

SPRING 2022

ARMY SUSTAINMENT

WWW.ALU.ARMY.MIL/ALOG

LOOK
INSIDE

ENABLING FORT TO PORT OPERATIONS

and Setting the Theater in Contested Environments

CONTENTS



4 PORT OPERATIONS, SETTING THE THEATER FOUNDATIONAL TO STRATEGIC READINESS

By Gen. Ed Daly

6 DRIVING READINESS AT ECHELON NOW AND FOR THE FUTURE

By Lt. Gen. Charles R. Hamilton

8 DEPLOY TONIGHT DEPLOYMENT PROCESS ISSUES

An Examination of Fort to Port Deployment Challenges, Shortfalls

By Maj. Gen. Mark T. Simerly

12 EVOLVING CONDITIONS, RESOLUTE TASKS | THE FUTURE OF DEPLOYMENT READINESS

An Interview With Maj. Gen. Heidi Hoyle and Mike Hutchison

By Lt. Col. Altwan Whitfield and Mike Crozier

18 GAME CHANGER Setting the Theater Key to Maintaining Dominance, Overmatch

By Lt. Gen. Donnie Walker

22 READY TO FIGHT

Forward Thinking Required for Fort to Port Operations

By Chief Warrant Officer 2 Kevin Coleman

26 THEATER LOGISTICS ANALYTICS Describing, Visualizing, Understanding the Operational Environment

By Maj. Gen. David Wilson and Maj. Tanya Leonard

32 WAR RESERVES STRATEGIC OPPORTUNITIES

Manage Risk, Cost, Effectiveness

By Col. Ronnie D. Anderson and Maj. Eric D. Baca

38 OPINION: JOINT SUSTAINMENT SUPPORT TO AGILE COMBAT EMPLOYMENT

By Maj. Bradly Mejean

40 OPERATION ALLIES WELCOME Immediate Support to America's Largest Non-Combatant Evacuation Operation

By Lt. Col. Matthew Rivera, Maj. Michael McCrory, and 1st Lt. George Ngoh

47 INSTITUTIONAL TO OPERATIONAL Doctrine Guides Collective Training

By Lt. Col. Seneta Burns, Maj. Lehman Smith, and Capt. David (Chad) Moll

50 OPINION: AN APPEAL TO SURVIVABILITY Equip, Train Logistics Formation now to Fight, Survive in Large-Scale Combat Operations

By Maj. Heath A. Bergmann

56 SUSTAINMENT FOR ECHELONS ABOVE BRIGADE ENGINEER OPERATIONS

By Capt. Garrett M. Curry

60 SUPPLY CHAIN MANAGEMENT IN A DATA-DRIVEN WORLD Army Logistics University's Approach to Supply Chain Education

By Capt. Matthew G. MacDonald and Dr. Robert Neeley

64 ARCTIC WINTER CONDITIONS EFFECTS ON TACTICAL FIELD MAINTENANCE

By Lt. Col. Raphael Jimenez, Capt. Alexander Banks, and Chief Warrant Officer 4 Brian Cox

68 DEFENDING THE BSA IN AN ISLAND FIGHT

By Capt. Jesse Nelson

"Simply said, setting the theater provides strategic depth for sustainment across commodities and all classes of supply, and ensures that our forces can move quickly to, and then throughout, a theater to accomplish their mission without a cold start to logistics."

Gen. Ed Daly

Light Medium Tactical Vehicles belonging to the 2nd Battalion, 34th Armored Regiment, 1st Armored Brigade Combat Team, 1st Infantry Division enter the Green Ridge vessel during port operations on Oct. 18, 2019, in the Port of Gdynia, Poland. (Photo by Staff Sgt. True Thao)

READ ARMY SUSTAINMENT ONLINE

For current and past
issues of *Army
Sustainment Professional
Bulletin*, go to

WWW.ALU.ARMY.MIL/ALOG



ON THE COVER

1st Armored Brigade Combat Team, 1st Infantry Division vehicles are loaded onto a barge Jan. 23, 2019, in Antwerp, Belgium. Barges are one of four different delivery methods being utilized to support the Operation Atlantic Resolve. (Photo by Sgt. Benjamin Northcutt)

BOARD OF DIRECTORS

MEMBERS

Maj. Gen. Mark T. Simerly (*Chairman*)
Commander, Combined Arms Support Command

Lt. Gen. Charles R. Hamilton
Deputy Chief of Staff, G-4, Department of the Army

Lt. Gen. Robert L. Marion
Principal Military Deputy to the Assistant Secretary of the Army for Acquisition, Logistics, and Technology

Lt. Gen. Donnie Walker
Deputy Commanding General, Army Materiel Command

Lt. Gen. Paul A. Chamberlain
Military Deputy for Budget to the Assistant Secretary of the Army for Financial Management and Comptroller

Lt. Gen. R. Scott Dingle
Army Surgeon General

EX OFFICIO

Brig. Gen. Michelle K. Donahue
Quartermaster General

Brig. Gen. Michael B. Lalor
Chief of Ordnance

Col. Frederick L. Crist
Chief of Transportation

Col. Stephen K. Aiton
Commander, Army Soldier Support Institute

Brig. Gen. Christine A. Beeler
Commanding General, Army Contracting Command

Brig. Gen. Anthony (Tony) McQueen
Commanding General, Army Medical Research and Development Command

ARMY LOGISTICS UNIVERSITY

Ms. Sydney A. Smith
President

Mr. Richard C. Myers Jr.
Civilian Deputy

Col. Gregory K. Gibbons
Commandant/Military Deputy

STAFF

Amy N. Perry
Editor

Frank Badalucco
Associate Editor

Sarah Lancia
Visual Information Specialist

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

By Order of the Secretary of the Army:

JAMES C. MCCONVILLE
General, United States Army
Chief of Staff

Official:

MARK F. AVERILL
Administrative Assistant
to the Secretary of the Army
2215200



PB 700-22-02
VOLUME 54, ISSUE 02
SPRING 2022

PHONE: 804-765-4754 (DSN 539-4754)
WEBSITE: WWW.ALU.ARMY.MIL/ALOG

Army Sustainment (ISSN 2153-5973) is a quarterly professional bulletin published by the Army Logistics University, 2401 Quarters Road, Fort Lee, VA 23801-1705.

Mission: *Army Sustainment* is the Department of the Army's official professional bulletin on sustainment. Its mission is to publish timely, authoritative information on Army and Defense sustainment plans, programs, policies, operations, procedures, and doctrine for the benefit of all sustainment personnel. Its purpose is to provide a forum for the exchange of information and expression of original, creative, and innovative thought on sustainment functions.

Disclaimer: Articles express opinions of authors, not the Department of Defense or any of its agencies, and do not change or supersede official Army publications. The masculine pronoun may refer to either gender.

Reprints: Articles may be reprinted with credit to *Army Sustainment* and the author(s), except when copyright is indicated.

Distribution: Official (Army-funded) subscriptions to *Army Sustainment* (for organizations and individuals with a professional or operational need for this publication) can be requested through our website or by calling or emailing our offices. Subscribers should submit address changes directly to *Army Sustainment* (see address below). *Army Sustainment* also is available at <http://www.army.mil/army-sustainment>.

Postmaster: Send address changes to:
EDITOR ARMY SUSTAINMENT/ALU/2401
QUARTERS RD/FT LEE VA 23801-1705.



Submissions Wanted

Army Sustainment is seeking articles on techniques, tactics, and procedures; emerging trends; lessons learned; and other experiences.

The editorial staff from *Army Sustainment* is seeking submissions from the community. As with all content submitted to *Army Sustainment*, it should be sustainment focused, provide professional development information, and should not contain any classified or sensitive information.

Submissions should be well-developed narrative articles and can be opinions, techniques, tactics, and procedures (TTPs), lessons learned, exploration of new technologies or emerging trends, or other similar content of a valuable nature to fellow sustainers.

General public affairs style coverage or content on units, exercises, initiatives and events that do not otherwise hold additional professional development

value are typically not as strong as those submissions that offer real, actionable sustainment information.

While the editorial staff here at *Army Sustainment* do conduct our own review and editorial process and have authority to approve content submitted to us for public release, we recommend at least some basic professional coordination between the submitting author and their organization's public affairs or public information office, especially for U.S. personnel working in NATO or other multinational organizations.

Army Sustainment chooses new topics for each bulletin and accepts contributions from the sustainment field. Check out our social media, including our page on Facebook, to learn about upcoming topics.

Find more information: www.alu.army.mil/alog/submissions.html

Port Operations,

Setting the Theater Foundational to Strategic Readiness



■ By Gen. Ed Daly

The Department of Defense released the classified version of the 2022 National Defense Strategy (NDS) in March, and the unclassified report is expected soon. The NDS specifies three primary ways the department will advance its goals: integrated deterrence, campaigning, and actions that build enduring advantages. Effective port operations and setting theaters across the globe—this edition’s theme—are unequivocally pivotal across all three.

We must first understand the areas of responsibility and theaters within

the geographic combatant commands (CCMD) in order to effectively set them. Theaters represent extended battlespace; they will be contested, expeditionary, multi-domain, and focused on potential large-scale combat operations. Each theater poses unique challenges for sustaining and maintaining the force. The U.S. Indo-Pacific Command is focused on the pacing challenge of China in a maritime-dominant domain, while U.S. European Command is focused on the acute threat of Russia in a land-dominant domain. Persistent threats, including Iran, North Korea, and violent extremist organizations, remain that we must plan and prepare to defend against, all while defending the homeland and our installations from a diverse range of threats.

While joint doctrine varies on the definition of setting the theater, Army Doctrine Publication 4-0, *Sustainment*, describes it within the sustainment warfighting function as a continuous shaping activity conducted during a steady-state posture and contingency or crisis response operations. Setting the theater describes the broad range of actions, including port operations, conducted to establish the conditions

in an operational area for the execution of strategic plans.

Simply said, setting the theater provides strategic depth for sustainment across commodities and all classes of supply, and ensures that our forces can move quickly to, and then throughout, a theater to accomplish their mission without a cold start to logistics. It allows the sustainment enterprise to demonstrate speed of response and agility to support CCMD operational plans and tactical requirements.

While the operational framework of setting the theater is rooted in the Joint Security Area (JSA), it is enabled by the Strategic Support Area (SSA). From the Army’s Organic Industrial Base, where equipment and ammunition are upgraded and stored, to Mobile Force Generation Installations that preserve the Army’s ability to project combat power, maintaining readiness in the SSA is a critical first step at the strategic level to set the theater.

At the operational level, the majority of work to set the theater occurs in the JSA. Field Manual 4-0, *Sustainment Operations*, and Army Techniques Publication 4-94, *Theater*

Sustainment Command, direct that theater sustainment command (TSC) conduct mission command of theater sustainment operations and coordinate and synchronize logistics movements and sustainment operations accordingly. Through the TSC, actions to set the theater include:

- Ensuring Army prepositioned stocks are positioned, modernized, and ready for combat.
- Providing the right commodities, from munitions to wholesale sustainment repair parts, in the right quantities and locations.
- Providing operational contracting support and Logistics Civil Augmentation Program capabilities.
- Hardening interior lines of communication and the distribution network.
- Diversifying and readying air and sea ports of debarkation to demonstrate agility.
- Enabling Foreign Military Sales to build partner capacity.

Sustainers must provide geographic combatant commanders the capabilities to demonstrate access, presence, and influence; ensure freedom of action; extend operational reach; and prolong endurance.

Setting the theater is not a once-and-done activity; it is an ongoing operation that requires logisticians to constantly assess the environment and current posture, think differently about threats, and act decisively. It also requires the right materiel investments in key capabilities in the sustainment

warfighting function such as ship to shore logistics vessel distribution, cargo-unmanned aerial systems, predictive logistics, and advanced manufacturing. Sustainers have more real-time data at their fingertips than ever before. We must be proficient, anticipatory, and deliberate in leveraging data analytics to remain ahead of need and ensure we do not consume readiness faster than we can sustain it.

