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Force Projection

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Equipment from the 2nd Stryker Brigade Combat Team, 2nd Infantry Division, is placed onto a ship at Port of Tacoma, Wash., on Aug. 14, 2017, as part of a sea emergency deployment readiness exercise. The exercise began at Joint Base Lewis-McChord, Wash., and tested the unit's ability to rapidly deploy on short notice. (Photo by Pvt. Adeline Witherspoon)

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Projecting Our Force: Our Strategic Advantage

The Army must be ready to effectively, efficiently, and quickly project and deploy forces forward with proficiency in movement and mobilization to achieve Army objectives.

■ By Gen. Gustave “Gus” Perna



Our military's strategic advantages are its operational reach and ability to overcome the logistics challenges inherent in projecting our forces forward. Today's environment requires our continental United States-based Army to be ready to respond—shoot, move, communicate, protect, and sustain—to win. The Army must be proficient at mobilizing for training rotations, rotational force deployments, contingencies, disaster relief, and any other missions that may arise.

Logisticians are key enablers of Army power projection. We must rebuild critical capabilities and skills to quickly and efficiently support mobilization requirements.

Mastering force projection is no small feat. It requires complex synchronization at home station and points of origin; across rail, air, and sea; and with the support of the total force. We must define, know, and understand roles and responsibilities across

the strategic, operational, and tactical domains in order to project our Army from one location to another.

Strategically, we must set conditions by prioritizing mobilization training, updating policies and doctrine, and synchronizing Army and Department of Defense efforts. Just as fighting and winning wars requires more than one service, so does successful force projection. In close coordination with the U.S. Transportation Command, other combatant commands, and our allies, we continue to cultivate the relationships required to do the necessary work of projecting our troops and equipment around the world when needed.

Operationally, force projection requires synchronizing and integrating across several commands. For the Army, the Military Surface Deployment and Distribution Command (SDDC) has the lead in this effort. SDDC must work with the various life cycle management commands, the Army Sustainment Command, and Forces Command units to meet force projection requirements.

SDDC has already improved the visibility, speed, and efficiency of ship and air movements. Through a global common operational picture, we can now see major materiel movements worldwide. We have decreased by months the time units need to move from stateside installations to overseas areas of operation. Continued synchronization will be critical as we rebuild mobilization and force projection skills.

Force projection is more than just moving equipment from the point of

departure. At the tactical level, Soldiers must place themselves at the point of arrival and backward plan from there. Proper planning ensures successful force reception, which means Soldiers are able to offload and move out efficiently and expeditiously with combat-ready equipment.

Units must practice force projection and reception and build mobilization exercises back into training calendars. Soldiers must relearn container management and packing. They should load cargo from back to front and consider how equipment will be unloaded on the other side.

Units must ensure equipment being projected is ready for use as soon as it is unloaded. Units must shore up accountability of equipment and be proficient in loading, unloading, tie-down, and marking equipment at railheads and ports. These tactical-level skills are mastered only through practice and training.

While we have made progress in synchronizing force projection, including resourcing and prioritization, across the Army Materiel Command and our partners in the U.S. Transportation Command and the Forces Command, we have more work to do across the force. We must be ready to effectively, efficiently, and quickly project and deploy our forces forward with proficiency in movement and mobilization to achieve Army objectives.

Gen. Gustave “Gus” Perna is the commander of the Army Materiel Command at Redstone Arsenal, Alabama.

A 100-Year-Old Question: Are You Ready to Move Today?

Just as it was 100 years ago, the Army is focused on how to project the force quickly to neutralize threats from multiple adversaries around the globe.

■ By Lt. Gen. Aundre F. Piggee

This year marks the centennial of the reorganization of the Army general staff in 1918, which created the Purchase, Storage, and Traffic Division, the precursor of the Army G-4 office. Maj. Gen. George Washington Goethals, best known for building the Panama Canal, was appointed as the director of this new division. He then led the effort to mobilize, outfit, equip, and sustain our forces during World War I.

This was a major undertaking because the Army was not organizationally ready for this new kind of warfare: a wide-scale expeditionary overseas conflict with an Army that was technologically advanced for its time. The millions of Soldiers involved created unprecedented logistics demands to quickly move manpower, equipment, and materiel where they were needed. Weapons, ammunition, and other supplies had to be transported to new training camps and moved by railroad to East Coast ports for shipment from the United States to Allied forces fighting in Europe.

Before Goethal's appointment, individual bureaus had acted independently, often competing with one another in the market and creating chaos and gridlock when war broke out. Goethal consolidated supply operations, secured centralized storage and transportation, and helped organize logistics to put an end to the paralysis of projecting the force.

An Ongoing Challenge

It is no surprise that, 100 years later, we remain focused on how best

to project the force quickly. We are an Army trying to maximize readiness while facing many of the same challenges our predecessors did. We are still a mostly United States-based force with multiple adversaries around the globe, and we are again on the cusp of a technological revolution.

Of course, there are differences as well. On the upside, our teams are better organized and synchronized through advanced communication capabilities and new enterprise-level logistics information systems.

There are many players involved in force projection, including logistics readiness centers that provide critical links to the Military Surface Deployment and Distribution Command and other deployment enablers. Our force also now has mobility warrant officers whose duties are to coordinate and ensure deployment readiness before the unit receives orders to move.

The downside is that we were once separated from our enemies by oceans that provided us with the protection of both time and space. Today's adversaries can reach out virtually and attempt to shut down our information systems before we move a tank out of home station. They can steal our data or corrupt it. Regional actors can close an airfield with a single missile or close a port by conducting sabotage in rear areas.

As we discussed in the last issue of *Army Sustainment*, near-peer competitors have multiple ways to attack and deny our ability to project our forces. This is the new Multi-Domain Battle

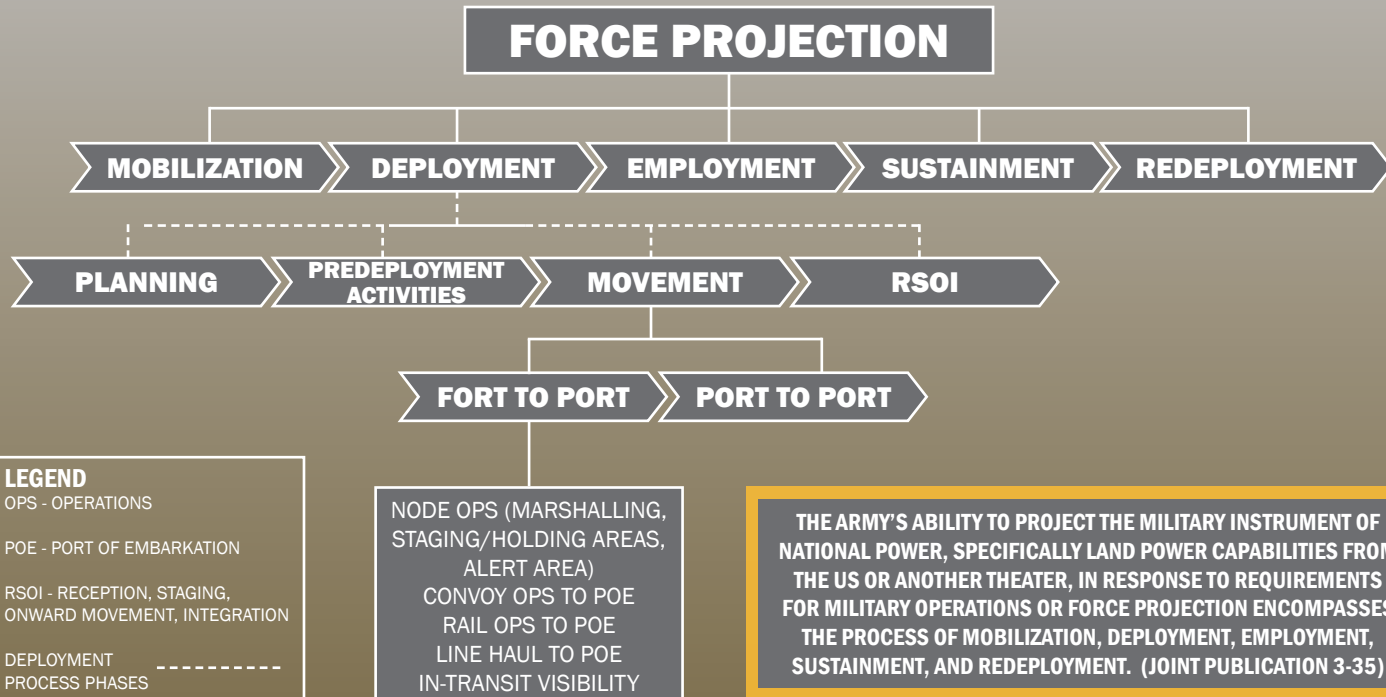


environment that we are challenged to deploy to and fight in today. Our potential adversaries are more capable than ever. The 100-year-old question is this: Are you ready to move when the time comes?

Enabling Force Projection

At the Army level, we are taking many positive steps to fully enable force projection. We are ensuring we have adequate munitions and that we are prepared to receive, store, and issue them. We are continuing to expand, in both Europe and Korea, our Army pre-positioned stocks, which are essential to our ability to equip early-entry forces and provide assurance to our allies.

We are working to modernize our rail assets. Today we have 560 rail cars capable of moving our heaviest combat vehicles; in the long term, we will invest in replacements for our aging cars and ensure they can handle the heavier weight of our current equip-





BRIGADE LEVEL RESPONSIBILITIES

NUMBER	DEPLOYMENT READINESS TASKS	MEASURE
1	IMPLEMENTED CDDP FOR SUBORDINATE UNITS.	YES NO N/A
2	APPOINT IN WRITING, AN OFFICER (WO1 OR ABOVE) AS A BRIGADE MOVEMENT OFFICER AND AN ALTERNATE (E7 OR ABOVE).	YES NO N/A
3	UNIT MOVEMENT OFFICER AND ALTERNATE HAVE ATTENDED OR CURRENTLY ARE SCHEDULED TO ATTEND A PROPONENT APPROVED UNIT MOVEMENT OFFICE DEPLOYMENT PLANNING COURSE AS OUTLINED IN CHAPTER 2.	YES NO N/A
4	BRIGADE MOVEMENT COORDINATOR AND/OR ALTERNATE HAS AT LEAST ONE YEAR RETAINABILITY IN THE UNIT.	YES NO N/A
5	BRIGADE MOVEMENT COORDINATOR AND/OR ALTERNATE HAS AT LEAST A SECRET SECURITY CLEARANCE.	YES NO N/A
6	CONTAINER CONTROL OFFICER APPOINTED, IN WRITING.	YES NO N/A
7	CONTAINER CONTROL OFFICER IS IN COMPLIANCE WITH SUBMITTING CONTAINER INVENTORY UPDATES.	YES NO N/A
8	CONSOLIDATE COMPANY MOVEMENT PLANS AND DEVELOP THEM INTO MOVEMENT PLANS FOR THE BATTALION. ACTIVE ARMY UNITS WILL DEVELOP DEPLOYMENT MOVEMENT PLANS FROM HOME STATION AND/OR INSTALLATION TO PORT OF EMBARKATIONS(POE). RESERVE COMPONENT UNITS WILL DEVELOP DEPLOYMENT MOVEMENT PLANS FROM HOME STATION/INSTALLATION TO MOBILIZATION STATION TO POE(S).	YES NO N/A
9	MAINTAIN COPIES OF SUBORDINATE MOVEMENT BINDERS AND/OR CONTINUITY BOOKS.	YES NO N/A
10	CONSOLIDATE AND FORWARD SUBORDINATE UNIT ORGANIZATION EQUIPMENT LISTS THROUGH THEIR CHAIN OF COMMAND TO THE INSTALLATION TRANSPORTATION OFFICE AND UNIT MOVEMENT COORDINATOR SEMI-ANNUALLY AND WHEN SIGNIFICANT CHANGES OCCUR.	YES NO N/A
11	HAVE A VALID TC-AIMS II USER ID, PASSWORD, AND ACCESS TO THE UNIT'S UIC.	YES NO N/A
12	CAN DEMONSTRATE THE KNOWLEDGE TO MAKE A MOVEMENT PLAN FOR AIR AND SURFACE MOVEMENT BY BUILDING SEGMENTS AND LEGS IN TC-AIMS II.	YES NO N/A
13	HAS A CONVOY STANDARD OPERATING PROCEDURE FOR MOVEMENT TO THE PORT OF EMBARKATION.	YES NO N/A
14	UNDERSTANDS LOCAL PROCEDURES TO REQUEST COMMERCIAL AND MILITARY TRANSPORTATION TO SUPPORT MOVEMENT TO THE POE.	YES NO N/A
15	UNDERSTANDS LOCAL PROCEDURES TO PREPARE SPECIAL HAULING REQUESTS.	YES NO N/A
16	UNDERSTANDS LOCAL PROCEDURES TO REQUEST BBPCT MATERIALS FROM THE UMC OR OTHER DESIGNATED SOURCE.	YES NO N/A

ment. We are also working to reduce the weight of future combat systems.

We are also trying to modernize Army watercraft, a key force projection capability in operational environments with restricted access to fixed ports. Some vessels have outlived their life expectancy, and we are investing to renew this capability.

We have standardized and updated deployable brigades' mission-

ment process under the Army Force Generation model. Under this model, units often became reliant on others to do many deployment activities for them.

In the next conflict, under the Sustainable Readiness Model, we can anticipate being required to perform more rapid deployment-related tasks on our own. So, to be ready to deploy when the order comes, both com-

deployment readiness. This issue's hip-pocket guide is a handy leaders' checklist for what you need to do to move your equipment from fort to port. Keep it in your pocket.

Know your responsibilities and train your Soldiers to the highest standards under realistic conditions. If they can perform required tasks for the hardest missions under the most difficult circumstances, they can certainly do the tasks required to complete easier jobs as well. With time being our most limited resource, using multi-echelon training means employing a team approach, which is critical to enhancing and maximizing training readiness.

As an Army focused on mission readiness and anticipating the next order to deploy, we must be innovative, be inspired, and above all, be ready.

essential task lists in order to include deployment tasks. We have sourced and funded emergency deployment readiness exercises, allowing the Army to select and test unit training deployments on short notice to help build expeditionary deployment skills in the force. We have also updated doctrine, including Army Regulation 525-93, Army Deployment and Redeployment.

We have recently used the opportunities presented by the Army's regionally aligned forces initiative to move units to test our deployment processes and force projection capabilities. Over multiple rotations, we saw faster and smoother deployments into the U.S. European Command area of responsibility, thanks to the sharing and application of lessons learned. Sharing lessons learned is a critical step in improving our overall force projection readiness.

Be Prepared

Being able to shoot, move, and communicate is the foundation of tactical combat tasks, and it also applies to our organizations. We must focus on ensuring we have the basics right.

We must rebuild the skills, experience, and muscle memory that have atrophied during nearly two decades of a highly resourced "push" deploy-

ment process under the Army Force Generation model. Under this model, units often became reliant on others to do many deployment activities for them.

- Have the necessary chains and tie-downs to secure vehicles for movement, including all the twist-lock knuckles to connect Tricon and Quadcon shipping containers.
- Secure the requisite bracing, blocking, packaging, crating, and tie-downs to correctly pack gear during load-out.
- Routinely review and maintain the unit equipment list.
- Certify and train a sufficient number of hazardous materials and load team personnel; focus on those additional duties that are critical to safely deploying the unit and ensure they are resourced.
- Check the results of the last unit command deployment discipline program evaluation as laid out in Army Regulation 525-93.
- Focus on the maintenance status of equipment to ensure it is maintained to technical manual 10/20 standards. If a vehicle will not start, you will not be able to call AAA for help getting from home station to the port of embarkation in the middle of the night.

This is just the start of the many tasks that are imperative to ensuring

There is another important lesson we can learn from our history. In 1919, the Army sent a convoy from Washington, D.C., to San Francisco to test our truck transport systems and prove the superior utility of the motor vehicle. It took them 62 days!

One of the convoy members was Lt. Col. Dwight D. Eisenhower. Years later, during World War II when he crossed the German border, Gen. Eisenhower saw the ease of mobility on German highways. These experiences later inspired him, as president, to launch our great interstate and defense highway system that Americans drive on today.

In the hallway outside of my Pentagon office hangs a quote by Gen. Eisenhower. It reads, "You will not find it difficult to prove that battles, campaigns, and even wars have been won or lost primarily because of logistics."

As an Army focused on mission readiness and anticipating the next order to deploy, we must be innovative, be inspired, and above all, be ready. Be proud that you are part of a great team. Working together across the Army helps us to grow closer to achieving our overall readiness goals every day.

Lt. Gen. Aundre F. Piggee is the Army deputy chief of staff, G-4. He oversees policies and procedures used by all Army logisticians throughout the world.

Embracing an Expeditionary Deployment Mindset

■ By Maj. Gen. Paul Hurley and Stacey Lee

Army Doctrine Publication (ADP) 3-0, Operations, and its subordinate publications, Army Doctrine Reference Publication 3-0 and Field Manual 3-0, are a marked departure from the manuals published before them. This latest 3-0 series still describes Army forces that can operate across the full range of operations, but the point of departure is using large-scale ground combat against a peer threat.

ADP 3-0 states, “Army forces, with unified action partners, conduct land operations to shape security environments, prevent conflict, prevail in ground combat, and consolidate gains. Army forces provide multiple options for responding to and resolving crises. Army forces defeat enemy forces, control terrain, secure populations, and preserve joint force freedom of action.”

The skills, expertise, organizations, and processes to support a patch-chart rotation are different from those supporting a limited- or no-notice deployment to an immature, potentially contested theater. The common requirement is the ability to plan, prepare, and deploy personnel and equipment from origin to destination to meet the operational commander’s requirements. Leaders at all levels in the Army have admitted that those deployment skills are mission critical but have atrophied across the force.

Efforts to rebuild the skills and experience (the muscle memory) are ongoing; however, while you can train a skill quickly, building experience takes time and multiple training iterations.

Historical View of Deployment

In August 1990, the Iraqi army invaded Kuwait and, led by the vaunted

Republican Guard, expected to deter and, if needed, protect Iraq against a ground assault. What it got instead was a lesson in the Army’s new Air-Land Battle (ALB) doctrine, which was applied with devastating effect. The U.S. military and coalition partners had flexed their deployment muscles to assemble from around the globe the largest multinational force since World War II.

In the first 6 months, the United States alone sent more than 296,000 Soldiers and over 2.3 million short tons of equipment and supplies into Saudi Arabia. With help from coalition partners, the multi-corps task force deterred further Iraqi aggression (Operation Desert Shield), drove the Iraqi army back across the Kuwait-Iraq border (Operation Desert Storm), and diminished the Iraqi military forces to the point of ineffectiveness.

Deployment excellence in Desert Shield and Desert Storm equated to these three factors:

- Shaking off the patch-chart rotation mentality that was ingrained through set rotations to Vietnam.
- Developing an expeditionary deployment mindset driven by the operational commander.
- Establishing a deployment culture that enabled a no-notice multi-corps, multinational deployment capable of conducting full-spectrum operations against a hostile state.

Following Desert Shield and Desert Storm, the Army began to look for ways to fill gaps identified in its deployment performance. The roughly 150 days required to deploy



The Combined Arms Support Command and the Deployment Process Modernization Office are taking steps to improve the Army’s deployment readiness by drawing on past deployment experiences.

five divisions and the 205 days to deploy the whole force were deemed too long. The Army was charged to look at the end-to-end deployment process, from infrastructure to strategic mobility resources, with the goal of significantly cutting deployment lead time.

The result, published by the Army in 1999, was the ambitious deployment standard of being able to have a division on the ground anywhere in the world in 120 hours and being able to have five divisions on the ground in 30 days. The envisioned force was lighter, more mobile, more lethal, and, more importantly, designed to maximize limited strategic deployment resources.

While the Army's generating force was busy sharpening its force projection skills, the operational force was busy executing multiple small-scale, noncombat operations in places like Bosnia and Kosovo. Studying large-scale deployments in support of major combat operations while executing small-scale deployments for contingency missions enabled the

Army to exercise deployment infrastructure and processes.

However, the small scale and infrequent nature of these deployments did not allow it to build the muscle memory across the force required to execute no-notice, total force deployments in support of large-scale combat operations.

Deployment excellence during the 1990s equated to these three factors:

- ❑ Matching an evolving equipment set to limited strategic mobility assets.
- ❑ Building deployment flows with a "just in time" mindset to avoid piling up "iron mountains" like those built in Saudi Arabia in 1990.
- ❑ Adapting and executing deployments geared to a lighter, faster, more modular force.

A decade after Desert Shield and Desert Storm, following 9/11, the U.S. military found itself once again planning and conducting a large-scale deployment. Operations Enduring Freedom (OEF) and Iraqi

Freedom (OIF) flexed deployment muscles not used in over a decade. Deployment planners began dusting off the old ALB doctrine, but the Army of the next decade evolved into something different.

