wren)

This process will be used for each vehicle type within a unit. While detailed, it provides an accurate estimate of class IIIB consumption that will help identify and mitigate shortfalls and ensure operational success. As with other classes of supply, adjust amounts based on historical data and actual consumption.

Calculate aviation fuel requirements the same as ground equipment. (See figure 7 on page 32.) Using the number of aircraft multiplied by the number of gallons per hour and air hours allows planners to compute the estimated fuel needed.

Class IIIP. There is no single manual describing class IIIP requirements by vehicle type. Unit standard operating procedures usually do not address the class IIIP basic loads required by vehicle platform. Additionally, class IIIP forecasting requires coordination with supporting maintenance elements.

Poor planning for packaged lubricants has detrimental effects. Commonly seen problems at the NTC are engines low on oil and tracks that cannot be adjusted due to lack of grease. Most units deploy with 15 to 30 days' worth of packaged lubricants as part of their stockage listing.

Environmental considerations such as dust, snow, and rain affect the consumption rate of class IIIP. Sustainers must analyze transportation trends and find out how long it takes items to arrive at the SSA and use this information to ensure timely replenishment.

Class IV

Class IV (construction and barrier materials) planning is conducted when planning for a phased defensive operation and for sustained unit defense. Every echelon is involved in materials planning and resourcing. Division-level echelons are responsible for determining each module configuration for their subordinate units. Each module will dictate the national stock number, nomenclature, quantity, and unit of issue for a given defensive combat configured load (CCL). These modules are found in the division operations order Annex

G (Engineering), Appendix 3 (General Engineering), Tab C (Engineer Specific Combat Configured Loads).

Logistics planners must coordinate closely with the brigade engineer planner in order to forecast class IV at the brigade level and below. The brigade engineer planner is responsible for determining the CCLs needed based on the brigade's defensive operation. The engineer planner tasks how many modules are resourced for each battalion and where the CCLs are initially placed in the brigade's area of operations.

CCLs are built on container roll-in/roll-out platforms or flatracks using a brigade-tasked detail supervised by the brigade engineer battalion. CCLs can be built by the supporting echelon-above-brigade units if multiple brigades are operating in the same area.

The BSB support operations section coordinates transportation of CCLs to supported units based on the brigade engineer planner's tasking. Each CCL should be delivered to the supporting FSC at least 48 hours before the defensive operation starts. This will give maneuver units' time to establish and improve their defensive positions.

Class IV is also used in sustained unit defense for force protection. Units training at the NTC consistently fail to plan for adequate class IV when building triple strand concertina wire defense. This happens because they do not understand how class IV is resourced for defense.

Planning for a sustained unit defense is a collaborative effort between the battalion executive officer and S-4 that integrates three primary defensive methods. The first is the use of engineer assets to construct berms and hasty fighting positions. This is the preferred method because it increases protection and decreases the use of unit resources and transportation assets. The second is by setting up triple-strand concertina wire around the unit's perimeter.

The final method is a combination of the previous two that integrates

Use	Temperate	Tropical	Arid	Arctic
Drinking water	1.5	3.0	3.0	2.0
Personal hygiene	1.7	1.7	1.7	1.7
Field feeding	2.8	2.8	2.8	2.8
Heat injury treatment	.1	.2	.2	.1
Vehicle maintenance			.2	
Standard planning factor	6.1	7.7	7.9	6.6

Figure 3. Daily water consumption factors in gallons per person. (Adapted from CGSC ST 4-2)

	M12A1 PDDA Rinse		M17 LDS Rinse	
Equipment	Gallons	Minutes	Gallons	Minutes
M1 Abrams	325	12	57	14
M2 Bradley	325	12	57	14
M113 APC	203	9	38	10
M109A Paladin	325	12	57	14
HEMTT	180	8	30	12
5-ton truck	158	7	42	11
Humvee	90	4	23	6

Figure 4. Detailed Equipment Decontamination Planning Factors. The rinse is done with the spray wand for an M17 LDS. (Adapted from Field Manual 3-11.5, CBRN Decontamination Multiservice Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Decontamination)

	Bulk Tanks	M1062	M969	M978	Blivet	TPU Pod	MFS
Usable Capacity		7,425	4,800	2,250	500	500	2,500
Bulk-fill rate (gpm)	600	300	600	300	125	125	
Self-load rate (gpm)	600	300	300	300			
Flow per nozzle (gpm)	50		60	50		25	
Nozzles	2		2	2	1	2	

Figure 5. Bulk fuel storage capability and planning factors in gallons. (Adapted from CGSC ST 4-2)

Legend

APC = Armored personnel carrier
GPM = Gallons per minute
HEMTT = Heavy expanded-mobility tactical truck
LDS = Lightweight decontamination system
MFS = Modular fuel system
PDDA = Power-driven decontamination apparatus
TPU = Tank and pump unit

their strengths. Planners should reference Technical Manual 3-34.85, Construction Surveying, to ensure adequate amounts of material are requested to sustain the unit's defense.

Class V (Ammunition)

Ammunition is forecasted through the Total Ammunition Management Information System operated by the brigade ammunition office. Weapon density, the number of personnel, and specific mission requirements will determine the ammunition requirements. Unit basic loads (UBLs) will vary with each operation. There is no "one size fits all" UBL.

Each combat phase may require unique ammunition. For example, high-explosive grenades are used for an attack, while the family of scatterable mines is used for a defense. Controlled supply rates are also considered by referencing the brigade operations order, Annex F, Paragraph 4, Section 3 (Supply).

Once UBLs are determined by the brigade ammunition office, the brigade master gunner, and the brigade S-4 and are validated through the Total Ammunition Management Information System, the BSB receives them from the ammunition supply point in mission configured loads. These loads must be reconfigured into CCLs for each subordinate unit.

Ammunition planners reference the Conventional Ammunition Packaging and Unit Load Data Index to determine transportation requirements for issuing ammunition to units and analyze the compatibility, weight, and cube dimensions of each set of ammunition with available transportation. This determines how many CCLs are built for each subordinate unit.

The planning factor for UBLs is three basic loads for a brigade-sized element: one with the unit with the weapon system (company level), one at the combat trains command post with the FSC (battalion level), and one stored at the ammunition transfer and holding point (brigade level). Planning for these UBLs enables smooth issuing of ammunition as phases progress.

According to section 2-19 of Army Regulation 710-2, Supply Policy Below the National Level, sustainers need to account for the basic loads and should be able to transport all CCLs with organic assets.

Planners must also consider how additional ammunition will be replenished. Unit replenishment from the ammunition transfer and holding point to each battalion's units is accomplished through expenditure reports. While the exact process is determined by unit standard operating procedures, expenditure reporting is the only method that brings a UBL back to 100 percent after each combat engagement. Companies should incorporate an expenditure reporting process through their platoon sergeants to ensure accurate replenishment.

Battalion S-4s ensure that logistics status reports capture what was expended. The expenditure report provides the brigade ammunition office with the information needed

Vehicle	Idle	Cross-Country	Road
M1 Abrams	17.3	56.6	44.6
M2/3 Bradley	1.4	18.0	8.6
M113 APC	1.0	10.5	8.9
M88 Hercules	2.0	42	31
M9 ACE	1.4	12.6	9.3
M109A6 Paladin	2.2	16.0	11.8
MLRS	1.3	15.0	8.6

Figure 6. Fuel consumption rates in gallons per hour. (Adapted from CGSC ST 4-2)

Aircraft	AH-64A	AH-64D	OH-58D	CH-47D	UH-60L
Max speed (knots)	170	150	120	170	193
Cruise speed (knots)	120	120	90	120	120
Endurance (hours)	2.3	2.3	2.0	2.5	2.5
Range (miles)	260	260	180	345	300
Passenger seats			1	33	11
Litter capacity				24	6
Ambulatory capacity				31	7

Figure 7. Aviation planning factors. (Adapted from CGSC ST 4-2)

Legend

ACE = Armored combat earthmover
APC = Armored personnel carrier
CGSC ST = Command and General Staff College Student Text
MLRS = Multiple launch rocket system

to request additional ammunition before subordinate units request it. The expenditure report itself is not an ammunition request; unit S-4s are still responsible for requesting replenishment on a Department of the Army Form 581, Request for Issue and Turn-In of Ammunition.

Class VIII (Medical Materiel)

Medical elements typically deploy with a three-day supply of class VIII to support a battalion. When forecasting class VIII requirements for medical operations, consider the mission, location, projected causality rates, and available medical assets.

Determining multiple courses of action and methods of execution will ensure accessibility of supplies and the timeliness of their delivery. Additionally, understanding projected casualty rates is crucial for forecasting unit requirements. Other considerations such as disease and accidents should also be included in estimates.

Class IX (Repair Parts)

Class IX is extremely difficult to forecast during an operation because of the unknowns involved with equipment wear and tear. Planners work in coordination with the SSA and maintenance support elements to best predict what and how much class IX is needed for an operation.

The time of year and operational environment will impact class IX requirements. For example, winter requires additional batteries and mountainous terrain requires additional tires. Units deploy with the SSA's authorized stockage list, which contains common-use items. Coordination with the SSA technician will help determine what assets are needed to transport class IX to subordinate units.

Transportation

Transportation requirements are interconnected with every class of supply. Transportation capabilities and requirements must be properly planned to support units. Having too few vehicles increases the number of trips needed to distribute supplies. Having too many increases class III and IX requirements and results in a backhaul of large quantities of supply, wasted man-hours, and the commitment of unneeded logistics assets.

Transportation is forecasted based on three things: the number of pallets needed per class of supply, the time needed to deliver supplies to subordinate units, and fighter management (ensuring Soldiers have the sleep, food, and equipment needed to cover the mission).

Pallets. In order to properly forecast transportation, planners must understand how many assets will fit onto a vehicle. Warehouse pallets are the common transportation planning factor for all classes of supply because equipment is attached to pallets, and the end state for most requirements is stated in the number of pallets needed for transport. For personnel transportation, planners need to know how many passenger seats and litter and ambulatory spots are needed and available. (This information is available in the Command and General Staff College Student Text 4-2, Theater Sustainment Battle Book.)

Supplies bound on pallets can sometimes be double stacked, effectively doubling the available space. Planners should be cautious when doubling loose items because the top stack will lose integrity in rough terrain.

Time and distance. Transportation time and distance factors are important to forecast because they allow synchronization of efforts by dictating movement times and the total time on the road. Convoy times can be determined by dividing the distance traveled by the speed limit.

Leaders must also account for time on station, the time needed to upload and download equipment. This analysis will help leaders plan the total time needed for a convoy and help subordinate units synchronize their efforts for maneuver units.

Fighter management. The final transportation planning factor is fighter management. The BSB's distribution company and FSC's distribution platoon are responsible for managing transportation assets to ensure vehicles and personnel are available for convoy operations.

Units that use all of their assets at once increase risk and do not have resources to allocate for emergencies. If missions allow, units should strive to place one-third of their equipment and personnel in a stand-down status at all times in order to conduct maintenance, administrative, and rest operations.

Accurately forecasting logistics requirements is a crucial yet often overlooked process. Relying on default pushes of supplies results in wasted man-hours, increased risk to Soldiers, and the unnecessary use of logistics assets.

Forecasting and mission analysis conducted at each phase of the operation provide planners with the ability to give their commanders logistics estimates that sustain the force through any operation. Defining unit capabilities, shortfalls, and mitigations through detailed analysis and forecasting ultimately shapes the sustainment battlefield, expanding the combatant commander's operational reach, freedom of action, and operational endurance.

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GCSS–Army: The Future of Army Logistics

■ By Maj. Kimberly Deaton

Spc. Joe Emanuel Clark, a U.S. Army South supply clerk, receives office supplies from Henry Ford, a warehouse operator, on Jan. 15, 2016, at the Army South warehouse. The supplies were ordered and processed through the Global Combat Support System–Army. (Photo by Sgt. Mahlet Tesfaye)

The Global Combat Support System–Army is a game-changing tool that can be used to improve the Army's readiness. But in order to fully realize its capabilities, preparation and training are necessary.

The Global Combat Support System–Army (GCSS–Army) fielding is a major modernization effort that will improve every warehouse, supply room, motor pool and property book office in the Army. GCSS–Army is based on commercial enterprise resource planning (ERP) software and has become the infrastructure for one of the largest ERP systems in the Department of Defense.

GCSS–Army is being fielded using a two-wave approach in order to avoid shocking the supply chain and disrupting ongoing operations. Wave 1, which was fully implemented in 2015, replaced the Standard Army Retail Supply System. Wave 2 replaces Property Book Unit Supply Enhanced and the Standard Army Maintenance System–Enhanced and brings all of their functionality into a single, integrated common operational picture.

Wave 2 will affect about 140,000 users from almost every command, unit supply room, field maintenance activity, and property book office in the Army. Wave 2 is nearly 50-percent complete, and should be totally fielded by December 2017.

System Benefits

Soldiers at every level and in every component will be able to use and benefit from GCSS–Army. This includes maintenance and warehouse clerks who use the system daily in their jobs and commanders who may use the system less frequently to check on readiness. Whatever the need, GCSS–Army brings together supply, maintenance, and property accountability functions and their associated financial data.

Uniformity of data. GCSS–Army integrates thousands of local databases into a single enterprise-wide view. No longer will the same data have to be updated in both Property Book Unit Supply Enhanced and the Standard Army Maintenance System–Enhanced. GCSS–Army will connect users at all echelons to a single database that can be accessed worldwide. Commanders can leverage this information to assess the readiness of their formations in near real time.

Improved tracking and planning. GCSS–Army enables warfighters to order, move, track, account for, and maintain equipment from the beginning to the end of the supply chain. This will allow commanders to anticipate, allocate, and synchronize the flow of resources. Asset visibility, equipment status information, and life cycle maintenance records for each piece of equipment greatly enable planning. Detailed analyses of supply metrics are also available, further improving the planning process.