A critical component of setting the theater is enabling port operations to facilitate the reception, staging, onward movement, and integration of forces and equipment within a theater. I recently visited ports on the East and West coasts and Gulf of Mexico, and I can attest that our transporters and sustainers are making our enterprise proud. In 2021 alone, we conducted 57 brigade-equivalent deployments, moving more than 27,000 pieces of equipment to support six CCMDs through 23 U.S. and 45 overseas ports. As we further refine the Joint Concept for Contested Logistics, we must ensure our ports are secure from physical and cyber threats, and our strategic lines of communications are protected. Our ports at home and abroad provide a critical capability to project combat power to theaters across the globe.

The Army’s effort to set the theater in Europe over the past few years is paying huge dividends today on the world stage in response to Russia’s attack on Ukraine. In fact, Army Chief of Staff Gen. James McConville recently told reporters that the ease with which Army units deployed to Europe and

immediately began operations are due to the planning, staging, and forward-thinking logistics to set the theater before the unprovoked invasion. The Army sustainment and logistics enterprise has proven critical to the U.S. whole-of-government effort to fortify our commitment to NATO and support to Ukraine.

Our forward presence gives us a competitive advantage, both physically and through our supply chains and strategic partnerships. Effectively setting the theater ensures the right equipment is positioned in the right condition at the right location to enable operational plans in competition, crisis, and conflict. It is foundational to the Army’s strategic readiness and our ability to sustain our forces, anywhere, at any time.

Gen. Ed Daly serves as the commanding general of the U.S. Army Materiel Command. He served three years as the deputy commanding general of AMC in his previous assignment. He managed the day-to-day operations of the Army’s logistics enterprise and served as the senior commander of Redstone Arsenal, Alabama. He served as the commanding general of Army Sustainment Command at Rock Island Arsenal, Illinois, and as AMC’s deputy chief of staff, overseeing the roles and functions of the headquarters staff.

Driving Readiness at Echelon Now and for the Future



■ By Lt. Gen. Charles R. Hamilton

Editor's Note: Lt. Gen. Charles R. Hamilton assumed duties as the Deputy Chief of Staff, G-4, on April 6. He most recently served as the Assistant Deputy Chief of Staff for Operations, G-4 3/5/7, where he oversaw the G-4's integration of strategic and operational logistics functions to sustain Army Forces. He has contributed several articles to the Army Sustainment Professional Bulletin throughout his career, detailing topics such as predictive logistics, remote expeditionary support, and pre-deployment training. In Hamilton's first recurring column as the DCS, G-4, he provides an initial look into how the Army Sustainment Enterprise (ASE) will continue to

advance its key initiatives that will effectively posture the Army of 2030.

The New Strategic Environment

Recent events at home and abroad—such as the ongoing COVID-19 pandemic and the conflict in Ukraine—have clearly demonstrated the importance of logistics to strategic readiness that is central to the Army mission. The doctrinal transition from counterinsurgency to large-scale combat operations has altered adversarial assumptions that guided previous decision-making across echelons. Faced with the complex and dynamic capabilities of near-peer adversaries, the new strategic environment will test our ability to deter and compete from the homeland to varying tactical points of contact. Those adversaries will seek to undermine our logistics capabilities across multiple domains, including at home. It will be prudent and in our best interest as part of the joint force to proactively prepare for competition, crisis, and conflict. Recognizing the unique constraints of this operational context will prove foundational to our strategic readiness as we posture ourselves to meet the demands set by the National Military Strategy. From a modernized and resilient Organic Industrial Base (OIB) to an

agile power projection infrastructure that ensures we can set and reset theaters in contested environments, our critical efforts to advance and sustain the Army's strategic readiness will remain enduring. However, how we drive those areas forward will adapt alongside the evolving nature of future warfare.

Strategic Readiness to Empower the Joint Force

Readiness is our core requirement as Army sustainers. Enabling readiness across the Total Army ensures the force learns from the past to accomplish today's requirements and prepare for future ones. Driving readiness across echelons is a complex, dynamic, and multi-dimensional task that begins, first and foremost, with our greatest asset—our people. The joint force will continue to rely on an agile and adaptive ASE into 2030 and beyond. Successful readiness is made possible in large part due to the Soldiers, civilians, and contractors at the ASE's core. While our high standards will remain the same, the sustainment tasks and strategic environment we operate will continue to evolve across multi-dimensional domains.

To maintain our sustainment capabilities as a distinct and unassailable strategic advantage, we

must be prepared to do the following:

- Achieve and sustain a strategic readiness posture that is resilient across all domains. The Joint Strategic Support Area (JSSA) is the center of gravity for generating and sustaining combat power. The ASE is integral to setting the JSSA to enable the Army's strategic readiness. The Army's OIB modernization efforts are critical to this endeavor. Achieving and sustaining strategic readiness will allow the Army to deploy and project combat power effectively. Strategic readiness will ensure the Army's logistics overmatch to sustain operations across distributed and contested environments. This posture is enabled through a resilient command and control network that supports information and decision-making advantage. Reducing sustainment demand which unburdens our reliance on extended lines of communication across echelons, will be decisive in sustaining operations in contested environments. Critical to this demand reduction will be our role in supporting the Army's climate initiatives to simultaneously increase strategic readiness and reduce harmful environmental impacts.
- Revolutionize our approach to data-enabled sustainment operations. The Army will advance the ways in which we collect, store, access, analyze,

and communicate our large streams of data across echelons. Data must serve as a readiness asset. It cannot simply describe a past reality, and instead, it must be leveraged to reliably and rapidly inform immediate and future decisions from the strategic to the tactical space. Transforming our sustainment information systems, processes, and procedures will establish data as a readiness asset and form the foundation of predictive logistics (PL). To achieve PL, we will revolutionize our approach to data to deliver and execute sustainment before needed. Beyond PL, we also must commit to precise logistics that will be exact, accurate, and refined. This will enable exhaustive and proactive decision-making across the strategic, operational, and tactical support areas on behalf of and with the direct benefit provided to the warfighter.

- Ensure our doctrine is forward-focused, agile, and reflective of the Army of 2030. Army doctrine provides the foundation for sustainment as a key warfighting function and underpins efforts critical to our readiness posture. Descriptive in nature, allowing for innovative thought and execution, doctrine provides a steady framework for collective action. While the principles of sustainment will remain in place, how we will be called to apply those principles to ensure freedom of action, extend operational reach, and

prolong endurance will evolve. Doctrine that is responsive to those needs and is reflective of the future-ready Army will sustain strategic readiness.

Current Strategic Readiness for Future Overmatch

History has continually told the story of the sustainer being central to battlefield victory. While we take pride in executing our mission in the background, the efforts do not go unnoticed. The Army of 2030 and beyond will place unique demands on our sustainers, but we will be ready to respond.

We must remain committed to the development of our people, prepare for the future through capitalization of revolutionary data-enabled sustainment, and ensure our doctrine is reflective of the Army of the future. I am honored and humbled to be your 47th Army G-4. People First, Winning Matters, Army Strong!

Lt. Gen. Charles R. Hamilton currently serves as the Deputy Chief of Staff, G-4. He most recently served as the Assistant Deputy Chief of Staff for Operations, G-4 3/5/7. Hailing from Houston, Texas, Hamilton enlisted in the U.S. Army. Upon completion of basic and individual training, he was assigned to Fort Hood, Texas. In February 1988, he graduated from Officer Candidate School as the Distinguished Military Graduate and was commissioned as a second lieutenant in the Quartermaster Corps. He earned a Bachelor of Science in Business Administration from Virginia State University and Masters' Degrees in Public Administration from Central Michigan University and Military Studies from Marine Corps University. He also is a graduate of a Senior Service College Fellowship – Secretary of Defense Corporate Fellows Program.

DEPLOY TONIGHT

DEPLOYMENT PROCESS ISSUES

An Examination of Fort to Port Deployment Challenges, Shortfalls



■ By Maj. Gen. Mark T. Simerly

As our Army adapts to challenges future conflicts may pose, Army forces must be prepared to deploy and deliver combat power to the combatant commander or joint force commander. This requires units deploying on short notice to austere locations with all or a majority of its assigned equipment.

With the risk of large-scale combat operations (LSCO), and rapid short notice deployment requirements we must rebuild our operational deployment capability. Years of predictable deployments

under the Army Force Generation (ARFORGEN) model, coupled with outsourcing the deployment process to strategic enablers and contractors, have eroded expeditionary deployment skills the Army once possessed. Planners cannot rely on theater-provided equipment once available for recent deployments to Iraq and Afghanistan. Preplanned ARFORGEN deployments caused the deployment execution to shift from an operation for commanders to a task for logisticians.

Army organizations are required to develop and adhere to the Command Deployment Discipline Program (CDDP) in accordance with (IAW) Army Regulation (AR) 525-93, *Army Deployment and Redeployment*, to achieve and maintain deployment skill proficiency and meet global crisis action requirements. The CDDP is a commander's tool to enhance deployment readiness. Routine field training exercises, combat training centers rotations, U.S. Forces Command emergency deployment readiness exercises, and other training events offer an excellent opportunity to practice and enforce the deployment readiness levels. A focused CDDP will build

deployment competency, capability, and confidence.

In an effort to identify fort to port challenges and provide actionable recommendations, the Combined Arms Support Command (CASCOM) Deployment Process Modernization Office (DPMO) in coordination with Center of Army Lessons Learned, and the deployment community of interest identified three ongoing issues common across the Army.

Fort to Port Deployment Issues

The three most significant fort to port issues and their contributing factors impacting unit readiness are: adherence to deployment policy and procedures, deployment skill proficiency, and deployment discipline.

Adherence to Deployment Policy and Procedures. Deployment standards ensure accuracy and speed of deployment to obtain strategic lift. Across the Army, units are not familiar with existing deployment policies and procedures contained within Defense Transportation Regulations, AR 525-93, and Army

Techniques Publication (ATP) 3-35, *Army Deployment and Redeployment*. Consistent enforcement of CDDP standards is not uniformly practiced and trained because deployment mission essential tasks (METs) were reintroduced late 2020. We discovered two primary factors that contribute to this shortfall are:

- **Standardized Roles and Responsibilities (R2).** Speed of deployment depends heavily

on every individual and unit fulfilling their specific actions in deployment process. Across several Army installations, deployment roles and responsibilities throughout the process did not adhere to established procedures as prescribed in AR 525-93 Appendix C. Additionally, R2 adjustments need to be made to accommodate the transition from an ARFORGEN

deployment model to a short notice LSCO and rapid deployment scenario. Unfamiliarity with R2 creates an unclear line of responsibility throughout the fort to port deployment operation. Some degree of modification is needed to accommodate the operational requirements of specific installations because of infrastructure and equipment limitations, labor shortfalls and



Soldiers assigned to the 258th Movement Control Team, Division Sustainment Troops Battalion, 3rd Division Sustainment Brigade, 3rd Infantry Division, inspect equipment during the 3rd Combat Aviation Brigade, 3rd ID, Emergency Deployment Readiness Exercise April 25, on Hunter Army Airfield, Savannah, Georgia. (Photo by Sgt. Laurissa Hodges)

training weaknesses. We are working with the community of interest to clearly define the R2 in doctrine and ensure Installation Deployment Support Plans are updated.

- **Quality Assurance and Quality Control (QA/QC) measures at installations.** Meeting regulatory and legal transportation requirements are critical to a successful deployment. Our observations frequently found that many units and installations failed to conduct a final QA/QC inspection at the installation prior to cargo movement to the port of embarkation (POE) by surface (rail, commercial truck, and convoy). Significant shortfalls discovered at the POE include bad movement data, frustrated cargo, inaccurate HAZMAT labeling and placarding, and incorrect vehicle configurations. These issues not only affect POE operations, but also violate existing state and federal transportation and HAZMAT regulations, creating potentially larger issues.

