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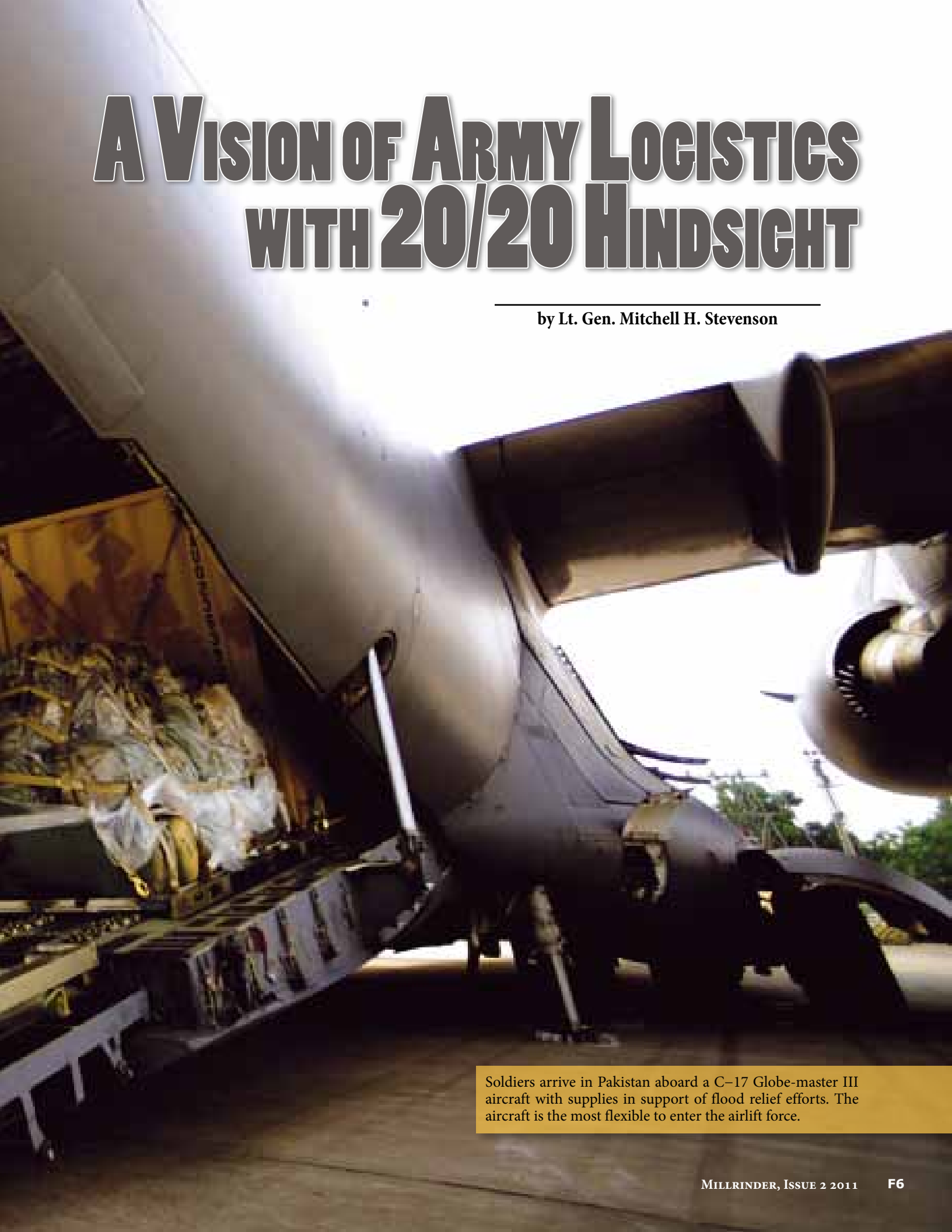
A Vision of Army Logistics with 20/20 Hindsight

by Lt. Gen. Mitchell H. Stevenson



Soldiers arrive in Pakistan aboard a C–17 Globe-master III aircraft with supplies in support of flood relief efforts. The aircraft is the most flexible to enter the airlift force.