Deployment excellence in OEF and OIF equated to these three factors:

- ❑ Units entering the predeployment cycle as soon as possible to validate the mission and timeline, link up with the deployed units, and train theater-specific tasks.
- ❑ Knowing deployment plans down to the individual Soldier level months in advance.
- ❑ Turning unit equipment over for storage prior to deployment. (Under a long lead-time model, this was almost as important as deploying.)

Current Initiatives

The Training and Doctrine Command (TRADOC) Army Capabilities and Integration Center leads the Army's efforts to describe the future operational environment. It develops



A company from the 101st Airborne Division marches across an apron to board the aircraft that will carry them to Saudi Arabia for Operation Desert Shield on Jan. 23, 1991, at Fort Sumter, S.C.

the framework to guide the future force from a concept to fully functional units that are ready to deploy and fight.

Documents such as the Army Operating Concept and the Multi-Domain Battle white paper form the underpinnings of the conceptual effort used to guide changes to doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF).

As a product of this conceptual thinking, Field Manual 3-0 indicates that the Army must regain its lost deployment muscle memory and reestablish the deployment culture across the operational force. However, as ADP 3-0 notes, the challenge is not a complete reset but an effort to capture the valuable skills and experiences from OEF, OIF, Desert Shield, Desert Storm, and other deployments of the 1990s and combine them into a road map for the Army going forward.

The Combined Arms Support Command (CASCOM) and Sustainment Center of Excellence leads the effort to develop and integrate the sustainment and logistics portions of this effort. Whether in concept or execution, the Army's ability to rapidly deploy around the globe with little to no notice and fight against a peer competitor touches every aspect of DOTMLPF.

Doctrine. Deployment and sustainment doctrine is getting a major overhaul in order to be synchronized with the new 3-0 series of publications. Army Techniques Publication (ATP) 3-35, Army Deployment and Redeployment; ATP 4-16, Movement Control; ATP 4-93, Sustainment Brigade; and ATP 4-94, Theater Sustainment Command, among others, are all being revised. Deployment and reception, staging, onward movement, and integration are primary focus areas.

Organization. Theater movement control elements are being fielded to give Army service component commands a greater ability to plan and conduct deployment, distribution,

and redeployment operations. Feedback from the field and events like the Sustaining Decisive Action War-game are informing this effort.

Training. Mission-essential task lists are being revised to include (or in some cases reintroduce) more deployment-related skills and tasks. CASCOM is developing a movement control training support package for the command post exercise-sustainment. The package is focused on theater sustainment command, expeditionary sustainment command, and sustainment brigade reception, staging, onward movement, and integration and movement control tasks.

Materiel. The Deployment Process Modernization Office (DPMO) is aggressively working to improve current deployment information systems and supporting processes. DPMO and CASCOM's Enterprise Systems Directorate are developing the requirements for future deployment information systems.

Leadership. Leadership training and education is focused on a multi-functional culture in which sustainers and logisticians can support across all functional areas. Professional military education for all cohorts and across courses is being revamped to add more rigor and relevance.

Personnel. Tables of organization and equipment and grade plates are being analyzed to ensure the right skill sets are in the right places. CASCOM is performing an in-depth review of sustainment and logistics organizations to ensure a correct balance between the active and reserve components.

Policy. CASCOM is analyzing current policies for relevance and revising or rescinding "dead end" or restrictive policies. DPMO is analyzing the deployment process end-to-end to identify policy gaps and develop solutions for decision-makers in the Army and joint communities.

Looking Toward the Future

As TRADOC's Multi-Domain Battle white paper notes, "Potential

adversaries now possess capabilities that allow them to contest both the deployment and employment of U.S. forces in greatly expanded areas of operation, interest, and influence."

The Multi-Domain Battle concept and the 3-0 series publications envision a force that is trained, equipped, postured, and positioned to "fight tonight" against a peer threat and that is supported by fully networked enterprise resource planning systems. This force will be able to operate with joint partners and strategic enablers in an integrated environment and be fully synchronized from the strategic support area to the deep fires area.

Overcoming adversaries' capabilities in order to provide the operational commander with freedom of action across multiple options, partners, domains, and dilemmas requires trained, experienced, and empowered deployment professionals.

Deployment excellence for the future force will equate to deployment professionals with these attributes:

- An expeditionary deployment mindset.
- The ability to leverage capabilities across all domains to see and understand faster than the adversary.
- The experience to develop for the operational commander options that capitalize on windows of opportunity in an increasingly fluid operational environment.

A tremendous amount of work has already been done to build the bench, but much is left to do. Deployment excellence for the future will require personnel, systems, and processes acting in concert at the speed of war.

Maj. Gen. Paul C. Hurley Jr. is the commanding general of CASCOM and the Sustainment Center of Excellence at Fort Lee, Virginia.

Stacey Lee is a retired lieutenant colonel and the chief of the DPMO Deployment Support Branch.

Improving the Composite Supply Company's Water Operations

The water purification platoon's water storage capacity is limited by the safety restrictions of its vehicles. Changing the modified table of organization and equipment would enable the unit to operate at maximum capacity.

■ By 1st Lt. Connor N. Cook

Water is essential to warfighters who are training and engaging adversaries on the battlefield. Without water, the Army cannot function and operations cease. Because of the growing complexity of the operational environment, Soldiers must be able to sustain themselves and cannot rely on bottled water deliveries. Soldiers can deploy at a moment's notice, but supply chains cannot be established as rapidly. In an expeditionary environment, water purification operations are critical to sustaining Soldiers.

The composite supply company (CSC) is an essential combat sustainment support battalion unit that provides water to Soldiers on the battlefield. CSCs also provide bulk and packaged class III (petroleum, oils, and lubricants), class IV (construction and barrier materials), class VII (major end items), class IX (repair parts), and shower, laundry, and clothing repair services to supported units.

The CSC transports supplies to the brigade support area (BSA), where the brigade support battalion receives and distributes the supplies to the forward support companies (FSCs). The FSCs, in turn, distribute the supplies to the forward line of troops (FLOT).

While a CSC can provide a wide array of supplies, its water purification platoon does not have the proper vehicles to optimally store and transport water. The unit's modified table of organization and equipment (MTOE) mans and equips the platoon to purify

and transport water, but vehicle safety restrictions create a shortfall in water storage and transportation capacity. The Army must reevaluate the vehicle assets authorized to the CSC water purification platoon to allow the platoon to operate at maximum capacity.

CSC Water Operations

The CSC water purification platoon is critical to ensuring that the brigade support battalion, the FSC, and the FLOT always receive fresh, potable water. Water is a basic requirement, but the process to purify, store, and transport water is complex. Within the water purification platoon, a water production section and a water storage section ensure Soldiers have drinking water.

The water production section can produce 150,000 gallons of potable water a day from a freshwater source and 100,000 gallons per day from a saltwater source. The section's tactical water purification system can even pump water from a muddy swamp and purify it into clean drinking water.

After purification, the water is transferred to the water storage section. The water storage section uses M105 load handling system (LHS) compatible water tank racks (hippos) to store and transport water to the BSA, where the FSCs will receive the water and push it to the FLOT.

The water storage section is authorized four M1120A4 LHS to move the hippos. For expanded capabilities,

the LHS can pull a palletized load system (PLS) trailer to transport a hippo. The section is authorized three trailers.

With its highly capable tactical water purification system and 30 hippos to transport water, the water purification platoon should be able to supply enough clean, potable water on the battlefield.

A Hidden Issue

By MTOE authorization, the LHS is the prime mover for the hippo, but the LHS does not have the payload capacity to move a full hippo. The maximum capacity for the hippo is 2,000 gallons of water. According to its technical manual, a full hippo weighs 25,942 pounds.

The technical manual for the LHS says that the payload capacity for the hydraulic hook, the component that loads and unloads the hippo onto the truck, is 26,000 pounds. According to this specification, the LHS has the capability to move a full hippo with no equipment issues. However, the LHS technical manual has been updated to warn operators not to exceed 24,000 pounds when loading the LHS.

When a load on the LHS's hydraulic hook exceeds the 24,000-pound capacity, the LHS overload indicator illuminates to indicate that the LHS hook is at capacity. This often happens when Soldiers load hippos. The LHS cannot meet its intended purpose to move a full hippo of water.

The LHS can safely transport a hippo filled with only 1,750 gallons of

water. If a Soldier fills a hippo with more than that, there is a much greater chance that the LHS hydraulic hook will break, which would deadline the vehicle or, even worse, place Soldiers in danger. The Army must swap the LHS with a different vehicle to allow water platoons' to achieve maximize efficiency and safety.

The Risks

The inability to optimally transport water presents risks. Either Soldiers will not be provided with enough water or the section will have to make more trips to deliver the commodity.

When hippos are not filled to maximum capacity, leaders must put more vehicles in each convoy. For example, if the mission requires 10,000 gallons of water, the unit will have to use six hippos instead of five to complete the mission. Another truck and trailer are required, but their availability is unlikely.

When more vehicles are on the road, more Soldiers are too. An increase of Soldiers in a hostile environment automatically multiplies the tactical risk, but a lack of proper rest is another significant consequence for the Soldiers. Even the most qualified driver will begin to experience diminished skills over the duration of the mission due to fatigue and added stress of an austere environment. From this, leaders assume additional risk of accidents.

The greatest risk is the possibility of a lethal attack. Small-arms attacks, indirect fire, and improvised explosive devices are strong possibilities in deployed environments. On the surface, only one more LHS is being added to the convoy. However, each additional vehicle increases the convoy's risk of a breakdown. Additionally, the chance of enduring a lethal attack on the route increases with the size of the convoy. Second- and third-order effects may include the addition of more gun trucks and personnel to provide security for the larger convoy.

A Practical Example

During a 2017 rotation at the National Training Center at Fort Irwin,



Soldiers prepare to load an M105 load handling system (LHS) compatible water tank rack onto an M1120 LHS during a 2017 National Training Center rotation at Fort Irwin, Calif.

California, the 226th CSC's water purification platoon received the mission to provide water support to an armored brigade combat team. During this rotation, the platoon operated 12 hippos with the capability to transport 24,000 gallons of water to the BSA. However, with LHSs as the prime movers of the hippos, the platoon was only able to transport approximately 20,000 gallons of water.

The second-order effect of this restriction was that the platoon had to place more LHSs on convoys to meet BSA requirements. This increased the number of Soldiers and vehicles on the road.

Because more Soldiers were out on convoys, their counterparts had to spend more hours securing the perimeter. With longer security shifts and constant 10- to 12-hour convoys, Soldiers could not achieve proper rest cycles. This increased the accidental and tactical risks for the rotation.

The stress and fatigue of Soldiers will only increase in an actual hostile environment. Leaders should not have to assume unnecessary risks to their Soldiers and equipment because they are not authorized the proper equipment to meet their missions. However, until there is a change to the authorized equipment for the water

purification platoon in a CSC, leaders must continue to assume extra tactical and operational risks because operations will halt without water.

The M1075A1 PLS should replace the LHS on the CSC MTOE for the water storage section. The PLS has a payload capacity of 33,000 pounds, which exceeds the weight of a full hippo. The PLS will alleviate the tactical and accidental risks leaders must assume and allow Soldiers to rest and recover.

In an expeditionary environment where bottled water is unavailable, the CSC is essential to providing water to Soldiers. With such a mission-critical task, the CSC's MTOE must be adjusted to maximize efficiency to store and transport water, which will reduce the tactical and accidental risks of the operation.

First Lt. Connor N. Cook is the water platoon leader for the 226th CSC, 87th Combat Sustainment Support Battalion, 3rd Infantry Division Sustainment Brigade. He holds a bachelor's degree in systems design and management from the United States Military Academy. He is a graduate of the Quartermaster Basic Officer Leader Course.



A civilian contractor and a 840th Transportation Battalion Soldier loosen the supports on equipment stored on the weather deck of the USNS Bob Hope at the Port of Shuaiba, Kuwait, on Nov. 1, 2017. (Photo by Sgt. Jacob Hearn)

The 595th Transportation Brigade's Commitment to Safety

The 595th Transportation Brigade emphasizes safety by conveying leaders' safety messages accurately and ensuring that safety managers and professionals are properly trained.

■ By Sgt. 1st Class Stephen Gibson

Safety is about standards—not only setting standards but also enforcing them. The 595th Transportation Brigade's safety mission is to preserve warfighting capabilities and enhance the force by providing a safe and healthy environment for Soldiers, families, civilians, and contractors.

The brigade has made great prog-

ress in reducing accidents, occupational injuries and illnesses, and equipment losses by ensuring that composite risk management is integrated into all it does.

When leaders at every level emphasize safety in the workplace and are consistent with their messaging, it shows how serious the brigade is about safety.

Emphasizing Safety

Emphasizing safety includes these important actions:

- ☐ Conducting daily safety briefings.
- ☐ Ensuring everyone has the proper personal protective gear.
- ☐ Incorporating composite risk management into all actions.

- Ensuring contractors have the proper licensing and certifications for port operations.
- Being vigilant in daily activities to identify safety hazards.
- Reporting accidents.

Near misses should also be reported. Reporting near misses helps to identify risky actions that have been taken and helps the brigade to implement new procedures to prevent or reduce accidents.

Contractors and Safety

A unique challenge that the brigade faces is incorporating local contractors in a foreign area of operations into the Army culture of safety and occupational health. The brigade is accountable for a large population of contractors within its area of operations.

A top priority when incorporating contractors into the Army safety culture is ensuring that they understand the unit's commitment to safety and the value that the safety procedures serve.

Not all local contractors speak English fluently. When trying to convey the importance of safety to the mission, speakers must ensure their audiences gain a complete understanding of the message that is being conveyed. Leaders can run into a problem when interpreters use a summarization technique of interpreting.

Leaders should ensure that the interpreter is using a simultaneous or consecutive mode. This means that the interpreter interprets the original source material without editing, summarizing, deleting, or adding, while conserving the language level, style, tone, and intent of the speaker. If the message is only summarized, or if tone, style, and intent are not accurately portrayed, it can cause confusion about the importance of safety requirements.

Turnover Challenges

Another challenge is the constant rotation of personnel throughout

the area of responsibility, which makes it difficult to keep a knowledge base at the ports. As with many other areas, the ports have a constant turnover of not only Soldiers but also civilians who maintain the safety program.

Not every person who takes over that responsibility will have the same level of experience or knowledge that the last person had, so it is imperative that the personnel who are managing the safety program not only have the proper training but also can be on the ground to complete the risk management process of supervising the implemented procedures.

Having safety managers on the ground during operations to conduct spot checks and report their findings assists the commander in gathering information on his or her unit's strengths and weaknesses.

Leaders should ensure personnel who will be overseeing safety at the ports hit the ground already properly trained. This way, the unit will not lose time by having to send the safety professionals back to home

station for training.

Safety is a top priority in the brigade and throughout the Army. A unique challenge for the 595th Transportation Brigade is incorporating local contractors into the Army culture of safety and occupational health. The brigade combats this challenge by ensuring that the contractors understand the priority that it places on safety, that interpreters convey leaders' safety messages accurately, and that safety managers and professionals receive the proper training needed to ensure missions are being conducted safely.

Sgt. 1st Class Stephen Gibson is the brigade safety noncommissioned officer for the 595th Transportation Brigade at Camp Arifjan, Kuwait. He holds a bachelor's degree in criminal justice from Troy University and is a graduate of the Senior Leader Course, Advanced Leader Course, Battle Staff Course, Sexual Harassment/Assault Response and Prevention Career Course, and Basic Leader Course.



Soldiers of the 3rd Armored Brigade Combat Team, 1st Armored Division, unload vehicles and cargo from the USNS Bob Hope at the Port of Shuaiba, Kuwait, on Nov. 1, 2017. (Photo by Sgt. Jaccob Hearn)

A black and white photograph of a UH-60 Black Hawk helicopter in flight, carrying a Humvee suspended from its hoist. The helicopter is positioned in the upper right quadrant of the frame, with its main rotor blades blurred due to motion. The Humvee is visible in the lower right corner, hanging from a cable. The background is a light, overcast sky.

Ready, Set, Globe

■ By Gen. Darren W. McDew

A UH-60 Black Hawk helicopter carries a Humvee during a training mission at Scott Air Force Base, Ill., on Sept. 6, 2014. (Photo by Staff Sgt. Clayton Lenhardt)



The U.S. Transportation Command sets the globe to meet dynamic threats and ensure deployment and distribution assets are postured to support an immediate and decisive response.

The joint force's ability to project power globally at the time and place of its choosing serves as the foundation for the nation's comparative strategic advantage. For 30 years, the U.S. Transportation Command (USTRANSCOM) has deployed and sustained personnel and equipment in support of national interests during natural disasters, epidemics, and acts of war.

Today, at USTRANSCOM, we stand ready to project power when needed, but we face a much different strategic landscape than we did only a few years ago. Rival powers pose a complex and sophisticated global threat, and emboldened regional actors and violent extremist organizations continue to complicate our strategic calculus.

Through our global presence and worldwide asset visibility, USTRANSCOM is uniquely positioned to shape the joint logistics enterprise to counter these emerging threats. Ultimately, this command enables strategic flexibility by setting the globe for logistics.

Today's Environment

Amidst an ever-changing environment, the most glaring implication for the joint deployment and distribution enterprise (JDDE) is the increased risk of facing contested logistics operations. Because of the rise of nation-state actors and the continued efforts of nonstate actors to invoke fear and instability around the world, the U.S. military is in competition or conflict in every domain.

The risk is further complicated by the military's significant reliance on commercial transportation assets. The steady reduction of the maritime fleet since World War II, coupled with current pilot and mariner shortages, has created a dependence on commercial transportation service providers to move the bulk of the force. In fact, when the nation goes to war, commercial industry moves 90 percent of the military's equipment.

Given these considerations, US-

TRANSCOM has refined its assumptions to plan for attrition in organic sealift and airlift fleets, denied access to strategically critical nodes, increased cyber vulnerabilities, and global mission command of disparate mobility forces. Yet our preparation for the challenges of our time cannot exist solely on paper.

To meet dynamic threats, we must set the globe for agile response and provide the president with options, regardless of a threat's location. The nation demands our intellectual rigor to ensure the global distribution network (GDN) and the strategic assets that comprise the JDDE are postured to support an immediate and decisive response, when required.

In a contemporary environment filled with global uncertainty and rising geopolitical tensions, the logistics enterprise must always be ready. The United States can no longer weight its logistics efforts to one theater if it expects to retain the ability to respond swiftly and decisively when disaster strikes elsewhere. It must not be shackled to the practices of the past; it must change the theater-specific lens through which it views and assesses threats.

Setting the Globe

The 2016 National Military Strategy introduces the concept of the global integrator. In this role, the chairman of the Joint Chiefs of Staff assists the secretary of defense in strategic planning and direction of the armed forces, effectively setting the globe. In support of the global integrator, USTRANSCOM specifically sets the globe for logistics, continually shaping the nation's ability to act within the transregional, multi-domain, and multifunctional threat environment.

Through USTRANSCOM's newly appointed role as the joint deployment and distribution coordinator, I exercise coordinating authority for JDDE operations and planning and collaborate with other combatant commands, the services, commercial industry, and interagency partners to



Members of the 766th Transportation Battalion participate in the U.S. Transportation Command Joint Transportation Reserve Unit rotary-wing familiarization exercise at Scott Air Force Base, Ill., on Aug 3, 2013. (Photo by Capt. Shamika Hill)

align and harmonize global logistics functions.

Setting the globe for logistics means building resilience within the JDDE, maximizing scarce strategic transportation assets, and leveraging the breadth of the GDN. This requires a combination of balancing resources previously employed in a theater-centric paradigm and regularly using the worldwide network of modes, nodes, and routes. Therefore, setting the globe involves two key concepts: balancing the globe and using the globe.

Balancing and Using the Globe

In an iterative process among the secretary of defense, chairman of the Joint Chiefs of Staff, services, and combatant commands, and considering current events and national-level strategic guidance, USTRANSCOM manages appropriate resources to

balance the globe for logistics. Balancing the globe means finding an equilibrium between the capabilities and capacity required to meet emerging threats, all while staying in line with secretary of defense priorities and authoritative guidance.

During the past 16 years of conflict, the Department of Defense stockpiled logistics resources in certain regions of the world and habituated the use of specific nodes for deployment and distribution by necessity. Establishing a balanced posture means redistributing these resources to ensure we can contend with any threat, regardless of the geographic area of responsibility from which it emanates.

In practice, balance also means positioning and repositioning mobility assets and developing realistic mobilization timelines across the Army Reserve, National Guard, and com-

mercial providers. We have to understand total organic and commercial capacity, capability, and infrastructure to link our lift resources to the requirements they meet. Having the appropriate authorities in place to shift these mobility assets at the speed of war informs and expedites risk-based decision-making about when and where to weight our efforts.

To help achieve balance, USTRANSCOM integrates execution across the GDN. Using the globe means we leverage a whole-of-nation approach to engage with allies and partner nations to expand access to assets and infrastructure. The command facilitates rapid deployment options by keeping the GDN ready in strategic locations and ensuring infrastructure exists when and where it is needed.