Deployment Skill Proficiency at Echelon. The lack of individual and unit deployment skill proficiency is primarily attributed to units not developing and enforcing a CDDP and ensuring individual and unit deployment METs are met. If deployment training is not a priority, critical deployment skills atrophy over time. The two main factors impacting readiness are:

- **Transportation Coordinators' Automated Information for Movements System II (TCAIMS II) Operator Proficiency.** TC-AIMS II is the Army's system of record that requires a level of operator proficiency to provide accurate unit movement data for deployments. TC-AIMS II operators do not work with the system frequently enough to navigate it correctly and respond to the dynamic requirements of rapid deployments. This creates data inconsistencies that could prevent units from meeting deployment timelines.
- **Unit Movement Officer (UMO) Proficiency.** UMO's are military occupational specialty immaterial personnel that receive a two-week certification course assigned to every battalion and company-level organization as an additional duty IAW AR 525-93. UMO personnel were often untrained and did not practice their deployment responsibility frequently enough to display any sort of proficiency.

Poor deployment skills proficiency presents a liability to unit readiness and reduces the unit's ability to respond rapidly to a contingency. Some of the observed results are delayed equipment, incorrect allocation of strategic platforms (air or sea), and inaccurate data, all of which creates delays in loading conveyances. LSCO deployments

present challenges that are not easily overcome while executing a deployment and require significant time and expense to mitigate. These delays will likely negatively affect the combatant commander's ability to build combat power.

Deployment Discipline at Echelon. Commanders do not treat deployments as an operation. Deployment discipline is created through routine and programed training. Operational planning of deployment is critical to ensure synchronization of equipment to build combat power at destination. Over the past several years, our Army has executed deployments mainly as an administrative move. To properly respond to LSCO requirements and meet critical response timelines, deployment must be treated as an operation and mission commanded like all other military operations.

Effective Mission Command. LSCO deployments are extremely fast paced, requiring constant monitoring and updating. Failure to establish mission command oversight, activate an operations center, publish deployment orders, and publish or update an N-Hour Sequence impact the effectiveness of the deployment mission.

Deployment Planning. Effective deployment planning is critical to the success of any operation. Commanders at all echelons should treat all deployments as operations driven by the operations officer. This will ensure the proper allocation of

resources and the sequencing of combat power at destination.

Fort to Port Deployment Issue Mitigation Initiatives

CASCOM is responsible for integrating efforts across doctrine, training, and system improvements to mitigate ongoing issues, provide recommendations and support the operational Army.

Doctrine. DPMO's Deployment Standards Branch made great strides in late 2021 and into 2022 revising deployment regulations and doctrine. The major revision for AR 525-93 is currently at the Army Publishing Directorate for final review and publication, tentatively late-Summer 2022, along with a first-ever Department of the Army Pamphlet 525-93, *Army Deployment and Redeployment Processes and Procedures*. The regulation and the pamphlet update synchronize authorities, roles, and responsibilities across all Army units and organizations deploying or providing support to deployment. ATP 3-35.1, *Army Prepositioned Operations*, published in April 2022, updates APS alignment globally and includes updated accountability, visibility, and employment processes and systems. ATP 4-16, *Army Movement Control*, also published in April 2022, realigns the movement controls functions and tasks to support the 3-0 and 4-0 series of publications, updates movement control units and responsibilities, and better presents Army movement control at echelon as a critical battlefield enabler for the

maneuver commander. Also open for major revision are ATP 3-35, *Army Deployment and Redeployment*, and ATP 4-13, *Army Expeditionary Intermodal Operations*. ATP 3-35 and ATP 4-13 are being revised to fully align with the changes in AR 525-93 and the 3-0 and 4-0 series of publications and will be vital resources supporting the Army's ability to project force globally.

Training. The U.S. Army Transportation School is also working on several initiatives to increase training capacity for UMO personnel. They are expanding the Unit Movement Officer Deployment Planning Course load from 600 students to about 3,100 students annually. In addition to One Army School System supported sites, they are positioning instructors to teach the accredited course at five satellite locations and mobile training team coverage for Hawaii and Korea. This approach will provide accredited instructors teaching a consistent course to the locations with the greatest demand. These training initiatives will help ensure units have trained individuals in key positions. In order to build proficiency, commanders must seek out opportunities for their personnel to practice, gain experience, and become proficient in their deployment skills.

Systems Improvement. Recent improvements with TC-AIMS II have made the program more versatile and user friendly. These enhancements include property book synchronization, password

reset security enhancements, an improved graphical user interface, the ability to merge plans, a theater operations' cost management module, and a data validator. To help reduce operator error, DPMO Systems Branch, along with the program manager, is developing a future release to create an interface with the Weigh in Motion System, which will import actual equipment dimensions into TCAIMS II.

Conclusion

Solutions to the Army's deployment challenges require more than just our mitigation initiatives. Commanders must reclaim ownership of the deployment process by placing equal emphasis on deployment planning and execution as they do on any other operation. All skills require practice and repetition before one can build proficiency, and commands must develop their CDDP and identify opportunities and capitalize on them to build individual skills. As command emphasis is more consistently applied and standards adhered to, many of these challenges can be solved.

Maj. Gen. Mark T. Simerly serves as the commanding general of the Combined Arms Support Command at Fort Lee, Virginia. He previously served as the commander of the 19th Expeditionary Support Command. He was commissioned as a lieutenant of Air Defense Artillery and awarded a Bachelor of Arts Degree as a Distinguished Military Graduate from the University of Richmond. He holds a Master of Science in National Resource Strategy from the National Defense University and a Master of Military Arts and Sciences Degree from the Army Command and General Staff College.



EVOLVING CONDITIONS, RESOLUTE TASKS

The Future of Deployment Readiness

An Interview With Maj. Gen. Heidi Hoyle and Mike Hutchison

■ By Lt. Col. Altwan Whitfield and Mike Crozier

Since June 2020, Maj. Gen. Heidi Hoyle has served as the 22nd commanding general of the Military Surface Deployment and Distribution Command (SDDC)—the Army Service Component Command to the United States Transportation Command (USTRANSCOM) and a major subordinate command to U.S. Army Materiel Command (AMC). A 1994 graduate of West Point who commissioned as an ordnance officer and most recently served as Commandant of the U.S. Army Ordnance School, Hoyle now

oversees a workforce of more than 5,000 transportation professionals across the world. In coordination with her deputy, Mike Hutchison, the two have principally prioritized SDDC's people and their collective ability to simultaneously advance the command's current readiness and future mobility posture in support of the Army and its joint force partners. *Army Sustainment* sat down with Hoyle and Hutchison to discuss the expeditionary deployment and sustainment challenges facing the Army as the future of warfare across contested domains continues to evolve.

When we last covered strategic readiness, a key takeaway was that it is perishable and part of our short-term muscle memory. How has SDDC exercised and adapted that same muscle memory to meet the needs of rapidly emerging requirements as outlined by the National Defense Strategy (NDS)?

Hoyle: As we look at 21st-century warfare, especially as outlined in the NDS, we look at many things that have changed how our senior leaders and logisticians need to effectively and efficiently deploy and

sustain combat power. The concept of warfare in the 21st century is vastly different than previous conflicts. The biggest difference I see is that it will be done in a contested environment, with threats that are both kinetic and non-kinetic. As we look across the Joint Deployment and Distribution Enterprise (JDDE), we're taking a strategic and operational view of what's happening across geopolitical spaces. Our commercial industry partners understand the nation's priorities and help us to prioritize commercial and military cargo to avoid economic impacts that could undermine domestic and international public support.

Additionally, our new operating environment within great power competition is defined by highly complex technology, which greatly compresses our response timelines. The cyber network is the foundation within which this all operates and can be fragile as great power comes together. Our adversaries will aim to restrict our access to and capability within once familiar terrain. Let's take China's Belt and Road Initiative as an example: the key space and terrain they're after and aim to occupy is being sought so that it will change the way we can project and sustain power. Equities we had full or near-full access to in the past are contested and may change moving forward, so we mitigate risk by ensuring clear and consistent civilian, governmental, and multinational integration and cooperation.

Climate is another key aspect of this changing terrain; the Army

recently released its climate strategy to control these changing factors. The recent increase in severe weather events in the U.S. and across the globe has forced the DOD to take a hard, close look at how this will impact future operations. We must commit to deliberate planning that considers environmental factors and regulations we are dutifully called to respect while establishing a framework for exceptions based on contingency demand. We, in the DOD, have committed to upholding the International Maritime Organization's 2023 environmental plan, which aims to cut vessel carbon dioxide emissions by 40% and 70% in 2030 and 2050, respectively; our close collaboration and partnership with industry will ensure we can do that without any negative operational implications. Industry will help us evolve how we should do business, but it will not change our mission set.

Hutchison: We must emphasize that communication with our industry partners is critical to keep them informed about what we see on the horizon, both strategically and operationally. We do this to strengthen the feedback loop between all parties; by sharing our experiences, we're strengthening that operational relationship.

Hoyle: That's a huge piece of the puzzle, effectively engaging in information exchange with our industry partners, almost to a butterfly effect where every piece of data we can share is important and may have positive ripple effects down the line. Our effective collaboration

with industry ensures that they remain a critical piece in the strategic and operational puzzle.

Assuming a contested homeland seems to be a mainstay of the Army's campaign planning. In your talks with industry, did they anticipate the same given their existing roles and responsibilities?

Hoyle: Given our consistent communication, they were certainly in lockstep, as our business is certainly theirs, and vice versa to an extent. For example, the military constitutes a small piece of the rail industry's business in the continental United States, so the focus has been on maintaining the status quo and their current posture.

Hutchison: One of the biggest challenges of this newly contested space is in the cyber realm. Even though we exist as a small piece of the commercial industry's business, we're working alongside them to identify and analyze cyber vulnerabilities in the commercial and defense transportation sector. What is a DOD problem also may play out in the commercial space, so there are certainly incentives for parties to work diligently alongside each other. We're preparing for updated Cybersecurity Maturity Model Certification requirements that will begin in 2025, both in our systems and the contracts with the industry that develops those systems. So, we're approaching this from all angles in tandem with and alongside our industry partners. We're not just anticipating contested



Lt. Col. William Prince Jr., then commander of the 838th Transportation Battalion, 598th Transportation Brigade, guides an M1A1 Abrams tank off a commercial vessel in support of Defender Europe on Feb. 20, 2020, in the port of Bremerhaven, Germany. (Photo by Sgt. Dominique Washington)

operations—we're actively practicing operations assuming some extent of system degradation to verify and validate our ability to move cargo and sustain the force in this new battlespace, starting with our power projection platforms and mobilization force generation installations. Partner capacity adds to the options provided to a commander in that operational and tactical space, and much of this is borne from our execution of exercises like Defender Europe and Pacific.

SDDC has always been a key member of the JDDE—how have your roles in this cohort shifted, if at all, when operating under the assumption of a future contested homeland?

Hoyle: The easy and right answer here is, "No"—we don't see our role changing. We're here to deliver the armed forces to their point of need and effectively synchronize global surface deployment and distribution requirements. As a command, we've structured our collective lines of effort accordingly: people as our strategic advantage, deployment and distribution readiness in the midst of emerging requirements, and the ability to rapidly evolve for the future. We've talked about our commercial partnerships, but another critical piece here is our other national programs, like the Strategic Seaport Program alongside the Department of Transportation's Maritime Administration, which

ensures that capabilities are available to deploy when and where needed. We also have similar programs on our rail and highway networks to communicate and amplify the DOD's requirements across all nodes in the transportation space and ensure the commitment of the right resources at the right time. Roles certainly haven't changed, but all stakeholders in this space operate with an understanding of the changing conditions and how we need to be positioned to respond rapidly. When the Army trains, we look at tasks, conditions, and standards. Whether we're executing counterinsurgency or large-scale combat operations, the standards and tasks we're committed to don't change. It's the conditions



A vehicle belonging to 1st Air Cavalry Brigade (1ACB), 1st Cavalry Division (1ID), is driven down the rear ramp of the commercial vessel ARC Independence Nov. 28, 2021, at the port of Alexandroupoli, Greece, in support of Atlantic Resolve. (Photo by Staff Sgt. Jennifer Reynolds)

that change. We must constantly assess how we operate within our environment's conditions, and so much of this is enabled by our persistent engagement with industry and the suite of diverse capabilities they've brought to past, bring to current, and provide for future fights across any given condition.