In the late 1990s, we spent quite a bit of time trying to envision what Army logistics would look like in 2010. There was considerable discussion of the need for a "Revolution in Military Logistics." The idea gained momentum, strongly influenced by the Army After Next project and by the emerging requirements associated with supporting the new brigade designs that began to develop. During his tenure as the Army Chief of Staff, General Pete Schoomaker established a task force that was given a blank sheet of paper to "revolutionize" logistics, leveraging all the work that had been done to date.

Now, looking back 10 to 15 years, how'd we do? What still needs to be worked on? And what did we miss entirely?

The events of 11 September 2001, the wars in Iraq and Afghanistan, and 32 deployments diverted our attention from transformation somewhat. However, overall progress has been, I think, substantial. We have leveraged the great work produced in earlier years and incorporated lessons learned from 9 years of combat to give us a very, very capable logistics force. Feedback from the field indicates that logistics transformation is working well, but we know we will never get things exactly right and must continue to adapt.

Our new capabilities were not dreamed up overnight—they were the result of years of study, debate, and experience. Furthermore, many of the principles that drove strategists back then generally remain valid today and will drive us in the future. Uncertainty, disorder, and fluidity will continue to characterize battlefields, and logistics must adapt accordingly.

What happened to the Revolution in Military Logistics that began in the late 1990s? The events of 9/11 and the wars in Iraq and Afghanistan introduced barriers to some changes, but overall progress has been substantial.

At a very high level, logistics transformation was about a concept of support for modularity that leverages joint and strategic partners. It created modular organizations that support full-spectrum operations; enhanced our theater-opening and force-reception capabilities; and developed a single Army logistics command and control capability at echelons above brigade that provides joint-capable options to the combatant commander.

With the Army Force Generation process, we also changed the way we generate forces—standardizing capabilities in Active and Reserve components to deliver a steady stream of trained and ready capabilities and centralizing what might be termed strategic reach back through the integration of industry and strategic partners in the national sustainment base, all while helping to scale back

A mechanic at Anniston Army Depot, Alabama, dismantles an M88 recovery vehicle. Army depots and arsenals have won 26 highly-coveted Shingo Awards for production and manufacturing excellence in the last 5 years.

Into the Future

The Army's Functional Concept for Sustainment

by Maj. Gen. James L. Hodge

These are exciting times for all the members of the sustainment community. Over 24 months ago, the Army re-wrote its Capstone Concept, which in turn created the need to rewrite the Army's Functional Concept for Sustainment. This rewrite, and all that it entails, is a major priority for the Army Combined Arms Support Command (CASCOM).

The past 8 years have provided valuable insights and observations concerning how we, as sustainers, conduct sustainment operations in support of the joint fight in the new operating environment. The Army Capstone Concept (Army Training and Doctrine Command [TRADOC] Pamphlet 525–3–0) and the Army Operating Concept (TRADOC Pamphlet 525–3–1) have changed the previous direction in which the Army was heading by acknowledging that the basic nature of war has not changed.

Despite our advances in technology, uncertainty re-mains a constant in the operational environment, and our dominance as warfighters will continue to force our adversaries to blend in with the local population, causing us to operate in complex and urban terrain.

As an expeditionary Army, we must be able to deploy to the fight, operate over extended distances, and deal with anti-access and area denial challenges, all while conducting distributed operations. We will also have to sustain all phases of full-spectrum operations, often simultaneously. Sustaining the future force in an era of persistent conflict, under conditions of uncertainty and complexity, requires an adaptive and versatile sustainment framework that is capable of maintaining the force's freedom of action.

The new TRADOC Pamphlet 525–4–1, The United States Army

Functional Concept for Sustainment 2016–2028, approved in October 2010, expands on the ideas presented in the Army Capstone Concept and the Army Operating Concept and describes the functional capabilities required to sustain the future force while conducting full-spectrum operations. Sustaining future Army forces in austere environments, often at the end of extended lines of communication, requires a logistics network capable of projecting and providing the support and services necessary to ensure freedom of action, extend operational reach, and prolong endurance.