The network is resilient when it consists of a robust mix of military and commercial modes, nodes, routes, and support. Using this approach, USTRANSCOM coordinates activities across the JDDE to preserve options. And options create opportunities.

USTRANSCOM's ability to leverage the GDN using our components and commercial transportation providers, combined with enhanced diplomatic relationships and increased global access, provides responsive and comprehensive options to meet the nation's strategic challenges. Furthermore, by setting the globe for logistics, USTRANSCOM improves the joint force's timeliness and agility, decreases risk, and builds decision space for the president.

When called on, USTRANSCOM provides the nation with a strategic advantage and stands ready to project power across the globe. Whether it is disaster relief, humanitarian assistance, or decisive combat power, we deliver!

Gen. Darren W. McDew is the commander of USTRANSCOM at Scott Air Force Base, Illinois.

A photograph of Lt. Gen. Patricia McQuiston, a woman with short blonde hair, wearing a U.S. Army digital camouflage uniform. She is shown in profile, looking towards the right. Her uniform features a name tag that reads "McQUISTON", a U.S. flag patch on the left chest, and three stars on the right chest. Other personnel in similar uniforms are visible in the background.

Mastering the Deployment Basics:

*An Interview With
Retired Lt. Gen. Patricia McQuiston*

■ By Arpi Dilanian and Matthew Howard

Lt. Gen. Patricia McQuiston, deputy commanding general of the Army Materiel Command, listens to a brief overview of Vibrant Response 14 at Camp Atterbury, Ind., on July 25, 2014. (Photo by Sgt. Thomas Belton)

During her 35-year Army career, retired Lt. Gen. Patricia McQuistion was involved in many major logistics movements. She served as deputy commanding general of the Army Materiel Command and as the commanding general of the Army Sustainment Command, the 21st Theater Sustainment Command, and Defense Supply Center Columbus.

Now as the Association of the United States Army's (AUSA's) senior director for membership, McQuistion continues to be a strong advocate for the Army. In this interview, she describes the importance of having everyone understand their roles in the complex deployment process.

Why is force projection so important to readiness?

Readiness of the force and being able to project that force anywhere in the world are absolutely critical for our ability to support the defense of the United States. Gen. Mark Milley talks so consistently about readiness being the number one priority because readiness gives you options. Those options allow leaders to make the right choices for our nation.

We talk a lot about playing away games—that if we had the choice, we'd always want to play an away game. To play that game, we have to get to where military activity is occurring before it can be projected upon our nation. It's a big world, and the ability to get from one part of it to anywhere that the U.S. military is asked to go is a big part of readiness.

Gen. Darren McDew, commander of the U.S. Transportation Command (USTRANSCOM), says that the strategic advantage over near-peer adversaries is the ability to project forces. How will we maintain this advantage?

I certainly agree with him. That is a strategic advantage. I'd add that

the ability to sustain forces while they're employed is also critical, and USTRANSCOM certainly provides a lot of resources to enable that to happen.

To master the basics, you have to focus on that problem set and maintain a good balance across the strategic mobility triad. This includes assets from the air and sea that will get you there, coupled with our Army pre-positioned equipment, ensuring we've got that postured correctly. The one thing better than getting there quickly is already being there. The balance among the three components is essential to maintaining strong capabilities. And how do we maintain those capabilities? By focusing attention and resources on them.

How will sustainment operations for force projection be affected as we encounter new domains?

A topic that repeatedly comes up from our experiences over the past 17 years is metering demand signals. How do we rationalize the demand signals and do it in a way that is probably different than we did in recent decades?

We do it by taking a look at all the algebraic equations to get a full understanding of how increasing "x" forces drives additional requirements for "y" and "z" support. For example, as you bring additional Soldiers, Marines, or Airmen into a theater, what are the requirements for things like security, repair parts, and life support services? How many more containers and trucks do you need to put on the road, and how much more fuel do you need? Will you bring additional civilians and contractors into a theater? How will your sustainment operations affect the local populace? Having a better understanding of those equations is important.

Understanding how one new element drives all of those other requirements—the tooth-to-tail ratio—is essential. Even in the early

A retired lieutenant general describes the importance of force projection, training, partnerships, and technology to the Army's effort to become more expeditionary.

stages of planning for deployment, always keep the redeployment and the retrograde required in mind. It shouldn't drive all the decisions, but it should always be a factor that you're thinking about throughout the length of the campaign and your operations.

What role will technology play in enhancing deployability? Do you foresee any game-changing innovations?

There are game-changing technologies right around the corner. Whereas cyber technology may understandably be the current hot topic, I think we'll see artificial intelligence and autonomy as the next inflection points that will further change the nature of warfare.

There are many benefits we can apply from deep machine learning, artificial intelligence, and being able to process the copious amounts of data required to help understand the deployment, employment, and redeployment processes. The Army can take great advantage of new technologies to help inform the requirements, but the security of that information is another important consideration.

Another technology we talk about is additive manufacturing. Even 10 years ago in Kuwait and Afghanistan, we were producing repair parts on-site. Some of that was done in mobile parts hospitals. They relied on subtractive manufacturing, where you put a blank [raw material] in and the tools take off everything you don't need for the part. In Afghanistan, we used additive manufacturing.

New manufacturing techniques will help the Army answer some demand. They're not the full solution for reducing the total requirement for shipping things to a theater, but they'll help.

The Army is focused on getting "back to basics." Can you describe the importance of emergency deployment readiness exercises, sealift emergency

deployment readiness exercises, and other exercises as the Army works to become more expeditionary?

Hearing the terms emergency deployment readiness exercises and sealift emergency deployment readiness exercises brings me back to my early days in the Army. As a second lieutenant, I was in charge of the departure airfield control group inspection process for the 25th Infantry Division. I recall walking through all of the requirements just to load a Humvee and send it somewhere in the Pacific region, and I always thought, "What happens next?" I wondered what happens at the other end when this stuff gets off.

I think it is important for Soldiers to know what happens next. If I were in charge of deployment training, I'd focus a lot of energy on laying out end-to-end processes for deployments. This would help teams understand and visualize how that process works and what happens next to that piece of equipment, that force, or that unit in the deployment and employment processes.

Do you have any examples of your use of visualization in an end-to-end process?

In my last assignment, we did that to tremendous effect to help get everyone's mind in the game. We mapped out the redeployment and the retrograde process out of Iraq and Afghanistan through multiple routes and then were able to watch a simulation of how the equipment actually moved.

We took a Stryker brigade and mapped out its redeployment. A local firm helped us put that information into a visualization tool so we could watch on screen as that equipment moved to Kuwait and then from Kuwait to an airfield in Saudi Arabia. It showed when we took out the communications packages, which were flown to Tobyhanna Army Depot, Pennsylvania, for reset. And it showed when

the Strykers were put on ships at a nearby seaport and sent back to Joint Base Lewis-McChord, Washington, for reset.

This visualization allowed us, from the most senior to the most junior person present, to understand the complexity of the routes, the required maintenance actions, and the time it takes to get that equipment home, reset, and back out to the force. The more the Army can do to put visualization tools and synthetic training environments in place to describe this very complex series of actions that has to happen, the better. When people can see where they fit into the big picture, it gives everybody a leg up.

How important is the reserve component's readiness to the total Army's ability to deploy in today's environment?

It is absolutely critical. Somewhere north of 75 percent of sustainment functions and force structure are in the reserve component. They're part of the total Army, they're critical operational forces, and we've learned a lot over the past 17 years about how to bring all that goodness together. It only makes sense to continue to build upon that understanding, trust, and mutual dependence.

We recently had Lt. Gen. Timothy Kadavy [director of the Army National Guard] here at AUSA talking about the role of the National Guard. He's looking at new ways for employing his part of the total force, and certainly the Army Reserve is doing so as well. There's a great deal we gain from the civilian job and military experiences of National Guard and Army Reserve Soldiers. And let's not forget to give a great deal of credit to Army civilians and all they do to ensure current and future readiness.

How can the Army better synchronize efforts with its partners to improve force projection?



Retired Lt. Gen. Patricia McQuiston, former deputy commanding general of the Army Materiel Command.

There are so many areas where the Army does very well with the help of many partners. Continual improvement comes with clear requirements and partner engagement. Understanding what the Logistics Civil Augmentation Program provides is important. It's a brilliant construct to have agreements with industry partners in different regions of the world and to have capabilities already on the ground and ready to employ when you need them.

We rely on our maritime partners and airlines that augment Air Mobility Command and Military Surface Deployment and Distribution Command assets. Strong relationships build the Army's ability to operate at the speed of trust. That shouldn't be undervalued.

Having good relationships and building trust with our allies also cannot be overstated. Understanding their processes and the systems

they use is critical so that you can exercise together, as well as understand the differences in border agreements, where you can travel, what you are allowed to send, and how you have to send it. You need to know, for example, if there's a change in rail gauges in Europe that will affect your planning.

There is much we've learned about working with our allies, such as the difference in equipment and employment of forces for multinational operations. Capturing and sharing all of that with future generations for when they consider deployment can save them time and effort.

Army pre-positioned stocks give the Army options. So do the exercises with partners, such as Pacific Pathways and U.S. Army Europe's extensive exercises with allies, such as Saber Guardian and Rapid Trident. To synchronize well, you have to practice.

What would you tell unit commanders and Soldiers to do to be more prepared to deploy?

Surprises are not force multipliers. The more you learn and the more you understand about the deployment process is to everyone's advantage. Start with the training schedule. The calendar is a forcing function, so schedule training, plan it well, adhere to it, and then really evaluate and assess how well you and your unit did.

Time is not on the side of a unit trying to deploy somewhere distant. Commanders may not have all the time they need, but they do have all the time that there is, so it's how they make use of time that will make the difference. Home-station training is very important—being on a red team and then using red teams to assess your unit's capabilities.

I've heard this a lot lately and it has really resonated with me: If you want to learn something new, read an old book. There's a tremendous amount of material published about how to do this. It doesn't have to be a surprise. It doesn't have to be learned on your own; you can learn from others, both their successes and mistakes.

And don't be too afraid to fail. I would say the first time you do something, it might be pretty ugly. Okay—just get on with it. Drive on, learn from it, and get better. Get better every time. Like your predecessors, you can and should master the basics.

Arpi Dilanian is a strategic analyst in the Army G-4's Logistics Initiatives Group. She holds a bachelor's degree from American University and a master's degree from Rensselaer Polytechnic Institute.

Matthew Howard is a strategic analyst in the Army G-4's Logistics Initiatives Group. He holds bachelor's and master's degrees from Georgetown University.

The Joint Logistics Enterprise of the Future

■ By Maj. Gen. Kenneth D. Jones



Soldiers from the 25th Sustainment Brigade and 2nd Brigade Combat Team, 25th Infantry Division, offload rigged low-cost, low-altitude supply loads from a palletized load system and move them to a waiting CH-47 Chinook helicopter on Dec. 12, 2017, during an air delivery exercise. (Photo Sgt. Ian Ives)



Data analysis is critical to the joint logistics enterprise's ability to use capabilities and resources to advance U.S. national interests.

The National Military Strategy (NMS) establishes five distinct problem sets and five mission areas with the greatest risk of having peer and near-peer adversaries. The NMS characterizes the joint operating environment (JOE) as an emerging battlefield of great power competition.

Predicated on the NMS and the emerging JOE, the joint logistics enterprise (JLEnt) addresses adversarial challenges through global, cross-domain, and multifunctional logistics solutions. These solutions defy legacy phasing and require global integration to manage scarce resources with greater efficiency and to balance capability, capacity, and readiness.

What Is the JLEnt?

The JLEnt is a globally integrated network of responsive logistics providers structured to achieve a common purpose. It is globally postured with geopolitical access and ready organizations and underpinned by a global command and control architecture. By design, the JLEnt encompasses an assortment of collaborative agreements, contracts, policies, legislation, and treaties designed to make it function in the best interest of the joint force commander.

The Joint Staff J-4 influences and advises the JLEnt for strengthening the joint force readiness posture, improving warfighting capability, and enabling globally integrated operations. Key Department of Defense organizations in the enterprise include the services, the combatant commands, the Defense Logistics Agency, the U.S. Transportation Command, and the Joint Staff J-3 and J-4.

The JLEnt also includes other government departments and agencies and nongovernmental organizations. Inextricably linked to commercial industry, these organizations represent an end-to-end value chain for countering adversaries and sustaining warfighter resilience and survivability.

Lt. Gen. Stephen R. Lyons, the director for logistics on the Joint Staff, recently said that "the purpose of today's JLEnt is to project and sustain military

power, enable global reach, and provide a full range of flexible and responsive options to joint force commanders."

The JLEnt enhances military readiness and presents multiple dilemmas to adversaries who seek to challenge the commitment and capabilities of the United States abroad. The JLEnt enables the United States to project power across oceans at any time and place. Moreover, the JLEnt gives the United States a comparative strategic advantage and enables it to remain a global superpower to support its allies and partners throughout the world.

The JLEnt of the Future

The emerging JOE, characterized by great power competition, will challenge the JLEnt to reassess its previous planning assumptions regarding permissive and semipermissive domains. To achieve and sustain a high level of readiness and project the force from the industrial base forward, the JLEnt must further access capabilities from all components to penetrate contested environments.

Furthermore, the JLEnt should expect to operate without 100 percent system readiness and compatibility with allies and host nations. Instead, the JLEnt must expect to fight at the end of long and contested lines of communications while competing in all five domains (land, maritime, air, space, and cyberspace). The JLEnt will continue to develop readily accessible capabilities in joint force formations to achieve mission success.

Visualizing the emerging JOE should drive realistic planning assumptions and influence important investments in force sizing, JLEnt capacity, network resilience, and comprehensive readiness to respond to major combat operations. Lt. Gen. Lyons emphasized that the increasing logistics demand underscores the need in a globally integrated environment to adjudicate scarce resources at the speed of war.

Also, the JLEnt cannot underestimate competition short of armed conflict in the so-called "gray zone." Adversaries are attempting to identify significant vulnerabilities through

in-depth cyber reconnaissance and infiltration of commercial information networks. Adversaries may deny access to precious or rare mineral resources and monopolize global manufacturing capabilities. These activities, sometimes under the guise of economic investments, can undermine the security of the United States and its allies. As a result, the JLEnt should strengthen partnerships with commercial industry and allies to preserve mission assurance and readiness.

As the JLEnt advances into the future, the United States must balance international concerns with operational requirements in contested areas. In most operations, joint reception, staging, onward movement, and integration and host-nation support (HNS) requirements define what is possible regarding force size, speed, and timeliness. HNS will remain a key enabler to support the JLEnt and enhance its capabilities.

A small but credible force quickly put in place on crucial terrain can have a greater impact than a more substantial force weeks or months later. Leveraging HNS as part of the joint reception, staging, onward movement, and integration process enhances international cooperation while supporting the JLEnt in globally contested environments.

Data Analysis

The JLEnt is a repository of logistics data. Data is a key enabler to improve readiness and lower the risk associated with managing finite resources and sustaining the joint force. Data access, analysis, and protection, therefore, can be a force multiplier to provide a competitive edge, minimize industry risk, and bolster the JLEnt.

Improving the analysis of JLEnt “data lakes” (storage repositories that contain raw data) helps to enhance joint force readiness. This analysis increases the nation’s comparative strategic advantage by improving logistics from the industrial base to the point of need. As with any comparative strategic advantage, the JLEnt must expect challenges to this status. Adversaries

are likely to exploit significant vulnerabilities to throttle the JLEnt’s ability to project military power.

The JLEnt must continue to evolve its global resource allocation process so it can best respond at the speed of war. Shifting priorities and paradigms have potential global implications, and geopolitical factors will continue to change with advancing technologies. These future changes will significantly affect industry capabilities to manufacture and deliver innovative solutions to future battlefield challenges.

The analysis of JLEnt data lakes and machine learning capabilities will drive the JLEnt to remain competitive over most adversaries. These emerging capabilities are a way for multiple agencies to validate investments in improving logistics and sustaining force readiness.

Today, internal processes, computer systems, and computer chip-enabled devices can generate more data than ever, in volumes too large and complex for humans to analyze without computer assistance. The emerging field of data science (extracting knowledge and insights from large and complex data sets) requires specialized skills to see patterns and recognize trends or potential gaps.

Machine learning can assist the JLEnt in addressing these complex questions and gaining a competitive edge over adversaries. The JLEnt will benefit from improved qualitative and quantitative decision-making that addresses complex sustainment requirements using data analysis tools and techniques. Recognizing data science as a valuable confluence of mathematics, computer science, and communication supports the JLEnt’s vision for improved learning and qualitative decisions for winning the nation’s wars.

Investments in big data support the NMS by improving global force projection, enhancing national security, and developing alliances. An emphasis on analysis will enable the JLEnt to deliver the right items, on time, and in the precise quantities needed.

The JLEnt needs to invest in off-the-shelf technology for combining multiple agency data lakes and leverag-

ing machine learning. This technology will enhance the JLEnt’s ability to accelerate decisions with better accuracy, predict the positioning of sustainment forces, build critical infrastructure, deliver logistics efficiently, and make the JLEnt more responsive and agile.

Through data analysis, the future JLEnt will mobilize or surge the right kind of capability regardless of the conflict or challenge the joint force encounters. Strategically, it is important for the JLEnt to have consensus on a vision of the future. In fact, it is fundamental to everything it considers in its effort to build a more responsive and informed enterprise.

Multiple entities have formal or informal responsibilities for parts of the JLEnt. Government representatives, industry associates, allies, and international partners are vital to supporting the joint and combined forces. Think tanks, policy centers, and academic institutions and individuals are also involved in the industrial preparedness of the JLEnt.

As the future unfolds, the JLEnt will strive to maintain and ensure a high state of readiness and responsiveness for contingency operations, humanitarian assistance, disaster relief, major conflicts, or related activities short of hostilities. Big data offers the greatest potential for accelerating change in logistics readiness and support to the joint force and U.S. allies.

In the face of these daunting challenges, only a dynamic, nimble, and well-informed JLEnt can make accurate and effective logistics assessments. Analysis is necessary to ensure the optimal deployment of capabilities and employment of resources required to advance U.S. national interests.

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Army pre-positioned stocks consist of critical warfighting stocks strategically positioned afloat and ashore. In conjunction with strategic sealift and airlift, pre-positioned stocks provide the joint force commander with the combat formations and enablers needed to defeat adversaries.

ASC's Installation Support to Force Projection

■ By Maj. Gen. Duane A. Gamble



The Army Sustain-
ment Command
supports force
projection of all
Army components
through a num-
ber of subordinate
organizations.

The Army Power Projection Program enables force projection through processes, capabilities, and infrastructure that are all designed to meet geographic combatant commander requirements across the full range of military operations. Through the Army Sustainment Command (ASC), the Army Materiel Command (AMC) synchronizes and integrates the materiel enterprise capabilities that support force projection from Army power projection platforms and mobilization force generation installations (MFGIs).

In addition to synchronizing AMC capabilities in support of force projection operations, ASC operates logistics readiness centers (LRCs) in support of installation and garrison commanders. LRCs execute many tasks that support deploying units. These tasks are synchronized by the garrison commander and prioritized by the installation commander.

AMC's other major subordinate organizations also play important roles in meeting force projection requirements. AMC leverages the Army Contracting Command, the Joint Munitions Command (JMC), and the life cycle management commands to provide the Army and the joint force with ready, reliable support to sustain global operations.

LRCs: ASC's Face to the Field

ASC's Army field support brigades (AFSBs) build readiness and enable force projection, reception, and garrison operations in accordance with the installation commander's priorities.

Four U.S. and three overseas AFSBs provide logistics support at approximately 78 sites globally to meet installation and unit readiness demands that are generated in support of force projection and theater opening operations. LRCs integrate deployment activities by providing the critical link between installations and the Military Surface Deployment and Distribution Command (SDDC).

The installation and garrison commanders are responsible for deploying units from home station to theaters of operation. They do so by leveraging the LRC's core logistics capabilities.

LRC directors are dual-hatted; they lead the LRC while serving as the garrison commanders' senior logisticians. As the senior logisticians, they advise the garrison commanders in the application of supply, maintenance, transportation, mobilization, and deployment support.

The LRCs execute these capabilities by establishing an arrival/departure airfield control group at each port of embarkation and debarkation, supporting installation marshaling, staging areas, and alert holding areas, and coordinating and facilitating inter- and intra-theater rail and ground transportation.

In addition to performing force projection tasks, overseas AFSBs execute the Army pre-positioned stocks (APS) program to enable rapid force projection. AFSBs also leverage the Army's Logistics Civil Augmentation Program (LOGCAP) to provide contractors to fill critical capability gaps in support of mobilization, force generation, and force projection operations.

LRCs, APS, and LOGCAP are frequently exercised during deployments, emergency deployment readiness exercises, and combat training center rotations. These events allow AMC to rehearse, execute, and review these critical services and to build competency in support of Army power projection operations.

The APS Program

The APS program positions critical combat, combat support, and sustainment unit sets, equipment, and supplies at strategic locations across the globe to enable the rapid deployment of forces in support of combatant commander requirements. Pre-positioned stocks demonstrate our nation's commitment to our allies while also

deterring potential adversaries.