Financial accountability and auditability. For the first time, logistics and financial actions are available together because GCSS–Army is the tactical logistics system of record and is fully integrated with the General Fund Enterprise Business System, the national-level financial system of record. In GCSS–Army, a record of transactions enables full auditability, unit readiness, and stewardship. In accordance with the Federal Financial Management Improvement Act, GCSS–Army is an important part of the Army's strategy to achieve audit readiness by 2017.

Leveraging Training

Like anything new, GCSS–Army requires training. To facilitate a successful conversion, units need to take advantage of all the training and resources that are offered. This ensures that every user can leverage the system's capabilities and realize its full potential.

Since about 50 percent of the Army has already completed Wave 2, valuable lessons learned have been harnessed for units that are still converting. GCSS–Army fielding can be thought of in three different phases: pre-conversion, conversion, and post-conversion. Training opportunities, resources, and lessons learned that are unique to every phase can help units be successful.

Pre-conversion training. Early preparation is a key to success.

Preparation for conversion begins a year before the actual fielding date. A key to success is good data cleansing, because the key enabling factor of GCSS–Army is data uniformity. Units must ensure that their data is clean and correct prior to conversion to GCSS–Army. Errors will result either in data not being accepted or in the errors being perpetuated throughout the system.

Online training is another imperative. Currently all users must complete GCSS–Army familiarization; however, beginning in January 2017, users will be required to complete advanced standalone user training. This training is very intensive, so Soldiers must be given adequate time and resources to complete it.

Before conversion begins, all users must understand what their roles will be in the new system and what these roles require. A Soldier should not be surprised by what his or her duties entail.

Conversion training. Allow Soldiers the time and flexibility to take advantage of both classroom and over-the-shoulder training. The extra time put into training will pay huge dividends in the long run. Once the trainers leave, it will be much harder to fix errors and relearn processes. Additionally, Soldiers should utilize the online post-deployment sustainment training, the virtual environment set up so that issues and questions can be resolved.

Post-conversion training. Just like marksmanship, GCSS–Army use is a skill that requires maintenance. At the unit level, GCSS–Army sustainment training should be incorporated into unit training plans and sergeant's time training. Constant practice and continued learning is key to GCSS–Army success.

Resources for Success

There are multiple resources to help users leverage GCSS–Army for their needs. One such resource is the GCSS–Army website, http://gcss.army.mil, which has links to tutorials, frequently asked questions, and multiple handouts and checklists. The website also has information about workshops and forums that walk users through different aspects of GCSS–Army. The resources also provide opportunities to collaborate and share best practices across units and components.

Another valuable resource is U-Perform, which can be accessed at https://www.uperform.redstone.army.mil. UPerform is a virtual environment that allows users to walk through transactions using step-by-step instructions and checklists for key functions and reports.

The GCSS–Army End User Manual should be the first place users look when they have questions. The manual is available at https://www.gcss-army.army.mil/GCSS-ARMY/EUMLaunch/garmy_jump1.html. It provides step-by-step instructions for all GCSS–Army processes.

If the manual does not provide enough detail and a user still needs assistance, GCSS–Army has a help desk that provides timely and constructive support. The help desk can be reached at https://www.gcss-army.army.mil/GCSS-ARMY/EUMLaunch/page14458.html or by calling 1-866-547-1349.

GCSS–Army is a logistics game changer. It is a tool that can improve the Army's readiness. In order to fully realize all of GCSS–Army's capabilities, Soldiers must prepare and train. There are a plethora of resources available to assist units and leaders as the conversion to GCSS–Army continues across the Army.

Once the Wave 2 conversion is complete and all of the tactical Army's property and ground maintenance functionality is in the system, the focus will shift to adding aviation maintenance and improved business analytics to the system. GCSS–Army is truly the future of Army logistics.

Spc. Xavier Alvarado, a shop clerk with Bravo Company, 307th Brigade Support Battalion, reads about how Global Combat Support System–Army's upcoming integration will affect his daily operations. (Photo by 1st Lt. Jonathon Hecker)

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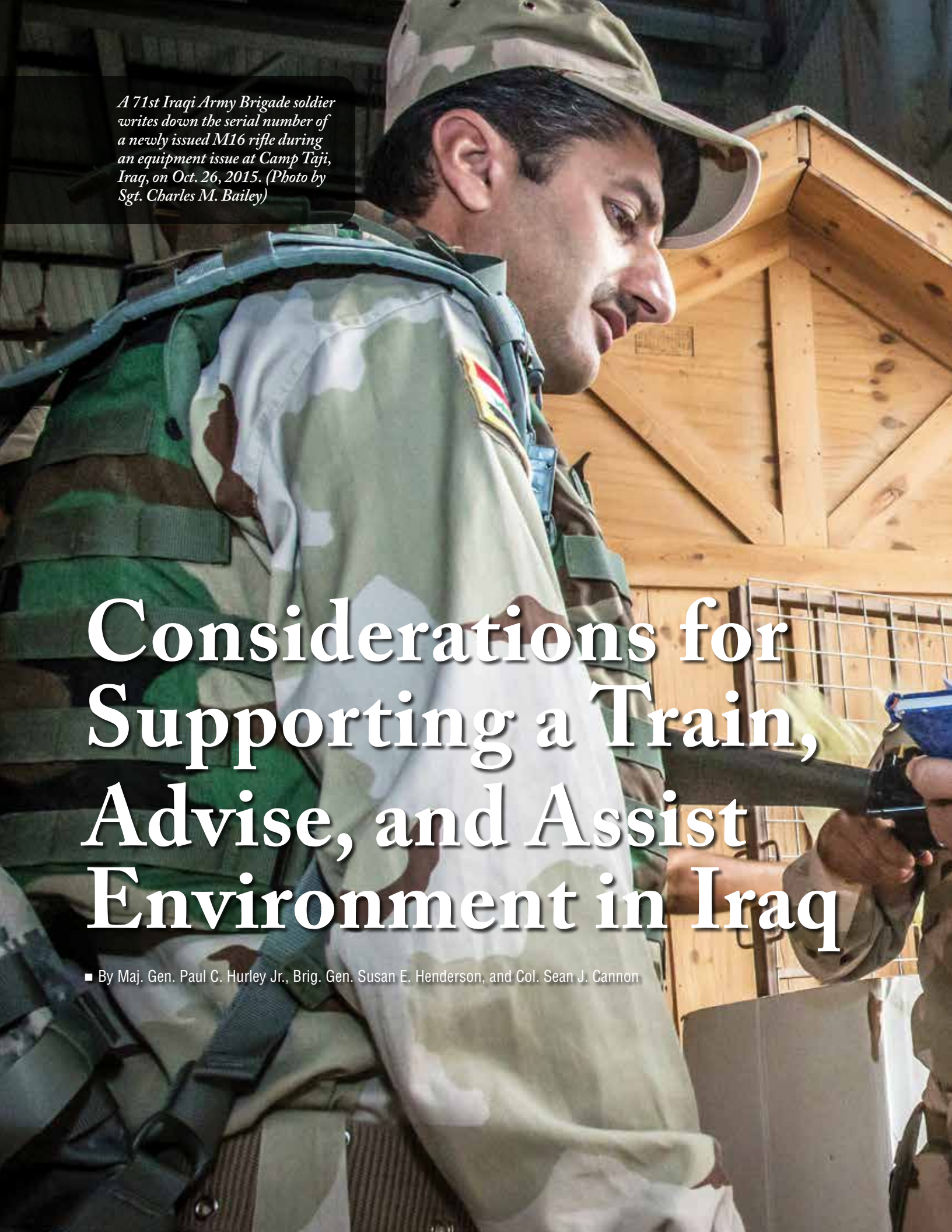

A 71st Iraqi Army Brigade soldier writes down the serial number of a newly issued M16 rifle during an equipment issue at Camp Taji, Iraq, on Oct. 26, 2015. (Photo by Sgt. Charles M. Bailey)

Considerations for Supporting a Train, Advise, and Assist Environment in Iraq

■ By Maj. Gen. Paul C. Hurley Jr., Brig. Gen. Susan E. Henderson, and Col. Sean J. Cannon

Waging a war against the Islamic State group, also known as Daesh, with a limited U.S. military presence requires nondoctrinal logistics solutions to support coalition, U.S., and host-nation forces. This is particularly true in the manning-restricted, contract-enabled, coalition-force operational environment in which the fight against Daesh is happening. This new and unfamiliar environment is having a profound effect on tactical sustainment estimates, the U.S. procurement system, and sustainment force structure in theater.

Train, advise, and assist (TAA) brigades that are scheduled to activate in fiscal years 2018 and 2019 are the Army's solution to this new environment. Although the Army has invested much time developing force structure for TAA brigades, the sustainment community has not kept pace in assessing their unavoidable impact on logistics.

The proving ground for the TAA concept has been in Iraq, where Combined Joint Task Force–Operation Inherent Resolve facilitates the fight against Daesh. Over the past year, the 1st Theater Sustainment Command (1st TSC) made several important sustainment observations that the Army must consider as it refines how it will fight using this concept:

- ☐ U.S. logistics underpins coalition success against Daesh.
- ☐ Emerging coalition materiel requirements in theater have outstripped organic industrial base (OIB) production rates and forced the Army to leverage existing U.S. war stocks.
- ☐ Procurement-based foreign policy in countries throughout the region undermines combat readiness.
- ☐ TAA efforts must work within partner force cultural norms, military processes, and budgetary restrictions to develop sustainment estimates that ensure the development of true operational capability and combat readiness.

Logistics and Coalition Success

Despite heavily resourced TAA efforts that produce competent and combat-ready Iraqi brigades, it is

FEATURES

The 1st Theater Sustainment Command provides insights into the support Iraqi forces now need and the impact these needs are having on U.S. Army sustainment.

U.S. logistics that underpins the coalition's operational success against Daesh. However, coalition partners in the region rely too heavily on U.S. logistics expertise and equipment to achieve operational capability.

Iraq is a case in point. Michael Knights, a military analyst with the Washington Institute for Near East Policy, stated in a 2016 interview with the Associated Press that the Iraqi army (IA) once possessed very skilled logisticians, but this talent decreased after the U.S.-led invasion and subsequent dissolution of the country's military.

Unfortunately, this logistics brain drain has limited the country from harnessing the full benefit of its investment in military technology. Additionally, the lack of a functional supply system contributes to chronic shortages in vehicles, weapons, and weapons systems.

Even though the costs for equipping and training forces are projected to decline, the logistics requirements for resupplying forces and repairing and replacing combat losses to sustain ongoing operations are expected to increase markedly. The lack of organic Iraqi capacity to maintain equipment is a critical weakness in the fight to defeat Daesh.

Without the authorities, access, and logistics structures of the past, the 1st TSC's challenge is twofold: providing operational and tactical logistics to U.S. forces while simultaneously providing materiel and supply support to the Iraqi forces.

To build and maintain momentum against Daesh in Iraq, the U.S. has agreed to supply, transport, and issue the equipment, uniforms, weapons, ammunition, and gear required to generate the Iraqi fighting force. This force includes the IA, Iraqi federal and local police, the Iraqi Counter Terrorism Service, border forces, tribes, and Peshmerga brigades (Kurdish forces of the autonomous region of Iraqi Kurdistan).

U.S. logisticians are meeting this nondoctrinal workload using a manning-restricted sustainment footprint that is arguably inadequate for the task. Regardless of manning, the mission of building and sustaining the IA is a critical component in the campaign against Daesh. The IA's success has not only tactical implications but also strategic ones.

Stripped OIB and War Stocks

Building and supporting a partner force in the fight against Daesh has required the U.S. OIB to respond at an unprecedented speed to the increasing demands in Iraq and Syria. Historically, the OIB responded to predictable demands created using well-documented forecasts and well-established budget cycles. A fairly predictable equation for equipment regeneration and ammunition expenditure was the norm, and the OIB established production cycles to meet that demand.

Because of the new operational environment, the OIB is now being asked to meet the unique, anomalous materiel needs of the IA and coalition armies at unprecedented production rates. Consequently, when the OIB cannot meet emerging requirements, the U.S. forces are forced to reach into theater war stocks to sustain the fight against Daesh.

Although war stocks fulfill the current materiel demand, we must assess how using these limited resources affects our ability to execute regional contingency plans. The 1st TSC and U.S. Army Central are working closely with the Department of the Army, the Army Materiel Command, and the U.S. Central Command to assess the composition, fill rates, and operational readiness of Army pre-positioned stocks in theater.

Procurement-Based Policies

Countries in the Central Command region have historically relied on a procurement-based foreign policy. This approach results in countries buying equipment from multiple sources in order to maintain international relations, rather

than using coherent buying strategies to build combat power.

Procurement-based foreign policy focuses on the end item without considering the downstream logistics requirements. It undermines combat readiness by creating multiple international supply chains that result in inadequate resourcing for life-cycle maintenance of combat systems.

Managing the operational readiness of existing equipment is clearly within the 1st TSC's comfort zone. However, helping coalition partners procure materiel to build and maintain combat power, using cumbersome processes like Foreign Military Sales and similar programs, is complicated.

It requires the ability to assess readiness, forecast operating tempo, and anticipate materiel requirements. It also requires an understanding of nonstandard automation systems and Office of Security Cooperation processes so that the correct parts are ordered early enough to build and sustain combat power.

Working in a TAA Environment

Resourcing the IA from a materiel perspective is only part of the U.S. effort to build Iraqi partner capacity. The 1st TSC has learned that it must partner with Iraq to go beyond replacement-based force generation in order to create a maintenance culture and help the Iraqis improve processes to maintain combat power.

We cannot use the same approach that we did in 2010 and 2011, when the U.S. Army tried to create an IA in its image. During that time, we found that cultural differences prevented our partners from implementing the automated processes and managerial techniques necessary to achieve operational readiness. This time, we must build and sustain combat power within our partner's cultural norms, military processes, and automation proficiency.