However, if the logistics network is to be successful, future Army forces must decrease the demand-side characteristics of the force. Those decreases will serve to reduce the strain and frequency of resupply operations. In support of this approach, TRADOC Pamphlet 525–4–1 serves as a foundation for future force development pertaining to sustainment and the sustainment warfighting function.

I foresee the greatest impact of the new Sustainment Functional Concept to be on our greatest resource, our sustainment leaders and Soldiers.

Concept development leads change for the Army and drives the development and integration of future capabili-ties. It also provides a framework for analysis, readiness assessments, prioritization, and feedback. The CASCOM team is conducting a number of efforts to hone future required capabilities in the Army Functional Concept for Sustainment by including a sustainment functional capabilities-based assessment (CBA) and conducting a number of organizational-based assessments (ObAs).

Our CBA looks across the 21 functional areas within the sustainment warfighting function and identifies gaps and solutions that enable us to accomplish our sustainment mission in the most appropriate and resource-informed manner. With

or reduce the deployed footprint.

The 1990s Vision of Logistics 2010

How did we get to this point? In the late 1990s, the thinking was that because of the expeditionary nature of Army operations—with forces deployed abroad for extended periods of time in locations with little infrastructure or lines of communication (LOCs)—we would require a fundamentally different view of sustainability. Indeed, that has been the case in Afghanistan and Iraq.

Back then, the premise of the joint operational concepts was that the key operational challenge would be to gain access to a theater, establish a sustaining capability, and establish a logistics footprint that not only could be smaller but would also take into account the social and political realities of the countries where the Army would deploy. That, too, has been the case.

Our goal was to "evolve a seamless logistics system that ties all parts of the logistics community into one network of shared situational awareness and unified action." To pursue that endeavor, we set goals for three domains: force sustainment, force projection, and technology application and acquisition agility.

Force sustainment

We wanted a single logistics system that would be more predictive and responsive. This was to be the single most important factor in laying the foundation for information supremacy and situational understanding.

Force projection

The focus here was on the need for lighter yet more powerful landpower systems that were easier to deploy globally, at lower cost, and with greater speed; strategic prepositioning of equipment and materiel to reduce initial air and sea transport requirements; and deployment of task-organized, modular logistics organizations to support initial combat operations.

Technology application and acquisition agility

The key here was the integration of technology and acquisition processes to work at reducing the physical size of our systems. The goal was to find materials that are lighter, stronger, and more reliable and consume less fuel, along with streamlining the process to quickly and cost-effectively acquire materiel and services necessary to maintain readiness, transition to war, and sustain combat operations.

What Has Come To Fruition?

Let's start at the top. One of the most significant changes has been the movement away from a division-centric force to the modular brigade combat teams and echelons-above-brigade units of today. Modularity has created a major change for logisticians in how we are organized and conduct operations. Overall, we've done a pretty good job of adjusting to the new organizations; functions; tactics, techniques, and procedures; and mis-

your support from the field, we are evaluating our theater sustainment command, expeditionary sustainment command, sustainment brigade, and explosive ordnance disposal formations dur-ing the ObAs to develop and refine critical required capabilities, gaps, and solutions for the Army and the sustainment community.

However, we are not developing the Sustainment Functional Concept in a stovepipe. We have successfully integrated our concept and CBA effort with the Army Capabilities Integration Center and the other TRADOC centers of excellence. This past winter, I had the opportunity to provide an assessment briefing to the Army Chief of Staff on our Sustainment Warfighting Functional Concept with the five other warfighting functions to ensure an integrated and mutual supporting approach to the future.

I foresee the greatest impact of the new Sustainment Functional Concept to be on our greatest resource, our sustainment leaders and Soldiers. We will emphasize cultural awareness, operational adaptability, and the practice of mission command to our Soldiers at all echelons. Well-trained and informed Soldiers will be our most versatile resource, while training and education will serve to create operational adaptability at the individual and small-unit levels. Sustainment Soldiers will be capable of reacting to unforeseen changes, operating in a degraded network, and making decisions at the lowest level.