AFSBs execute APS operations through regional Army field support battalions (AFSBns). AFSBns establish, maintain, and prepare for issue unit equipment sets ranging from sets for full armored brigade combat teams to individual companies. In addition to unit sets of equipment, AFSBns establish, maintain, and configure for issue contingency supplies and equipment to meet combatant commander requirements.

Combat readiness and speed of issue are two key focus areas for ASC, AFSBs, and AFSBns. Under Gen. Gus Perna's leadership, AMC is pushing the Army to fully enable the equipment sets in APS with command, control, communications, computers, intelligence,

surveillance, and reconnaissance assets to ensure that equipment sets are fully configured for combat and "ready to fight" when deploying units arrive. The APS program continues to adapt to meet the demands of a dynamic global environment. An example of this adaptation is the addition of an APS set programmed for 2025.

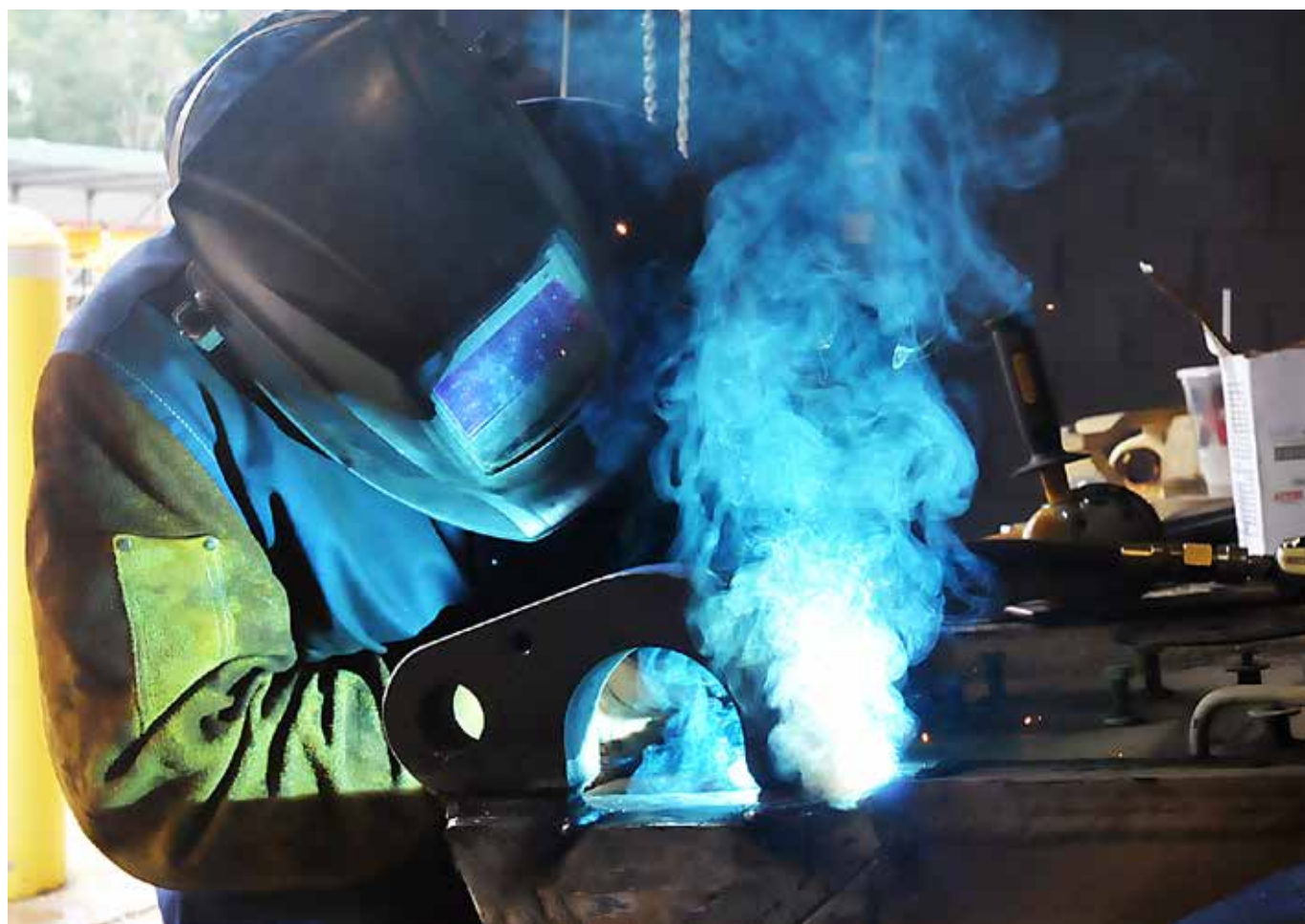
Support From LOGCAP

LOGCAP provides Army service component commands with the strategic capability to set the theater by providing contracted capabilities to meet theater opening, theater distribution, and theater sustainment requirements in phase zero and ahead of the flow of time-phased force deployment units. Since 2015, LOGCAP IV has fea-

tured regionally aligned task orders that have enabled the rapid response of contracted capabilities for training and contingency operations.

Since the first quarter of fiscal year 2016, U.S. Army Europe has employed LOGCAP contracts to support the deployments and sustainment of regionally aligned forces. U.S. Army Europe and the 21st Theater Sustainment Command used contracts to meet the reception, staging, onward movement, and integration requirements associated with a regionally aligned armored brigade combat team, combat aviation brigade, and sustainment task force.

In the U.S. Northern Command, LOGCAP support was employed in response to Hurricane Maria. LOGCAP support began to arrive



A logistics readiness center contracted employee welds the front end of an Abrams tank at Fort Benning, Ga. Vehicle maintenance is just one of the many missions of the logistics readiness centers. (Photo by Jon Micheal Connor)

within 96 hours of notice to proceed. The LOGCAP contractor established two 1,500-person life support areas, and both sites were fully operational within 26 days in a very austere environment with severely damaged infrastructure.

Like APS, LOGCAP continues to evolve to meet Army and combatant commander requirements. The next evolution of LOGCAP will occur in late fiscal year 2018 with the transition from LOGCAP IV to LOGCAP V. LOGCAP V will preserve the regional task order construct of LOGCAP IV but will add dedicated theater planning capabilities to better enable phase zero “set the theater” planning for Army service component commands.

Deployment Support From JMC

JMC’s support in mobilizing and deploying units is critical to providing trained and ready forces in support of contingency operations. JMC receives, stores, issues, distrib-

utes, and provides safety assistance for ammunition to enable outload support and power projection of munitions in support of combatant commands, contingencies, training, operation plans, and our allies.

JMC manages nine plants that annually produce more than 1.6 billion rounds of ammunition ranging from small-arms ammunition to bunker-busting bombs. Concurrently, JMC synchronizes the flow of training ammunition and to-accompany-troops ammunition to LRCs that issue ammunition to deploying units at power projection platforms and MFGIs. JMC also deploys and pre-positions combat load ammunition for ground reaction and quick reaction forces as required by the Forces Command, the National Guard Bureau, and the Department of the Army headquarters.

JMC also is responsible for the distribution of ammunition on a call-forward basis to theaters of op-

erations. JMC installations prepare the ammunition for transport by rail to one of two continental United States sea ports of embarkation for onward movement to the requesting theater of operation.

ASC Resources in Action

ASC capabilities supported multiple deployments and missions to include humanitarian aid and disaster relief efforts, combat training center rotations, and deployments in support of readiness. One recent deployment ASC supported was the deployment of the 2nd Armored Brigade Combat Team (ABCT), 1st Infantry Division (1st ID), from Fort Riley, Kansas, to the U.S. European Command area of responsibility in support of Operation Atlantic Resolve.

LRC–Riley, 407th AFSB, in concert with and in support of U.S. Army Garrison Fort Riley and 1st ID leaders, provided installation deployment capabilities to enable



A ship departs the Goose Creek, S.C., port to sail around the globe as part of Army Pre-positioned Stock 3.

the deployment of the ABCT to Europe. Support from the LRC and SDDC was critical in the movement of over 2,200 pieces of equipment by rail and line-haul to the seaport of embarkation and the movement of over 4,000 Soldiers to the aerial port of embarkation. The LRC facilitated the accomplishment of these tasks through continuous interaction with the 1st ID division transportation office and close coordination with the 2nd ABCT.

The 407th AFSB commander said that the 1st ID approached the deployment as a division-level operation driven by commanders with logistics as a supporting effort. The AMC team ensured seamless support between stateside and overseas AFSBs and incorporated deliberate planning and rehearsals that included SDDC early in the deployment timeline. The mission was led by the 1st ID and the LRC's installation transportation office and was well-resourced.

Reserve Component Support

ASC currently provides support at two active MFGIs: Fort Bliss and Fort Hood, Texas. However, additional capacity may be required to support force projection and contingency operations. If additional capacity is required to support a major contingency operation, ASC would work with the Forces Command, the Installation Management Command, and other stakeholders to determine the required resources to support the deployment of Army Reserve and National Guard units in support of large-scale operations. ASC is prepared to leverage contracted capabilities to rapidly expand core logistics functions at MFGI locations.

With the growing importance of Army power projection platforms and the setting of theaters, AMC, through ASC, synchronizes and integrates the materiel enterprise outputs in support of garrison and

senior mission commander priorities. AMC plays a critical role in synchronizing the allocation of resources through its major subordinate commands in order to project forces across the globe.

As AMC's operational link to the field, ASC synchronizes AMC's life cycle management command and leverages its AFSBs, LRCs, and contracted capabilities to provide core logistics functions that enhance readiness, rapidly set the theater, and support Army power projection.

Maj. Gen. Duane A. Gamble is the commanding general of ASC. He holds a bachelor's degree from Western Maryland College and master's degrees from the Florida Institute of Technology and the Industrial College of the Armed Forces.

Col. William Cain, Joi McIntosh, and Jacob Addy contributed to this article.



Joint Deployment and Distribution Coordination From the Fort to the Port

■ By Maj. Gen. Kurt J. Ryan

Pfc. Traven Friend, a tank mechanic with the 4th Squadron, 10th Cavalry Regiment, 3rd Armored Brigade Combat Team, 4th Infantry Division, conducts maintenance on an M88 recovery vehicle during seaport operations to offload the brigade's heavy equipment from a cargo vessel at the Port of Bremerhaven, Germany, on Jan. 6, 2017. (Photo by Capt. Scott Walters)



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The Army is
rebuilding its
deployment read-
iness and learn-
ing lessons from
brigade-sized over-
seas deployments
and rotational
force deployments.

The demand for Army forces is increasing, and the Army needs to train on its mission-essential tasks (METs), including deployment and redeployment tasks. These tasks will play a critical role in rapidly presenting forces for worldwide deployment and employment by a combatant commander or joint force commander.

The Army had 55 opportunities to practice deployment or redeployment tasks in 2017. That operational tempo is significantly faster than it was in previous years, but the number will increase again in 2018 to 82 brigade deployment or redeployment opportunities. Our institution and the entire joint deployment and distribution enterprise (JDDE) must take advantage of these operations to train on atrophied deployment skills.

In our predominantly continental United States (CONUS)-based Army, deployment tasks start with the ability to project combat power from our forts to designated strategic seaports. This is the fort-to-port phase of power projection. The Army designates a number of key locations (forts and depots) that maintain adequate deployment infrastructure and connectivity with the national highway and rail networks. These locations serve as Army power projection platforms.

Additionally, during large-scale contingency operations, if a significant portion of the Army Reserve and Army National Guard has to mobilize, the Army expands mobilization force generation installations to accommodate post-mobilization readiness training. Then the Army leverages these facilities for fort-to-port deployment coordination.

Predeployment Preparation

As captured by multiple after action reviews, 2017 proved that our junior and senior leaders, both commissioned and noncommissioned, are aggressively training to rapidly alert, marshal, and prepare their unit equipment for global deployments.

An emphasis on deployment-related tasks drives unit training schedules to allocate time and resources to practice METs associated with the deployment process. Home-station readiness results are measurable and depend on the following certainties.

Leader presence matters. When commanders and senior enlisted leaders, from the division through platoon levels, are involved in pre-deployment and deployment operations, and when the deployment is planned, resourced, and rehearsed as a tactical operation in conjunction with the unit's METs, the unit's efficiency and effectiveness significantly improves.

Deployment must be practiced at a realistic pace. "Speed of war" outload, driven by division and brigade commanders, builds the right deployment culture at installations. Installations and deploying units should drive deployment readiness by practicing 24/7 deployment operations at the speed required by the combatant commander's operation plan.

Practicing deployments at a realistic speed is essential for helping the Army and its installations identify power projection platform deployment process gaps, including rail load, truck load, and air load limiting factors that may affect large-scale deployment support.

Data must be accurate. Deployment data accuracy, or the lack of it, drives the entire deployment continuum from fort to foxhole. Commanders who emphasize accurate and regularly updated organizational equipment lists and unit deployment lists significantly improve their success in planning and ordering strategic transportation (rail, truck, air, barge, and ship). The Transportation Coordinators' Automated Information for Movement System II remains the commander's system of record for ensuring deployment data accuracy.

Rail safety is important. Adequately trained unit rail loading teams and proper unit-stored block-

ing, bracing, packing, and tie-down equipment, identified prior to rail and line-haul operations, improve the speed and safety of equipment in transit.

Help is available. Requesting on-site assistance by JDDE enables early improves deployment synchronization and coordination with the designated strategic seaport. The Military Surface Deployment and Distribution Command (SDDC) provides several special-mission teams for power projection platforms.

For example, deployment and distribution support teams are eight-man teams of transportation specialists that help division G-3s and brigades prepare for fort-to-port operations. Likewise, an SDDC rail operating crew, consisting of an engineer, conductor, and switchman, may be provided to assist logistics readiness centers with maintaining 24/7 rail operations.

Movement to the SPOE

A well-executed marshalling and out-load plan at the installation sets conditions for the success of follow-on operations at the designated seaport of embarkation (SPOE).

The Army maintains 20 strategic seaports in CONUS to facilitate power projection outside CONUS. If unit equipment is deploying by strategic sealift, equipment will flow to one of these ports. SDDC will direct units to send equipment to the appropriate SPOE, and the authorization to move equipment from fort to port will be captured in the port call message.

Units and installations must maintain discipline during onward movement to ensure equipment does not flow too early or too late to the designated SPOE; either scenario can disrupt unit cargo flow and ship stow timelines. Each SPOE can absorb a predetermined number of rail cars and line-haul trucks. They utilize unit cargo staging and ship berthing space as specified in port planning orders.

Commanders can “close” equipment at a designated seaport in several ways. If they are near the designated seaport, commanders can convoy road transportable equipment to the SPOE. Aviation units will self-deploy rotary-wing aircraft to the SPOE on the date designated in the port call message. More likely, commanders will leverage the commercial rail and trucking industry and order an adequate number of rail cars, trucks, and trailers through the supporting installation transportation office.

Lessons Learned

Army units are improving fort-to-port processes with every deployment opportunity. The most successful deployment operations of 2017 resulted in several observations.

First, units should ensure in-transit visibility from fort to port. They should use an on-site mission command element and share reporting information with the JDDE.

Division headquarters enable brigades to project rapidly from power projection platforms. A well-synchronized common operational picture of the deployment process, nested with the U.S. Transportation Command and shared routinely with SDDC battalions and brigades, can significantly improve the deployment process and allow problems to be effectively resolved across the JDDE.

An adequately manned unit port support activity (PSA), with a mission-command element provided by the division and brigade headquarters, greatly improves reporting accuracy during fort-to-port operations.

Second, units should anticipate and prepare to address all known equipment readiness faults. Broken equipment can adversely affect seaport download and ship upload operations. A robust unit maintenance and recovery element at the seaport should be part of the PSA. Maintainers should know the mainte-

nance readiness status of every piece of equipment departing the power projection platform, along with the required repair parts, to facilitate repair of that equipment before ship stow operations begin.

Third, units should maintain adequate fuel in each prime mover to facilitate operations at both the SPOE and seaport of debarkation. As a rule of thumb, all departing unit equipment should have three quarters of a tank of fuel and be marked accordingly. If the unit deploys with less fuel than that, the PSA must provide refueling capability at the SPOE to ensure there is adequate fuel for reception, staging, and onward movement in the gaining theater.

My next power projection article will focus on unit actions at the SPOE. It will address port support activity operations and how to best interface and coordinate with the U.S. Transportation Command, SDDC, and commercial port authorities to accomplish this common goal: the safe and effective outload of unit equipment configured to arrive at the geographic combatant command ready to fight.

By practicing our deployment tasks with regularity and realism at the speed of war, we will rebuild our deployment proficiency at echelon, enhance our credibility as a deterrent force, and, when called upon, project our military strength globally as the preeminent and decisive land combat force for our nation, the world’s lone military super power.

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It's Time to Rebuild Our Culture of Deployment Readiness

■ By Brig. Gen. Jeffrey W. Drushal and Capt. Alex Brubaker

Soldiers from the 135th Expeditionary Sustainment Command prepare for a deployment by packing weapons and equipment on June 21, 2017, in Birmingham, Ala. (Photo by Cpl. Jacob Hearn)



TWO MAN LIFT

3,000 LB LOAD CAPACITY

DEC 2016

PACKING LIST ENCLOSED

The Army was
once adept at de-
ployment, but it
has lost that skill
and must now
rebuild a culture
of deployment
readiness.

Fight Tonight! First to Fight! Wheels up in 18 hours. These are recognizable slogans that emphasize a unit's readiness to go anywhere, anytime, and fast. But what is the Army's deployment readiness narrative?

The Army uses pre-positioned stocks to facilitate rapid employment force projection, but what are we doing to employ follow-on forces? What if our strategy of assurance and deterrence fails and we have an armed conflict with a nation state?

A recent effort to assemble an armored brigade combat team in Europe took 14 days. If war were declared tomorrow, how long would it take to move an Army corps into the Pacific or Eastern Europe? It is a tough question with variables outside the Army's control, but we can do better at training what is in our control. This article discusses how our expeditionary deployment skills have atrophied and some solutions to help get them back.

Atrophied Deployment Skills

Years of predictive deployments under the Army Force Generation model, combined with outsourcing our deployment process to strategic enablers, has eroded our expeditionary deployment skills.

When the Army deployed to Operations Desert Storm, Desert Shield, and the first rotations of Iraqi Freedom and Enduring Freedom, each unit was responsible for the readiness of its equipment, deploying it, and bringing it back.

As we looked for cheaper, faster ways to integrate into theater, we began using theater-provided equipment and leaving unit equipment in the left-behind equipment program. During major exercises in other countries, we used Army pre-positioned stocks. Those vital deployment skills have slowly transitioned out of the force.

Years of sustained conflict in Iraq and Afghanistan have caused the deployment narrative and culture to change. Instead of deployment

being viewed as an operation for commanders, it became a task for logisticians. Years of strategic enablers, such as deployment support teams, left-behind equipment, and theater-provided equipment, have eroded units' deployment expertise and responsibility, and the onus is now on sustainers.

The reasons we shifted our focus made sense at the time, but over the course of 20 years, the overall impact has grown. Recently, the Army conducted inspections of the deployment readiness exercise program in order to assess current capabilities. The results showed suboptimal deployment training that focused on tasks like "alert" followed by scheduled training for the day.

Units rarely executed deployment readiness exercises in conjunction with installation transportation office (ITO) support. The few times that units did use that support are examples of the ITOs' inability to resource 24/7 operations without additional personnel.

The command deployment discipline program was found to be stove-piped in S-4/G-4 channels, limiting the commander's knowledge and involvement. On the whole, units have struggled to train the deployment process realistically.

The Army's potential missions, including direct action, deterrence, security force assistance, and humanitarian assistance and disaster relief, all have one common thread: the ability to rapidly alert, assemble, and deploy to any known point on the globe. The Army must be ready to deploy, fight, and win, anywhere in the world. The time to start rebuilding our culture of deployment readiness is now.

The Deployment Narrative

The Army has no overarching narrative when it comes to deployment. As the chief of staff of the Army continues to beat the drum for readiness, we must convey the importance of deployment readiness. To do so, we must leverage the



Soldiers from the 874th Forward Surgical Team from Fort Jackson, S.C., conduct a deployment readiness exercise on Sept. 8, 2017, to prepare for a potential short-notice deployment from home station to anywhere in the world they are called to provide medical support. (Photo by Maj. Simon Flake)

processes within the Army, the Joint Staff, and the Office of the Secretary of Defense to develop a narrative for Army forces that encompasses the current operational environment as well as operation plan requirements.

We need to influence the development and content of the 2018 National Military Strategy to ensure that it includes discussions of deployment readiness, the Army's strategic deployment capabilities, and the requirements that Army forces must meet. This will drive the prioritization of resources toward deployment capability.

Army Policy Adjustments

The Army should publish a policy revision requiring unit commanders to reconcile their unit equipment list with the unit property book every month. This will force the use of our systems of record, increase the accuracy of movement and dimensional data, and assist with the mobility community's quality assurance and quality control checks.