Hutchison: Our role certainly hasn't shifted, but, as Hoyle mentioned, the ways in which we're able to support that role have advanced. Our information systems and other supporting technology

will continue to be some of our central force multipliers, along with the people who execute operations within those systems. We've started to treat data as a provided commodity as we order transportation services, and we want to be judicious in how we distribute that data so we can control that information flow as conditions change. We're tied in with USTRANSCOM on the requirements side of the house as they explore enterprise capabilities to use data and information better. The JDDE writ large has done a good job keeping pace with the transition

to a digitally enabled organization, and we're ensuring our own parallel progress as those conditions change.

How does SDDC strike a balance between their sustained readiness efforts and modernization initiatives? Are the two at odds?

Hoyle: There is certainly a balance to be struck between the two, but we don't see them as being competing interests. We're lucky at SDDC to have the Transportation Engineering Agency (TEA) on

our staff to lead our transportability assessments so that our readiness can track alongside vehicle modernization efforts. For instance, as the Army evolves from the M113, Armored Personnel Carrier, to the Armored Multi-Purpose Vehicle (AMPV), we are integrating its varying movement requirements into our operational framework—all enabled by TEA. When we acquire new equipment, we're able to immediately tie current and future requirements into that acquisition to fully leverage that materiel to its maximum operational affect from day one. As a command, we're focused on ensuring our current transportation requirements best support immediate readiness but are also tailored to meet future warfare's evolving needs. So, readiness and modernization really are inextricably linked at SDDC.

Hutchison: We believe we can maintain our current readiness even as we look specifically at what will be needed in 2030 and beyond. Tactically speaking, we check the Program Objective Memorandum (POM) cycle to ensure the readiness of our currently fielded equipment. We're simultaneously identifying the requirements for future equipment dictated by that outlook toward 2030 and even 2050, with much of this enabled by TEA's assessments and analysis. We synchronize with Army Materiel Command and the Deputy Chief of Staff, G-4, on the budget side of this equation so we can address those critical materiel development and acquisition requirements. We,

as a command, also work alongside the Army Corps of Engineers to maintain and advance our two military ocean terminals—Military Ocean Terminal Sunny Point in North Carolina and Military Ocean Terminal Concord in California—so they're ready to support our rapid deployment needs when and where necessary.

What are some of the most crucial operational effects sustainers and transporters need to be aware of as SDDC modernizes its key in-transit and business operational systems?

Hoyle: As we work through our modernization efforts, we recognize a key effort is preparing the relevant sustainment and transportation community for any changes, especially those that are systems or based on technology. For example, we were some of the earliest adopters of the cloud for data storage across Army Materiel Command for mission assurance purposes. We're forward looking in how we want to leverage advances made in artificial intelligence to help us make smarter cargo decisions faster at scale. For instance, we are currently testing new technologies to capture available volume across staging areas at our 842nd Transportation Battalion in Texas. Additionally, we're focusing on connecting the end-to-end unit move process – from ordering for air or surface movement to stow planning and terminal management and even billing—into a single, authoritative system. With this in

mind, we mustn't take our current capabilities for granted as we work in tandem with industry and academia on these projects.

Hutchison: We certainly rely heavily on the commercial industry to accomplish our mission. Central to that partnership is our ability to intelligently structure contract modes which offer us agility and flexibility. Tied to this dynamic are our port diversification efforts, we want to minimize costly, one-time only, limited duration agreements for stevedoring, or cargo loading and unloading, and other services. Regardless of port location, leveraging regional contracts with one key service provider helps us avoid administrative costs and increases our terminal readiness. Sustainers who recognize that relationship and work to bolster it appropriately to increase our capabilities will be successful now and in the future.

Lt. Col. Altwan Whitfield is currently serving as the deputy director of the Army G-4's Logistics Initiatives Group. Previously, she was the commander of the 841st Transportation Battalion at Surface Deployment and Distribution Command. She holds a bachelor's degree in Special Education from Converse College in Spartanburg, South Carolina, and a master's degree in Public Administration with a concentration in Education from Troy University in Montgomery, Alabama.

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

Feature Photo
After arriving at the port, 1st Armored Brigade Combat Team, 1st Armored Division, from Fort Bliss, Texas, move armored and tracked vehicles and other equipment forward to their final destination via the Korean rail system on Feb. 27 at Busan, Korea. (Photo by Kevin Bell)



Game Changer

Setting the Theater Key to Maintaining Dominance, Overmatch

■ By Lt. Gen. Donnie Walker

Setting the theater is key to maintaining dominance and overmatch across crisis, competition, and conflict, and no community has a bigger role than our sustainment and logistics enterprise. Simply said, setting the theater involves strategic, operational, and tactical activities that establish and maintain favorable conditions for conducting Army and joint operations. It requires having the forces, equipment, infrastructure, and relationships firmly established forward to provide combatant commanders with the range of tools they need to respond quickly. This enduring forward presence builds trust and helps assure allies and partners in a region and serves as a credible deterrent to potential adversaries.

Army Materiel Command (AMC) leads efforts at the strategic level to set theaters with sustainment supplies and commodities. This starts by assuring the Army's strategic power projection capability projects combat power globally. It's further accomplished through the forward positioning of Army prepositioned stock (APS) and equipment and through foreign military sales (FMS), which build shared capabilities and capacity with allies and partners.

Power Projection Infrastructure

To effectively set the theater, the Army must have the right infrastructure to project combat power from its installations in the U.S. and abroad into potentially contested theaters thousands of miles

away by land, sea, or air. Having the very best trained, ready, and equipped forces in the world does nothing if we cannot get them to where they need to be and sustain them once there. The ability to rapidly surge combat-ready forces into and across theaters is critical in projecting forces at a moment's notice to support the joint force and our allies and partners.

AMC's transportation offices, depots, arsenals, plants, ports, and installation infrastructure—railheads, roads, and airfields—are key to the nation's power projection capabilities and must be modernized to support current, surge, and future Army readiness requirements. To accomplish this, AMC is leading the Army's effort in developing and implementing a holistic facility investment plan (FIP) that identifies all requirements for more than 141,000 facilities across its installations and aligns resources with Army and commander priorities. Using the latest capabilities in data analytics and visualization, the FIP provides a 10-year outlook, updated annually, that ensures funds are allocated to the highest priority projects based on Army readiness requirements.

AMC also is nested with Army Futures Command and the modernization community to ensure that power projection infrastructure is modernized alongside the Army's weapon systems.

From airfields and railheads at mobilization force generation installations to cranes and docks

at our military ocean terminals and commercial ports, our strategic power projection capabilities provide a strategic advantage, and they rely on ready, modern infrastructure.

Army Prepositioned Stock

As a critical component of the strategic mobility triad, with sealift and airlift, APS is strategically placed sets of equipment ready for Soldiers to draw and move out immediately to tactical assembly areas. APS cuts the timeline and reduces the strategic lift requirements for deploying units by providing the theater-specific combat equipment required to respond rapidly, speeding troops to the frontlines. More than just tanks and artillery pieces, APS includes combat sustainment and enablers such as command, control, computers, communications, cyber, intelligence, surveillance, and reconnaissance. APS is separate from commodities such as food, fuel, medical supplies, and munitions staged in theater but work together to provide commanders with the equipment, supplies, and sustainment capabilities they require. Managed by Army Sustainment Command, the Army currently maintains six APS sets aligned with a geographic combatant command or afloat.

The Army is employing a 21st-century APS strategy focused on expansion, repositioning, and modernization to ensure the right equipment is postured in the right regions for rapid employment. For example, in the last two years, AMC repositioned thousands of pieces of equipment and modernized APS

facilities and infrastructure to best support combatant commander requirements for the European and African theaters.

Part of the 21st-century APS strategy uses APS in competition to support exercises and deployments of regionally allocated forces, not just as a war reserve. During the Defender-Europe 21 series of linked exercises, equipment configuration, and hand-off area teams assigned to Army Field Support Battalion-Benelux issued 281 pieces of APS equipment to infantry, signal, and support units in Germany and Estonia. Following the exercise, sites at Zutendaal, Belgium, and Eygelshoven, Netherlands, received, inspected, and performed maintenance on all forward-issued equipment to ensure it was ready for issue again. Exercising the draw and employment of APS in competition

builds skills and muscle memory that will pay dividends should we move into crisis or conflict.

APS also demonstrates its relevance and criticality in real-world contingency operations in Europe. Following Russia's invasion of Ukraine in February, President Biden ordered the deployment of several thousand U.S. troops to Europe to assure our NATO allies and partners and deter further aggression. Soldiers from the 1st Armored Brigade Combat Team, 3rd Infantry Division, who deployed from Fort Stewart, Georgia, to Germany on short notice, drew equipment from APS-2 stocks, and immediately began training with allies and partners at the Grafenwoehr Training Area. Elements from the German armed forces Bundeswehr Logistics Command delivered multiple loads of vehicles and

equipment from Mannheim to Grafenwoehr, demonstrating the interoperability and partnership with allies. APS serves its purpose on a global stage as troops quickly deploy, draw equipment, and move out to conduct their missions.

Foreign Military Sales

We will not fight the next war alone. Security assistance and FMS sustain strong relationships with allies and partners and build their capacity and readiness while supporting combatant commander priorities. AMC and our U.S. Army Security Assistance Command (USASAC) are critical in establishing and maintaining military partnerships through execution of its security assistance and FMS program. The AMC Security Assistance Enterprise currently executes more than 6,100 FMS cases with more than 135



An M1A2 Abrams main battle tank is loaded onto a German rail car on March 10, at Coleman worksite in Mannheim, Germany. The 405th Army Field Support Brigade recently began augmenting its line-haul heavy equipment transporter deliveries of an entire armored brigade combat team's worth of Army Prepositioned Stocks-2 equipment with rail. (Photo by Maj. Allan Laggui)



Military vehicles originating from the 402nd Army Field Support Battalion are downloaded from U.S. Navy Ship Red Cloud in preparation of Army Prepositioned Stock 3 on Feb. 24 at Subic Bay, Philippines. (Photo by Staff Sgt. Katie Nelson)

countries, the preponderance of all Army FMS security assistance provided to our allies and partners.

As we have seen during the current conflict in Ukraine, FMS is proving invaluable to enabling our allies and partners. From 2019 to the present, USASAC implemented 107 FMS cases and provided more than \$300 million of equipment to Ukraine. From ammunition to small arms; Javelin missiles to night vision devices and radios; and from HMMWV variants to Toyota Land Cruisers, FMS demonstrates our commitment to building partner capacity.

The key to successful FMS is offering partners and allies a total package of materiel, spare parts, training, publications, technical documentation, maintenance support, and other services AMC

provides to Army units. This ensures partners and allies receive equipment and can effectively train, utilize, and maintain it.

Conclusion

Our logistics capability has long been a strategic advantage for the U.S. Army. With current events in Eastern Europe, our nation's ability to respond with dynamic force deployment and employment to assure our allies and partners and deter our adversaries has never been more important. Properly setting the theater is foundational to success.

We must lean forward in modernizing critical power projection infrastructure, anticipate future requirements and preposition equipment accordingly, and continue to develop critical relationships with allies and partners through security

assistance. Setting the theater through the Army principles of logistics and sustainment—from the strategic support area to the tactical point of contact—assures our ability to maintain a combat-credible force that can demonstrate clear strategic and operational overmatch over adversaries and do it second to none.

Lt. Gen. Donnie Walker currently serves as the deputy commanding general of the U.S. Army Materiel Command and the senior commander of Redstone Arsenal, Alabama. Walker was commissioned as a second lieutenant in the Quartermaster Corps upon his graduation from Auburn University in 1987. He earned master's degrees in Logistics Management from the Florida Institute of Technology, and Military Arts and Sciences from the U.S. Army War College.