By the time you read this article, we will have completed our important work on the current edition of the Army Functional Concept for Sustainment, we will be about to complete the Sustainment Functional CBA, and we will start the revisions of the next editions of the Army Operat-ing Concept and the Army Functional Concept for Sus-tainment. Throughout our efforts, your involvement has proven instrumental to our success, and I value your con-tinued input and look forward to hearing from you on these vital and important concepts for our sustainment community.

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sion roles. Combat service support (CSS) within modularity has done exactly what it was designed to do: sustain combat operations in two theaters without mission shortfall.

Force Sustainment

Admittedly, we have not yet achieved our vision of a Single Army Logistics Enterprise (SALE), but we are well on our way with technological advancements that significantly impact operations. The Army Materiel Command's Logistics Modernization Program leads the way, having just launched its final deployment. The Global Combat Support System-Army (GCSS−A), which involves the reengineering of 12 legacy Army logistics processes, is not far behind, operating near its full functionality in a limited-user test with the 11th Armored Cavalry Regiment at Fort Irwin, California. With the SALE, we will finally achieve a web-based, integrated enterprise solution that enables materiel readiness and provides asset management and accountability, acquisition compliancy, and financial transparency.

As we move toward realization of the SALE, we continue to look for ways to replace legacy systems and applications. In the last five years, we've cut the Army's standing repository for information technology investments by 80 percent. By centralizing the Army corps/theater automated data processing service centers at a single site, we reduced the Army's tactical supply system footprint, reduced network traffic, enhanced response time, and saved 115 manpower slots that were returned to the force pool.

Two other information-related technologies have been implemented and are greatly enhancing force sustainment: very small aperture terminals and item unique identification.

Very small aperture terminals (VSATs) use commercial satellite technology to deliver the networks to warfighting sustainment units. Network communications can now be provided for up to 40 tents, vans, or shelters within a 7- by 7-kilometer area using wireless bridging between nodes. All CSS units now have connectivity organic to their units. VSATs have been, and will remain, a game changer for Army sustainment.

Item unique identification (IUID) represents a significant step in improving asset visibility and will enable the life-cycle management of end items and major components like never before. Initial results in the 160th Special Operations Aviation Regiment indicate a potential for a 50-percent reduction in digital arms-room inventory, issue, and receipt times, as well as a reduction in transaction times in automated tool rooms, aviation life support equipment management, and organizational clothing and individual equipment management.

Technology has transformed Army logistics. With this very small aperture terminal, warriors in remote locations have a wireless ability to send in their orders.

For deployment and in-theater distribution management, the Transportation Coordinator's Automated Information for Movements System (TC−AIMS) is on line and working well. The decision to adopt the Air Force's Cargo Movement Operation Systems (CMOS) in place of blocks IV and V of TC−AIMS will be helpful. The Movement Tracking System (MTS) also continues to evolve; it now incorporates an ability to read active radio frequency identification tags on the cargo being carried by MTS-equipped trucks, thus eliminating the need for fixed interrogator networks.

In-transit visibility has continued to mature. As we move cargo out of Iraq, into Afghanistan, and back to the continental United States (CONUS), we're able to see where the cargo is all the time; that is unlike Operation Desert Storm, where we had little-to-no visibility of cargo shipments and zero "in the box" visibility. In some instances, we also are using sensor technologies to address the condition of items, along with pilferage and intrusion of containers. And our commercial carriers are using satellite transponders to identify and track cargo.

Several improvements have been made in distribution. Velocity management has gone from an idea to a routine way of doing business, reducing average customer wait time for outside CONUS air shipments from 21 days in 1994 to just 13 days in 2010. We are leveraging the Defense Logistics Agency's forward distribution depots to gain further efficiencies. The Army stood up the Army Sustainment Command, bringing together the power of our strategic and joint partners in the national sustainment base and extending that power forward into Afghanistan and Iraq.

We are collaborating with system product managers to demonstrate a condition-based maintenance capability to monitor health indicators of our more complex weapon systems. We've already equipped over half of the Army's manned aircraft fleet with the ability to collect essential maintenance data from components and transmit that information off-platform. Thus far, this has extended the time between overhaul on 22 parts, eliminated almost 5,000 maintenance events, improved more than 125 maintenance procedures, and enhanced safety through avoidance of at least three class A mishaps.