The Army should establish clear installation deployment standards across the globe so that the process is simple and known no matter where you go. Additionally, port

call messages should be published through Department of the Army G-3 operations channels to ensure unit compliance.

Commander's Actions

As leaders, we can only emphasize a finite number of priorities. It is time to start increasing our emphasis on deployment training. Command deployment discipline inspection results should be put into commanders' channels to give them accurate snapshots of their deployment readiness. Divisions could also add or modify their deployment

readiness slide in the logistics readiness review briefings and make it more comprehensive to provide a total picture of capabilities.

Units should consider adding unit movement briefings as part of company-level change of command outbriefings. Part of the briefing would detail the unit's last roll-out program that moved 100 percent of its modified table of organization and equipment items through the installation deployment process.

Collective Training

There is no standard baseline for the "deploy" mission-essential task. Look at three different companies within a brigade combat team on the Army Training Network and you will see three different collections of tasks. The armored company

has eight collective tasks. The signal company has three collective tasks. The distribution company has 27 collective tasks.

The difference in the number of tasks being trained between a distribution company and a signal company in a brigade combat team is 24. We need to standardize the "deploy" task and subordinate collective tasks across the Army. The centers of excellence should establish a working group and determine what tasks all units should train. Deployment fundamentals should not be radically different among the various types of tactical units.

The Army must revamp its institutional approach to deployment training for combat training center rotations and warfighter exercises. We should evaluate units deploying

to combat training centers from fort to port and from tactical assembly area to fort. Deployment and redeployment should be included in the after action review.

Build Individual Expertise

We must determine the best options for Soldiers to gain individual experience in an environment that is increasingly hampered by time limitations and resource constraints. These options should be conducive to a generation that uses the internet to get quick and easy answers.

The Deployment Process Modernization Office maintains a digital repository of deployment information called the "Deployer's Toolbox." It includes best practices, forms, regulations, and deployment smart books.



Army Deployment Rehearsal

For the United States to deter conventional attacks, its opponents must know that we can amass forces at their doorsteps. We must resource and execute the deployment of an Army division from the United States to one of our geographic combatant commands every two years based on an existing operation plan's time-phased force deployment data.

Only then can we validate the Army's force projection capabilities and speed of assembly. From these drills, we will gather vital data metrics and understand our limitations so that we can better prepare for conflict.

Rebuilding a culture of deployment readiness is a deliberate process that will take time, resources,

and energy. The effort belongs to every Soldier and Army civilian.

Most of our personnel who have experienced expeditionary deployment are senior officers and non-commissioned officers. Many of these people will leave the Army in the next five years, and we need to leverage their expertise before we have to relearn what we have lost.

Enacting new policies and commander's actions, training in new ways, and emphasizing deployment as an operation will help us get back to a culture of deployment excellence to ensure the Army is ready for the future fight.

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business management from the University of Tampa, a master's degree in logistics management from the Florida Institute of Technology, and a master's degree in strategic studies from the Army War College. He is a graduate of the Transportation Officer Basic Course, Combined Logistics Officer Advanced Course, Command and General Staff College, Logistics Executive Development Course, Army War College, and Army Senior Leader Seminar program.

Capt. Alex Brubaker is the proponent officer for the Transportation Corps. He received his commission from the University of Michigan and is a graduate of the Transportation Basic Officer Leader Course, Combined Logistics Captains Career Course, and Support Operations Course.



Soldiers from the Headquarters and Headquarters Battalion, 2nd Infantry Division Artillery, board a C-17 Globemaster III at Moses Lake, Wash., on Oct. 18, 2017. Elements of the unit participated in a deployment readiness exercise in preparation to support 2nd Infantry Division operations in South Korea. (Photo by Pfc. Ethan Valetski)

Projecting the Force in the Pacific

■ By Brig. Gen. James S. Moore



A 25th Infantry Division Stryker vehicle is offloaded from the Ocean Jazz cargo ship at Yokohama North Dock, Japan, on Sept. 8, 2017, in support of Orient Shield. Orient Shield, held at Camp Fuji, Japan, is one of the many exercises linked by Pacific Pathways. (Photo by Luis Casale)



Recent developments in the Pacific, including a historic escalation of tensions on the Korean peninsula, ongoing issues between China and its neighbors in international waters, and a reevaluation of the relationship between the United States and the Philippines, are reminders that the region remains a very volatile political environment. In addition to its political challenges and regional threats, the Pacific Rim is extremely susceptible to natural disasters and is well deserving of its “Ring of Fire” moniker.

These conditions create a requirement for the Army to be able to deploy a sizable force on short notice to the U.S. Pacific Command (PACOM) area of responsibility (AOR) to counter a significant threat or provide a large-scale humanitarian cri-

sis response. The Army and its joint force partners must be prepared to swiftly execute such an operation.

PACOM is the largest unified combatant command. In addition, PACOM's AOR is not a contiguous landmass with ground lines of communication; islands and peninsulas make up much of the land in the region. Clearly, force projection into the PACOM AOR, whether in response to a critical military contingency or a natural disaster, can not just instantly happen at the onset of a crisis. It must be planned, developed, and set.

Projecting a force from the continental United States (CONUS) across the world's largest ocean requires constant, full-time attention in order to properly reassure allies, deter aggression, set the theater for poten-

tial contingency operations, and provide timely humanitarian assistance. Only through multiple lines of effort, including CONUS-based activities, multilateral exercises, regional engagements outside of CONUS, and the ongoing, synchronized actions of multiple stakeholders, are we able to credibly project the military element of national power across the Pacific.

Force Projection

Army Regulation 525-93, Army Deployment and Redeployment, defines force projection as “the ability to project the military element of national power from CONUS or another theater in response to requirements for military operations.” Army Doctrine Publication 4-0, Sustainment, elaborates by saying that the processes of force projection



Deploying units to
operations in the
Pacific requires
maintaining con-
stant relationships
with numerous
entities in order to
be ready at a mo-
ment's notice.

(mobilization, deployment, employment, sustainment, and redeployment) “are a continuous, overlapping, and repeating sequence of events throughout an operation. Force projection operations are inherently joint and require detailed planning and synchronization.”

The Stepping Stone to the Pacific

Of the five processes within the force projection construct, mobilization and deployment and their associated subtasks are arguably the most critical. Recognizing this importance, the Army has designated certain CONUS-based installations as mobilization force generation installations (MFGIs) and others as power projection platforms (PPPs). Fortunately for PACOM, Joint Base Lewis-McChord (JBLM), Washington, is both an MFGI and a PPP.

MFGIs are Army installations designed and resourced to provide power projection support, pre- and post-mobilization training, and sustainment capability for active and reserve component units. JBLM is one of seven primary MFGIs. One of its tenants, First Army's 189th Combined Arms Training Brigade, conducts multicomponent integrated collective training both before and during units' mobilization.

PPPs are Army installations with access to designated local sea and air ports of embarkation (POE) that can rapidly deploy at least one combat brigade in support of strategic requirements. Poised on the U.S. Pacific Northwest coast, JBLM is uniquely positioned to connect Army combat forces to PACOM's AOR in support of the nation's strategic priorities. With McChord Field and the Port of Tacoma, as well multiple alternate sea POEs within close proximity, JBLM enjoys a multitude of strategic mobility options to rapidly deploy combat forces.

JBLM's advantages as a PPP extend beyond its great locale. The 593rd Expeditionary Sustainment Command (ESC) at JBLM is fortunate enough to partner with a host

of outstanding organizations working in concert to effectively execute strategic deployments of tenant units and mobilized reserve component forces.

These organizations include the Military Surface Deployment and Distribution Command's 833rd Transportation Battalion and 1395th Deployment and Distribution Support Team, the Army Materiel Command's 404th Army Field Support Brigade and Army Field Support Battalion-Lewis, and Logistics Readiness Center-JBLM, whose Installation Transportation Division and Strategic Deployment Center (SDC) provide equipment marshalling support and direct unit movement data support to deploying units.

The Transportation Operations Branch of the 593rd ESC Distribution Management Center provides strategic mobility support to I Corps' separate brigades, and the 593rd ESC's 13th Combat Sustainment Support Battalion routinely transports equipment from unit motor pools to the SDC and from the SDC to the Port of Tacoma. All of these organizations' resources were brought to bear during a recent sea-lift emergency deployment readiness exercise, when the Forces Command redirected a Stryker brigade combat team to deploy its cargo to the National Training Center by sea instead of rail.

Setting the Theater Partnerships

Setting the theater is a critical component of effective force projection. It addresses the requirements necessary to support the geographic combatant commander's theater campaign plan, including agreements that allow U.S. forces' access to ports, terminals, airfields, and bases within the AOR.

In the Pacific, force projection and setting the theater are interdependent and inexorably linked, and their processes must be continual in order to be effective in times of crises. The 8th Theater Sustainment Command is responsible for setting the the-

ater in the Pacific, which involves all activities related to shaping the operational environment and establishing favorable conditions for military action.

The 593rd ESC is the sole deployable logistics command at JBLM. It supports a PACOM-aligned corps headquarters and has established essential relationships across the Pacific to enable critical continual force projection processes.

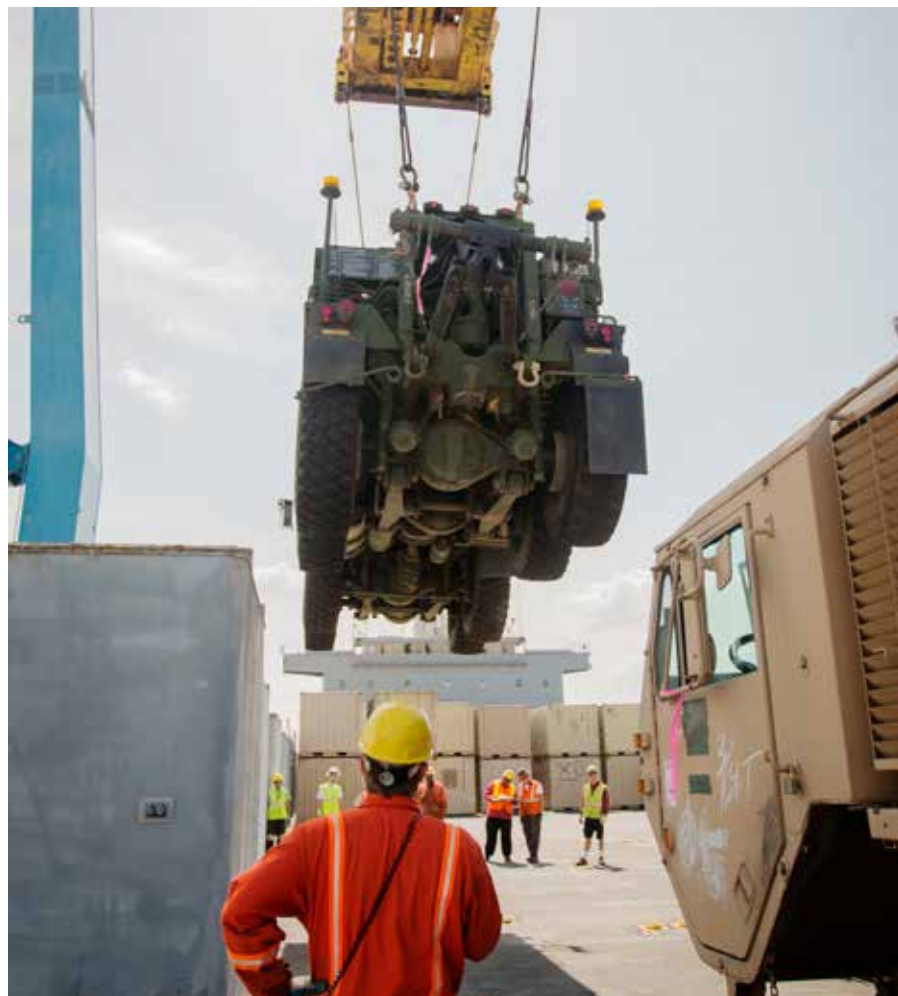
In order to understand the Pacific operational environment and anticipate force projection requirements in advance of a potential crisis, the 593rd ESC partners with the 19th ESC and Eighth Army in Korea, the 10th Regional Support Group and I Corps (Forward) in Japan, U.S. Army Pacific and the 8th TSC in Hawaii, and U.S. Army Alaska.

These staffs and units collaborate on multiple initiatives, including mutually supporting planning efforts and joint and multinational exercise support. For example, Army watercraft subject matter experts from the 593rd ESC, U.S. Army Pacific, and the 10th Regional Support Group recently collaborated to leverage two Japan-based landing craft utility vessels to transport Marine Corps cargo to and from a combined bilateral exercise in the Philippines.

Force Projection in Action

Pacific Pathways is an annual multilateral exercise in the form of a series of three strategic deployments around the Pacific. Each Pacific Pathways deployment features an Army task force, frequently components of a brigade combat team, whose equipment is transported from CONUS to multiple exercise locations and then back to CONUS on a single vessel.

For Pacific Pathways 18-2, the Indiana National Guard's 76th Infantry Brigade Combat Team will ship its equipment by rail to JBLM. After downloading there, the cargo will undergo preparation for sealift, including a thorough cleaning for agricultural inspection, before it is called forward



Equipment from the 2nd Stryker Brigade Combat Team, 2nd Infantry Division, is loaded onto a vessel at the Port of Tacoma, Wash., on Aug. 14, 2017, during a sea emergency deployment readiness exercise. (Photo by Pvt. Adeline Witherspoon)

to the Port of Tacoma for vessel loading in May and strategic deployment in support of the PACOM commander's training objectives.

This single movement of a reserve component force from the geographic heart of CONUS across the expanse of the Pacific and back requires the coordination of every organization previously mentioned and highlights the criticality of each process of force projection.

A major contingency or catastrophic natural disaster in the PACOM AOR is a distinct possibility with unpredictable timing. Deploying a sizable ground response force into an AOR as dynamic and vast as the Pacific requires deliberate plan-

ning before a crisis occurs. The processes of force projection, setting the theater, and establishing strong partnerships are the keys to success.

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Soldiers of the 529th Regimental Support Company, 3rd Infantry Regiment, participate in a joint tactical aerial resupply vehicle exercise at Fort A.P. Hill, Va., with the Army Research Laboratory, on Sept. 22, 2017. (Photo by Pfc. Gabriel Silva)

Autonomous Aerial Resupply in the Forward Support Company

Forward support companies are ideally positioned to use autonomous aerial resupply capabilities to support maneuver elements in Multi-Domain Battle.

■ By Lt. Col. Jeremy C. Gottshall and Capt. Richard A. Lozano

The concept of using unmanned aerial systems (UASs) to transport equipment and supplies continues to gain momentum and widespread acceptance by Army leaders. The Army Operating Concept, the Robotic and Autonomous Systems Strategy, and the Army Functional Concept for Movement and Maneuver all call for

developing this capability.

Accordingly, the Army and its joint and industry partners have been working to introduce and refine autonomous aerial resupply capabilities to expedite sustainment operations and to minimize Soldiers' exposure to risk. However, the focus has shifted from large, unmanned helicopters carrying thousands of

pounds of supplies between static forward operating bases to a smaller, decentralized, organic capability supporting small, dispersed maneuver formations.

To be sufficiently responsive in the dynamic, rapidly changing conditions of close combat, an autonomous aerial resupply capability must reside in the organization that

sustains the lowest echelons of maneuver forces: the forward support company (FSC).

Speeding Resupply

Driven by a renewed emphasis on readiness, capability developers have been examining how unmanned logistics systems could improve distribution from within the brigade combat team (BCT) to the BCT's forward maneuver formations. This effort is even more imperative for the future operational environment.

In the future fight, Army forces will face highly capable adversaries who will challenge U.S. dominance in every domain—air, land, sea, space, and cyberspace. The enemy will challenge U.S. air superiority and deny the Army's use of static safe havens, including forward operating bases and logistics hubs. To win in this scenario, Army forces will task organize at the lowest practical level and operate semi-independently to exploit temporary windows of advantage.

Dispersed and semi-independent maneuver elements require their own decentralized sustainment capabilities to maintain a high operating tempo, endurance, and operational reach. Because windows of advantage are fleeting, the ability to move quickly against an enemy's weak points is crucial. In this environment, the virtue of autonomous aerial resupply is its ability to move mission-critical equipment and supplies when other modes of transportation are not available and before a window of opportunity closes.

Responsive logistics, including aerial resupply, is paramount in this operational environment. Unfortunately, access to manned aviation support for resupply is typically a 72- to 96-hour process. Maneuver and logistics commanders can expect similar delays from unmanned cargo aircraft assigned to aviation units because they use the same multiechelon air movement request and approval procedures. For a commander executing maneuver in Multi-Domain Battle, waiting

this long for resupply or transportation of mission-essential equipment could mean the loss of an initiative when a temporary window of local superiority closes.

The Army should decentralize unmanned aerial resupply capabilities by assigning them to FSCs for local control and immediate response just as unmanned intelligence, surveillance, and reconnaissance capabilities are assigned to BCT maneuver formations. Resupply metrics should be in minutes, not days.

Why the FSC?

In the future operational environment, fleeting periods of local dominance will require rapid, timely action; this action will require responsive sustainment. Robust organic sustainment is even more critical in an access-denied environment, where lines of communication—including air, ground, and mission command networks—could be regularly interdicted by enemy action.

Maneuver units at all levels must become less dependent on higher echelons. Therefore, autonomous aerial resupply should be integrated at the lowest level possible.

According to Field Manual 3-96, Brigade Combat Team, FSCs provide the greatest flexibility for logistics support within the BCT. Although organic to the brigade support battalion, FSCs are frequently attached by the BCT commander to their supported maneuver battalions, and they provide the link from the brigade support battalion to the supported battalions.

Because FSCs normally operate in close proximity to their supported battalions or squadrons, they are best positioned to react quickly to changing conditions and logistics requirements. Furthermore, the FSC commander can divide the company and place some elements forward with the supported unit and other elements in the brigade support area. By doing this, the FSC can anticipate and rapidly respond to urgent movement requirements. It can either de-

liver supplies and mission-essential equipment from the brigade support area or the maneuver battalion's combat trains.

The FSC is ideally situated to use an autonomous aerial distribution capability as an additional means to fulfill routine or urgent resupply requests. This capability would reduce the supported elements' vulnerability to enemy action and increase their ability to exploit an enemy's weakness. Essentially, autonomous aerial resupply gives the FSC a solution to support Multi-Domain Battle maneuver.

Challenges and the Way Ahead

Providing UASs for sustainment support directly to maneuver formations would present some challenges that would need to be addressed before the capability could be effectively implemented. These hard questions must first be answered:

- ☐ How will unmanned logistics systems be operated in a manner that maximizes safety for other aircraft and personnel on the ground?
- ☐ How will these systems be integrated into the tactical airspace control network?
- ☐ Who will operate these systems for the FSC, and what level of training will they require?
- ☐ How will the systems be maintained, and by whom?
- ☐ Will these systems displace other equipment in the FSC?
- ☐ How will cyber and network security concerns be addressed?
- ☐ How much payload should one systems deliver?
- ☐ How fast and how far should the systems be able to go?

To tackle these issues, the Army and Marine Corps established the requirements integrated product team (IPT) for the joint tactical autonomous air resupply system (JTAARS) in October 2016. The IPT is exploring these questions and refining procedures in order to successfully implement autonomous



Soldiers of the 529th Regimental Support Company, 3rd Infantry Regiment, load a joint tactical aerial resupply vehicle with supplies during a tactical unmanned aerial resupply exercise on Sept. 22, 2017, at Fort A.P. Hill, Va. The exercise was held with the Army Research Laboratory. (Photo by Pfc. Gabriel Silva)

aerial resupply at the most forward tactical echelons.

The IPT consists of capability developers and subject matter experts from the Sustainment, Maneuver, Mission Command, and Aviation Centers of Excellence as well as from the Marine Corps headquarters and other stakeholders. The IPT's ultimate objective is to fully document JTAARS requirements and transition JTAARS into a program of record.

In the meantime, Army research organizations and their industry partners are tackling the technical challenges to develop air vehicles with the physical characteristics, automated navigation systems, and associated human-control interfaces that will allow the systems to be integrated into FSCs.

Multiple Department of Defense organizations are actively pursuing technology to deliver capabilities simple enough to maintain and operate within the FSC. The Armament Research, Development and Engineering Center has teamed with an industry partner to develop the joint

tactical aerial resupply vehicle, formerly known as the Picatinny Pallet. The U.S. Central Command is also pursuing a cargo UAS.

Together, these representative technology approaches were submitted as a single joint capability technology demonstration proposal. The proposal seeks to develop and demonstrate air vehicles capable of autonomously delivering payloads of 300 to 600 pounds, which aligns closely with the JTAARS IPT's preliminary requirements analysis. While this joint capability technology demonstration was not funded, the work to investigate this solution space continues.

Additionally, the Army Research Laboratory and the Office of Naval Research are working with an industry partner to scale down an existing helicopter autonomy package for integration into smaller unmanned aerial vehicles such as the joint tactical aerial resupply vehicle. This would greatly reduce the requirement for operator control inputs.