Feature Photo
Soldiers with the 2nd Armored Brigade Combat Team, 1st Armored Division conduct rail operations on April 20, 2020, at the rail head on Fort Bliss, Texas. (Photo by Staff Sgt. Michael West)



Ready to Fight

Forward Thinking Required for Fort to Port Operations

■ By Chief Warrant Officer 2 Kevin Coleman

The U.S. Army has faced many adverse challenges due to COVID-19, and yet we continue to stay ready and lethal for deployment and redeployment operations. This requires forward thinking to meet mission requirements while caring for the well-being of Soldiers. Leaders must continually educate subordinates on the importance of successful execution during the first two deployment phases. These phases—pre-deployment activities and fort-to-port operations—set conditions for the rest of the deployment. Pre-deployment activities and fort-to-port are vital to the reception, staging, onward movements, and integration (RSOI) process to ensure units stay lethal and ready. Mobility warrant officers (MWOs) play a vital role in supporting the deployment and redeployment process. MWOs need to look at operations from a transportation

feasibility lens and convey their commander’s strategic message. This requires synchronization at the tactical, strategic, and operational levels which allows MWOs to assist anywhere during the deployment process.

During my time in 1st Armored Brigade Combat Team (1st ABCT), 1st Cavalry Division, senior leaders understood the importance of educating all leaders on the importance of People First, Command Deployment Discipline Program (CDDP), critical tasks, maintenance readiness, and accountability of equipment. In the spring of 2020 during Operation Atlantic Resolve, brigade readiness was more dependent on personnel implementing CDDP to meet the commanders’ intent. The 1st ABCT developed a Combat Leaders University where leaders learn the importance of reporting accurate equipment status reports, especially concerning non-mission-capable equipment that would hinder the fort-to port operation. Additionally, commanders learn the significance of reporting accurate unit deployment lists, as these affect the allocation of resources and assets, including commercial trucks, railcars, vessels or aircraft, and material handling equipment for fort-to-port operations.

Power Projection Platform

For a successful fort-to-port operation, your power projection platform (PPP) must efficiently support multiple simultaneous operations for rotational deploy-

ments, training exercises, and no-notice missions, especially during a pandemic. PPPs are Army installations that strategically deploy one or more brigade combat teams and/or mobilize and deploy high-priority Army reserve component units per Army Techniques Publication 3-35, *Army Deployment and Redeployment*. Installations should provide the installation deployment support plan, which defines the concept of support and should include measures to address the quality of its services as it prepares units for deployment. Some installations possess the capabilities required to de-conflict the utilization of assets, while others outsource these assets. Also, other organizations are available to augment the civilian workforce, such as movement control teams (MCT). Incorporating the MCTs early during the planning phase will aid in identifying shortfalls and bridging capabilities gaps for fort-to-port operation. Additionally, this provides experience to the MCT personnel, helping them stay proficient in their occupation. PPPs should host a synchronization meeting with the unit, installation transportation office, supporting agencies, and higher echelons to ensure the combatant commander’s intent is being met.

Troop/Equipment Movement

The ability to conduct equipment’s rapid and orderly movement throughout fort-to-port operations is imperative to project combat power at decisive points. Thinking ahead is essential during the planning process to ensure leaders achieve

“Ready to Fight” standards for the equipment and personnel arriving in the theater. The Military Decision-Making Process will help the unit determine the different types of force packages based on prioritizing equipment departing from installation. While working with the brigade S3 operations staff, I learned that operations drive logistics, and understanding this helps prioritize personnel and equipment outflow from installation. This includes your recovery support, life support, communication plans, mission at hand, specialized occupations, and key personnel.

Rehearsal of Concept Drill

A rehearsal of concept (ROC) drill is a dry walk-through of a plan between a commander and their subordinates. The ROC drill creates a shared understanding of the unit’s plan and is key to the fort-to-port operation. The recommended attendance is the brigade and battalion command teams, brigade and battalion staffs, and node officers in charge. Army Doctrine Publication 5-0, *The Operations Process*, is a good reference when discussing how to prepare, plan, and execute. A best practice is for other units on the same installation deploying later to attend the ROC drills and to have a planner embedded into the current unit deployment operations. ROC drills allow the execution of fort-to-port operations to be a seamless process. In 1st ABCT, we used a ROC drill to cement our brigade plan and allow us to see potential issues in time and space, especially potential delays



Maj. Bo Olsen, the S-3 from the 1-7th CAV CAV, 1st Armored Brigade Combat Team (1ABCT), 1st Cavalry Division, assisted with the accountability of equipment arriving at the Port of Beaumont for 1ABCT while collaborating with the 842nd Battalion SDDC Surface Deployment and Distribution Command on Oct. 8, 2020, at the Port of Beaumont, Texas. (Photo by Chief Warrant Officer 2 Sidiq AL-Uqdah)

with the sterile yards. It also allowed us to fragmentary order the plan as the agricultural sanitization node handed off equipment to the sterile yard. Furthermore, we conducted the initial site survey with the battalion that owned the port and created a mutual understanding of port operations. Additionally, upon arrival at the Port of Beaumont, Texas, we conducted a ROC drill with the Surface Deployment and Distribution Command personnel that demonstrated how we broke down tasks across the port detail.

Have you ever heard leaders continuously ask where their equipment is located? This is because equipment accountability is extremely important to commanders,

and they require constant status updates. Placing field grade officers or senior captains with a senior NCO facilitated a great reporting chain throughout the brigade and provided crosstalk among units. Understanding that multiple systems are in place for in-transit visibility and having representation throughout the process always stresses the importance of accountability. This assists in command and control of personnel and equipment, allowing leaders to speak with outside agencies on behalf of commanders as changes in the execution phase occur. Additionally, the unit held nightly fusion cell synchronization meetings with brigade and battalion leaders, which allowed the team to rapidly reallocate resources as

needed and kept the brigade moving in the right direction.

The goal is for all Soldiers to understand the importance of how we move, and how we fight to continue to be a lethal force and to be ready when called upon. We must learn from one another and be open-minded to new ideas to reach the same objective.

Chief Warrant Officer 2 Kevin Coleman currently serves as a mobility warrant officer. He holds an associate degree in Homeland Security, Emergency Management.

*Feature Photo
Then Warrant Officer 1 Kevin Coleman, a brigade mobility officer from the 91st Engineer Battalion, guided the rail load team in prioritizing loading containers on Sept. 28, 2020, at the rail operation center at Fort Hood, Texas. (Photo by Chief Warrant Officer 2 Edilma Cruz)*

Theater Logistics Analytics

Describing, Visualizing, Understanding
the Operational Environment

■ *By Maj. Gen. David Wilson and Maj. Tanya Leonard*

Setting the theater requires an analysis of the operational environment (OE) in which forces will operate to identify what is needed to execute operations within the theater. It is incumbent that strategic planners across all warfighting functions analyze the operational environment to understand constraints that will affect their ability to execute the mission. The DOD has six geographic combatant commands across the globe, including U.S. Africa Command, U.S. Central Command, U.S. European Command, U.S. Indo-Pacific Command, U.S. Northern Command, and U.S. Southern Command. Each geographic combatant commander (GCC) is responsible for an area of responsibility within their region. Each GCC must develop a theater campaign plan and theater engagement plan while setting conditions within the theater to conduct operations during a crisis, competition, and conflict. A comprehensive analysis of the OE is required to understand the theater of operations and ensure the development of suitable, acceptable, feasible, and flexible theater plans.

OE Assessment Tools

Planners use several tools to assist commanders in visualizing the operational environment, including the intelligence preparation of the battlefield (IPB) and the theater logistics analysis (TLA). The IPB is one of the most frequently used tools that provides an analysis of the OE. The IPB is a tool that analyzes

the OE from an intelligence lens and assists commanders in understanding mission variables that could affect operations to include enemy, terrain, weather, and civil considerations. Field Manual 4-0, *Sustainment Operations*, describes the sustainment preparation of the operation environment (SPoOE) as an assessment tool used by theater planners to analyze the OE and identify resource factors that could impact sustainment operations. Joint Publication 4-0, *Joint Logistics*, describes the SPoOE as the TLA, a supporting process used by planners that provides an initial sustainment assessment of resources, infrastructure, and logistics within an OE. The TLA is the genesis of theater sustainment planning and facilitates the development of the theater logistics overview (TLO), the concept of logistics support (COLS), and the logistics estimate.

Theater Logistics Analysis

The TLA is a strategic-level process and the foundation of sustainment preparation and planning at the theater level. The TLA is a powerful sustainment tool used to inform decisions across all phases of the conflict continuum and assists in setting and shaping the theater. The TLA is a detailed analysis of each country within a theater. This analysis provides commanders with critical information about each country, including threats, geography, environmental factors, host nation agreements, and country infrastructure and military resources. Theater sustainment planners, joint logistics

enterprise (JLEnt) partners, and partner nations all facilitate the development of the TLA. The TLA is a continuous process that begins before setting the theater and is refined throughout crisis, competition, and conflict as the operational environment evolves. The TLA is essentially a theater sustainment common operating picture for the GCC at Phase 0, which is maintained to ensure the commander has an accurate sight picture of sustainment capabilities and constraints across the area of responsibility. The GCC's ability to understand, visualize, and describe sustainment within the theater enables the execution and sustainment of operations. The TLA enables the JLEnt to conduct integrated and synchronized logistics operations through a shared understanding of the environment and posture of sustainment within the OE across the strategic, operational, and tactical levels.

Threat

The threat analysis is one of the most important features of the TLA. Identifying and evaluating threats, risks, and vulnerabilities is key to understanding the OE in which U.S. forces deploy and operate. The threat analysis entails a granular assessment of enemy capabilities, operations, investments, and alliances within the theater. Additionally, it examines critical U.S. and host nation networks and infrastructure, which enemy forces could target. Counterinsurgency has taught us that targets assigned to non-lethal assets are

frequently more important than targets assigned to lethal assets. Sustainment nodes and networks are often vulnerable targets for enemy forces due to the adverse effects degraded logistics have on military operations. It's important to identify threats, risks, and vulnerabilities in the TLA to execute appropriate countermeasures to protect critical theater nodes and assets.

Examining enemy capabilities, operations, investments, and alliances is an in-depth process. It's important to identify and understand enemy capabilities due to their direct ability to hinder and limit operations. Enemy forces have the means to target theater operations and sustainment through kinetic and non-kinetic capabilities. For instance, increased technology has enabled near-peer adversaries to exploit U.S. networks through cyberwarfare. The use of cyberattacks to degrade sustainment networks is probable in all theaters, and the identification of this risk during the TLA will prepare U.S. forces for future operations. Economic diplomacy is another non-kinetic capability used by near-peer adversaries that affects sustainment. Near-peer adversaries use economic diplomacy to lure nations into debt traps to increase political leverage. Countries that fall into debt traps are often pressured to support lender nation interests, resulting in forced strategic alliances. Alliances forced by economic diplomacy become problematic when U.S. forces look at access, basing, and overflight across

the theater. Kinetic capabilities like chemical warfare remain a risk to forces and sustainment across the theater. The first large-scale use of chemical warfare was chlorine gas during World War I. Since then, chemical warfare has advanced and is likely to be used in conflict by near-peer adversaries to specifically target sustainment nodes like aerial and seaports of debarkation. This risk requires analyzing mitigation efforts and sustainment requirements in the event of a chemical attack within the theater.

Near-peer adversarial operations and investments must be scrutinized to identify potential strategies that will be used to limit and hinder U.S. operations. The employment of advanced technologies and capabilities within the region by adversaries can be used to determine current enemy capabilities and future operations. Furthermore, infrastructure investments, emerging weapon systems, and alliances must be explored to ensure the GCC understands U.S. forces' potential threats within the theater. Planners must remain abreast of all enemy threats and activities within the region to anticipate enemy strategies that may be used to disrupt operations and sustainment.