We continue working to implement a common logistics operating environment (CLOE), which comprises a fully-integrated suite of Army logistics information technologies and processes that fuse network-centric data-sharing and sensor-based self-reporting systems within the Army's LandWarNet construct in support of multifunctional logistics operations.

Innovation also has been brought to distribution in the tactical and operational spaces through improved aerial resupply options, including both high- and low-altitude resupply systems. Joint precision airdrop systems are used at 20,000 feet and above; at lower altitudes, low-cost low-altitude systems are used at 150 to 500 feet above the ground. Testing of another system, free-drop packaging (for altitudes below 100 feet), is ongoing.

In Soldier protection, significant enhancements have been made over the past decade, particularly in body armor. The same can be said for Army combat helmet capability enhancements, such as fragmentation protection, increased Soldier comfort, and helmet sensor internal mounts.

Warfighter feedback has driven improvements in field feeding. We developed and continue to enhance unitized group rations (UGRs), simplifying and streamlining the process of providing high-quality meals to the Soldier in the field. The first UGR, introduced in 1995, maximized use of commercial items, significantly reduced line-item requisitioning, eased preparation and assembly, and reduced the logistics footprint.

Various improvements have continued to the present. For example, in 2005, we replaced the unitized B ration, which had 200 meals on 1 pallet, with the UGR−B, which offers 400 complete meals (also in 50-serving modules) on a pallet; this effort reduced the overall cost of the ration by reducing components by more than 65 percent. In 2007, we introduced "UGR−Express," a complete self-contained, self-heating group meal for up to 18 Soldiers operating in remote areas.

As these food improvements were being made, we also designed the First Strike Ration, an eat-on-the-move assault meal designed for short durations of highly mobile and high-intensity combat operations. Each First Strike Ration contains a day's supply of food, averaging a total of 2,900 calories, while at the same time reducing the Soldier's load. One ration, in place of three daily meals, ready-to-eat, saves 49 percent in weight, 55 percent in

space, and 22 percent in costs.

We also are looking at improvements in battery use. Use of rechargeable batteries is increasing, with some units using them 90 percent of the time during dismounted operations. Modular brigades of all types are now able to leverage many of the benefits of rechargeable batteries, and we are now examining policy and training recommendations that provide for their use, when practical, as the preferred method of powering end items.

Force Projection

It is in this domain that the greatest improvements have occurred. We have significantly enhanced our throughput and capacity at power-projection installations. For example, whereas the railhead at Fort Hood, Texas, in years past had a 4-spur railhead with no supporting facilities, today it has a 240-railcar railhead, a 300-railcar classification yard, a 45,000-square-yard marshalling yard, and the capability to deploy 240 to 320 railcars per day. Similar improvements at the Fort Lewis, Washington, rail and logistics facility have provided a capability to deploy 240 railcars per day. And there are many more such examples.