Coalition forces must see themselves accurately and then must have the desire to address readiness shortfalls. Through TAA efforts, the 1st TSC facilitates introspection and teaches Iraqi forces how to accurately assess their operational readiness. Using this information, Iraqi forces can develop accurate sustainment estimates that outline the supply and service support required to maintain operational readiness now and to build combat power for future operations.

To grow this effort, the 1st TSC has established a logistics operations center in Iraq, jointly manned with U.S. and Iraqi logisticians. There, U.S. Soldiers leverage TAA teams, co-located with IA units, to collect readiness data. This data is aggregated to provide Iraqi leaders with a readiness report similar to an 026 (deadlined equipment) report. The report allows the IA to see its readiness and to identify necessary class VII (major end items) and class IX (repair parts) required to maintain combat effectiveness.

Once this materiel is identified, the U.S. experts at the logistics operations center help the IA order the needed materiel through the Security Cooperation Information Portal so that the Office of Security Cooperation–Iraq can coordinate for the appropriate funding stream and the Army Materiel Command can forecast requirements to the national OIB.

Through the logistics operations center, U.S. commanders have partnered with the IA to assess existing combat power, forecast requirements for class IX, and develop a coherent procurement process for combat systems. The resulting plans are presented to the Department of the Army and Army Materiel Command so that they can manage associated U.S. military OIB production rates.

Sustainment requirements have changed in nature, grown in volume, and increased in velocity over the past two years as the Army attempts to sustain its forces working to train, advise, and assist units in Iraq. The entire Iraqi force structure has also changed as it fights Daesh.

The Army's combat power is not what is needed this time. What Iraq needs is help in the form of TAA assets and, more importantly, logistics and sustainment, without which the Iraqi forces would certainly fail.

Logisticians are essential to any war effort, but right now, they are the Iraqis' kingpin. Only by leveraging effective, timely sustainment resources will the Army be able to address the complex challenges of this environment and help the IA succeed.

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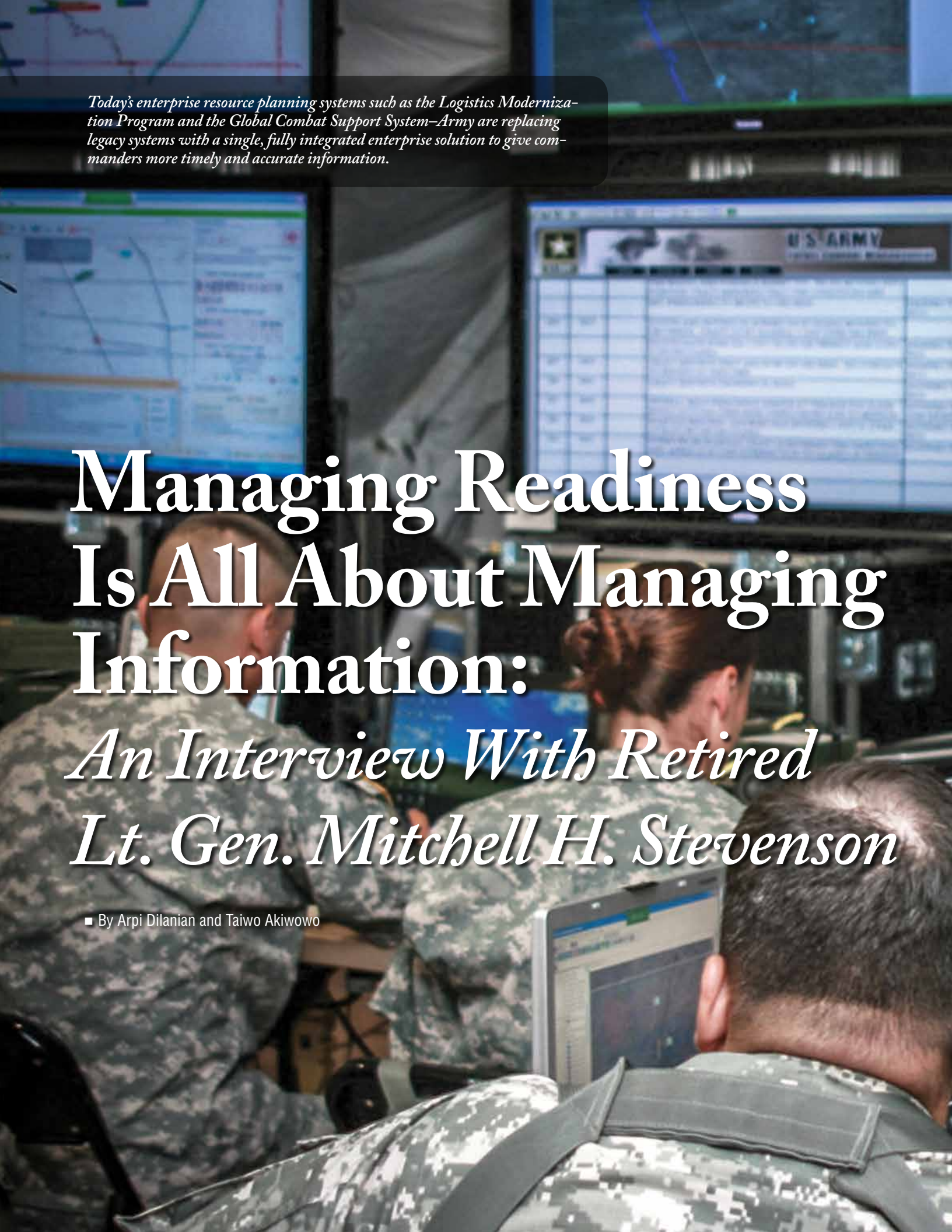

Today's enterprise resource planning systems such as the Logistics Modernization Program and the Global Combat Support System–Army are replacing legacy systems with a single, fully integrated enterprise solution to give commanders more timely and accurate information.

Managing Readiness Is All About Managing Information:

An Interview With Retired Lt. Gen. Mitchell H. Stevenson

■ By Arpi Dilanian and Taiwo Akiwowo


FORT
Big Tanks

FEATURES

A former Army G-4 discusses the importance of developing and integrating enterprise resource planning systems to provide commanders with more timely and accurate information.

A 37-year Army veteran, retired Lt. Gen. Mitchell H. Stevenson rose through the ranks to become the Army's Deputy Chief of Staff for Logistics, G-4. In that position, Stevenson developed the policies that led to the successful retrograde of 2.3 million pieces of equipment and the closure of more than 400 bases in Iraq at the end of Operations Iraqi Freedom and New Dawn. In his position as the Army G-4, Stevenson also orchestrated the deployment of 30,000 troops and their equipment to support the surge in Afghanistan.

Stevenson established the Army's transformation to the two-level maintenance system, and he initiated many programs aimed at repairing and returning battle-damaged equipment to combat. Always a champion of information technologies, Stevenson discusses how enterprise solutions have an impact on readiness.

What was the impetus that drove the Army to move from legacy logistics information systems? Can you review the history?

I can probably give you the entire history. In short, I was working in the Pentagon in 1997 when GCSS–Army [Global Combat Support System–Army] and the LMP [Logistics Modernization Program] were born. At the time, our logistics systems were not very integrated, even though they were all managed by the same program manager. We knew we needed to do better.

For GCSS–Army, we started out by pursuing custom-built software. Then, in about 2003, the Army made a significant decision to abandon that approach and move toward a commercial enterprise resource planning system. The Army went with a [Systems, Applications, and Products in Data Processing] SAP-based solution, the same as the Army Materiel Command did in the late '90s with the LMP.

It's taken a lot longer than any of us wanted it to, from the birth of the idea in 1997 to fully fielding GCSS–Army by the end of 2017. That's 20 years.

One of the reasons is that we wanted to ensure the system would work in combat. This is not just about developing a peacetime system. Anybody can set up a system to work in a building with nice fat pipes that bring in and send out data. But to do it in an expeditionary environment through satellites—that is much harder.

Will information technology be a big factor in helping logisticians build readiness?

Yes, absolutely. Managing readiness is all about information. The more accurate and the more timely that information can be provided to decision-makers, the better the Army is going to be at managing readiness.

One of the things that Soldiers who have fielded GCSS–Army remark about is the ability to see what's going on elsewhere in the enterprise. Say the part I'm looking for in a repair action is not available locally. Where is it available? In a pre-GCSS–Army environment, we had to go to more than one system to get visibility. Today in GCSS–Army, it's right there in front of you. You can see it immediately; you know how far away it is and what it's going to take to get it there. So you have an instant effect on readiness. And, just multiply that a thousand fold and you can see how important just this one aspect is. There are many others.

What other changes will the enterprise solution yield?

The biggest advantage that we will realize eventually—it's not there yet—is the ability to eliminate reconciliation between disparate systems.

Before GCSS–Army, the systems we were using were stovepipes that did not use a common source of data. So you were constantly having to reconcile [data]. Is all of the property in the property book registered in the motor pool? Or, conversely, is everything in the equipment master file in SAMS [the Standard Army Maintenance System], or do I have something I'm maintaining that's not in the property

Retired Lt. Gen. Mitchell H. Stevenson discusses managing information within Army sustainment formations. (Photo by Samuel Curtis)

book? You literally had to print the two, set them side-by-side, and check them off. And this was happening regularly in every company, battery, troop, and detachment throughout the Army. It took enormous amounts of manpower. We don't have to do that anymore.

Now, ratchet that up. Between GCSS–Army and the Army LMP, we will work in a single Army enterprise where we use common master files between the two systems. So now a piece of equipment that is being issued out of a depot, for example, will come to a unit that is going to use it, and with it comes all of its historical information because it's part of the enterprise.

It gets used in the unit for years, and at some point it's going to go back to the depot to be repaired. And all of that user-level information—services performed, the maintenance actions that have taken place over its lifetime, all of that history—will go back with it to the depot. Imagine how valuable having that history is.

It's like my medical file. Everything that's ever been done to me—the physical exams I've had, the medications I've had, everything throughout my life, immunizations I've had—is all in a file. Doctors find that very valuable because they can then determine whether or not something has cropped up over time that needs to be addressed and so forth. I would submit to you that logisticians need that same kind of historical information to make good decisions.

What was the biggest game-changing technology for you?

VSAT—the very small aperture terminal. It is a small, commercial satellite dish that you can set on this desk. It's not very big, and it's portable. It gives us the ability to stay connected to the World Wide Web wherever we go in the world.

Back in 2003, when we went into Iraq, there were times that we had no communications, no network, because the network was actually moving. We didn't know who was where, we didn't know what the readiness was, and we didn't know who needed what. Transactions were not moving, and requisitions that were coming out of the theater were not being passed to the sources of supply. We were reordering things that didn't need to be reordered. All because we couldn't communicate. The VSAT has solved that.

Go to a readiness meeting today and the level of information that the captain, the major, and the sergeant first class have at their fingertips will astound you. Not only do they know what is needed and when it's going to be there, but they can tell you where it is at that moment—all because of an interconnected network. That's the world in which we live, and we should expect no less than that for a modern Army such as ours.

What else do you think the Army can do to facilitate the enterprise?

People have heard me say this before, so this will sound to some like a broken record, but we have got to enable smartphones.

We used to agonize over how many bar code readers we should authorize in a typical company so that they can do property accountability. And my question is, why authorize any at all? No self-respecting 18-year-old Soldier today isn't carrying a smartphone. So why are we buying barcode readers? They've got one. It's their smartphone. We've just got to enable it onto the network. Then, imagine how quickly you can do an inventory, for example.

You had a reputation of being an early adopter of email use. Can you talk about how technology helped you manage?

People say that I have a good memory, but it is actually computers that are really good at remembering things. Microsoft Outlook has a really nice feature to it that has gotten better over the years. It allows you to search through .pst files to find things, and so all you have to do is be smart enough to do searches.

It has come in very handy over the years. I just use the product and its capabilities to help me do my job. That's really what technology is all about.

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Taiwo Akiwowo is a strategic communication analyst in the Army G-4's Logistics Initiatives Group. She holds a bachelor's degree from Howard University and a master's degree from Trinity University.

More than 2,500 pieces of equipment within the brigade combat team rely on GPS and satellite communications systems to provide network synchronization timing and positional data. The loss of connectivity can have significant implications for the future force.

Ensuring Freedom of Movement in 2025 and Beyond

The Freedom of Movement Rehearsal of Concept Drill explored the implications of sustaining future operations.

■ By Jim Young and Maj. Joseph C. Zabaldano

The U.S. Army Operating Concept: Win in a Complex World describes the future operational environment as complex, which means that it "is not only unknown, but unknowable, and constantly changing." The concept states, "The Army cannot predict who it will fight, where it will fight, and with what coalition it will fight."

The Sustainment Center of Excellence, in its mission to understand the future and develop a sustainment force that can adapt for the future operational environment, recently completed its annual sustainment rehearsal of concept (ROC) drill. This year's drill was called the Freedom of Movement ROC Drill (FOMRD).

From May 16 to 20, 2016, more than 125 subject matter experts from across the institutional and operational Army gathered at Fort Lee, Virginia, to explore that future.

The ROC Drill

In 2013 and 2014, during the Global Logistics ROC Drill and the Globally Responsive Sustainment ROC Drill, the efforts were

very much focused on the sustainment warfighting function. In 2015 and 2016, the experiments were focused on understanding the implications of Army Warfighting Challenge (AWFC) 16. AWFC 16 challenges sustainers to set the theater, sustain operations, and enable freedom of movement in an austere environment over extended lines of communication.

In 2015, the Theater Opening ROC Drill focused on understanding the roles, responsibilities, and functions of Army forces opening the joint operational area within the task of setting the theater for the combatant commander.

The 2016 FOMRD explored the other two aspects of AWFC 16: sustaining operations and enabling freedom of movement. Using a fictitious Europe-based scenario set in 2030, participants were led through discussions with four objectives:

- Understanding the implications of conducting simultaneous joint combined arms maneuver and wide-area security.
- Identifying the unique sustainment requirements for Army special operations forces.
- Identifying the unique support requirements for Army aviation.
- Examining the challenges associated with sustaining small, widely dispersed units over extended distances.