Geography and Environmental Factors

Geography and environmental factors affect every aspect of war and must be considered when analyzing the OE. These factors can limit and hinder operations within a theater. The TLA analyzes how geography,

Planners who can describe current infrastructure and resources within a theater can assist the GCC in understanding available capabilities that can be used for immediate response to crises in the region.

terrain, climate, and weather influence how the theater is set and the execution of operations and sustainment. Geography and terrain are linked to time and distance. For example, the Indo-Pacific region is geographically dispersed, consisting of chains of island nations; the distribution of islands across the Pacific affects the time and distance required to move throughout the region. In contrast, the Middle East region is predominately land-based, making the time and distance to travel throughout the region significantly less. The time and distance required to deploy forces and materiel in and around theater rapidly is critical information the GCC must understand to set, sustain, and operate within the theater.

Geography and terrain are critical to sustainment regarding natural resources within a region. Natural resources like water, wood, oil, and steel are vital assets used to sustain operations and should be considered when setting and sustaining the theater. Planners must determine what natural resources are available in the region and how to obtain those resources that are unavailable. Terrain that offers abundant natural resources reduces the burden of sustainment in a theater. Similarly, terrain is often used as a tactical advantage in war and is key when planning forward posture sites and sustainment nodes within a theater. Planners must assess key terrain and infrastructure to identify suitable locations for prepositioned stocks and essential sustainment nodes like

ports of debarkation, theater storage areas, and theater gateways.

Additionally, climate and disease affect force health and sustainment operations. Extreme temperatures and weather increase loss of life and adversely affect personnel, equipment readiness, and equipment storage. Endemic diseases within the region impact force health, so identifying diseases during the TLA facilitates force health protection measures before deployment. Rising global surface temperatures are slowly increasing sea levels in all regions. The constant rise in sea levels is causing coastal erosion, affecting existing infrastructure throughout the globe. If existing infrastructure becomes inoperative, new infrastructure will be required for operations across theaters globally. Hence, the need for continuous site surveys and country assessments within every combatant command to understand the impact of environmental factors on terrain.

Furthermore, weather conditions can impede operations; heavy precipitation and winds affect air, maritime, and surface operations within a theater. Without fail, geography and environmental factors will impact operations within a theater. Planners must analyze every aspect of geography, terrain, climate, and weather to ensure the GCC recognizes and understands all elements that could degrade or hinder operations within the theater.

Host Nation Agreements

The TLA analyzes host nation agreements due to their ability to

enable operations and sustainment within the theater. Agreements provide host nations with logistics capability, access, basing, and overflight. Two primary host nation agreements facilitate military operations within a theater. These agreements include the Acquisition and Cross-Servicing Agreement (ACSA) and Status of Forces Agreement (SOFA). Agreements are negotiated through the Department of State and delegated from executive power by the president or legislation from Congress.

ACSAs are bilateral agreements to exchange logistics support, supplies, and services with host nations. Supplies and services covered by ACSAs include medical services, port services, storage services, communication services, and more. ACSAs reduce the logistics tail, increase multinational interoperability, and provide commanders flexibility by using supplies and services that reside within the host nation. ACSAs enable U.S. forces to rapidly deploy and begin initial operations using host nation logistics support. Furthermore, ACSAs can support joint multinational exercises within a theater. As U.S. forces continue to increase joint multinational exercises across theaters, the lack of agreements affects the ability to execute exercises throughout the theater. SOFAs are unique multilateral and bilateral peacetime agreements that establish the rights and privileges of U.S. forces while in host nations. SOFAs vary and can include provisions covering entry

and exit of personnel, access and use of facilities, criminal jurisdiction, and more. The U.S. currently holds SOFAs in several nations, enabling U.S. forward presence and access across the globe.

Planners must understand what agreements the U.S. holds with each country within a region to shape, set, operate, and sustain the theater. These agreements impact forward presence, the posture of Army prepositioned stocks, logistics support, and multinational interoperability. The lack of agreements within a theater can be used to inform the Global Posture Review, Theater Engagement Plan, and Department of State at large on agreements that need to be forged.

Infrastructure and Resources

The TLA examines existing resources and infrastructure within the theater to identify what is available and needed to set, operate, and sustain the theater. The theater's resources and infrastructure are local or brought in by military forces. Local infrastructure within the theater can be used to facilitate several sustainment operations, including theater opening, theater storage, theater distribution, and health service support. Planners conduct a broad analysis of host nation infrastructure, including communications and financial networks, road and rail networks, waterways, ports, airfields, and bridges, all of which are key to enabling distribution operations. Additionally, planners analyze host nation resource facilities that can

be used to execute sustainment operations. These resources include refineries, water production, and sanitation facilities, manufacturing plants, cold storage facilities, and more. Furthermore, an analysis of host nation services is required to determine the amount of local labor used to support military operations.

In addition, to identifying host nation resources and facilities, planners must identify existing military capability within the host nation. Planners must understand all sustainment capabilities within a region that can be used to enable the GCC's priorities, including sustainment forces, sustainment nodes, and Army prepositioned stocks. All military resources must be considered regardless of service; supporting the GCC's priorities is a joint effort. Planners who can describe current infrastructure and resources within a theater can assist the GCC in understanding available capabilities that can be used for immediate response to crises in the region.

Conclusion

The TLA is how joint forces analyze the theater and operational environment. This process and tool prepare planners to develop the theater logistics overview, concept of logistics support, and logistics estimate, which all describe the "what, how, and when" for sustainment within the theater. Through a comprehensive view of sustainment, this tool highlights sustainment gaps that will force the culmination of the joint force

if not addressed. The TLA is the genesis of all sustainment planning within a theater. Without this tool there is no true understanding of what sustainment capability exists to execute competition, crisis, and conflict operations. The TLA is a powerful tool, but it's only as good as its existence and use by strategic and operational planners, who develop operational plans and inform the execution of operations at the tactical level. When the TLA, TLO, COLS, and running estimates are all in alignment, the JLEnt is better postured to achieve unity of effort, which will ensure that there's sustainment unity of action. Most importantly, the joint force commander can achieve JLEnt wide visibility through access to resources, data, and processes, ensuring that our logistics responses are rapid and precise in support of joint all domain operations.

Maj. Gen. David Wilson is the commanding general of the 8th Theater Sustainment Command. He's served as the U.S. Combined Forces Command, and United States Forces Korea / United Nations Command Director, J4/U4; and CFC Deputy C-4, and the 40th Chief of Ordnance. Wilson holds a bachelor's degree in Business Administration from the Citadel, a master's degree in General Administration from Central Michigan University, and a master's degree in National Resource Strategy from the Industrial College of the Armed Forces.

Maj. Tanya Leonard is the commander's initiative group officer for the 8th Theater Sustainment Command. She holds a master's degree in General Administration from Central Michigan University and a bachelor's degree in Criminal Justice from the University of Delaware.

Feature Photo
Soldiers of the 1st Theater Sustainment Command unload an airbeam tent during a training exercise on Aug. 23, 2021, at Fort Knox, Kentucky. (Photo by Staff Sgt. Godot G. Galgano)

War Reserves Strategic Opportunities

Manage Risk, Cost, Effectiveness

■ By Col. Ronnie D. Anderson and Maj. Eric D. Baca

The fiscal benefits the Army and all military services realize in exercising economies of scale to stockpile prepositioned war reserve materiel (PWRM), Army prepositioned stocks (APS), and munitions are a strategic risk in the current global environment—especially in large-scale combat operations (LSCO). Consolidated stockpiles that are both mal-positioned and within range of enemy long-range fires can imperil the Army’s ability to rapidly deploy and penetrate adversaries’ anti-access and area denial (A2AD) systems as described in the multi-domain operations (MDO) concept. Compounded by adversarial long-range fires capabilities, near-peer competition through contested, access-denied areas has significantly complicated the calculus of how and where to deploy crisis response forces to create dilemmas for our enemies and mitigate their disruption operations.

The MDO concept proposes deploying in smaller packages to dispersed seaports and airports of debarkation. Field Manual 3-0, *Operations*, states that the side that most rapidly builds combat power can seize the initiative. These deploying forces will be required to conduct joint reception, staging, onward movement, and integration (JRSOI) operations, including receipt of their allocated PWRM, APS, and munitions within the kinetic capability of enemy long-range fires. Significant strategic planning is required to balance the costs of staging large, consolidated material stockpiles against the associated risk incurred from A2AD strikes on those stockpiles while still making them operationally relevant. This article proposes a risk mitigation strategy for regional and global threats while reclaiming the fiscal benefits of economies of scale and identifying opportunities for additional efficiencies.

What is PWRM?

As defined in Chairman of the Joint Chiefs of Staff Instruction 4310.01E, *Logistics Planning Guidance For Prepositioned War Reserve Materiel*, PWRM refers to war reserve materiel strategically located to facilitate a timely response in support of combatant commander (CCDR) requirements during the initial phases of an operation. Rapid power projection centers on our ability to provide strategic air and sealift capabilities

expeditiously to meet established and emerging crises. To act as a deterrent in competition, prevent adversaries from attempting a fait accompli attack, mitigate the tyranny of distance, and reduce the burden on the strategic lift, geographic combatant commands (CCMD) determine PWRM requirements to fulfill their operational plans (OPLAN)s as consistent with national strategic direction. Service components establish, fund, manage, and maintain PWRM located in the geographic CCMD area of responsibility (AOR). By prepositioning stocks afloat and ashore, we reduce U.S. Transportation Command requirements to provide dedicated lift to support the movement of forces, equipment, and materiel. The Secretary of Defense (SECDEF) has Title X responsibility to provide overarching strategic guidance concerning planning and resourcing priorities. These link the DOD current and future needs for prepositioned stocks—such as desired responsiveness—to evolving national defense objectives and ensure financial resourcing is provided to maintain the PWRM. Evolving threats from global and regional adversaries necessitate the strategic locating of stocks along with a PWRM triad: expediting force closure through positioning in line with OPLANs, reducing the cost to store and maintain, and mitigating risk to stocks.

Bridging The Efficiencies Gap

Services and service components store PWRM and munitions across the globe in consolidated, service-specific warehousing and storage areas to gain the financial benefits of economies of scale. These operations generally have a single warehousing requirement, which includes the costs of facilities maintenance, climate control, energy, security, and other associated costs. They also have the benefit of a single, broadly written, large-scale statement of work to generate a single contract to operate the facility, manage and care for personnel, maintain and account for the materiel, conduct daily operations, and support operational requirements. However, given the current global environment, optimizing any one leg of the triad increases the risk to OPLANs that should be mitigated with deliberate decisions by the SECDEF, CCDR, component commanders, and the services. Allowing

any one service to consolidate nearly all their PWRM or munitions in one storage location is an exceptionally grave risk—doing so could eliminate that component’s contributions to the OPLAN should enemy long-range fires target that location. Put simply, it is equivalent to putting all your eggs in one basket.

Seeking harmony—not balance—within the PWRM triad is key when determining how, where, and why PWRM is stored globally. Perfect balance is not always the answer, as commanders assume unequal risk or responsibility along all triad axes. Decisions are often made based on service-specific Title X requirements without seeing the benefits of joint solutions to common problems shared by all the services. If, however,

service components coordinated joint force PWRM and munition storage requirements, the triad could be harmonized and smaller capability-sets executed across dispersed joint operating facilities closer to their intended point of use, including key OPLAN JRSOI nodes. Doing so would enable components and the services to gain back funding and contracting economies of scale by sharing oversight responsibilities and streamlining site operations costs proportionately to the requirements of each stakeholder. The graphic below depicts an exercise map illustrating current storage methods and proposes the alternate joint storage concept.

How Do We Fund Joint Operations?

Each location’s lead service is charged with the Title



The Army Prepositioned Stock-2 site completed the fielding of 36 Avenger Air Defense Systems and 10 M1083 cargo trucks on May 2, 2018, in Dülmen, Germany. The site is set up to house a brigade's worth of vehicles and equipment as part of NATO's deterrence operations. (Photo by Brittany Jones)

X responsibilities to develop, execute, and supervise contracted capabilities for joint support locations. There are at least three methods to fund and conduct joint storage operations in a manner that buys back the economy of scale enjoyed with large-scale, single-service storage operations. The first, and most easily controlled at the service component level, is a jointly funded contract. In this case, the lead service—typically the service with the preponderance of forces and requirements—would issue the contract, but all the components would identify requirements and fund their proportional share of the contract. If properly executed, this could afford maximum flexibility to support each service component’s unique requirements in a joint environment. The contract could be built to streamline contract line items, corresponding lines of accounting, and contract management functions unique to each service components’ requirements. This method requires extensive planning, execution, and management commitment from the joint community, but the result could ultimately achieve cost savings in a resource-constrained environment and improve the overall capability to urgently respond in times of crisis.