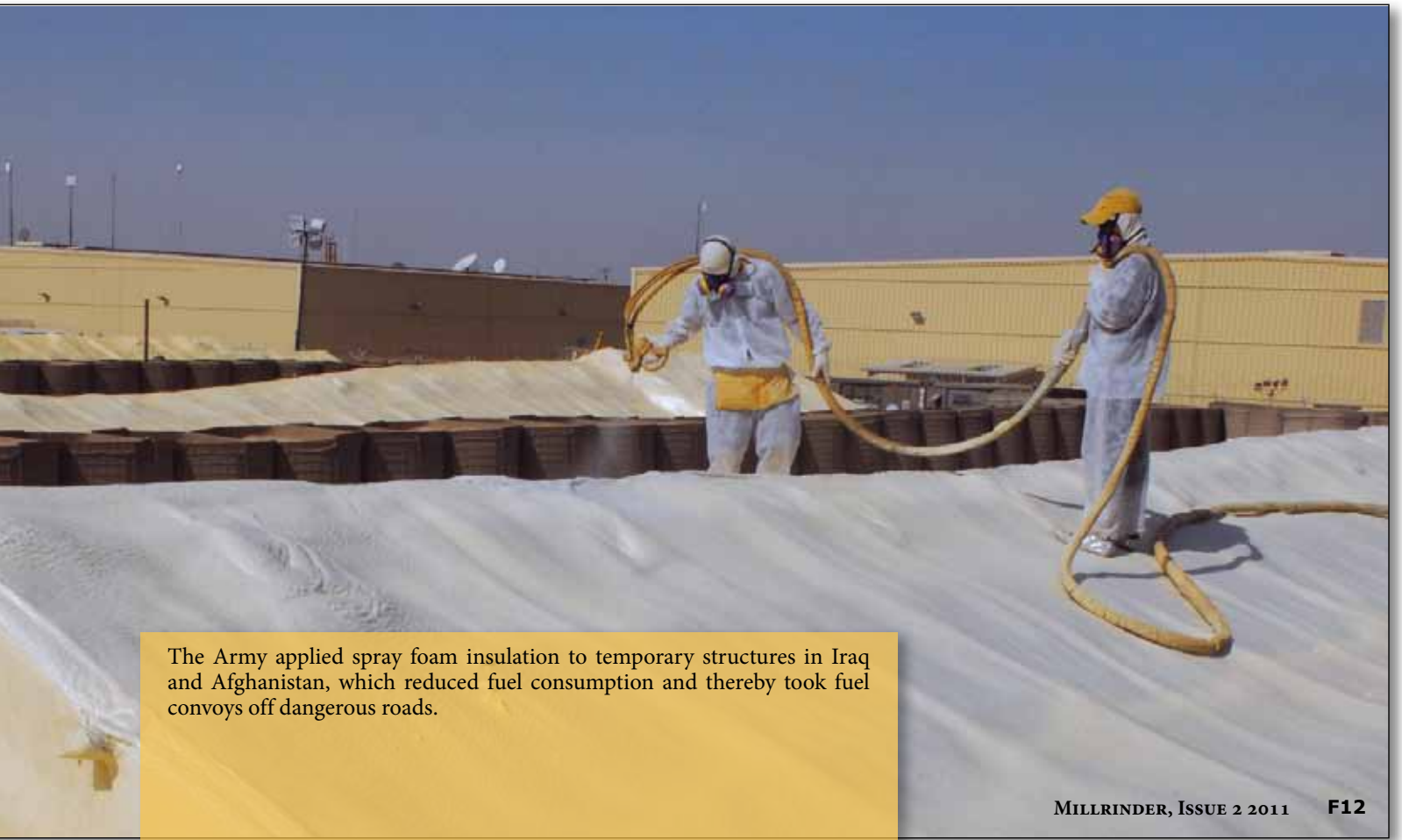
At the joint level, we now have a "Distribution Process Owner," resulting in a stronger relationship among the Defense Logistics Agency (the supply arm of Department of Defense logistics), the U.S. Transportation Command, and the services. The outcome has been better planning, execution, and control of global distribution operations.

The C−17 Globemaster III, the most flexible cargo aircraft to enter the airlift force, has replaced the C−141 Starlifter as our principal cargo lifter. It is capable of rapid strategic delivery of troops and all types of cargo to main operating bases or directly to forward bases. The C−17, designed to provide direct delivery of cargo loads to austere airfields, has been used extensively in Afghanistan. It can land with payloads of up to 160,000 pounds on austere runways as small as 3,000 feet by 90 feet.

Technology Application and Acquisition Agility

Significant accomplishments have also been made in this domain. Sensors are being used to report real-time status of critical items; diagnostics and prognostics can sense pending system failures, requisition parts, and schedule repairs; smart munitions are enabling materiel mass to be decreased; and artificial intelligence and intelligent agents are helping logisticians to perform analytical and judgmental tasks.

In acquisition reform, we have increased the use of electronic commerce; conducted privatization and outsourcing of non-core capabilities; increased the use of commercially contracted maintenance and services; and implemented the use of performance or commercial instead of military specifications



The Army applied spray foam insulation to temporary structures in Iraq and Afghanistan, which reduced fuel consumption and thereby took fuel convoys off dangerous roads.

where appropriate.