In a separate effort, the Army Medical Research and Materiel

Command's Telemedicine and Advanced Technology Research Center is seeking to develop capabilities for future combat medics. These capabilities include medical resupply and casualty evacuation with UASs that use vertical takeoff and landing when conventional medevac assets are denied access or unavailable.

Regardless of what form the technical solution ultimately takes, autonomous aerial resupply will provide the FSC commander an additional tool to accomplish the mission of providing adaptable and flexible distribution support for the maneuver battalion. UASs may not immediately replace existing capabilities within the FSC, but they will provide a uniquely responsive distribution option to help maneuver forces seize, maintain, and exploit the initiative in Multi-Domain Battle.

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The authors would like to thank Dr. Lance Saunders and Dr. George Zsidisin from the Supply Chain Management Department at Virginia Commonwealth University for their contributions to this article.



Paratroopers of the 54th Engineer Battalion, 173rd Airborne Brigade, prepare a simulated casualty for evacuation with Canadian and Slovenian soldiers while conducting sustainment operations during exercise Allied Spirit IV at the Joint Multinational Readiness Center in Hohenfels, Germany, on Jan. 20, 2016.

Enabling Multinational Operations at the Tactical Level

This article outlines nine lessons learned by a multinational forward support company during Allied Spirit IV.

■ By Capt. Shane Covert

Allied Spirit IV involved military forces from eight countries fighting as one multinational task force (MTF) in a decisive action training environment at the Joint Multinational Readiness Center in Hohenfels, Germany. During the exercise, the forward support company (FSC) from the 54th Brigade Engineer Battalion had attach-

ments from four other countries and supported a mechanized infantry battalion from the United Kingdom. This article outlines nine lessons learned by that MTF FSC during Allied Spirit IV.

1: Integrate Immediately

The first and most basic lesson when operating as an MTF FSC

is to physically integrate during reception, staging, onward movement, and integration (RSOI). Unfortunately, integrating attachments from multiple countries during RSOI is not easy. Coordination must take place well in advance, and units must know who they will be fighting alongside.

Coordinating for living arrange-

ments needs to be a priority. Ensuring all attachments within the MTF FSC live together facilitates team cohesion. This arrangement will also allow language barriers, misinterpretation of acronyms, and misconstrued military definitions to be resolved early.

Daily operations, such as wake up, living space cleanup, and leadership huddles will posture the MTF FSC to accomplish day-to-day operations as a team. Eventually the MTF FSC will refine these simple tasks so that it can accomplish difficult ones. Do not wait until a combat training center rotation or, even worse, combat to build this team cohesion.

2: Conduct Troop Issue With All Attachments

Troop issue is a complex task that needs to be under the mission command of an MTF FSC. Drawing classes I (subsistence) through V (ammunition), mission rehearsal exercise equipment, and multiple integrated laser engagement system gear are all part of troop issue during RSOI.

Working through how an MTF FSC will obtain all of these resources is simplified when everyone lives in the same area because details can be communicated throughout the day with ease. Accomplishing these tasks as an MTF FSC allows resources to be shared between nations. Throughout this process, the MTF FSC members begin to learn each country's vehicle capabilities. They also learn how to accomplish basic logistics, such as operator licensing, fuel compatibility, and equipment staging.

Do not let administrative constraints such as acquisition and cross-servicing agreements prevent troop issue from being synchronized and led by an MTF FSC. Given the complexity, each country will have the tendency to conduct its own troop issue. Do not let this happen.

3: Bring Enough Radios

As an MTF FSC, FM radio communication needs to be practiced at every opportunity, specifically during the situational training exercise (STX). Accents and language barriers

make FM communication challenging. Another challenge is that the single channel ground and airborne radio system (SINCGARS) is not compatible with NATO's other FM platforms. Two solutions to this compatibility shortfall are to establish a tactical voice bridge (TVB) or to distribute additional SINCGARS to allied forces.

The TVB is established by connecting each nation's radios to a tactical voice gateway utilizing W2 cables. Establishing a TVB allows each nation to use its own radios so that they do not have to be trained on an unfamiliar system. The problem with the TVB is that it creates a substantial amount of static. Deciphering accents and overcoming language barriers with heavy static makes communicating with a TVB very challenging.

The preferred method is to distribute additional SINCGARS to partner nations' attachments. The additional time spent training on the SINCGARS pays dividends. For this reason, plan to bring additional SINCGARS to train with prior to



A Soldier from the 54th Engineer Battalion, 173rd Airborne Brigade, briefs a group of Canadian and U.S. Soldiers during Allied Spirit IV at the Joint Multinational Readiness Center in Hohenfels, Germany, on Jan. 21, 2016.

deployment. Ensure that all components, such as the appropriate cables, headsets, and simple key loaders, are brought as well.

4: Use Support Requirements for STX Training

During the STX, the MTF FSC will be engaged in two separate efforts: fulfilling real support requirements and accomplishing training objectives. Supporting the battalion by providing food, distribution, vehicle recovery, maintenance, and field feeding will remain the priority and distract from the FSC's training objectives. Additionally, RSOI and troop issue requirements prior to the STX do not allow much time for training preparation.

Waiting until the STX to overcome communication challenges and become familiar with partner nations' capabilities dooms an MTF FSC to failure. Developing and practicing standard operating procedures for FM communication, analog tracking, gun truck management, field trains command post (FTCP) operations, and logistics release point (LRP) operations are all training objectives that need to be exercised before combat. Three of these areas are easy to incorporate during the STX: FM communications, analog tracking, and gun truck management.

During the STX, treat each support requirement as if it is happening during combat. For example, if a supported unit has a broken-down vehicle, do not immediately dispatch a recovery team without conducting radio checks, submitting a trip ticket, and attaching convoy security.

Coordinate the deliberate training events such as logistics convoys, LRP operations, and FTCP operations toward the end of STX. Ensure that everyone in the MTF FSC has a task and purpose during these events. Coordinating these events toward the end of STX ensures that everyone in the MTF FSC can participate and that they

are not committed to any troop issue requirements that may have carried over into the STX. This allows more time to refine FM communication, analog tracking, and gun truck management before engaging in training with opposing forces.

5: Have the Issue Yard Configure MCLs

Mission configured loads (MCLs) reduce time at LRPs and expedite combat missions such as obstacle emplacement. Unfortunately, developing MCLs is very challenging and needs to be coordinated for in advance.

Knowing exactly what the using unit wants in the MCL is one of the most difficult tasks and requires constant communication and engagement with the using unit to find out what to put in MCLs. Once this is known, contact the corresponding troop issue yard to see if it can assist in configuring certain items. This will reduce the amount of unneeded supplies received and the time spent configuring an unmanageable number of items.

For example, the using unit wants 58 pickets, but the troop issue yard configures and distributes only pallets with 400 pickets. The unit now has 342 unneeded pickets and must separate the 58 pickets from the 400 pickets. Having the troop issue yard configure MCLs is possible with enough lead time and mitigates the problems that arise when brigade support battalions (BSBs) and FSCs configure multiple MCLs.

6: Use MCL Flat Rack Exchanges

When MCLs are distributed from one unit to another, they are typically distributed by flat rack on the back of a load handling system (LHS). LHSs use flat racks in order to strap down and transport various supplies. Flat racks are 20 feet long and 8 feet wide and are raised and lowered by an LHS internal crane.

An efficient technique to transfer supplies from one unit to the next is to conduct a flat rack exchange in

which the distributing unit swaps a flat rack full of supplies for an empty flat rack from the requesting unit. This eliminates the need to unload supplies from one flat rack and load them onto another.

For example, if flat rack exchanges were not used and the BSB distributed 40 pallets of concertina wire to the FSC, then the FSC would need to unload the 40 pallets from the BSBs flat racks and load them onto the FSC's flat racks.

If a forklift were not available, then Soldiers would be forced to move these pallets by hand. Each pallet weighs approximately 500 pounds. But if a flat rack exchange were used, then the BSB and FSC would simply exchange approximately five flat racks.

Units are hesitant to conduct flat rack exchanges because flat racks are serial numbered items, and they don't want their flat racks confused with those from another unit. An effective technique to assist with property accountability is to paint the tongues of the flat racks with a vibrant color specific to the unit. That way each unit can easily identify its flat racks.

7: Use a Map and Trackers in the MTF FSC CP

The MTF FSC command post (CP) is the centralized information hub where orders are disseminated during combat. This CP needs to have a constant flow of communication and needs designated personnel to update analog tracking systems and monitor radio communications.

Incorporating representatives from each nation inside the CP is critical. Maximize the opportunity during STX to exercise CP operations. Real-time information about the enemy, the MTF, and other friendly units needs to be clearly displayed in the CP. An effective way to do this is to develop two large boards: one depicting information on maps and the other depicting information with graphics and trackers.

The map board needs to include

significant activities from the enemy, friendly units, designated checkpoints, and the FTCP security plan. This information needs to be updated in real time and shown to personnel departing for support missions. Once the personnel return from their mission, they need to be debriefed inside the CP and the map board needs to be updated with any additional significant activities that took place during their mission.

The other board needs to be populated with details such as convoy information, resource allocation, and battle damage assessment and repair statuses. One technique for capturing convoy details is to have places on the board for blank, current, and completed trip tickets. Each trip ticket needs to include all details associated with who and what is in the convoy. Items such as battle rosters, sensitive item information, vehicle administrative numbers, and commodities can be listed on the trip tickets.

Use magnets on the back of key vehicle graphics such as gun trucks to create a visual representation of resource allocation. Battle damage assessment and repair statuses need to be provided by the maintenance control section (MCS) and updated on the board every time the reallocation packet moves to the next echelon.

8: Centralize Gun Trucks

During Allied Spirit IV, the MTF FSC was responsible for supply convoys, casualty evacuation, vehicle recovery operations, enemy prisoner of war transportation, and reconstitution transportation. All of these missions required convoy security. Reaction time for these missions depended on how fast vehicle operators could stage vehicles, submit trip tickets, and receive mission briefs.

During Allied Spirit IV, nine times out of 10, slow reaction times were caused by inefficiencies in gun truck allocation. Appointing a noncommissioned officer-in-charge (NCOIC) responsible for managing all convoy security gun trucks will mit-

igate inefficiencies and increase gun truck availability. The NCOIC needs to have constant radio communication with the CP in order to receive missions. This communication also enables the CP to update the mission command boards.

An effective way to centralize gun trucks is to place all of them at the FTCP and to have designated gun truck teams act as a quick reaction force. Use one team for daytime operations and another at night.

Another task for the gun truck NCOIC is to ensure that enough MK93 gun mounts are brought from home station in order to mount the M2 .50-caliber machine guns, M240B machine guns, or M249 squad automatic weapons onto the gun trucks. Without the MK93 gun mount, these weapons systems cannot be used on the gun trucks.

9: Split the MTF FSC

The main body of the MTF FSC needs to establish an FTCP instead of being inside the brigade support area (BSA). By doing this, the MTF FSC is able to react faster to the using unit at the forward line of troops.

This also allows the FTCP to remain small and mobile. However, having the MTF FSC establish an FTCP creates a disadvantage because there are not as many personnel available to provide perimeter security. A sergeant of the guard should be designated to manage the security posture of the FTCP and to communicate FTCP head counts to the CP. This security posture should be visually depicted on the map board in the CP.

Large items of equipment associated with pass-back maintenance such as the forward repair system, the standard automotive tool set, and the MCS expansible van need to stay at the BSA. These items of equipment should be accompanied by a small maintenance team to provide pass-back maintenance, conduct MCS operations, and act as a liaison between the BSB and the FSC. Another FSC liaison team needs to be at the battal-

ion TOC to maximize shared understanding—especially if the battalion is from a different nation.

Initial preparations such as living arrangements and troop issue are the building blocks for a successful MTF FSC. Solving problems during this less threatening time builds the confidence needed to accomplish complex tasks such as MCL development, flat rack exchanges, CP operations, convoy security, and FTCP operations.

Initial integration rarely occurs in an MTF FSC because of its complexity and a lack of understanding about how beneficial it is. Do not overlook this initial integration as so many others have. Arriving prepared with FM communication equipment, marked flat racks, and analog tracking systems will set the MTF FSC up for success.

Be sure to use the delivery of support requirements during the STX as opportunities for combat training. Defining roles and responsibilities for key positions such as sergeant of the guard, radio operators, convoy security NCOIC, and gun truck teams will further increase the MTF FSC's proficiency. Splitting the FSC between the FTCP, the BSA, and the battalion TOC will maximize shared understanding. Applying these lessons learned to any FSC operating as part of an MTF will ultimately make multinational operations a success.

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Sgt. Roderic C. Sterling II, a member of the United Arab Emirates Detachment, 831st Transportation Battalion, unloads cargo from a commercial carrier at Al Maktoum International Airport on Apr. 22, 2017. (Photo by Sgt. Gabriel Roca)

Using Multimodal Operations to Project and Sustain the Force

■ By Lt. Col. James Peckham, Maj. Barry J. White, and Capt. Sung Min Kim

The United States has been performing large-scale combat operations in the Middle East since Operation Enduring Freedom began in 2001. As the U.S. Transportation Command's (US-TRANSCOM's) representative for Army transportation expertise, the Military Surface Deployment and Distribution Command (SDDC) is at the forefront of sustaining combat readiness in the region.

SDDC's initial efforts to set the theater centered on single port management of select seaports within the Persian Gulf. However, over the past 16 years, those efforts have expanded through diplomatic agreements with host nations and the establishment of stevedoring and related terminal services (S&RTS) contracts with local shipping companies to provide port services. The 831st Transportation Battalion,

located in Bahrain, has the ability to provide port management oversight from Saudi Arabia, Qatar, the United Arab Emirates (UAE), and Afghanistan.

Supporting long, protracted combat operations in the Middle East poses multiple challenges because of the distance between the two ongoing operations in Iraq and Afghanistan. Nonetheless, these operations are synchronized by transportation

experts. USTRANSCOM's multimodal contracts enable SDDC to find cost-effective ways to support the warfighter through commercial air and ocean carriers. In this way, SDDC hones those battle-tested transportation networks that ultimately shape the operational environment and support combat operations.

SDDC interfaces with commercial transportation solutions that support deployment, redeployment, and sustainment requirements by contracting the shipment of military cargo on commercial U.S. flag vessels. Commercial sealift assets move 80 percent of military cargo in order to sustain an economically feasible and efficient flow of cargo that satisfies all requirements associated with two named operations in the U.S. Central Command (CENTCOM) area of responsibility.

The Challenges of Afghanistan

Sustaining the operation in Afghanistan poses several logistics challenges since the country has no direct link to a viable sea line of communication. The primary modes for sustainment in the country are ground lines of communication (GLOCs) from either Europe through the Northern Distribution Network or through Pakistan.

The most viable line of communication is from the south, originating at the ports of Karachi and Qasim in Pakistan. It is known as the Pakistan GLOC (PAKGLOC). Our commercial carrier partners call both of the ports on regular basis. Unfortunately, the PAKGLOC is riddled with delays that hinder the timely delivery of cargo.

Political strife between Afghanistan and Pakistan results in border closures, and both customs officials and police consistently misunderstand border-crossing procedures on both sides of the border. All of that hinders the timely delivery of critical supplies and equipment. Every piece of cargo on both routes is closely monitored by the 831st Transportation Battalion.

The final and most reliable method of transporting cargo in and out of Afghanistan is by aircraft through USTRANSCOM's multimodal contracts.

Multimodal Transportation

Multimodal transportation is the use of both aircraft and sea vessels to transport cargo. USTRANSCOM has contracts with commercial air companies to carry cargo on "door terms," meaning the cargo is picked up at a military unit's deployed location and delivered to the units' home of record at fair market value for shipping goods globally. The first leg of the movement is by a commercial, contracted, wide body cargo aircraft.

Commercial multimodal lift was initially established in the UAE around 2010 to support Afghanistan retrograde efforts and continues to prove its effectiveness. The land-locked country is supported by cargo that arrives by sea vessel and is further moved by aircraft. The current multimodal process is a proven force multiplier that synchronizes critical sustainment, deployment, and redeployment cargo into and out of combat theaters.

UAE's primary hub for multimodal operations includes both Al Maktoum International Airport and the port of Jebel Ali. Cargo destined for Afghanistan passes through both nodes. The detachment from the 831st Transportation Battalion is SDDC's forward deployed representative in the UAE. It provides oversight for all strategic multimodal operations while assisting the warfighter with booking cargo on commercial carriers.

The UAE was designated as the ideal location for multimodal trans-shipment because of its advanced transportation infrastructure and its proximity to Afghanistan. Geographically, the UAE and Afghanistan are 1,800 kilometers apart, but they are linked by a viable air bridge.

In terms of infrastructure, the

UAE is one of the most developed countries in the Middle East. The government has heavily invested in its transportation infrastructure with state-of-the-art seaports and well-developed airports for both personnel and cargo. These advancements make the UAE conducive to large-scale sustainment operations, and commercial carriers for both sea and air have made the country the multimodal hub for the Middle East.

With 67 berths, Port Jebel Ali is the largest and busiest seaport in the Middle East. The port covers more than 134 square kilometers and has the capacity to handle more than 22 million 20-foot equivalent unit containers annually.

Al Maktoum International Airport, which opened in 2010, is located 20 kilometers southeast of Jebel Ali. The airport is the UAE's primary airport for general cargo operations and directly links to Jebel Ali through a tax exclusion zone. The UAE's Ministry of Defense (MOD) imposes restrictions on the movement of U.S. military cargo from Al Maktoum to Jebel Ali, but the restrictions are mitigated daily by the 595th Transportation Brigade's forward strategic transportation officer and the 831st Transportation Battalion's UAE Detachment.

Al Maktoum International Airport is the prime node for multimodal operations and provides a generally clear and secure route to Jebel Ali and the vital link between air and sea transportation. All door-booked retrograde cargo arrives at Al Maktoum by commercial air carrier. Upon arrival, the cargo is moved to Jebel Ali where it awaits its second leg of conveyance aboard a U.S. flag vessel to its final location.

Additionally, Al Maktoum has been used as a hub to deliver large military equipment such as mine-resistant ambush-protected vehicles and rough-terrain cargo handlers by C-17 Globemaster III aircraft. In situations where commercial aircraft cannot deliver critical combat power to and from Afghanistan because

of cargo hold restrictions, the UAE Detachment contracts necessary support through its S&RTS contract to load and unload intratheater aircraft. These missions, commonly referred to as hybrid C-17 multimodal operations, require a great deal of synchronization from start to finish but provide an additional option to move low-priority cargo when commercial means are unattainable.

The UAE does present its share of challenges. The sovereign nation limits the types of cargo that the U.S. government can process through its commercial ports. Because the UAE prohibits sensitive items, the United States cannot use the UAE as a platform to provide specialty equipment to warfighters.

The customs process is also challenging. The long lead times that the UAE MOD requires, along with the vast amount of cargo that is transshipped, continually strain the 831st Transportation Battalion's UAE Detachment, the brigade forward strategic transportation officer, and the MOD. Any delay in MOD approvals from Al Maktoum to Jebel Ali can potentially add staging or detention cost to the overall price of a move. If the cargo is not approved to move from Al Maktoum to the port of Jebel Ali, detention fees are levied against the cargo until it receives approval.

Although commercial multimodal transportation is extremely expensive, the pros of using it outweigh the cons. The Air Mobility Command coordinates strategic lift aboard C-17s for all cargo that is too sensitive to move either commercially or through the PAKGLOC. Because the number of C-17s filling lift requirements in theater is limited, commercial multimodal transportation provides the critical lift required to meet the demand for both retrograde operations and redeploying units. Unit line numbers that are not identified as priority cargo for Air Mobility Command flights are booked on commercial multimod-

al transportation after being validated by both CENTCOM and USTRANSCOM.

Improving Operations

Shifting multimodal operations from the UAE to the Sultanate of Oman could potentially minimize transportation delays. Prior to 2014, Oman was used as the multimodal

With a population almost half the size of the UAE's, Oman's roads are less congested and provide safe transport for high-priority and sensitive cargo. Oman's strategic location also provides a critical advantage: any cargo sailing to Oman from the continental United States can avoid traveling through the Strait of Hormuz, a highly contested

The 831st Transportation Battalion has an established footprint in Salalah. Oman is considered a "warm" location, which means the battalion has the ability to deploy quickly to support cargo movement through the nation's ports as required.

hub for retrograde cargo, but a shift in U.S. policy forced a relocation of airlift and other services.

Oman has all the requirements necessary to be a primary hub for all multimodal operations, including stable airfield operations and adequate seaport facilities on its southern coasts at the Ports of Salalah and Duqm. The Port of Salalah is the largest port in Oman and has several berths that are suitable for U.S. government use. The Port of Salalah also possesses the capabilities to stage and load cargo.

The 831st Transportation Battalion has an established footprint in Salalah. Oman is considered a "warm" location, which means the battalion has the ability to deploy quickly to support cargo movement through the nation's ports as required. The battalion maintains an active S&RTS contract and office space at the port, which would make re-establishing permanent operations relatively easy.