These four objectives were broken out into eight themed vignettes that facilitated in-depth discussion over five days:

- Sustaining offensive operations.
- Mission command.
- Special operations forces and conventional forces sustainment interdependencies.
- Support area operations.
- Health readiness and casualty reporting.
- Reconstitution and reorganization.
- Retrograde and transition from operational phase 3 to phase 4.
- Distribution and materiel management.

Using the scenario and a terrain map, facilitators guided the discussions of the participants to answer questions related to the analytical objectives of the experiment. While most of the participants were physically at Fort Lee, the experiment was also distributed to the 11 Training and Doctrine Command (TRADOC) battle labs located throughout the continental United States.

The Sustainment Battle Lab and TRADOC Analysis Center–Lee formed the nucleus of the ROC drill's analysis team, which weighed the comments from participants and used analytics software to identify trends in the collected data.

At the conclusion of the event, the analysis team refined the data into key observations and insights for incorporation into a final report. The report had doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy (DOTMLPF-P) recommendations for follow-on implementation or further exploration.

Unique to this year's experiment was the inclusion of participants from the TRADOC Commanders' Forum as part of a facilitated senior-leader discussion.

Taking advantage of the presence of the TRADOC commanding general, his staff, and the commanding generals of the TRADOC centers of excellence, the Sustainment Battle Lab gained the perspectives of both action officers and senior leaders on problems that the Army will face in 2030 and beyond related to enabling sustained operations and freedom of movement.

Some of the key insights and takeaways from the ROC drill and senior-leader discussion follow.

> While the Army Operating Concept describes the future as unknown, unknowable, and constantly changing, one certainty for the future is that all units must be security enablers not security consumers.

Mission Command

The Army must beware of relying on digital systems without having contingency plans. Soldiers must understand manual and analog processes for when digital systems are no longer available.

The Army has made and continues to make significant technology investments in automating basic Soldier skills, mission command systems, and business enterprise systems. Many of these technologies are enabled by GPS or they are on networks that require GPS to communicate.

At the same time, the United States faces both state and nonstate actors that have increased their ability to interfere with GPS and are conducting persistent cyberattacks against U.S. forces and joint interorganizational and multinational (JIM) organizations.

To mitigate the threat to the Army's ability to conduct mission command and sustain forces, sustainers must be prepared to operate in a degraded cyber environment by understanding, planning, and training to execute manual processes.

The Army must also understand command and support relationships. In general terms, command and support relationships among Army units

have been misunderstood for a long time. Although they have been clearly documented in multiple doctrine publications, they are not understood. Soldiers use colloquial terms such as "hand-shake con" or "ride-along con" to describe doctrinal terms, such as general support, direct support, operational control, assigned, and attached, without fully understanding the implications.

The differences between Army and joint doctrine regarding command and support relationships compound the lack of understanding for sustainers. When nondoctrinal terms are used to describe support relationships, supported unit commanders lose confidence in their abilities to influence supporting organizations and direct command relationships.

In order to correct this learning and experiential deficit, the Army must ensure that leaders understand command and support relationships at all levels. It must also establish command and support relationships as part of the planning process and ensure that they are well understood by affected units.

The Army must also address the lack of interoperability among mission command systems and sustainment information systems. Sustainment information systems, such as the Global Combat Support System–Army, the General Fund Enterprise Business System, and the Integrated Personnel and Pay System–Army, must be interoperable in order to be integrated as part of a sustainment common operational picture.

Once a sustainment common operational picture is achieved, it must be synchronized and integrated into the Command Post Computing Environment to provide a commander with the true status of a unit on one system.

Security

The Army should increase organic convoy protection capabilities. While the Army Operating Concept describes the future as unknown, unknowable, and constantly changing, one certainty for the future is that all units must be security enablers not security consumers.

According to Lt. Gen. H.R. McMaster, the director of the Army Capabilities Integration Center, "Units must be capable of self-protection and be able to defeat anticipated threats. The future calls for a smaller, more agile force, and the Army may not be able to dedicate maneuver and maneuver support assets to protect convoys."

To mitigate level II and III threats and to make every unit a security enabler, sustainers must be proficient in convoy protection tasks and every sustainment vehicle must be a combat platform capable of engaging the enemy with direct fire. The FOMRD resulted in these recommendations:

- ☐ Identify sustainment requirements for weapon systems to increase lethality, generate security, and provide overmatch.
- ☐ Equip support units with combat platforms with enhanced armor and hostile fire detection with multispectral sensor suites, such as hard-kill and soft-kill active protection systems.

Regarding the first recommendation, the Joint Light Tactical Vehicle Capability Production Document, version 3.5, (which has been approved by the Joint Requirements Oversight Council) identified the requirement to be able to reach out to a stationary target at 2,200 meters with current, approved weapon systems. Armor improvements have been made against small-arms, roadside, and underbelly threats and include the ability to add additional armor as required.

Regarding the second recommendation, the Sustainment Center of Excellence proposed a force design update that provided sustainment units with organic convoy protection platforms; unfortunately, the force design update was returned for future consideration.

When the protection of enabling forces cannot be ensured through organic capabilities or through the maneuver force, future Army formations must be able to meet sustainment needs through demand-reduction technologies such as water from air, sustainable power, and other technologies that make the force more self-sustaining.

By reducing the demand for sustainment, it will be possible to amass the effects of sustainment without amassing sustainment personnel, thereby improving our security posture.

The Army also needs to consider the security of support area operations. The future requires sustainers to keep forces dispersed to avoid creating a high-payoff target for the enemy. This is a risk consideration for refuel on the move, maintenance collection points, flat rack exchanges, logistics release points, ambulance exchanges, and base cluster formations.

Dispersed units create a more robust intelligence-gathering network for mission command; effectively reporting data from a wide area has an intelligence crowd-sourcing effect that can improve situational understanding. However, widely dispersed units present challenges in preparing systems, forecasting supply chain requirements, and distributing supplies on the battlefield.

Another issue is medical evacuation through contested airspace. The future operational environment will not provide the military with assured, constant access to airspace. This may affect the Army's ability to perform aeromedical evacuation without exposing additional aircraft and crews to risk.

The inability to completely control airspace will result in significantly more ground evacuations and will require additional planning considerations. Although they are not supported by current policy, autonomous air and ground transportation capabilities may provide evacuation op-

tions with minimal risk to additional personnel.

Integration with JIM Partners

JIM partners are those military forces, government and nongovernmental organizations, and elements of the private sector with which the Army must plan, coordinate, synchronize, and integrate during operations. Potential roadblocks to integration and interoperability include a lack of common terms, the classification of information, the equipment fielded, and the capabilities of communication networks.

Although some JIM partners have independent supply networks, improved interoperability can lead to enhanced distribution, better use of resources, and synchronized effects. Interoperability continues to be a concept that requires more effort and resourcing. Developing common sustainment estimators and interoperable mission command systems is necessary to fully leverage partner capabilities.

Dependency and Readiness

As the Army's end-strength has declined, an increasing amount of the Army's enduring sustainment capacity has been met with operational contract support (OCS). The demand for contracted support on the battlefield has resulted in "contractor fratricide," or increased competition among JIM partners for contracted support; this has driven up contracting costs.

Another problem with OCS is the inability to clearly articulate requirements and a lack of coordinated planning. Planners must carefully balance the mix of military and contracted support to avoid mission failure. This is especially important when planning the transitions between operational phases 0 and 1 and between phases 3 and 4.

To improve a commander's ability to develop and integrate contract support requirements, the Combined Arms Support Command requested that TRADOC establish a capability manager for OCS.

The capability manager will be responsible for non-acquisition OCS capabilities development across the DOTMLPF-P spectrum. The capability manager will also integrate support from the Office of the Assistant Secretary of the Army for Acquisition, Logistics, and Technology regarding acquisition-related OCS issues and provide a single point of contact to coordinate DOTMLPF-P initiatives.

Over the past 15 years of operations in Southwest Asia, the Army has had to rely on contracted maintenance support in garrison for ground vehicles and aircraft. This reliance has resulted in Army ground and aviation mechanics not being fully trained or able to perform routine maintenance tasks. As the Army transitions to a peacetime or garrison Army, leaders will have to balance the use of contracted maintenance support with providing maintenance Soldiers with the opportunity to maintain their proficiency.

Reserve component dependency also has some implications. During the 2015 Theater Opening ROC Drill, one insight was the Army's dependence on Army Reserve and National Guard forces for the capabilities required to support expeditionary theater opening and early-entry operations.

It was noted that reserve component forces may lack training opportunities and resources, which can cause increased mobilization time lines. As a result of last year's efforts, 20 reserve component sustainment units were identified for increased resourcing, which will lead to improved early mobilization.

This year's exploration of sustaining operations and ensuring freedom of movement produced similar recommendations for maneuver support formations. The maneuver enhancement brigade (MEB), which is the Army's only functional and multifunctional brigade designed to own and manage terrain within the corps and division support areas, is found only in the Army Reserve and National Guard.

The MEB is responsible for providing mission command to synchronize maneuver support and protection for the supported command throughout the theater, corps, and division by conducting joint security area or support area operations. However, a lack of integration with the active component has resulted in the MEB's capabilities and missions being misunderstood by the active component force.

The insights and recommendation that resulted from the FOMRD will inform ongoing capability development activities, including the sustainment enterprise Force 2025 operational and organizational design concept and the AWFC 16 running estimate.

Additionally, as part of the Army's overall Force 2025 Maneuvers campaign of learning, the FOMRD will help to shape next year's sustainment ROC drill, which is tentatively planned for April 2017. The drill will explore contested distribution operations (seaports and aerial ports of debarkation through the theater, corps, and division support areas).

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Creating a European Network to Connect Multinational Formations

The 21st TSC's efforts to implement logistics systems and web-based applications on a common network led to the creation of a new dedicated mission network.

■ By Capt. Christopher O. Dorsey

Providing a centralized sustainment mission command structure to support the multinational effort known as Atlantic Resolve presents multiple challenges. Disparities in the various allied forces' structures, planning processes, operating procedures, communications systems, and military lexicons highlight a need to establish interoperability at every echelon, from the theater sustainment command (TSC) headquarters to forward deployed movement control teams.

Employing interoperable communications and mission command systems is critical to strengthening relationships with our allies. One of the 21st TSC's biggest challenges in supporting Atlantic Resolve was the development of a logistics common operational picture that allowed multinational commanders and staffs to visualize and understand capabilities and requirements in real time.

To overcome this challenge, the 21st TSC focused on implementing logistics systems and web-based applications on a common network that all stakeholders could easily access and use for collaborative sessions. After implementing several logistics systems, the 21st TSC used a new network: the Eastern European Mission Network (EEMN).

The Right Operating System

To facilitate mission command, the 21st TSC implemented several different systems, including the Battle Command Sustainment Support System (BCS3), Global Combat Support System–Joint (GCSS–Joint), Logistics Functional Area Services (LOGFAS), and Battlefield Information Collection and Exploitation Systems (BICES).

BCS3. The 21st TSC initially relied on BCS3, but the system quickly demonstrated that it was obsolete in today's multinational operational environment. The system could be used only by U.S. forces and attached allied partners. Because of that and because the Army discontinued its use after March 2016, BCS3 was dropped as a platform option.

GCSS–Joint. The 21st TSC developed working groups internal to U.S. Army Europe (USAREUR) and reached out to strategic partners, including the Army Materiel Command and the Defense Information Systems Agency. One system, GCSS–Joint, quickly took center stage.

GCSS–Joint offers an in-depth look at logistics and movements. It also provides real-time visibility of Soldiers across the battlefield. The system synchronizes the power of multiple pre-existing sources, including the Logistics Information Warehouse (LIW), while collating data from nine different fields: health readiness, deployment and distribution, supply, maintenance, logistics services, operational contract support, engineering, base and installation support, and planning.

GCSS–Joint fuses data sources to create a common operational picture for logistics, operations, and intelligence. It produces reports while simultaneously viewing battlefield conditions in real time.

The most important feature of GCSS–Joint is the system's availability through either the nonsecure internet protocol router network (NIPRNET) or the secret internet protocol router network (SIPRNET). However, the interoperability of this system ends at the joint level and does not carry over to a combined environment. NATO allies and partner nations cannot access the system.

Because integrating NATO communication and mission command structures were imperative for success in the European theater, GCSS–Joint's limited user network proved to be unsuitable. This forced the 21st TSC to continue its search for a mission command platform.

LOGFAS and BICES. LOGFAS became the next mission command option. It is a tool comprising three major subsystems: movement and transportation, logistics reporting, and a subcomponent that assists with resource planning. This system was specially developed to plan, coordinate, and monitor sustainment activities supporting military operations.

LOGFAS is accessible through both the NIPRNET and the SIPRNET. However, through a cross-domain solution, NATO allies can access the system and tie it into the NATO infrastructure through BICES.

BICES is an Office of the Under Secretary of Defense for Intelligence system that provides U.S. forces, NATO personnel, and other allied

military organizations with near real-time correlated, situational, and order of battle information.

As a standalone application, LOGFAS is a logistics tool designed by NATO for use with U.S. and other allied partners. When coupled with BICES, information can easily be shared with other NATO allies and partners.

While testing LOGFAS and BICES, the 21st TSC discovered that the BICES server infrastructure was only operational during approved NATO exercises. Therefore, information was only attainable when NATO exercises were underway.

However, a mitigating solution was developed to allow for cross-domain information dissemination. That solution was to email LOGFAS data from the NIPRNET to the SIPRNET and from the SIPRNET to BICES. This can be done without decreasing classification levels or creating information spillage.