The second method is a lead service contract to conduct the joint storage operation, where the lead service is reimbursed through an Inter-Service Support Agreement. This case still retains the economy of scale and accomplishes readiness and dispersion objectives, but the financial benefits are realized at the service and

DOD levels.

The third method is an inter-component memorandum of agreement. The two component commands agree on reimbursement through military interdepartmental purchase requests or other payment-in-kind arrangements. This method cannot be neglected because some munitions storage functions are still conducted by military personnel. In this case, one component may offer to conduct ammunition storage operations and ask another service to provide movement control functions, for example, an equitable force requirement that is also jointly beneficial.

One may argue that reconsolidating equipment and munitions at a joint support facility increase the consolidation risk that the concept is trying to avoid. However, the joint force realizes reduced overall adversarial risk by dispersing service-specific capabilities across multiple joint nodes with smaller footprints. Dispersing service capabilities across joint storage locations reduces

threats to large stockpiles, operationally links capabilities to points of intended use, and optimizes costs through shared facilities with common-user requirements.

Cross-Combatant Command PWRM Planning Adds Efficiencies

The U.S. military can further improve our ability to influence competitor decision calculus, enable rapid deployment, and more safely penetrate enemy A2AD or long-range fires capabilities by developing joint PWRM and munitions storage activities near the seams

Evolving threats from global and regional adversaries necessitate the strategic locating of stocks along with a PWRM triad: expediting force closure through positioning in line with OPLANs, reducing the cost to store and maintain, and mitigating risk to stocks.

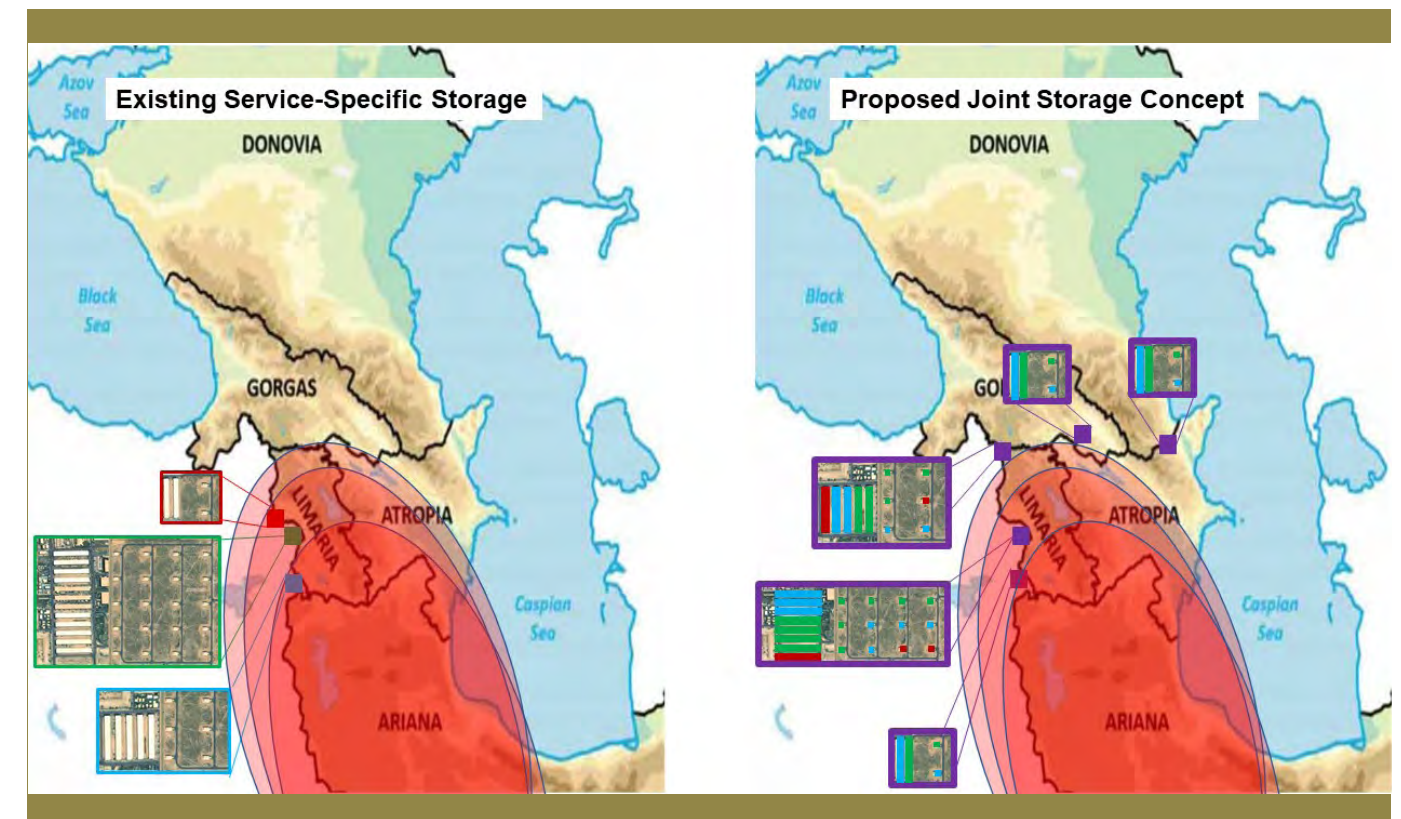


Illustration of current storage methods and proposes the alternate joint storage concept for an exercise. (Army graphic)

of geographic CCMD boundaries. Our adversaries are not hindered by self-imposed geographic boundaries and thus see the globe as one strategic battlefield. Blurring our geographic boundaries through global reach and expeditious response increases deterrence. It provides more opportunities to exercise equipment sets and the tools to simultaneously influence multiple AORs through snap deployments and exercises. Efficiencies are created when critical stocks are prepositioned such that the PWRM triad becomes mutually beneficial to one or more CCMD due to geographic proximity along key ground or sea lines of communication. CCMDs would have access to these stockpiles and could use them for exercises and planning for contingency operations serving multiple OPLANs. Posturing along CCMD seams could serve to assure multiple partners, deter multiple adversaries, and potentially reduce the overall requirement for forward-positioned stocks.

Conclusion

Proper positioning, planning, and resourcing of PWRM and munitions remain vital to maximize assurance to

U.S. allies and partners, deter adversarial aggression, and readiness for crisis response or OPLAN execution. While the threat of long-range fires changes the U.S. posture calculus for positioning PWRM and munitions, dispersing and protecting forward resources through joint solutions can create dilemmas during competition, reduce force closure times in crisis, and create potential cost savings. Further policy changes to create cross-CCMD resourcing can increase readiness and reduce global storage requirements while simultaneously reducing force closure timelines and risk to force and mission during LSCO.

Col. Ronnie Anderson is currently serving as the division chief for U.S. Central Command J-4 plans and operations divisions. He holds a master's degree in Logistics from the Florida Institute of Technology and a master's degree in Strategic Studies from Marine Corps University.

Maj. Eric Baca is currently serving as a joint logistics planner and PWRM manager for U.S. Central Command J4 plans and operations divisions. He is a certified theater logistics and joint planner and holds a master's degree in Supply Chain Management from Kansas University.

Feature Photo
Mine-Resistant Ambush Protected All-Terrain vehicles are staged for issue on June 27, 2019, at the Army Prepositioned Stocks-5 remote lot, Camp Arifjan, Kuwait. (Photo by Justin Graff)

OPINION:

Joint Sustainment Support to Agile Combat Employment

■ By Maj. Bradley Mejean

After 20 years of entrenched counter-insurgency and counter-terrorism fights, every service is conducting an operational overhaul reorienting towards large-scale conflict against a near-peer threat. The Army, Navy, Marines, and Air Force tactics and technology require significant revamp from the permanent basing, air superiority, and uncontested logistics we enjoyed for most of the Global War on Terror. One major emerging theme is a switch to decentralized operations to offset new adversarial deep-strike capabilities despite our different approaches.

In December 2021, the Air Force published Doctrine Note (AFDN) 1-21, outlining their new Agile Combat Employment (ACE) concept.

From AFDN 1-21, "... ACE shifts operations from centralized physical infrastructures to a network of smaller, dispersed locations that can complicate adversary planning and provide more options for joint force commanders." This concept is not unique to the Air Force, but the logistical challenges, specifically transportation, associated with decentralized operations for the Air Force are unique.

The ACE concept attempts to address main operating bases (MOB) vulnerabilities by dispersing small amounts of aircraft and associated support personnel to airfields across the area of operations for short durations. However, one of the main logistical shortfalls is the lack of organic Air Force transportation assets to move support packages between the MOB to a contingency

landing site. In addition to the initial support package, decentralized sites may require additional Class III, V, or IX deliveries, depending on the length of stay. AFDN 1-21 recognizes that this level of decentralization and associated transportation requirements have never been within their organic capability. As such, they have highlighted the sustainment core element as a joint function.

ACE sustainment requirements will have to be theater specific to fit the unique challenges and assets of the region. Specific to U.S. European Command (EUCOM), the Army could use the extensive land networks in Europe and provide rapid response transportation assets to make ACE a reality. ACE operations are currently delegated to wing commanders (O-6 command). The average wheeled

transportation availability for the command is somewhere below 15 platforms total, which will be expected to support the distributed operations and the MOB. These assets are likely barely enough to handle transportation requirements on the base, let alone assisting in force projection.

Based on their EUCOM requirements, Army Transportation can assist with a combat sustainment support battalion (CSSB) with transportation platforms and traffic management assets. An example construct and command relationship could consist of two composite truck companies (CTC) (Light), one support maintenance company (SMC), and a movement control team (MCT) aligned under the 21st Theater Sustainment Command and tactical control to 3rd Air Force. The CTCs have cargo-carrying capabilities, the SMC provides maintenance support to the wheeled vehicle fleet, and the MCT will coordinate and manage transportation support for the movements. If we transition to large-scale conflict, CTCs also come with organic security to protect the logistics convoys traveling between airfields. For an even more modular approach, the aligned CSSB could generate forward logistics elements tailor-made to provide the movement coordination and platforms for a wing commander to execute ACE operations. At the same time, the maintenance assets remain centrally located. ACE is still a new concept, and the exact transportation requirements will differ depending on the aircraft manifest, airfield capabilities, and duration of stay.

Before committing to support, the Army has opportunities to test this support model at a version of the Rapid Forge exercise the Air Force conducted in 2019 where, in addition to multinational interoperability tests, members of the 4th Fighter Wing set up austere command and control and maintenance assets to practice decentralized operations. A good secondary option is designing one of the several annual Red Flag exercises held at Nellis Air Force Base, Nevada, to test whether this Army structure is an efficient fit for their transportation needs.

Assuming this model is taken to the operational phase in EUCOM, the Army stands to gain considerable experience through coordinating and executing transportation missions using both organic and host capabilities on multinational routes. In addition to operational experience, our sustainment units can begin understanding the types of international support and cooperative agreements necessary to streamline coalition logistics during large-scale combat operations. Whether this model runs for one deployment or many, the lessons learned could be valuable insights that save time, effort, and lives if we are forced to fight in Europe again.

Maj. Bradley Mejean is currently a Joint All Domain Strategist student at the Air Command and Staff College (ACSC) at Maxwell AFB, Alabama. He was commissioned into the Transportation Corps in 2011. He has completed assignments in the 1st Cavalry at Fort Hood, Texas, and the 5th Special Forces Group (Airborne) at Fort Campbell, Kentucky.

Specific to U.S. European Command (EUCOM), the Army could use the extensive land networks in Europe and provide rapid response transportation assets to make ACE a reality.