We made great progress in how we conduct business operations through implementation of the Single Stock Fund and National Maintenance Program while adapting to a Materiel Enterprise that will support broader efforts that lead to a balanced Army, better business processes, shorter cycle times, and reduced costs.

At a time when the Army's energy costs have continued to rise, we have embarked on a strategy to help achieve, over time, less energy consumption, which will ultimately take fuel convoys off dangerous LOCs. In the short term, the Army has done such things as applying exterior spray foam insulation to temporary structures in Iraq and Afghanistan, which reduces fuel consumption for heating and cooling by 50 percent.

Technology also has improved the way water is produced on the battlefield. In Iraq and Afghanistan, 1,500 gallon-per-hour tactical water purification systems are in use, as are 125 gallon-per-hour lightweight water purification systems. And water re-use technology is now used in all of our laundry and shower units.

For the past five years, the Army has been able to sustain in Iraq and Afghanistan ground equipment readiness rates of greater than 90 percent. Our military industrial base production, for example, is twice as high as pre-war levels, and it is now at the greatest output since the Vietnam War. Our depots and arsenals are world class. In the last five years, they have won 26 Shingo Awards (what some call the "Nobel Prize" for production and manufacturing excellence). They have reduced costs, increased productivity, and gained efficiencies—all while our Nation is at war.

As part of our logistics transformation, we also have gone from a four-level to a two-level maintenance system, supported and enhanced by the creation of Army field support brigades forward on the battlefield. It's the sum of all these improvements that has been a game changer for maintenance support.

ATLAS DROP, an annual joint aerial-delivery exercise sponsored by U.S. Army Africa, brings together U.S. servicemembers with counterparts from the Ugandan People's Defense Forces, and is designed to enhance the readiness of both countries' resupply and logistical capabilities. The two-week training from April 11-21, will consist of classroom instruction and a field training exercise. AD11 will increase the capability of both UPDF and U.S. forces to resupply Soldiers operating in remote areas.

Many new technologies are being developed to reduce demands on manpower; improve the efficiency of logistics support; and improve reliability, maintainability, sustainability, and operational readiness. These include next-generation wireless communications that can significantly enhance the visibility of Army assets; robotics technologies that can perform repetitive, dangerous, or difficult work that humans cannot perform well or would not want to perform; micro-electrical mechanical systems that can track temperature, humidity, and vibration so they can monitor shelf-life and environmental factors affecting assets; and such things as the Hellfire Captive Carry Monitor for Asset Readiness, which is in use today by the Army to monitor and record the environmental details of assets in storage and transport.

What Do We Still Need to Do?

Despite all that has been accomplished since we introduced the Revolution in Military Logistics, two wars and 32 deployments have somewhat slowed some of the transformation that had been envisioned a decade earlier, making the "revolution" more of an "evolution."

As priorities changed, the needed funding for development and fielding of technologies that we thought would be important had to be diverted to more important areas, such as fielding and sustaining tens of thousands of mine-resistant, ambush-protected (MRAP) vehicles critical to keeping Soldiers alive on the battlefield. So, we're not done yet—not by any means! Full transformation will take a great deal more time, perhaps a decade or more. Consequently, Army logistics must continually adapt accordingly!

Afghanistan and Iraq have shown us that the need to support small dispersed units over significant distances will only grow in importance, as will the need to appropriately size and reduce the logistics footprint. Many of our changes represent paradigm changes in how we operate. The evolving strategic environment will pose a series of strategic choices that we will need to examine as we adapt the character of logistics' contributions to the fight.

Over the last decade, logistics organizations, processes, tools, and technology have witnessed significant adaptation, which has created a continuum of momentum that makes the next level of adaptation more readily apparent. Technology maturation will be a factor, but our continued partnering and teaming with industry and academia will help to shape the progression, integration, and implementation of evolving technologies. As we move forward, we will continue to seek capabilities that satisfy the Soldiers' needs and help us to better manage the uncertainty that will continue to characterize current and future operations.

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