Sgt. Andre Richardson from the 51st Transportation Company, 39th Transportation Battalion (Movement Control), 16th Sustainment Brigade, 21st Theater Sustainment Command, directs the loading of an M1A2 Abrams tank in Marijampole, Lithuania, on August 13, 2015. (Photo by Sgt. Bridget Cantu)

The Initial Interoperability Test

Last year, the 21st TSC participated in exercise Trident Juncture, a NATO-led exercise that involved 36,000 service members from more than 30 allied and partner nations. This is where LOGFAS received its most extensive use. However, the interoperability of LOGFAS with partner nations' systems was challenging.

System architecture is the most important function when designing a network. If system architecture is not fully coordinated and configured to support logistics requirements and capabilities prior to operations, the result is predictable: degradation of initial capabilities, development of nonstandard solutions, and less efficient support to operations.

Allies used several networks to access data, but interoperability between those networks did not exist. A lack of system interoperability affected readiness and posed a significant risk to mission success.

The solution required a single champion with the ability to bring together all of the players. In anticipation of future NATO and allied partner exercises, such as Anakonda 16, USAREUR filled that single champion role by developing one network to communicate with all players involved.

The EEMN

Department of Defense network-based infrastructures, primarily the NIPRNET and SIPRNET, have long empowered allied forces attached to U.S. formations to communicate with U.S. forces globally.

However, USAREUR developed the EEMN, a dedicated mission network, to enable allies to communicate through a single, specified network. This ensured interoperability and functionality of applications in support of host nations. This network is also tied into the 21st TSC's infrastructure, enabling the TSC to communicate in a combined environment.

The EEMN is a forcing function for mission command. This network encompasses a server-based application to ensure Army elements are displayed accurately on the battlefield while providing near real-time messaging for all allied forces. The network is available only during exercises and periods of real-world contingency support, but it allows organizations to continually test the network's capacity and capability to communicate with allies and partners.

The 21st TSC, USAREUR, and NATO have taken steps to enable mission command throughout the USAREUR area of responsibility through both hardware and web-based application research. The 21st TSC will continue to pursue options that improve interoperability and communication with NATO allies and partner nations.

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Sgt. Roderick Booker, a petroleum supply specialist with the 703rd Brigade Support Battalion, 4th Infantry Brigade Combat Team, 3rd Infantry Division, gives a class on issuing fuel to ground vehicles at Fort Stewart, Georgia, on June 25, 2014. (Photo by Sgt. Joshua Laidacker)

The Transformation of a BCT Through Excess Property Divestiture

Reorganizing a BCT and divesting its excess equipment is not an easy task; however, with proper planning and the correct system, it can be done while maintaining readiness.

■ By Maj. Charles L. Montgomery

Divesting excess equipment within Army units, regardless of structure and size, is not a new phenomenon. But because of recent force structure changes, organizations are managing an increased number of equipment transactions that exceed their organic capabilities. The Army sustainment community must construct a viable system to handle tasks associated with excess equipment divestiture.

In June 2013, it was announced that 10 brigade combat teams (BCTs) would reorganize. The 4th Infantry BCT (IBCT), 3rd Infantry Division, at Fort Stewart, Georgia, was designated as one of them. The reorganization entailed reflagging the 4th IBCT to the 2nd IBCT, adding the 1st battalion, 30th Infantry Regiment, as a third infantry battalion, converting the brigade special troops battalion to the 9th Brigade Engi-

neer Battalion, aligning the 1st Battalion, 9th Field Artillery Regiment, under division artillery, and adding two forward support companies.

The first major action involved scrubbing the brigades' modified tables of organization and equipment (MTOEs) for fiscal years 2014 and 2015. This process allowed the brigade to realize the magnitude of the mission and establish parameters to frame the operational approach. In the process, the 2nd IBCT added 1,237 pieces of equipment, cut 432 pieces of equipment, and divested more than 3,712 items of excess equipment worth approximately $52.7 million dollars.

The brigade established a permanent mission command element within the 2nd IBCT footprint designed to centrally locate all excess equipment. This facilitated a smoother transition of property. Centrally locating excess equipment created motor pool space so that battalions could add their fiscal year 2015 MTOE authorizations without experiencing space limitations.

The Divestiture Plan

The 2nd IBCT retained mission command to synchronize the activities of multiple organizations across Fort Stewart in order to create a shared understanding of its divestiture goals and external requirements. This structure allowed the brigade to achieve unity of effort based on that shared understanding. Over time, this reduced duplicate efforts and the amount of time wasted.

The mission command system used during this process was the Lead Materiel Integrator Decision Support Tool (LMI DST), an unclassified, web-based collaborative tool that guides stakeholders through the planning and execution of materiel distribution.

LMI DST is the Army Materiel Command's system of record for divesting excess equipment. All equipment identified for divestiture must be entered into LMI DST to initiate the vetting process.

Ensuring an organization's success means having multiple users who are trained on LMI DST and understand its intricacies. The Army Sustainment Command constructed a mobile training team at the 3rd Infantry Division's request. This team trained users at the battalion and brigade levels on how to operate LMI DST.

> To improve divestiture operations, the Army needs to establish an overarching structure with associated authorities to rapidly account for, process, ship, and adjudicate equipment transactions.

The brigade also solicited LMI DST training assistance from the division G-4 asset visibility team. The training targeted battalion S-4 noncommissioned officers and clerks to ensure each battalion had access to the system in order to manage their excess inventory.

The transitioning units had to answer the following five questions:

- ☐ Who will receive LMI DST training?
- ☐ Who will train the unit on LMI DST?
- ☐ How will the unit help the property book office (PBO) handle significant transaction increases?
- ☐ Who will consistently interface with the division G-4 asset visibility team?
- ☐ How will the unit assist the supply support activity with turn-ins and materiel release orders without interrupting daily unit supply operations?

Executing the Plan

The execution phase started when personnel began relocating identified equipment to the 2nd IBCT excess yard, where a reception team of subject matter experts identified, inspected, sorted, and determined the final location of equipment before its entry into the yard.

The PBO conducted an in-depth analysis of all identified equipment labeled excess. During this process, the PBO identified legacy equipment and placed priority on cross-leveling it with more modern equipment that would remain within the organization.

Prior to entering equipment into LMI DST, the PBO had to certify that the equipment was not needed within its organization. If equipment was needed in subordinate battalions, the PBO simply generated an internal lateral transfer. Once a final determination was rendered on truly excess equipment, it was loaded into LMI DST to begin the vetting process.

PBOs and battalion S-4s were required to understand that if the proper documentation was not entered into LMI DST, the equipment was not vetted and remained at the brigade level. Once the equipment met the qualifications, the division G-4 asset visibility team verified and cross-leveled equipment throughout the division before submitting it higher for further vetting.

Ideally, battalion S-4s have access to LMI DST to monitor equipment that has received disposition instructions. The brigade S-4 should create a tracker by directly pulling the data from LMI DST to ensure the brigade remains on a glide path to meet its divestiture goals. However, individual unit supply sergeants are ultimately responsible for making turn-in appointments at logistics readiness centers.

During the execution phase, conducting routine and consistent

stakeholder meetings is essential. Stakeholders have a vested interest in the unit achieving success. Also, the Army benefits when equipment transitions on time from installation to installation because it improves the unit status report ratings of gaining organizations.

Managing Assessments

Continually assessing units' progress ensures that units divest equipment within a reasonable time frame. The 3rd Infantry Division G-4 held a monthly meeting that covered multiple facets of division logistics. In particular, it covered equipment divestiture from a macro perspective. During the meeting, brigade executive officers and brigade S-4s were responsible for briefing current, overdue, and projected statuses of equipment identified for divestiture.

One of the brigade S-4's concerns was how vast and time-consuming the mission was. A brigade S-4 rarely receives additional personnel for such missions. Therefore, the S-4 had to manage the expectations of the brigade executive officer and the battalion and brigade commanders while balancing operational requirements with divesting excess equipment. The brigade S-4 had to be willing to refine the plan and reallocate resources as necessary.

Establishing time lines will serve as a great indicator on how well or poorly the brigade is accomplishing its divestiture goals. LMI DST will assign a suspense for every equipment transaction, and the brigade S-4 should create a mechanism that alerts battalions when equipment reaches its 90-, 60-, and 30-day windows to ensure the established suspense is accomplished.

Finally, company commanders, supply sergeants, and PBOs must make an effort to clean property books as the organization transitions. Multiple second- and third-order effects occur if the property books are not accurate. These effects include low equipment-density file percentages, increased overdue maintenance services, and increased financial liability investigations of property loss because of a lack of equipment accountability.

Over the course of this divestiture, the 3rd Infantry Division had coordinating authority with most of the enablers. However, over time this authority became inconsistent. Also, during the preliminary planning of BCT restructuring, units should be aligned and issued direct liaison authorized.

For example, the brigade had a battalion that transitioned from being combined arms to light infantry. The combined arms battalion issued all of its equipment to another battalion on a different installation; however, no backfill was identified to replenish the battalion's light infantry equipment set.

Research proved that the battalion receiving the combined arms battalion equipment transitioned from being a light infantry battalion. So why not align these two units from the start? This is just one issue an established divestiture infrastructure could solve.

To improve divestiture operations, the Army needs to establish an overarching structure with associated authorities to rapidly account for, process, ship, and adjudicate equipment transactions.

A logistics convoy from D Company, 703rd Brigade Support Battalion, 4th Infantry Brigade Combat Team, 3rd Infantry Division, conducts an ammunition resupply mission on June 25, 2014, at Fort Stewart, Georgia. (Photo by Sgt. Joshua Laidacker)

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Soldiers operate a fuel point at Fort Hood, Texas. Logistics readiness centers provide a variety of fuel to operate all types of Army vehicles. (Photo by Jon Michael Connor)

What the Army Sustainment Command Does for Readiness

■ By Chief Warrant Officer 5 Billy Jackson

The Army Sustainment Command (ASC) is the "face to the field" for field- and sustainment-level maintenance. ASC has battalions, brigades, logistics readiness centers (LRCs), logistics support teams (LSTs), and brigade logistics support teams (BLSTs) located around the world and uses them to help improve equipment readiness.

LRCs at major installations can perform maintenance on most equipment in the Army, including everything from tanks to lawnmowers, radars to radios, and missile launchers to 9-millimeter pistols.

Field-Level Maintenance

Field-level maintenance is the foundation for keeping equipment ready. With thousands of Army civilians, contractors, and Soldiers, ASC supports and performs field-level maintenance through LRCs, LSTs, BLSTs, Army field support battalions and brigades, and the Distribution Management Center (DMC).

LRCs. ASC uses 64 LRCs to perform field-level maintenance for organizations that do not have the capability or capacity to perform scheduled and unscheduled maintenance. During a period from 2010 to 2013, LRCs reset more than 100,000 pieces of rolling stock and performed services and unscheduled maintenance on more than 75,000 pieces of equipment that were enrolled in the left-behind equipment program.

BLSTs and LSTs. The first contact that units have with the Army Materiel Command's logistics enterprise is through one of the ASC's BLSTs for modified table of organization and equipment units and through an LST or Army field support battalion for table of distribution and allowances organizations.

A BLST synchronizes acquisi-

tion, technology, and logistics while providing logistics and maintenance support to a brigade combat team and the units in its area of responsibility.

The BLST ensures warfighting readiness by resolving maintenance and supply issues. It provides on-site assistance for training, force modernization, and materiel fielding and technical, maintenance, and logistics support forward in brigade combat teams' deployed areas of operations.

An LST has some of the same capabilities as a BLST. During combined training center rotations, LSTs support BLSTs and other organizations that do not belong to a BCT.

The DMC. The DMC is made up of four divisions: supply, operations and mobility, distribution integration, and materiel readiness.

The Materiel Readiness Division (MRD) and Installation Logistics Directorate (ILD) perform most of the maintenance analyses and assist in the validation of maintenance operations and requirements in support of LRCs, Army pre-positioned stocks, equipment for predeployment training, and equipment that has been specially issued to ASC because of maintenance issues. The MRD's focus is to ensure these programs meet an equipment readiness rate of 90 percent.

To ensure the LRCs were performing quality maintenance, from May 2015 through May 2016, the MRD analyzed more than 850,000 passback maintenance work orders from major commands and activities around the world.

Sustainment-Level Maintenance

The ILD is responsible for oversight and management of the LRCs. The LRCs' primary maintenance mission is to perform field-level maintenance, but some also perform sustainment-level maintenance for the National Maintenance Program. The MRD assists the ILD with performance-based analysis of the LRCs. The analyses are used to determine workload and manpower balance, resource requirements, and ensure Army regulations and policies are upheld.

The LRCs at Fort Sill, Oklahoma; Fort Hood, Texas; Fort Campbell, Kentucky; and Joint Base Lewis-McChord, Washington, all perform sustainment-level maintenance. In fiscal year 2016, these organizations repaired more than 14,000 items, including generators, engines, transmissions, heaters, and wheel assembles, in support of the wholesale supply systems.

> Field-level maintenance is the foundation for keeping equipment ready. With thousands of Army civilians, contractors, and Soldiers, ASC supports and performs field-level maintenance through LRCs, LSTs, BLSTs, Army field support battalions and brigades, and the Distribution Management Center.

Logistics Information Warehouse

The MRD uses several logistics information systems (LIS) to track and analyze equipment readiness. The Logistics Information Warehouse (LIW) is the go-to source for analyzing maintenance data.

The LIW houses several critical tools that maintenance personnel need to succeed, such as the Materiel Common Operating Picture, the Modification Management Information System, the Army Oil Analysis Program, Federal Logistics Data, and data from test, measurement, and diagnostic equipment. These tools are used to determine if there is a supply or maintenance issue that is affecting the readiness rate. The MRD also uses the Army War Reserve Deployment System and the Global Combat Support System–Army for equipment readiness analysis because the information contained in these systems is not currently available in the LIW.

Most echelon-above-brigade organizations use LIW to check their subordinate units' readiness. LIW is the Army's official repository for maintenance data. Company, battalion, and brigade maintenance officers must reconcile unit LIS info with LIW data. Higher headquarters do not have access to the subordinate unit's LIS if the unit is still using the Standard Army Maintenance System. What is displayed or printed from the LIS may not be what LIW is displaying, so leaders may see a different readiness rate.