In addition to its seaports, Oman's major airports located in Muscat, Duqm, and Salalah are served by multiple international air carriers that have the capacity to support ongoing operations.

waterway that runs between Iran to the north and Oman and the UAE to the south.

One point of concern for logistics operations in Oman is the introduction of customs fees associated with U.S. government cargo. Unlike cargo transloaded in the UAE, Oman requires a tariff for all cargo either passing through or terminating in the country. The additional fee would be included in the overall transportation cost.

The Navy, Marine Corps, and Army already conduct bilateral exercises in Oman yearly. With all of these factors taken into consideration, Oman offers many benefits for logistics operations in support of U.S. objectives.

Developing the Port of Duqm is a national priority for the Oman government. Both the Department and Defense and Department of State would have to continue discussions in order to determine long-term efficiencies. With this underdeveloped port at the doorstep of the geographic combatant command, the U.S. government has a great opportunity to stake an early claim in the development process.

Even with improvements in Oman,

the UAE remains the ideal location for the trans-shipment of cargo because of its advanced logistics infrastructure. The ports in the UAE boast state-of-the-art automated materials handling equipment. While the port infrastructure in Oman is greatly improving, it simply cannot match the speed and performance of UAE operations. Currently, both air and sea commercial carriers use Jebel Ali as a major hub in their distribution architectures. A wholesale change would take time.

Despite port limitations and the high cost, multimodal operations in the UAE provide commanders and sustainers with a critical capability to deliver equipment to the end user. This year alone, the UAE Detachment has been responsible for tracking and monitoring over 1,800 pieces of cargo.

Commercial multimodal operations through the UAE provide the primary air line of communication for Defense Transportation System cargo supporting combat operations

in CENTCOM. The 831st Transportation Battalion's detachments are SDDC's forward representatives and key components in ensuring that strategic lines of communication remain open to provide flexibility for commanders.

As operations change and priorities shift, one constant is that SDDC will always be there to set the theater and shape the operational environment through port management and cargo distribution.

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- ☐ 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

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- ☐ Keep your writing simple and straightforward.
- ☐ Attribute all quotes to their correct sources.
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Soldiers with the 787th Combat Sustainment Support Battalion, from Dothan, Ala., receive dinner from a mobile kitchen trailer at Forward Operating Base Santé Fe at the National Training Center, at Fort Irwin, Calif., on Aug. 15, 2015. (Photo by Spc. Michael Germundson)

The Keys to Success for a Forward Support Company at the NTC

■ By Maj. Jared W. Nichols and Capt. Hunter B. Cantrell

Without sustainment, an Army can win one battle, but it cannot win a war. That is why rotations at the National Training Center (NTC) are just as important for sustainment units as they are for maneuver units.

During NTC Rotation 16-08, G Forward Support Company (FSC), 101st Brigade Support Battalion

(BSB), maintained an expeditionary mindset, placed the right personnel across the battlefield, and balanced sustainment assets across echelons. This article explores how G FSC maneuvered to support the 1st Battalion, 16th Infantry Regiment, 1st Armored Brigade Combat Team, 1st Infantry Division, during the NTC rotation.

According to Army Techniques Publication (ATP) 4-90, Brigade Support Battalion, when planning for sustainment, the maneuver battalion command team, the BSB command team, and the FSC commander must collaborate to determine the best method of employment commensurate with the brigade concept of support.

There is no single “right” way to execute sustainment because there are many variations of sustainment execution based on the experience and leadership within the BSB, the FSC, and the supported units. According to ATP 4-90, those considerations are the following:

- The FSC’s location in relation to the supported battalion.
- The decision to separate elements of the FSC by platoon or by other sub-elements into multiple locations.
- The benefits of locating FSC elements in the brigade support area.
- The benefits of co-locating battalion staff sections and medical elements with the FSC.
- The security of the FSC locations.
- The establishment and location of the maintenance collection point (MCP).

Staying Mobile

The configuration of the various mission command nodes across the battalion was central to the FSC’s ability to remain mobile. Leaders determined that all assets needed to be as expeditionary as possible because

mission command nodes tend to stay in one place for too long.

After experimenting with various configurations before deploying to the NTC, the FSC relied on expandable vans and camouflage nets for rapid setup and movement. The FSC was able to break down and be ready to move within two to three hours after initial notification. The company remained mobile by not setting up any permanent or semi-permanent structures like sleeping or maintenance tents. The company relied heavily on camouflage nets for concealment, security, and shaded work and rest areas.

The FSC also used a forward logistics element (FLE) that enabled it to split operations while on the move. The FLE is a doctrinal concept at the BSB level, but the employment of a FLE at the company level allowed the FSC to move assets forward. The FLE was a distribution platoon of class III (petroleum, oils, and lubricants) and class V (ammunition) that moved forward to the next combat trains command post (CTCP) location.

Moving the FLE forward ensured continual support to the line

companies, allowed the CTCP and MCP to consolidate and reorganize, and enabled the FSC to move to its next location. If the maneuver battalion continued to move forward, the CTCP could have moved past the FLE and established its operations. The intent was to keep the FSC flexible by having assets that were ready and available at all times so that no break in sustainment to the battalion would occur.

Mission Command

In order to execute mission command, the company needed to properly disperse its sustainment assets across the battlefield. The most common dispersion of an FSC’s personnel is 60 percent at the CTCP and 40 percent at the field trains command post (FTCP).

Battalion and FSC leaders decided that the 60-40 split would not work. Instead, leaders decided to place 90 percent of the personnel at the CTCP and MCP and 10 percent at the FTCP. This gave the FSC more assets forward to support the battalion’s varied missions, reduced vulnerability by shrinking the logistics footprint within the brigade support area, and enabled some assets to be moved past other FSC assets on the battlefield as the battalion continued to move.

Mission command of the FTCP was given to the FSC executive officer (XO) and the headquarters and headquarters company (HHC) XO so that the FTCP could operate 24 hours a day and provide continual logistics support forward to the battalion. Contributing to the FTCP’s ability to operate nonstop was the additional duty tasking of the maintenance control sergeant, the battalion S-4 non-commissioned officer-in-charge, two Global Combat Support System-Army clerks, an S-1 clerk, and two additional Soldiers.

All of the personnel assigned to the FTCP mission were selected for their ability to operate independently with little guidance. The loss of the personnel was felt in their respective



Crew members and mechanics from G Forward Support Company, 101st Brigade Support Battalion, 1st Armored Brigade Combat Team, 1st Infantry Division, reinstall an engine during National Training Center Rotation 16-08 in August 2016. (Photo by Capt. Jonathan Camire)

sections, but the right people had to be selected for the critical mission.

The FTCP's 24-hour liaison presence with the support operations cell allowed the FSC and the battalion to stay current on all brigade scheme of support updates. The FSC and HHC XO's immediately communicated any changes from the battalion to the BSB and vice versa. The FTCP was able to plan and prepare for all logistics packages heading toward the forward line of troops (FLOT).

The FTCP relieved the FSC leaders of a great burden by allowing the commander and first sergeant to focus sustainment efforts from the CTCP to the FLOT. The strategy enabled the company to focus two or three steps ahead of operations at the FTCP and CTCP.

Set Up and Organization

The set up and organization of the CTCP and MCP played a critical role in the success of the battalion. The CTCP consisted of the FSC distribution and headquarters platoons and an HHC element made up of the S-4 and S-1 cells. The FSC headquarters platoon and HHC element combined forces to create a combined command post that used both entities' mission command systems. This set up enabled the CTCP to monitor more FM and digital radio networks.

The battalion S-4 remained in charge of the mission command node while the FSC commander maintained overall command of the CTCP. This arrangement allowed the FSC commander and first sergeant to move to help their troops at points of friction on the battlefield instead of being tied down to a one location. The S-4 maintained control over managing the mission command systems and communicating with the battalion.

The CTCP was placed one to two kilometers from the battalion tactical operations center and no more than 10 kilometers from the battalion FLOT. The MCP was placed with its own perimeter defense within one

kilometer of the CTCP.

The maintenance platoon leader was in charge of MCP operation and the perimeter defense plan. The internal maintenance operations of the unit maintenance collection point (UMCP) were managed by the maintenance control officer. This arrangement allowed the maintenance chief warrant officer to focus on the maintenance of vehicles and equipment.

The maintenance chief warrant officer and the prescribed load list section resided in the UMCP. The

battalion's basic load of ammunition. During the final battle period of the NTC rotation, the G FSC was the only FSC able to conduct a resupply of classes I (subsistence), III, and V to its supported companies because its assets had already been pushed forward.

A successful FSC is a vital part of successful battalion combat operations. An FSC will succeed if it maintains an expeditionary mindset and arrays the right personnel and

A successful FSC is a vital part of successful battalion combat operations. An FSC will succeed if it maintains an expeditionary mindset and arrays the right personnel and sustainment assets across the battlefield.

UMCP maintained mission command of the MCP.

Separating the CTCP and MCP footprints allowed the FSC to reduce its overall footprint while maintaining mutual support. When the CTCP moved, the MCP still had a defensible perimeter and was able to independently sustain itself.

Supply Placement

The CTCP kept more than one day of supply on hand. This gave the battalion greater freedom of movement and maneuver and provided contingency supplies in case there was a break in the chain of support. By having all fuelers, water assets, and ammunition assets forward, the FSC was able to pre-position the FLE closer to the FLOT to provide the companies with emergency resupply.

Throughout the NTC rotation, the FSC never dropped below 2,000 gallons of water, one day's supply of ice (180 bags), three day's supply of food (heat-and-serve rations and meals ready-to-eat for approximately 600 Soldiers), 6,000 gallons of fuel, and

sustainment assets across the battlefield. The FSC has to be forward with the fight and provide flexible options for its maneuver battalion.

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Soldiers from the 16th Special Troops Battalion, 16th Sustainment Brigade, engage targets during the nighttime convoy live-fire exercise portion of Vanguard Proof at Pocek Range in Postonja, Slovenia, on March 23, 2017. The combined exercise between the 16th Sustainment Brigade and the Slovenian armed forces focused on enhancing NATO interoperability and developing individual technical skills. (Photo by Paolo Bovo)

Objective T: Preparing Units to Fight Tonight

The 16th Special Troops Battalion is using Objective T to stay combat ready.

■ By Lt. Col. Brian J. Ketz, Capt. Christopher L. Miles, Capt. Sean K. McLachlan, and 1st Lt. Evan T. Kowalski

The Army Operating Concept stresses the importance of units seamlessly integrating and sequencing activities. A unit's ability to perform multiple activities simultaneously in unified land operations is especially critical to the ever growing mission set in the European theater.

The 16th Special Troops Battalion

(STB), 16th Sustainment Brigade, headquartered in Baumholder, Germany, plays an important role in ensuring regionally aligned units are able to integrate and perform multiple activities seamlessly. The STB allows maneuver commanders to concentrate combat power toward the objective with speed and audacity by providing specialized

sustainment support across Europe and Africa for all of the warfighting functions.

The key to ensuring a unit is ready to perform these functions is the objective task assessment methodology found in Field Manual 7-0, Train to Win in a Complex World. Rather than having a commander subjectively determine a unit's readiness level,

Objective T provides a standardized and deliberate training assessment methodology with objective unit assessment procedures that are applied across the Army.

Using the Objective T assessment as a baseline for unit proficiency, the 16th STB created a complex and dynamic two-year unit training plan designed to achieve multiechelon collective training proficiency. The STB's plan culminated with two multifaceted and multinational battalion-level exercises called Vanguard Proof. The exercises demonstrated the battalion's ability to simultaneously integrate signal, finance, human resources, explosive ordnance disposal (EOD), and airborne capabilities into a decisive action training scenario across international boundaries.

Planning for Objective T

In order to fully capitalize on the Objective T assessment and create a tangible training focus, the STB identified Objective T requirements and parameters, determined objectives using a mission-essential task list (METL) crosswalk, assessed operational and mission requirements, and built a plan in accordance with the Sustainable Readiness Model (SRM).

The first step in applying the Objective T model is to identify the following parameters:

- ☐ The unit being assessed (a squad, company, or battalion).
- ☐ The type of training environment (day, night, field, or classroom).
- ☐ The percentage of the organization present.
- ☐ Whether the evaluator will be external or internal to the organization.
- ☐ Performance measures and an overall task assessment (T equals trained, P equals needs practice, and U equals untrained).

The key to reaching the highest level of readiness is to ensure that the unit maximizes participation and incorporates a combat-like environ-

ment, realistic performance measures, and an external evaluator. These measures will ensure that the unit trains to a real-world scenario and has an unbiased evaluation.

The next step is to determine training objectives using the battalion's METL. Each organization in the Army is assigned its own METL, which includes corresponding key collective tasks. Determining the objectives allows commanders to deliberately plan and execute training to prepare for their unit's functional mission set.

The objective of the 16th STB training program is to develop leaders who are familiar with and embrace friction on the battlefield, can operate in a contested battlespace, and can integrate multiple capabilities simultaneously in a joint environment. More specifically, the STB possesses METL tasks such as conduct mission command, conduct area and base security opera-

tions, and perform tactical actions associated with force projection and deployment. A METL crosswalk highlighting key collective and individual tasks allows commanders to determine the specific areas that require more focus.

A unit also must assess its theater-specific requirements. Creating a long-range calendar can be a useful tool for commanders to visualize and ensure that requirements do not conflict with one another. In some cases, commanders can capitalize on external support missions as opportunities for Soldiers to train on METL tasks.

Nonetheless, operational requirements are at least as important as training objectives because higher echelons need the battalion to serve in its functional capacity.

Building a Battalion SRM Plan

The final step of preparation is to create an SRM plan. Incorporating



An 86th Air Wing C-130 Hercules aircraft drops three pieces of heavy equipment belonging to the 16th Special Troops Battalion, 16th Sustainment Brigade, on Pocek Drop Zone in Postonja, Slovenia, on March 21, 2017, during the heavy drop operation portion of Vanguard Proof. (Photo by Paolo Bovo)

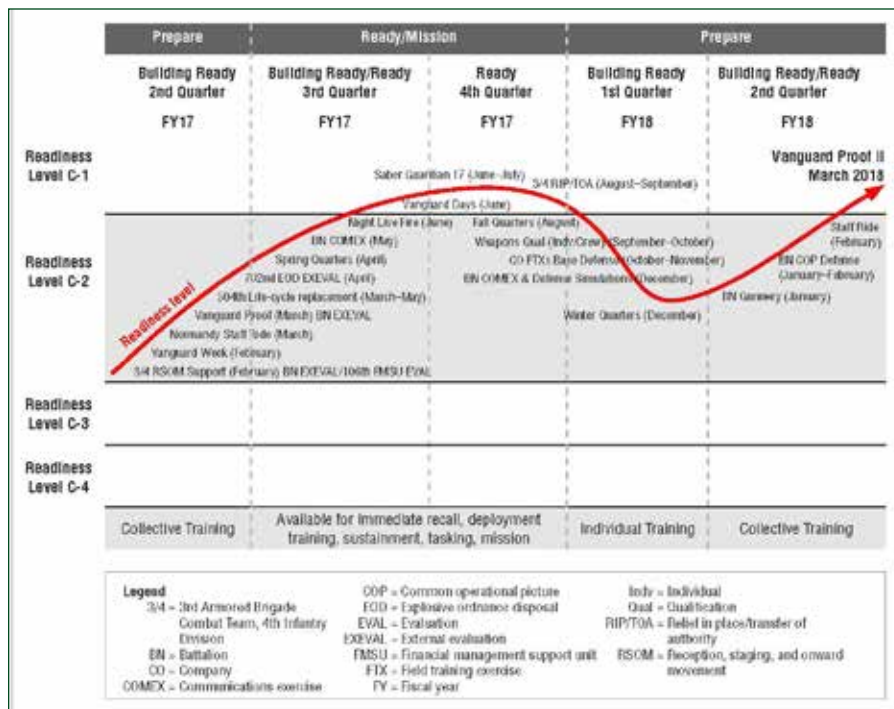


Figure 1. This Sustainable Readiness Model cycle assisted 16th Special Troops Battalion planners in highlighting key events and the battalion's projected readiness level as they planned and executed the Objective T assessment process.

both operational requirements and training objectives in this tool is critical. Also, it is most beneficial to integrate those elements at the lowest possible levels.

Figure 1 illustrates a template for a battalion SRM cycle. The 16th STB developed this cycle to assist leaders in highlighting key events and the battalion's projected readiness level. The cycle proved to be effective for staff planning and executing the Objective T assessment process.

The Objective T Assessment

The battalion's training program enabled it to develop Vanguard Proof, a set of two multifaceted and multinational battalion-level field training exercises that tested the unit's ability to exercise mission command on a large scale.

The first exercise took place in Postojna, Slovenia, in March 2017. This event consisted of a tactical convoy across four international borders, a convoy live-fire exercise, improvised explosive device lanes, and aerial resupply operations. Most

importantly, this event allowed the battalion to determine a baseline assessment for the next phase of its training focus.

The STB's final culminating event, Vanguard Proof II, is scheduled for March 2018. This event will focus on area base defense and other functional capabilities. Using the steps outlined above, the STB planned the event to optimize Objective T results.

The battalion identified Objective T requirements and parameters, determined objectives using a METL crosswalk, assessed operational and mission requirements, and captured the plan on a battalion SRM cycle. This focus will ensure that the STB fully capitalizes on the opportunity to maximize training readiness.

The 16th STB's Objective T certification program not only develops skilled sustainment professionals but also develops agile and adaptable leaders ready to respond to the friction of war. Through a series of staff exercises, professional leader

development, and field training exercises, the battalion certified its junior leaders and Soldiers to execute combat support operations through all phases of unified land operations. The STB also developed an experienced staff ready to provide critical mission command for subordinate and adjacent units.

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Maj. Tyonne Carter, 3rd Infantry Division Sustainment Brigade, and Cpl. Tyrone Rowe, a Canadian air force movement control specialist, synchronize the movement of over 5,000 troops and one thousand pieces of rolling stock on May 7, 2017, in support of Exercise Maple Resolve. (Photo by Staff Sgt. Michael Bohannon)

Sharing Sustainment Techniques and Practices During Maple Resolve 2017

■ By Lt. Col. David Carlson and Capt. Dexter Harris

Exercise Maple Resolve is the Canadian Army's largest and most logistically complex training exercise. This annual rotation is a joint and multinational exercise geared toward facilitating interoperability, international relations, and the certification of designated Canadian Army and Royal Canadian Air Force units to meet government-directed operational outputs.

Maple Resolve is a fully immersive

force-on-force training event similar to U.S. Army combat training center rotations. The 2017 exercise involved over 5,000 troops from New Zealand, Great Britain, Australia, the United States, and Canada.

U.S. Army North (ARNORTH), the Army service component command to the U.S. Northern Command, has the responsibility of strengthening military partnerships with Canada and Mexico. AR-

NORTH was the headquarters element for U.S. support during Maple Resolve and delegated tactical control of more than 800 Soldiers, Airmen, Marines, and Department of Defense civilians to the 3rd Infantry Division Sustainment Brigade (IDSB) Special Troops Battalion (STB).

After assuming control, the STB provided mission command, synchronization with the Canadian Army, administrative assistance, re-

deployment support, joint reception, staging, onward movement, and integration support, and logistics and sustainment support to all U.S. forces participating in the exercise.

An exercise of this scale is not possible without the shared understanding, forecasting, and execution of sustainment operations. The major sections that made the exercise possible were the Canadian Manoeuvre

support for maneuver, fires, and maneuver support organizations. The Canadian Army's administrative companies, commonly referred to as the "first line," provide similar but general support because of the size and design of the total force.

The next level of U.S. tactical sustainment support includes brigade support battalions, aviation support battalions, combat sustainment sup-

port battalions, STBs, and Army field support battalions. In the Canadian Army, the service battalions fulfill this level of logistics support.

technicians to be trained and proficient on multiple vehicle platforms, communication suites, and weapon systems. This diversified proficiency ensures that the limited pool of mechanics and technicians have a broad skill set and are able to service and repair a wide range of CAF vehicles and equipment.

For the most part, a CAF logistician wears an army, navy, or air force uniform, but that has no bearing on which service component he or she serves in. For example, a culinary specialist or supply technician who wears an air force uniform is equally employable on a naval vessel, at an air force base, or within an army unit. Additionally, enlisted logisticians across the CAF receive the same level of training within the same schoolhouses.

In recent years, the U.S. Army's massive amount of training requirements, high operating tempo, and budgetary constraints required the reorganization of its sustainment units. Merging similar military occupational specialties (MOSs) to restructure skill sets has been one means of efficiently managing the sustainment force. Some career fields were given new MOSs while their previous MOSs became additional skill identifiers.

As engagements in Iraq and Afghanistan turned from conventional operations to prolonged counterinsurgency and nation-building operations, the sustainment capabilities of the Army National Guard and Army Reserve became increasingly important to active duty component support. Today, more than 73 percent of the Army's echelons-above-brigade sustainment capability is in the reserve component.