ASC's subordinate organizations are the first level of entry into Army Materiel Command's worldwide enterprise system for modified table of organization and equipment units and table of distribution and allowances organizations. Using Army field support brigades and battalions, LRCs, LSTs, and BLSTs is a sure way to increase readiness in your organization.

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Soldiers from the 261st Ordnance Company and civilians from McAlester Army Ammunition Plant, Oklahoma, load missiles onto flatbed trailers during Operation Golden Cargo in June 2011. (Photo by Sgt. Ferdinand Thomas)

Making the MOST of Mobilized Ordnance Specific Training

Joint Munitions Command facilities provide ordnance units with training that they could not accomplish otherwise. Expanding this program would provide greater benefits.

■ By Col. James Groark

In 2007, ammunition platoons often needed six months to become proficient in their ordnance tasks because they lacked hands-on predeployment training. To fill this training gap, the Joint Munitions Command (JMC) led an initiative to improve the readiness of deploying ammunition units using mobilized ordnance specific training (MOST). Since its implementation, MOST has successfully closed the training gap for proactive ammunition units that have taken advantage of hands-on training at ammunition depots and from JMC's skilled civilian workforce.

However, recent lessons learned in Afghanistan and Kuwait have identified a lack of hands-on ammunition training prior to deployment. This gap remains because of a shortage of rigorous, realistic exercise platforms for the Army's 60 modular ammunition platoons—42 of which are in the reserve component.

These findings should trigger the ordnance community to reinvigorate and expand the MOST program in order to provide ordnance Soldiers with the skills required to win on tomorrow's battlefield. When a Soldier is in contact with the enemy, nothing is more valuable than ammunition.

Reinvigorating MOST

Expanding MOST would create a synergized training partnership that

A Soldier from the 163rd Ordnance Company, an Army Reserve unit based in California, stencils ammo boxes as part of mobilized ordnance specific training at Blue Grass Army Depot, Kentucky.

incorporates the expertise and resources of JMC, the Defense Ammunition Center, the Combined Arms Support Command, the Ordnance School, First Army, the Army National Guard, and the Army Reserve.

For example, the Defense Ammunition Center and the Combined Arms Support Command would provide lessons learned from the current fight and requirements for the future fight that would be incorporated into MOST training events. This would ensure units stay abreast of current training and wartime requirements.

The Ordnance School has designed a 96-hour "Ammunition Crucible" that will soon be available through the Combined Arms Training Strategy planning tool. The training event provides tasks, conditions, and standards for ammunition units setting up operations in an austere environment and executing core mission-essential tasks.

First Army will advise, train, and assist MOST training to achieve readiness requirements directed by the Department of the Army. In other words, the best of the institutional training domain combined with challenging, wartime replicative hands-on missions will provide the Army's modular ammunition platoons with training opportunities that are not available at home station.

A Two-Phased Approach

MOST consists of a two-phased approach: munitions individual sustainment training (MIST) and munitions unit sustainment training (MUST). (See figure 1.)

MIST allows individuals and small teams of ammunition specialists to support JMC missions while receiving tailorable training on critical individual munitions tasks. These tasks include ammunition storage, shipping, accountability, and stock control.

MIST is available throughout the year at participating JMC depots such as Tooele Army Depot (TEAD), Utah; McAlester Army Ammunition Plant, Oklahoma; Crane Army Ammunition Activity, Indiana; and Blue Grass Army Depot, Kentucky. It is a win-win opportunity when these JMC depots partner with ammunition units that are close by. For minimal transportation cost and administrative effort, ordnance Soldiers can sharpen their individual skills while supporting the local depot's mission requirements.

MUST builds upon MIST and provides modular ammunition platoons with an annual or capstone event designed to increase collective proficiency on mission-essential tasks. JMC facilities accommodate unit training plans based on the commander's training objectives. The technical training available includes explosives safety, supply stock control, storage procedures, surveillance, blocking and bracing, loading operations, materials handling equipment, inventory, maintenance, and firefighting.

What MOST Can Accomplish

The MOST expansion would build multi-echelon, joint training events in a field environment. Opportunities exist to synchronize functional munitions training at JMC depots with other collective training events such as Nationwide Move, a logistics mission that transports excess ammunition between JMC-managed installations. Integrating joint and interagency training audiences with ammunition units

eliminates the potential for stovepiped training and increases opportunities for mission command at all echelons.

An excellent example of the potential of MOST is Operation Overblast, an exercise conducted by the 13th Combat Sustainment Support Battalion in April 2015 at TEAD. The unit provided mission command for the 60th Ordnance Company, which conducted multiple collective and individual tasks in a field environment while directly supporting TEAD's mission workload.

The commander's training objectives achieved by the 60th Ordnance Company included the following:

- ☐ Deployed assets from Joint Base Lewis-McChord, Washington, to TEAD.
- ☐ Exercised mission command as part of an expeditionary task force.
- ☐ Conducted ammunition logistics support and interagency training with TEAD personnel.
- ☐ Supported TEAD in preparing major munition shipments (50-plus containers) to Korea, Australia, Japan, and other areas requiring support.
- ☐ Augmented the TEAD fire department and conducted specialized search and rescue training.

The 63rd Ordnance Company commander said that Operation Overblast provided a true collective training event that focused on munitions skills that are rarely accomplished at home station and barely addressed during combat training center rotations.

Training Resources

A one-stop shop for units requesting MOST opportunities resides with the JMC Army Reserve Element Detachment located at the JMC headquarters at Rock Island Arsenal, Illinois. The detachment provides nationwide coordination among all components for MUST missions at JMC depots. In addition, the Mission Analysis, Readiness and Resource Synchronization system provides units with the capability to search for, review, and nominate units for ordnance and ammunition collective training events. This tool is located at https://mobcop.army.mil/MARRS/default.aspx.

The reserve component personnel assigned to the detachment are ready, reliable, and skilled Soldiers that allow JMC to expand its global support to the warfighter and provide individual and collective training opportunities at 14 JMC depots by leveraging Soldier augmentees.

The Army's 60 modular ordnance platoons require more functional training opportunities. The Army cannot create adaptive, skilled, and trained munition sustainers without enough exercises and collective training that mirror the functional complexity of modular ammunition platoons' wartime missions.

If mandated and fully funded, MOST would fill the individual and collective training gap. The combination of expanding MOST opportunities, Army Reserve collective training exercises, and combat training center rotations delivers the required balanced approach to ensure the Army's munition sustainers win on tomorrow's battlefield.

Examples of MIST/MUST Training	
Standard Examples	Advanced Examples
Munitions familiarity	Stock development and review
Field storage and handling	Sustainment information systems
Store, issue, and receive	Advanced demilitarization
Inventory and accountability	Nonstandard munitions
Materials handling equipment	Effects
Compatibility	Rotary-wing and rail operations
Explosives safety	Advanced explosives safety
Vehicle and container inspections	Weapon platform familiarity
Blocking, bracing, and tie-down	Munition master gunner training
Standard Army Ammunition System–Modernization	Electrical safety and high-energy retaining ordnance

Figure 1. This chart lists examples of mobilized ordnance specific training, which includes munitions individual sustainment training (MIST) and munitions unit sustainment training (MUST).

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Soldiers from the 701st Brigade Support Battalion conduct lateral transfers to on-post units at Fort Riley, Kansas. (Photo by Lt. Col. Bradley Nelson)

Inactivation: An Opportunity for a Major Logistics Training Event

Inactivating the 4th Infantry Brigade Combat Team, 1st Infantry Division, provided unique training opportunities for logisticians and allowed the unit to become a force multiplier for deploying units.

■ By Lt. Col. Joseph M. Colacicco

In June 2014, the 4th Infantry Brigade Combat Team, 1st Infantry Division (ID) (4/1 IBCT), received formal notice that it was to begin inactivation as part of force restructuring. The order directed an inactivation date of June 15, 2015.

However, because the unit was assigned as an Army contingency force and as the regionally aligned force to Africa, it was required to maintain readiness through February 2015. To accommodate these responsibilities, Forces Command allowed 4/1 IBCT a 90-day extension. By June 15, the 4/1 IBCT was required to draw down to a provisional unit that would remain to close out all personnel and equipment actions by September 15.

The Plan

The 4/1 IBCT's plan for inactivation included the same lines of effort that all inactivating units follow: training and operations, equipment divestiture, personnel divestiture, and facilities transfer.

The 4/1 IBCT was required to draw down to 10 percent of its 3,400 Soldiers (340) and 30 percent of its

52,000 pieces of equipment (15,600) by June 15, 2015.

By reviewing the after-action reviews of several units, brigade leaders determined that equipment divestiture was the keystone of the inactivation process. Equipment divestiture required personnel, which drove facilities requirements.

Previously when units inactivated, battalions and companies worked to divest their equipment and left junior officers as provisional commanders to close out the brigade's personnel and equipment actions. This structure allowed units to maintain leadership continuity throughout the process, and each unit remained responsible for divesting its own equipment.

The 4/1 IBCT would instead maintain the structure of an existing unit in order to smooth the transition to the provisional phase. The IBCT would close all but one company and one battalion unit identification code (UIC) by June 15, 2015. Equipment would be maintained by a cohesive unit under its regular headquarters. The reduction in overhead would allow 4/1 IBCT to meet the mandated 90-percent reduction on time.

The primary purpose of the strategy used by 4/1 IBCT was to gain effective use of personnel in order to maintain multiple units and centralized control of the logistics involved with the inactivation. The 4/1 IBCT commander designated equipment divestiture as the decisive operation for inactivation and named the 701st Brigade Support Battalion (BSB) as the main effort for the brigade.

Task Organization Changes

Funneling the equipment through the BSB required changes to both the brigade and BSB task organizations. So on Jan. 4, 2015, the attachment of the forward support companies to their supported battalions ended, and they reintegrated into the 701st BSB and assumed a direct-support relationship.

This provided the BSB commander with the flexibility to draw down his unit and consolidate his low-density military occupational specialty Soldiers, such as mechanics and automated logistical specialists, while still supporting the brigade.

Additionally, the commander attached the supply support activity (SSA) to the field maintenance company designated to control all equipment divestiture operations. These efforts facilitated unity of command and established necessary relationships well before the brigade's transition to a provisional status.

> At every level in the brigade, Soldiers and leaders relearned the basics of property accountability, transfer procedures, the need for inventories, maintenance operations, SSA operations, and transportation planning.

Establishing the BSB support operations fusion cell was the most critical event in preparing for turn-ins. The fusion cell served as the BSB commander's entity to provide oversight of equipment divestiture.

Under the control of the BSB support operations officer (SPO), the cell consisted of SPO entities and representatives from the brigade property book office and transportation section, a brigade S-6 technical expert, and a liaison officer from each battalion.

The fusion cell controlled the workflow, planned and organized transfers, tracked transfer status, monitored and coordinated with on-post agencies, and provided visibility for the brigade and BSB commanders. This cell essentially served as the materiel management center for the brigade during the inactivation process.

Early Actions

Because of the 4/1 IBCT's requirement to maintain readiness through February 2015, its battalions began taking actions early to prepare for inactivation. Beginning in July 2014, Soldiers worked to ensure all of their excess equipment and non-mission-essential modified table of organization and equipment items were entered into the Lead Materiel Integrator Decision Support Tool (LMI DST). (LMI DST is the Army's database for vetting lateral transfers and issuing directives.) These early actions allowed the brigade to divest more than 10,000 items before January 2015 and reduced the brigade's equipment by nearly 20 percent.

In January 2015, large-scale unit turn-ins to the BSB began. The battalions remained responsible for completing the transfer of all equipment that had valid LMI DST transfer directives. The remaining equipment was transferred to the BSB. This left a workload of just over 31,000 property book items for the 701st BSB's SSA.

Equipment Intake and Prep

On Jan. 9, 2015, mass equipment turn-ins to the BSB began based on unit priorities set by the brigade commander. Each company had a turn-in day with appointments scheduled Tuesdays through Thursdays. The BSB used Mondays and Fridays for internal SSA operations and overflow from prior appointments.

Additionally, flex days were built in to the schedule to accommodate potential shifts caused by mission or training requirements. The battalions' liaison officers met each day in the fusion cell to provide turn-in estimates, work special cases, and adjust the schedule.

The turn-in requirements were simple: clean each piece of equipment in accordance with Army guidance.

Units turn in rolling stock to the 701st Brigade Support Battalion at Fort Riley, Kansas, as part of the equipment divestiture process leading up inactivation. (Photo by 1st Lt. Kaitlyn Anderson)

Since all of the mechanics reverted to the BSB in January 2015, technical inspections were not required.

Once received in the SSA, the equipment was inspected and required parts were ordered. Each piece was categorized as "ready for transfer" or "held for maintenance" and put into storage. With the consolidated workforce in the BSB, the SSA received up to 1,400 pieces in a day, adding more than 30,000 pieces of equipment to the SSA hand receipt by March 30.

Equipment Divestiture

During the turn-in phase, the SPO fusion cell, the property book office, and the 1st ID G-4 ensured all equipment was loaded in LMI DST and monitored the vetting and receipt of disposition instructions. Equipment took only three paths out of the SSA: lateral transfer, turn-in to Defense Logistics Agency Disposition Services (DLA DS), or depot turn-in.

Lateral transfers. Lateral transfers were the most difficult to execute. They required the equipment to be at the highest standard of the three divestment paths. They also required coordination of schedules between different units and meticulous inventories to ensure gaining units properly signed for and posted the equipment to their property books. The BSB handled on-post lateral transfers like any other lateral transfer within the 1st ID.

Off-post lateral transfers required management by a "slingshot" (a property-away team). Each team consisted of a slingshot officer-in-charge (OIC), a supply specialist, and other specialty personnel, if required. The slingshot OIC ensured all paperwork was prepared correctly prior to shipment, packaged the shipment, and coordinated with the gaining units. If the shipment contained sensitive items or was valued at more than $10,000, the OIC escorted the equipment and conducted a face-to-face transfer with the gaining unit.

The S-3 developed a concept of operations for each off-post transfer, and the BSB tracked each as diligently as it would any tactical operation. This positive control facilitated the posting of the signed lateral transfer documents by the property book officers and minimized loss of visibility.

DLA DS turn-in. Equipment vetted for turn-in to DLA DS was the easiest to execute, but it had the highest volume of the three divestiture pathways. The turn-in process involved assigning a dedicated team to execute three turn-in appointments each week from February through the first week of September.

These turn-ins included not only property book items but also class II (clothing and individual equipment), class VII (major end items), and unserviceable class IX (repair parts) that had accumulated in 4/1 IBCT over the course of multiple deployments. Locking in three appointments per week for six months enabled a constant flow rather than a large surge.

Depot turn-in. The final and most interesting path for equipment was depot turn-in. The 701st BSB conducted throughput shipments straight to the depots instead of flooding the Fort Riley Logistics Readiness Center with equipment or relying on a DLA Demand Data Exchange Customer Collaboration team for help near the end of the process.

Depot turn-ins were handled in the same way that off-post lateral transfers were. Shipping equipment directly from the 701st BSB and sending an escort to accompany it had the same result as escorting off-post lateral transfers. The depots allowed the slingshot OIC to schedule a turn-in appointment and provided the appropriate personnel for the items list provided by the OIC. Army depots and

chemical materiel activities were very responsive and processed equipment within hours of its arrival.

Meeting the End State

The final two months of inactivation was a period of intense management that focused on the divestiture of the last 8,500 items remaining in the IBCT. The 701st BSB conducted daily meetings on the status of shipments and receipt of disposition instructions.

With more than 3,000 items still awaiting disposition in mid-July, the BSB commander directed the SPO to send lists of on-hand equipment to the Army Materiel Command item managers in order to receive direct disposition instructions.

Between this directive and the 1st ID G-4's push to receive disposition for heavy vehicles, the brigade ended up having less than 120 pieces of rolling stock that had not been divested by August 15. These items were transferred to the 1st ID Sustainment Brigade along with an OIC and a team of mechanics who would complete divestiture once disposition instructions were received.

On Sept. 15, 2015, the inactivation mission was successfully completed when the last 23 Soldiers in the 701st BSB were transferred out of the unit and the UIC was closed.

Inactivation Lessons Learned

Sustainers can learn several lessons from this highly successful operation.

Equipment divestiture can be a force multiplier. The decision to consolidate equipment into the BSB allowed for the transfer of Soldiers to units with critical shortages well before the June 15 inactivation date. By moving the equipment out of the units, entire companies were able to inactivate and Soldiers were made available for transfer to 1st ID brigades that required manpower for upcoming deployments.

By mid-May 2015, only nine of the original companies and battalions remained in the brigade. On June 2 only 238 Soldiers remained, under one company UIC and one battalion UIC, to execute equipment divestiture. If 4/1 IBCT had followed the model that previous units had used, there would have been between six and 20 UICs, each with an OIC, noncommissioned OIC, a supply clerk, an administrative clerk, and other personnel.

Inactivation is primarily a logistics operation. If equipment is the center of gravity, then inactivation is a logistics operation. The key tasks are core logistics competencies both at the unit level (with supply transactions and inventory procedures) and at the BSB SSA level (with receipt, storage, maintenance, distribution, and materiel management).

Planning for the BSB to serve as the provisional unit ensured that the brigade's logisticians were locked in to execute the operation. Any battalion headquarters can handle the oversight of remaining Soldiers and equipment, but only a support battalion has the expertise and background to seize opportunities with depots and item managers to rapidly divest equipment.

Inactivation is a logistics training event. At every level in the brigade, Soldiers and leaders relearned the basics of property accountability, transfer procedures, the need for inventories, maintenance operations, SSA operations, and transportation planning. Moving one piece of equipment out of the brigade touched on all of these tasks, and the 4/1 IBCT had the opportunity to execute 52,000 moves.

The BSB logisticians had the opportunity to truly manage a logistics operation. Employing the SSA and mechanics, coordinating cross-country shipments, escorting equipment to depots, and working with item managers are not daily tasks in a support operations section in garrison, and many BSB Soldiers do not do these tasks while deployed.

The logisticians also learned how to constantly be on the lookout for more efficient ways to execute these tasks. For example, the SPO coordinated with the installation transportation office to allow all shipments to depart directly from the SSA instead of the logistics readiness center; this reduced the number of times a load was touched from three to one.

Inactivation requires a proactive approach. Units cannot be afraid to contact item managers and coordinate with depots. This is not advocating for every company in the Army to contact item managers and depots; however, BSB support operations sections should not be afraid to do so.

Prior to modularity, coordination like this was done through the division materiel management centers, and this task was intended to move into the BSB. It works, it is efficient, and it allows a brigade combat team to meet its logistics requirements. Some might say that it is nondoctrinal; the 701st BSB argues that it is just doctrinal throughput.

From its receipt of mission in July 2014 until successful completion in September 2015, the 4/1 IBCT responsibly transferred 3,400 Soldiers and 52,000 pieces of equipment. Critical to meeting the assigned mission was properly identifying the key problem, divesting equipment, reorganizing early, funneling equipment through the BSB, and leaving the right leaders and Soldiers in place to see the inactivation to its conclusion.

Lt. Col. Joseph M. Colacicco is an assistant professor at the Command and General Staff College's School for Command Preparation at Fort Leavenworth, Kansas. He commanded the 701st Brigade Support Battalion through its mission to inactivate the 4th Infantry Brigade Combat Team, 1st Infantry Division, at Fort Riley, Kansas. He holds a master's degree in logistics management from the Air Force Institute of Technology, and he is a graduate of the Quartermaster Basic Officer Leader Course, the Combined Logistics Captains Career Course, the Support Operations Course, the U.S. Army Force Management Course, the Command and General Staff College, and the Joint Petroleum Seminar.

The Logistics Estimation Workbook: 18 Years and Counting

■ By Lt. Col. Damian A. Green

The Logistics Estimation Workbook (LEW) provides an automated sustainment planning tool focused on brigade combat teams. It is designed to improve the logistics estimation process during planning and orders development, and it can be tailored for all phases of an operation.

The LEW uses doctrinal profiles and usage rates to calculate supply, maintenance, transportation, and casualty estimates. The planning factors used in the LEW mirror those used by operations logistics planners, by the Combined Arms Support Command's Planning Data Branch, and in the Theater Sustainment Battle Book. Additionally, experiences from multiple support operations officers have been included to keep the planning tool relevant.

Since 1998, the support operations community has turned to the LEW for help in planning estimates for logistics requirements at the tactical level. This "home grown" tool was developed by a former instructor for the Support Operations Course at Fort Lee, Virginia.

The LEW, a simple Microsoft Excel spreadsheet-based tool, quickly became popular with Combined Logistics Officers Advanced Course students. Over the years, the tool has been added to the programs of instruction for the Logistics Captains Career Course, the Support Operations Course, and other logistics courses.

Since its inception 18 years ago, keeping the LEW up-to-date has been the responsibility of the user community. The LEW is a compilation of tools that draws from Army logisticians' experiences. As the user community faces a new challenge and develops a tool or method to address it, the LEW is modified to share the technique.

For instance, during a National Training Center deployment, a brigade combat team's S-4 and support operations officer provided the basis of the tentage and latrine worksheet using the Central Command Sand Book as a guide.

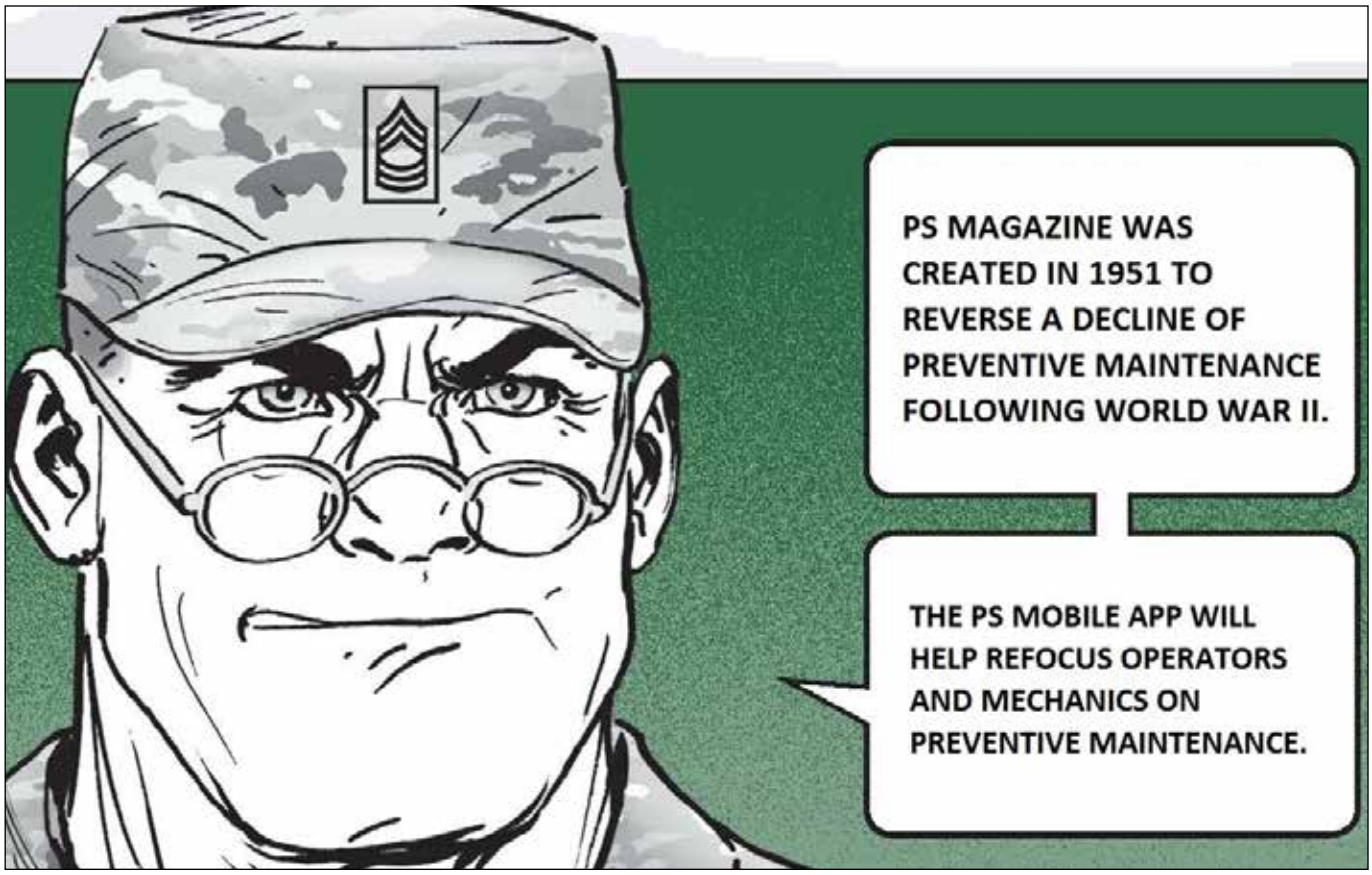
This was expanded during an Iraq deployment in which concrete, trash, and gray and black water planning capabilities were added. A new G-1/G-4 battle book highlighted the need to capture a units' lift and haul capabilities, so that was added to the LEW as well.

Multiple critiques of the shortfalls of automated logistics planning tools in articles and monographs resulted in the addition of truck equivalents and an integrated synchronization matrix. The critical requirement for extending the life of the LEW is that Soldiers continue to share experiences and products.

There is always room for improvement. Planning tools, especially ones that are not tied to live data, are not going to address every situation. These tools do not understand cultural nuances or real-world changes. With your insights, they can improve planning by giving you information to combine with your knowledge, your training, and your integrated plan with your maneuver counterparts.

Lt. Col. Ray Ferguson discusses the benefits of using automated planning tools for sustainment planning during a P934 course.

Lt. Col. Damian A. Green is a G-4 staff officer. He holds a bachelor's degree in education from Providence College and master's degree in supply chain management from the University of Kansas. He is a graduate of the Infantry Officer Basic Course, the Combined Logistics Officers Advanced Course, the Combined Arms and Services Staff School, the Support Operations Course, Intermediate Level Education and the School of Advanced Military Sciences.



Master Sgt. Half-Mast McCanick shares some PS Magazine *facts.*

PS Magazine Launches Mobile App

After 65 years in print, the popular preventive maintenance magazine is switching its focus from print to mobile distribution.

■ By Jonathan W. Pierce

The Army has relied on *PS, The Preventive Maintenance Monthly* (known as *PS Magazine*) since 1951 to publish a monthly technical bulletin small enough for Soldiers to carry in their uniform pockets. The magazine delivers concise maintenance information, reports on changes in national stock numbers for repair parts, and sometimes preventive maintenance information that is not yet available in other technical publications.

PS Magazine has printed 767 issues in 65 years. But today, the magazine's readers prefer mobile media over printed publications. That is why *PS Magazine* has created a mobile app to connect with readers.

The app was demonstrated during the Spring Association of the United States Army symposium in Huntsville, Alabama, where readers were able to access PDFs of January 2014 through March 2016 issues through Apple and Android mobile apps. In June, interactive issues from March through June were added, and issues continue to be added to the app as they are published.

The PDF issues within the app load to digital devices much faster than the PDFs from the magazine's website. Links to URLs and email addresses for points of contact are active, and some articles link to videos.

Information that needs to get to the field fast will be in the app's hot topics within days of its availability. Other resources that contain long-lasting, useful information, such as ground and

aviation guide signals, will be available in app resources.