On one hand, the U.S. Army's massive sustainment community can be seen as an advantage. On the other hand, its size is a disadvantage because of the multiple echelons of logistics that a requisition must transit in order to reach the end user.

port battalions, STBs, and Army field support battalions. In the Canadian Army, the service battalions fulfill this level of logistics support.

The next levels of U.S. support includes the Army field support brigades, sustainment brigades, expeditionary sustainment commands, and theater sustainment commands. These entities interface at the operational, strategic, and national-provider levels and serve as sustainment advisers to division, corps, and theater commands.

Organizational Structure

The Canadian Armed Forces (CAF) generate task-tailored organizations that provide theater-level support to bridge the gap between the operational and strategic levels of sustainment. These organizations are normally referred to as joint task force support components and are responsible to theater commanders for all theater-level sustainment. Because a support component typically has between 100 and 300 regular and reserve forces, it takes the phrase "doing more with less" to a new level.

The modest size of the Canadian Army requires its mechanics and

States. In recent years, the Army has maintained a 1-to-1 ratio of contractors to Soldiers in both Afghanistan and Iraq, which has allowed Soldiers to focus more on inherently military obligations.

Likewise, the CAF relies on a wide range of contracted services that are not organic to the force. In particular, it leverages operational-level movement, life support, and general sea and ground transport contracts that enable the CAF to conduct both domestic and expeditionary operations effectively.

Information Systems

The Global Combat Support System–Army (GCSS–Army) is the U.S. Army’s premier logistics and finance enterprise resource planning system. It provides leaders and decision-makers with a single sustainment picture to manage combat power. The CAF uses the Defence Resource Management Information System (DRMIS), which has been progressively implemented over the past 10 years and delivers nearly the same information to its leaders and users.

Arguably, the biggest difference between the systems is that DRMIS is used by all elements of the CAF whereas GCSS–Army is used by only the U.S. Army. Although this difference does not make one system more efficient than the other, the point is that both armies are sustaining and resourcing themselves through an enterprise resource planning system.

Having these fully integrated systems gives leaders knowledge about ammunition accountability, operational and equipment readiness, property accountability, financial management, supply management, and total asset visibility. This knowledge allows them to maximize available resources while efficiently stewarding available funds.

A number of information and mission command systems, including the Combat Service Support Automated Information System Interface, Joint Capabilities Release Logistics,

and the Transportation Coordinators’ Automated Information for Movements System II, empower commanders and leaders in the Army to manage sustainment resources. In the Canadian Army, the Fleet Management System, the National Material Distribution System, DRMIS, and the Land Command Support System provide the same capabilities and decision-support tools. However, the Canadian systems are jointly used across its army, navy, air force, and special operations forces.

These streamlined systems give the Canadian Army a great advantage when requesting, transporting, and delivering resources for multiple services. For example, army supply technicians can send supply requirements to their counterparts in the navy, and the context and process of the order is easily understood by both services.

Support Operations

Forecasting is a term that nearly every logistician knows, but some understand its necessity better than others. So which army is better at forecasting requirements?

On one hand, the U.S. Army’s massive sustainment community can be seen as an advantage. On the other hand, its size is a disadvantage because of the multiple echelons of logistics that a requisition must transit in order to reach the end user. Furthermore, the U.S. supply system has 15 priorities for ordering parts and supplies, while the Canadian system uses only four.

The size of Canadian Army sustainment can be viewed as both a gift and a hardship. Even though the service battalions have entities that manage internal and external support to other units, they have neither the operational reach nor the prolonged endurance capabilities that exist in the second and third layers of U.S. Army sustainment.

Despite their differences in size, there are similarities in how U.S. and Canadian logistics units provide support. The logistics operations section

of the Canadian service battalion and the support operations section of the brigade support battalion work in a similar fashion.

Both sections are responsible for forecasting requirements based on the maneuver plan while remaining flexible and adaptable during times of adversity. Both use a fix-far-forward approach for maintenance support and a push-far-forward method for commodity support. These sections work with their respective administrative companies and forward support companies to handle internal commodity management with external resourcing.

The Canadian and U.S. sustainment communities must continue to invest in logistics developments in order to train, man, and equip the forces in order to improve readiness and interoperability for future contingency operations. Regardless of who has the most efficient sustainment force, each army can learn from the other at least one new way to approach the future unknowns in such a complex world.

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This sign for the Interstate Highway System salutes President Dwight D. Eisenhower, who initiated the system in the 1950s. (Photo by Carol M. Highsmith)

Dwight D. Eisenhower and the Birth of the Interstate Highway System

The millions of travelers who use the U.S. Interstate Highway System each year may take for granted the system's history, which sheds light on its importance to U.S. society.

■ By Lee Lacy

On June 29, 1956, President Dwight D. Eisenhower signed legislation funding the construction of the U.S. Interstate Highway System (IHS)—something Americans had dreamed of since Detroit started building cars.

The Missouri Highway Commission awarded the first contract to

begin building the interstate along the famous Route 66 in rural Laclede County, 160 miles southwest of St. Louis. However, construction on the first section of interstate actually began in St. Charles County, Missouri, on Aug. 13. Kansas and Pennsylvania have also made competing claims that their states were first to possess sections of interstate.

No matter who was first, the enthusiasm for a uniform system of roads, bridges, and tunnels was very high in 1956, nearly 50 years after the introduction of Henry Ford's Model T automobile. The building of the IHS, formally known as the Dwight D. Eisenhower National System of Interstate and Defense Highways, proceeded rapidly

throughout the country, and by the early 1990s, nearly 45,000 miles of interstate highway were complete.

In order to understand the IHS's importance in U.S. society, let's examine its history. President Eisenhower is widely regarded as the catalyst for the IHS. His motivations for a highway network stemmed from three events: his assignment as a military observer to the First Transcontinental Motor Convoy, his experience in World War II, where he observed the efficiencies of the German autobahn, and the Soviet Union's 1953 detonation of the hydrogen bomb, which instigated a fear that insufficient roads would keep Americans from being able to escape a nuclear disaster.

The First Transcontinental Motor Convoy

In the summer of 1919, Lt. Col. Eisenhower was a dejected mid-career Army officer. He narrowly missed out on overseas service during World War I and anticipated a reduction in rank as the Army shrank and prepared for peacetime operations. Adding to his discontent, he was physically separated from his wife and infant child because of a shortage of military housing.

Eisenhower was assigned as an observer to an unprecedented military experiment: the First Transcontinental Motor Convoy. The operation was a road test for military vehicles and was used to identify the challenges of moving troops from coast to coast on the existing infrastructure. The excursion covered 3,200 miles from Washington, D.C., to San Francisco. It included 79 vehicles of all sizes and 297 personnel.

During the expedition, Eisenhower gained some insight for the creation of a network of connected roads and bridges. Eisenhower's report to Army leaders focused mostly on mechanical difficulties and the condition of the patchwork of

existing roads. He reported a mix of paved and unpaved roads, old bridges, and narrow passages.

Narrow roads caused oncoming traffic to run off the road and encounter added difficulty when re-entering the roadway. Some bridges were too low for trucks to pass under. Eisenhower pointed out that the roads in the Midwest region of the United States were impracticable, but the roads in the east were sufficient for truck use.

Eisenhower singled out a western section of the Lincoln Highway, a transcontinental road with routes through Utah and Nevada, as being so poor that it warranted a thorough investigation before government money should be expended. He praised California for having excellent paved roads. Lastly, he observed that the different grades of road determined much of the convoy's success.

World War II

During World War II, as the supreme Allied commander, Gen. Eisenhower was the architect of the defeat of Nazi Germany. As Allied armies raced across France and into Germany, he marveled at the vast highway system built by the Germans prior to the war. Eisenhower wrote in his presidential memoirs, "During World War II, I had seen the superlative system of German autobahn—[the] national highways crossing that country."

This advanced European highway system helped the Allies. The autobahn aided the Allied victory by enabling the Allies to efficiently resupply forces that pursued the German Wehrmacht across France and into Germany.

The famous Red Ball Express was a magnificent achievement that kept swift-moving Allied field armies resupplied. In August and September of 1944, an around-the-clock operation of 6,000 trucks delivered materiel to forces on the move. It involved a 300-mile divided road that eventually converted to

a super highway. The road extended from the Normandy beachhead to terminals near Paris. Later, a second super highway extended from Paris into Germany.

Instrumental in the logistics success following the D-Day landings was Lt. Gen. Lucius Clay. He was a key aid to Eisenhower during the war and later when Eisenhower ascended to the presidency. Eisenhower knew Clay, a West Point-trained engineer, was a respected troubleshooter, an effective administrator, and politically adept.

In 1954, Eisenhower appointed Clay to head the President's Advisory Committee on the National Highway System. The so-called "Clay Committee" began work to develop a national highway plan, and its outcome was a report to Congress on the National Highway Program.

The resulting "Grand Plan" obligated \$50 billion of federal funds over 10 years to build a "vast system of interconnected highways." The committee based its proposal on four points. The first point appealed to safety. It cited 36,000 traffic fatalities each year and their multibillion dollar effect on the economy.

Next, the report cited the physical conditions of existing roads and their effect on the cost of vehicle ownership. It was thought that poorly maintained roads adversely affected the economy by increasing transportation costs, which were ultimately borne by the consumer.

The third point involved national security. The pervasive threat of nuclear attack in the United States called for the ability to execute the emergency evacuation of large cities and the quick movement of troops essential to national defense.

The last point appealed to the health of the U.S. economy. Improvements in transportation must keep up with the expected increase in the U.S. population. Moreover, road improvement is essential to the economy and an efficient use of taxpayer money.

The Clay Committee concluded its report by stating that the positive economic attributes of the highway system were the potential for economic growth and the well-being of the economy through “speedy, safe, transcontinental travel” that could improve “farm-to-market movement.”

The Cold War

The IHS was the largest public works project undertaken in the United States and came at a time when the Cold War consumed not only a large part of the federal budget but also the attention of the U.S. public.

The Cold War played a pivotal role in the creation of the IHS. Shortly after Eisenhower took office in 1953, Soviet leader Josef Stalin died, setting off a power struggle

in the Kremlin. It was not until September that Nikita Khrushchev emerged as the general secretary of the Communist Party of the Soviet Union.

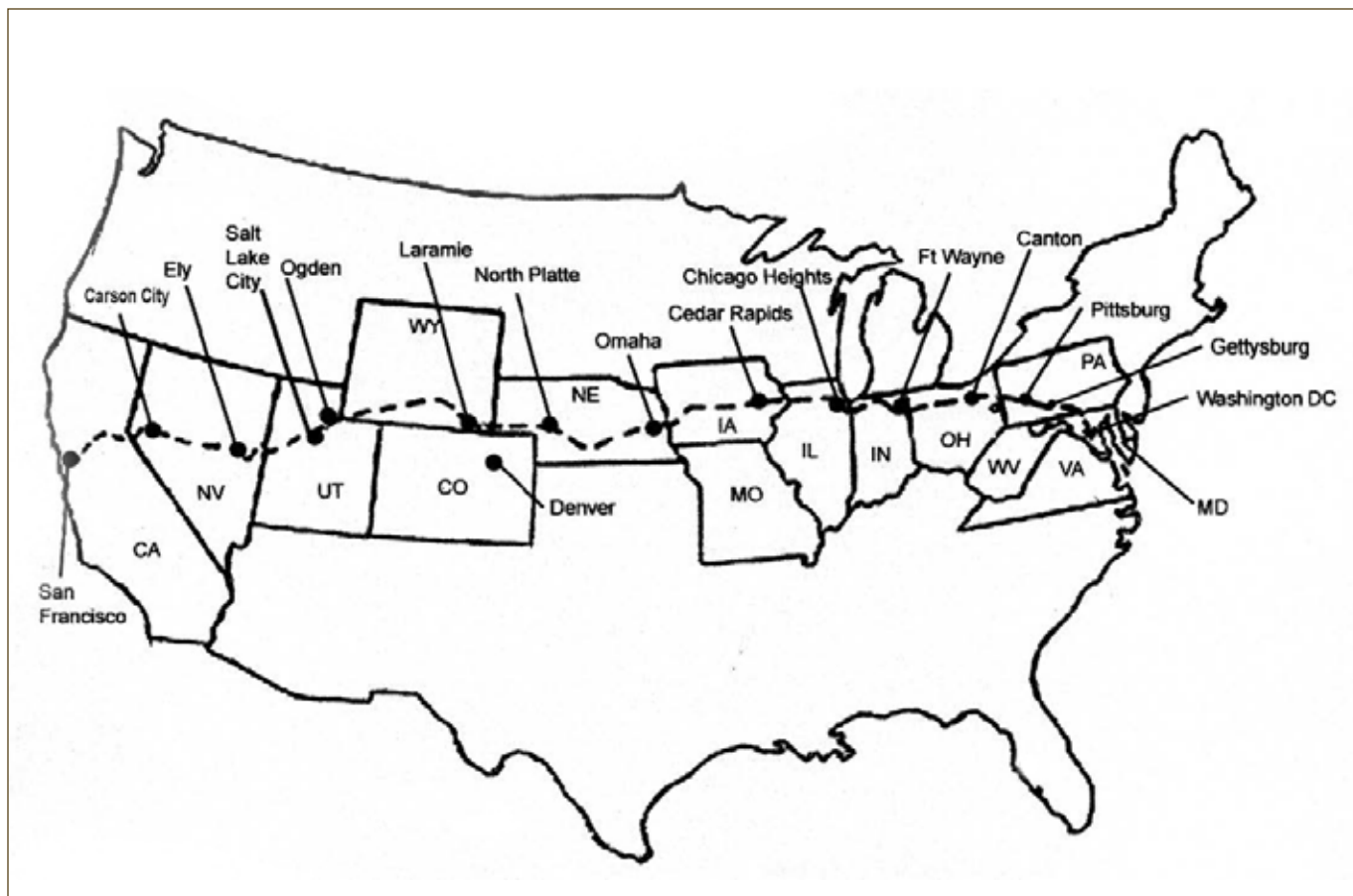
On Aug. 12, 1953, the Soviets exploded their first hydrogen bomb, thus moving closer to the United States in nuclear parity. It was unsettling to have a superpower with an unstable government armed with the latest nuclear weapons technology. This event further jolted an already rattled U.S. public, which routinely engaged in civil defense drills. Citizens built bomb shelters, stockpiled food, and prepared for imminent nuclear war.

In a July 1954 speech to the Governors’ Conference, Vice President Richard Nixon expressed concern over the “appalling inadequacies” of the existing U.S. road infrastructure

and its inability to meet the needs for responding to a national emergency on the scale of atomic war. Nixon mentioned atomic or atomic war no less than 10 times in the speech.

This topic was on the minds of most Americans. Seventy-nine percent of the public thought a nuclear conflict between the United States and the Soviet Union was imminent. In the event of war, 70 million urban residents would require evacuation by road.

The Clay Committee also warned of the need for large-scale evacuation of cities in the event of nuclear war. Furthermore, it cited federal civil defense authorities who were worried that a withdrawal from urban areas would be the largest ever attempted. The Committee soberly stated, “The rapid improvement of



This map of the First Transcontinental Motor Convoy shows the route the convoy took across the United States. The 1919 operation was a road test for military vehicles and was used to identify the challenges of moving troops from coast to coast on the existing infrastructure. The excursion covered 3,200 miles from Washington, D.C., to San Francisco.

the complete 40,000-mile interstate system, including the necessary urban connections thereto, is therefore vital as a civil-defense measure.”

National Defense and the Testing Phase

A large-scale urban evacuation drill conducted in June 1955 drove home the importance of an evacuation plan. The ensuing confusion coupled with crowded evacuation routes seemed to make President Eisenhower’s case for the IHS. Moreover, the administration was serious about the role of a uniform system of roads for national defense and directed Department of Defense (DOD) involvement.

When the IHS began in earnest, a testing facility was created in central Illinois to evaluate pavement, road standards, and construction techniques, among other things. The DOD contributed equipment and personnel for the tests.

Military leaders knew from their experiences in the two previous world wars that roads were vital to national defense. During World War I, military truck traffic destroyed roads. In World War II, defense plants were often supplied by truck, but the lack of road standards sometimes impeded timely delivery.

Over a two-year period, Army trucks drove 17 million miles on the test roads. Some vehicles carried blocks of concrete in an effort to see how long a 24-ton truck would take to destroy roads and bridges. Highway building and maintenance standards were developed from the tests.

The Interstate We Know

Congress passed the Federal-Aid Highway Act of 1956 creating federal funds for interstate highway construction. As the IHS developed, so did its ability to support national defense. For example, throughout the system, mile-long stretches of concrete pavement double as emergency landing strips

for military aircraft. Many Army posts, especially where division-level units are garrisoned, are near interstate highways. For example, the 1st Infantry Division at Fort Riley, Kansas, is adjacent to I-70, and the 1st Armored Division at Fort Bliss, Texas, is close to I-10.

During Operations Desert Shield and Desert Storm, the IHS

tion’s infrastructure.

At the time of the incident, approximately 150,000 of the nation’s nearly 600,000 bridges “were considered either structurally deficient or functionally obsolete,” according to a 2012 ABC News report. Since the I-35 incident, political leaders have called for a major investment in the nation’s infrastructure.

Over a two-year period, Army trucks drove 17 million miles on the test roads. Some vehicles carried blocks of concrete in an effort to see how long a 24-ton truck would take to destroy roads and bridges.

contributed to the success of mobilizing the military for war in the Middle East. Military planners were emboldened by the ability to move personnel and materiel with ease during national emergencies.

An Aging System

Despite its convenience and ease of movement, the IHS is showing its age. When funding was appropriated in 1956, planners knew that, at some point, roads, bridges, and infrastructure would deteriorate. The IHS was expected to last only into the 1970s when improvements would be needed. The 1956 appropriation ran out in 1972, and current funding is sustained by the motor fuel tax, which is funneled into a trust fund.

The IHS’s disrepair was highlighted in July 2007 with an unfortunate tragedy in Minnesota. On a summer day near Minneapolis, a section of a steel arch bridge on Interstate 35 collapsed into the Mississippi River. The accident killed 13 people and injured another 145.

The accident remains one of the worst bridge failures in the history of the United States, and it highlights the poor condition of the na-

Most Americans see the IHS for what it is: a quick, efficient, and convenient means of travel. The automobile culture, which hit its stride in the 1960s, thrived on networks of paved roads and inexpensive gasoline. Along the way, an entire segment of the economy was born. Businesses catered to travelers. Hotels, motels, restaurants, and service stations appeared at interstate exits to serve weary motorists.

The IHS is an icon and marvel of man’s ingenuity. Great leaders such as Dwight Eisenhower and Lucius Clay had the foresight to conceive and build a network of interconnecting highways that helped to shape and define postwar America. Who from the current generation of leaders will repair, rebuild, and expand the IHS?

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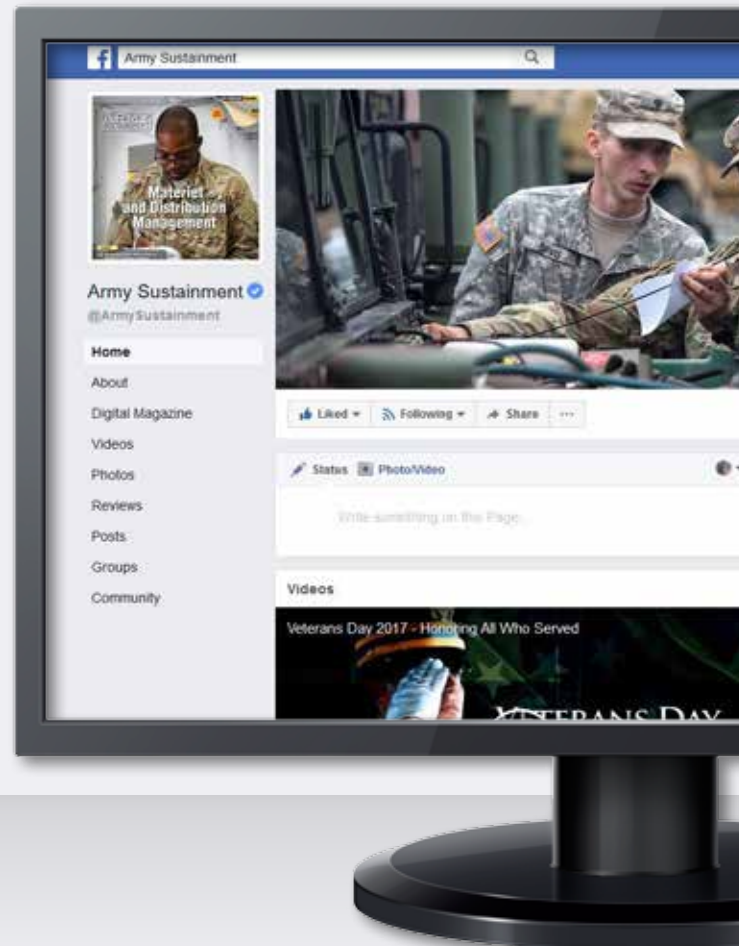
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