Emphasis on Maintenance

During the Army's numerous deployments to Iraq and Afghanistan, maintenance was often a task performed by civilian contractors. This freed up mechanics and maintainers to increase unit combat power. Now units are spending more time at their home stations, and maintenance is once again the task of the Soldiers who are trained as mechanics, armorers, and communication repairers.

Mid-grade Soldiers may not have much experience in their maintenance specialties. Their company and battalion commanders may not have held weekly battalion maintenance meetings. The Army is pushing to bring maintenance back as a fundamental task for operators, unit maintainers, senior noncommissioned officers, warrant officers, lieutenants, and commanders.

The goal of unit maintenance and sustainment actions is operational readiness, equipment availability, Soldier safety, and maintenance cost reductions. Company and battalion commanders must wrestle with maintenance daily and report on it monthly. Maintenance occurs despite the unit training, formations, taskers from higher headquarters, and the awards, promotions, and disciplinary actions that enhance esprit de corps and unit cohesion. The Army helps maintainers by providing technical manuals (TMs) and bulletins, lubrication orders, modification work orders, and safety of use messages.

However, commanders cannot read all of the TMs for their units' weapons, vehicles, gear, and equipment. For many maintainers, the length of an operator-level TM is daunting. Further exasperating the efforts of Soldiers returning to a maintenance environment are out-of-date technical publications for which print funding is unavailable.

Worse, some publications have incorrect or missing information. Additionally, Army equipment TMs can be complex. Besides electrical, drive train, and engine components of a vehicle chassis, a separate TM may be required for the main weapon system.

Remaining Relevant

While the magazine is reducing the number of copies it prints, there are no immediate plans to cease printing the publication.

Anecdotal comments by general officers tell us that *PS Magazine* played an essential role in helping them when they served as platoon leaders and company commanders. Some would read the magazine and then use the information to inspect unit equipment, leaving mechanics to wonder how their leaders knew so much. Others have insisted that operators and maintainers read the magazine not only to help them in their current work but also as a continuing education opportunity.

Experienced maintainers know preventive maintenance cannot be done by memory. Hidden lube points are often overlooked, and there are things that look like lube points but are not supposed to be lubed. There are also drain plugs that should be open sometimes, but not other times. Getting the right tension for tracks on combat vehicles requires specific procedures so that the track is not too loose or too tight.

TMs have more specific information in them than *PS Magazine* could publish in a year. Nevertheless, the magazine is a tool that can help keep your maintenance know-how current, your equipment running, and your passengers and cargo safe. And Soldiers will find PS to be an easy read; it is direct, concise, and often humorous.

PS Magazine is a tool that belongs in your toolkit. Its information is official and has been approved by equipment proponents. In print or in the mobile app, *PS Magazine* can go with you wherever you go. The mobile app is available in the Apple App Store and through Google Play.

The March 2016 issue of PS Magazine *(back and front covers shown above) was the first interactive issue published in the new mobile app.*

Jonathan W. Pierce is the supervisory editor of *PS Magazine*. He holds a bachelor's degree in psychology from the University of Maryland and a master's of fine arts degree in creative writing from Wilkes University. He is a retired Army master sergeant and a graduate of the Defense Information School Basic Journalism Course, Newspaper Editors Course, and Intermediate Photojournalism Course.

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I certify that the statements made above by me are correct and complete:

Fred W. Baker III, 26 August 2016

Let's Talk!

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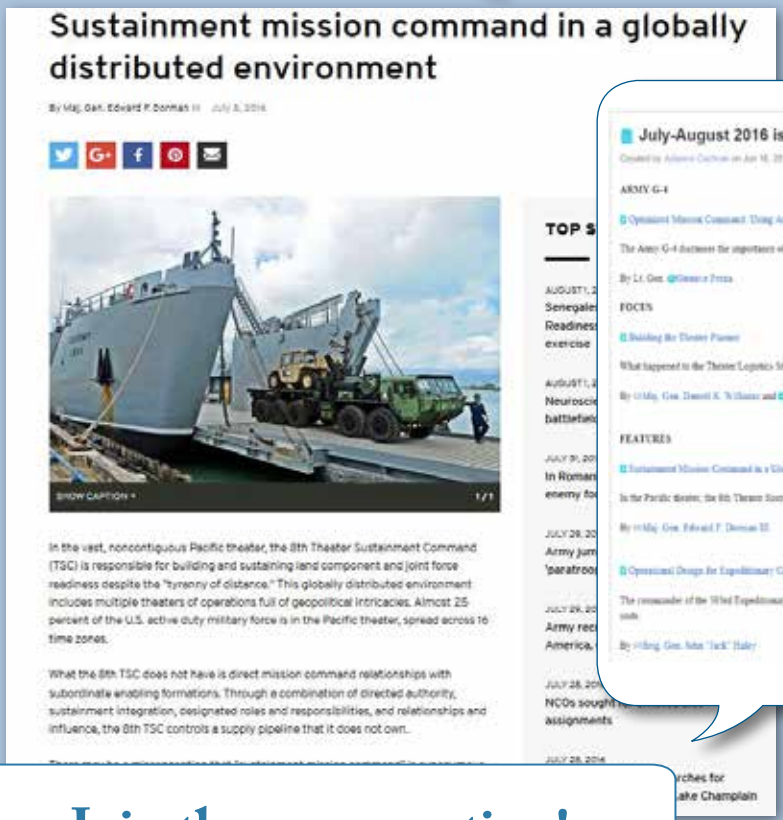

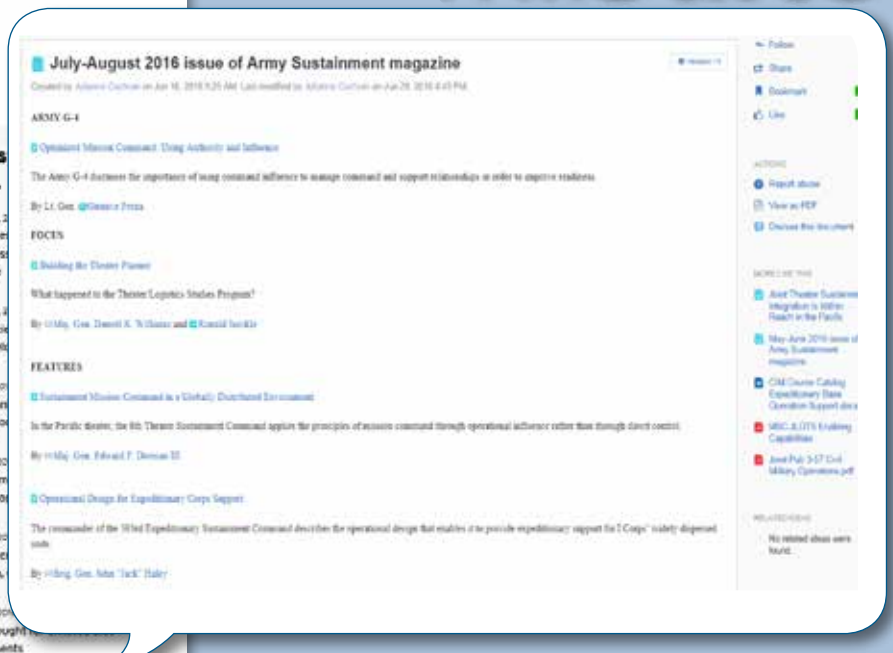

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Exchange KNOWLEDGE, LEVERAGE Expertise and Share EXPERIENCES

Sustainment Knowledge Centers

The Sustainment Knowledge Network (SKN) is a platform for rapidly disseminating and integrating sustainment information and knowledge among Sustainers within the Generating and Operating Forces. It is an enterprise-level "One-Stop-Shop" that gives you access to live video conferencing via SKN-Live, as well as archived conferences for information/training purposes. Utilize Knowledge Centers (KCs) developed to address the needs of Sustainers (OD,TC,QM, SSI and ALU), access logistics and sustainment lessons learned and tools designed specifically to improve the processes of sustainment organizations across the full spectrum of the Army's operational construct. SKN links all aspects of Sustainment and Logistics which provides the means to rapidly produce, share and respond to the critical knowledge needs of our Soldiers and DoD Civilians whenever and wherever needed.

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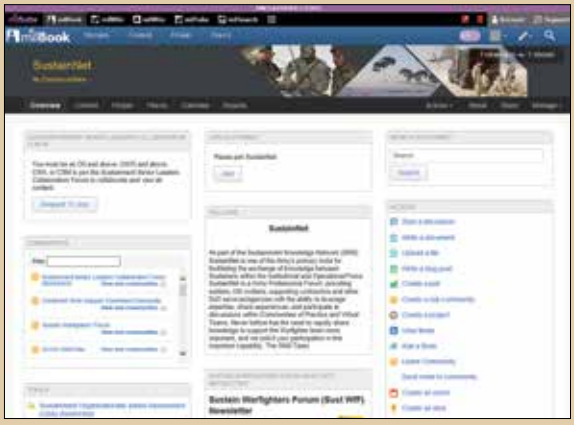
SustainNet

SustainNet is one of the Army's primary tools for facilitating the exchange of knowledge between sustainers within the Generating and Operating Forces. SustainNet is an Army Professional Forum, providing Sustainment and Logistics Soldiers, DoD Civilians, supporting contractors and other DoD services/agencies with the ability to leverage expertise, share experiences and participate in discussions within Communities of Practice and Virtual Teams. In our current resource-constrained environment, it is more important than ever that we take advantage of the knowledge that we have gained from our collective and individual experiences. Come join the conversations on SustainNet.



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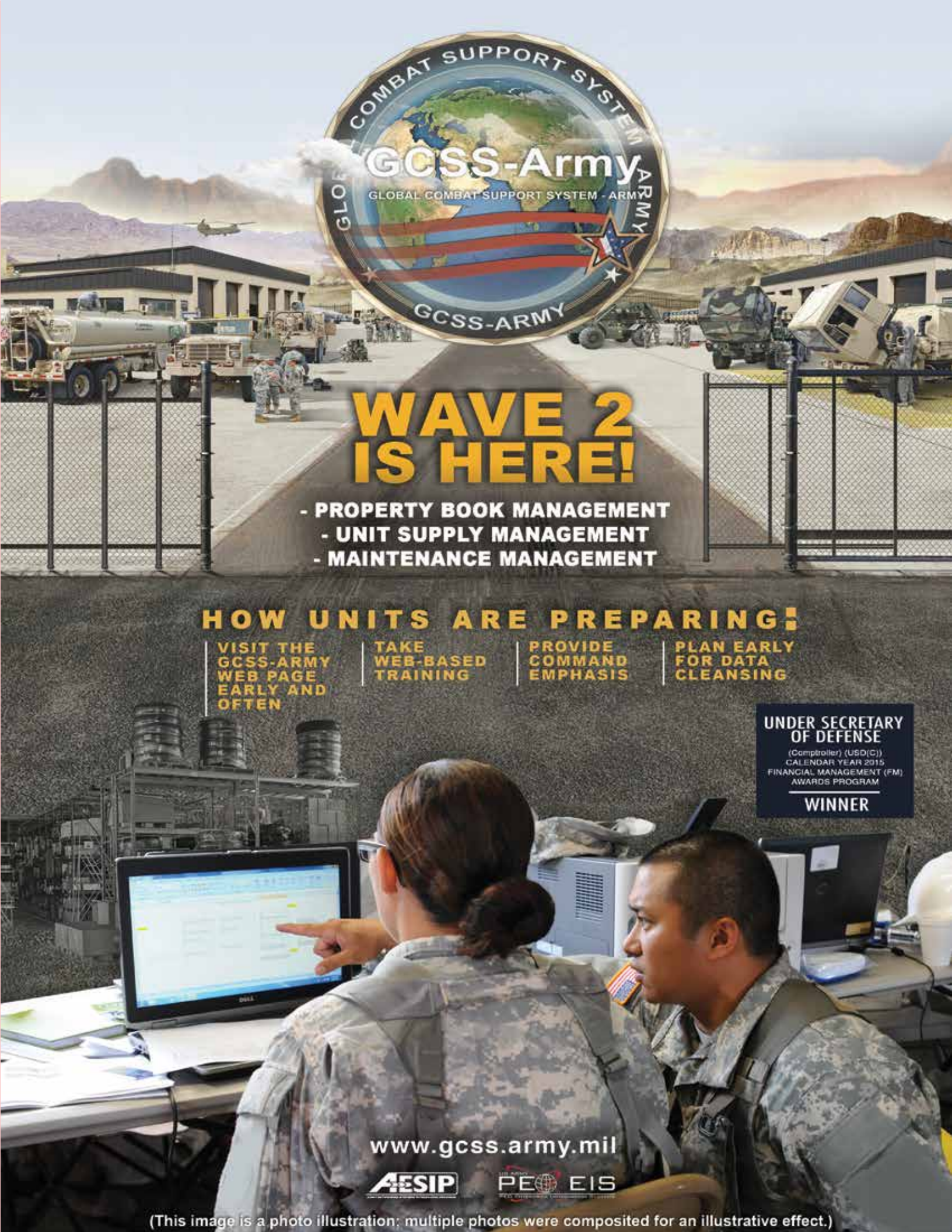
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Spotlight On

Sgt. Wesley Todd, with the Illinois Army National Guard's 333rd Military Police Company, checks the measurements on a device he invented that makes it easier and safer for Soldiers to remove a seized howitzer muzzle break while repairing or maintaining the guns. The idea for the device was submitted through the Combined Arms Support Command's Supply and Maintenance Assessment and Review Team (SMART) program and has been adopted by the Army. It is scheduled to be manufactured and distributed to maintenance organizations Armywide. The purpose of the SMART program is to streamline and improve unit-level logistics support through a single-source logistics suggestion program. (Photo by Staff Sgt. Robert Adams)

SMART
SUPPLY AND MAINTENANCE ASSESSMENT AND REVIEW TEAM
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