OPERATION ALLIES WELCOME

Immediate Support to America's Largest Non-Combatant Evacuation Operation

■ *By Lt. Col. Matthew Rivera, Maj. Michael McCrory, and 1st Lt. George Ngoh*



In August 2021, as the Islamic Republic of Afghanistan collapsed amid a blistering Taliban offensive, thousands of Americans and allies saw imminent danger in a Taliban-controlled Afghanistan. Numerous amounts of people flocked to Kabul to board U.S. evacuation flights and flee imminent danger. What ensued was Operation Allies Welcome, the largest non-combatant evacuation operation in history. To facilitate the evacuation, Ramstein Airbase (RAB) in Germany served as an Air Force-administered intermediate staging base to provide life support to evacuees. However, a high rate of inbound travelers and capacity restrictions at final destinations in the United States forced the Army's 21st Theater Sustainment Command (TSC) to expand holding capacity and ensure the speediest route to safety.

Headquartered in Kaiserslautern, Germany, the 21st TSC established the Army's complex on Rhine Ordnance Barracks (ROB), close to RAB. The unit selected to mission command the Task Force Home operation was the 39th Transportation Battalion (39th MCB). Task Force Home grew to a holding capacity of more than 8,000 evacuees and would support more than 12,000 evacuees by the mission's end. To accommodate different populations, the area of operations would consist of seven distinct life support areas (LSAs), providing comprehensive life support functions, one being a large, centralized facility with hardstand

buildings called the Deployment Processing Center (DPC) and the others as temporary camps. The following is a recounting of 39th MCB's sustainment efforts to operate Task Force Home through exercising its mission essential tasks and providing non-standard sustainment support.

The 39th MCB's mission essential tasklist (METL) includes establishing movement control operations, managing assigned and attached units providing transportation support, conducting expeditionary deployment operations at the battalion level, directing establishment of subordinate units and headquarters units, and conducting actions associated with area defense. The unit performed these functions by assuming mission command of the Army's operation by establishing a tactical operations command, establishing a unit area with Tactical Control (TACON) infantry and military police providing security, and leveraging organic and TACON logistics units to lead camps and provide logistics support. For the 39th MCB to establish its area of operations, it needed to execute large-scale deployments to achieve full operational capability. Finally, the unit performed movement control functions to control evacuees' flow between locations on RAB, ROB, Landstuhl Regional Medical Center, and other miscellaneous movements.

While 39th MCB can self-sustain in a garrison footprint, its METL does not support large-scale external

sustainment functions. However, this mission called for the unit to provide non-standard sustainment centering upon supply and service management. Supply consisted of the bulk of the work done by the ground units involving supply Classes I, II, III, IV, VII, VIII, and X. These can be divided into two categories: life support, which included Classes I/II/VI/VIII, and facilities support, which included Classes III, IV, and VII. These supply classes were provided through a combined contractor, military, and civilian effort and were scaled to match demand. These types of non-standard support required the employment of 15 companies acting as camp leadership teams and two contracting officer's representatives (CORs) assigned to the area of operations.

Life support and population morale represented the core of 39th MCB's mission. Over time, the unit established several lines of operation to guarantee a suitable quality of life for the evacuees. This was a complex task that required significant optimization of the unit's approach. With maturation, reductions in supply chain disruptions, redundancy of efforts, and wasted time led to successful mission completion.

Provision of Class I, food and water, represented a significant portion of the supply support and was complicated due to the evacuees' differing cultural expectations of food. The first step in determining how to approach this challenge was identifying the population's needs. The extensive Class I support

was obvious immediately upon establishing the task force; however, several assumptions about Class I proved incorrect. Furthermore, adjustments occurred frequently as the unit adapted to sustain longer-term life support operations when presented with increased evacuee holding times.

While the issues with Class I varied, a few were significant. The style and ingredients used in the food cooked by the 55th Quartermaster Company (55th QM Co), an attached field feeding company, stood in stark contrast to the average Afghan's diet. The lack of bread, flavored rice, and fruits caused confusion and resulted in the underfeeding of babies and toddlers. Additionally, several evacuees transiting the camps had medical conditions and were skeptical of exercising flexibility in constructing their diets. Furthermore, avoidable disruptions in the Class I supply chain and varying portion sizes raised tensions.

39th MCB adopted a blended military-contractor approach to satisfy Class I demands. This consisted of field feeding support to the DPC by the 55th QM Co consisting of hot meals for breakfasts and dinners with rations served for lunch. Contractors filled the capabilities gap left by the 55th QM Co and serviced the rest of the camps. During Task Force Home's early days, evacuees would join long queues to receive and eat their meals from dining facility/cafeteria tents to ensure that living spaces

stayed free of food waste. As the mission matured, food distribution operations changed to allow family representatives to take food back to the living quarters.

To address issues with Class I, 39th MCB used a two-track strategy. One was working with contractors to adjust meal support, and the assigned CORs maintained supervision of the feeding operations to ensure quality. The other track was to work through the 55th QM Co to adjust military meals by increasing the amount of served fruits, seeking more recognizable ingredients, and providing specialized culinary training. These efforts resulted in a dramatic increase in evacuee satisfaction of the food and a noticeable decrease in underfeeding among vulnerable populations.

From the outset, 39th MCB leadership knew that the inbound evacuees would be mostly without clean clothes, blankets and pillows, and hygiene items. Clothing and personal items, Classes II and VI, respectively, were in great demand for the duration of the operation. Evacuees were initially supposed to be in Germany no longer than ten days, and, as such, clothing laundering services and equipment were not contracted. However, this proved unrealistic, and evacuees often spent weeks in the encampments while their clothing became soiled and hygiene items rapidly consumed.

39th MCB established multiple lines of effort to satisfy the need for clothing, blankets, and hygiene

items. As the largest encampment, the DPC leveraged its interagency liaison to research, contact, and employ several charitable organizations to fulfill requirements. These organizations provided significant amounts of clothing, bags, blankets, toys, and other miscellaneous personal items. The liaison also contacted local German Afghan civil groups, local religious organizations, and other individual donors to coordinate the delivery of needed supplies. A later effort to establish a permanent solution was direct MCB coordination with the local United Service Organization (USO) and Red Cross, who provided structured, larger-scale support.

Class II and VI supplies distribution occurred primarily from the DPC's central processing building because the DPC was the largest distribution site within the task force. External LSAs would draw from DPC stocks to fulfill their supply demands. This central processing building processed all evacuees to the DPC camp and most of the evacuees to other LSAs. It evolved into three independent sections managed by volunteer leaders and overseen by DPC leadership: the Red Cross distribution point, the USO distribution point, and a miscellaneous donations distribution point. The Red Cross provided comfort kits, including hygiene items and blankets. The USO provided donated clothes and winter wear to the evacuees unused to the cold German weather. The miscellaneous distribution point provided a baby bottle exchange service, donated



Volunteers and 21st Theater Sustainment Command Soldiers from the Kaiserslautern community give Afghan evacuees cold weather clothing items on Sept. 22, 2021, at Rhine Ordnance Barracks. The clothing came from donations from the local community. (Photo by Sgt. 1st Class Aaron Duncan)

baggage items, and specific winter wear items. These locations relied on interpreters to communicate with customer evacuees and distribute requested items.

Through the entirety of Task Force Home, Medical supplies, CLVIII, were also in great demand. Before their arrival, leadership assumed inbound evacuees were likely to arrive with a wide array of physical injuries, infections, and behavioral health issues. The 30th Medical Brigade (30th MED BDE) procured medical supplies to provide continuous healthcare. 30th MED BDE established its initial routine

care clinic in the DPC central processing building, and increased role is throughout the LSAs to reflect increasing demands as the population enlarged. In addition to routine care, 39th MCB facilitated the distribution of thousands of Varicella, MMR, Johnson and Johnson COVID-19 vaccination doses and COVID testing.

The attached linguist team was the only element in the task force with the language skills capable of assisting medical experts in providing care. For routine visits to Role 1 clinics, interpreters first determined an individual's symptoms and then

guided them to their relevant Role 1 clinic. There, dedicated linguists at each of the clinics would sit with the evacuees individually and assist them in communicating with medical professionals. Linguists also played a critical role in gathering personnel data from evacuees and locating patients for medical care.

In addition to life support, facilities support played a key role in 39th MCB's mission. ROB is not designed to support this type of mission; the unit made significant efforts to establish and improve necessary facilities. This required employing supply Classes III, IV, VII, and X and

contracted services to provide security, capacity, cultural accommodation, and facilities maintenance.

The MCB used supply Classes III, IV, and VII to bolster security by providing greater observation for security forces and controlling movement within each of the camps. Construction fencing was erected along key perimeters for access control, evacuee flows, and privacy. Furthermore, the unit set up lights to ensure security forces had clear lines of sight at weak points along these perimeters. Fuel was needed for the trucks and forklifts

transporting construction materials, the diesel-electric light sets, and other miscellaneous equipment.

Due to supply constraints, a combined military and contractor approach was necessary to provide adequate security. Fences and barriers were employed in all LSAs and the DPC. Camp leadership leveraged the DPC's stocks of construction fencing and traffic barriers to control traffic flows, restrict areas, and obscure external observation of the camp's operations. To achieve the same effects in the outlying LSAs, contractors, supervised by assigned CORs, used

preexisting fencing to establish parts of the LSA perimeters and then erected temporary construction fencing to fill gaps. Contractors also provided their own diesel-electric light sets and fuel to camps that needed them.

To address the impending billeting challenge, lodging capacity on ROB required rapid expansion. The DPC had an array of pre-constructed personnel holding areas (PHAs) that could house evacuees but lacked beds. It also lacked restrooms and showers required to accommodate the anticipated population. Planned sites



Afghan evacuees receive the Measles vaccine from 30th Medical Brigade, 21st Theater Sustainment Command personnel on Sept. 18, 2021, at Rhine Ordnance Barracks, Germany. (Photo by Sgt. 1st Class Aaron Duncan)



Soldiers from 21st Theater Sustainment Command provide security and assistance to Afghan evacuees at the transit area known as pod 51 on Sept. 9, 2021, at Ramstein Air Base, Germany. The transit center provides a safe place for the evacuees to complete their paperwork while security screenings and background checks are conducted before they continue on to their final destination. (Photo by Sgt. 1st Class Aaron Duncan)

for the other LSAs had no preexisting infrastructure and required temporary tents and ancillary facilities to be emplaced. This merited heavy reliance on contractors to provide tents, climate control, restrooms, and showers. Contractors also provided the DPC and the outlying LSAs with toilets and showers, which CORs inspected daily for serviceability.

Each of the camp leadership teams coordinated with the relevant contractors to emplace tents, restrooms, and other key assets. Before construction, these teams considered the cultural norms and the evacuee population and

provided for privacy between men, women, and families. Tents were placed based on terrain availability, cultural restrictions, and inputs from contractors to allow for adequate organization and servicing. Evacuee use patterns informed the locations of equipment, and those locations evolved to accommodate shifting needs.

Concerning facilities maintenance, 39th MCB identified cleaning supplies and other miscellaneous items and contracted deep cleaning services and waste disposal as necessities. Soldiers intermittently did basic, non-hazardous cleaning,

and evacuees conducted more routine cleaning in living areas. This required an assortment of cleaning supplies to ensure regular cleaning activities. The unit used two distinct methods to procure these supplies: government purchase card (GPC) and Global Combat Support System-Army (GCSS-Army). High urgency and non-standard purchases required the use of the unit GPC. Camp leadership communicated immediate needs of miscellaneous items to battalion (BN) S-4, who further submitted requests. The use of the GPC was most prevalent during the beginning of Task Force Home and tapered off as the mission

ended due to increased long-term predictability. Conversely, the use of GCSS-Army was initially sparse but grew to encompass most purchases by the end of operations. However, both methods relied on BN S-4's engagement in procurement.

Servicing of contracted assets fell into two categories: hazardous material cleaning and waste disposal. Hazardous materials cleaning services included laundering soiled bedsheets, cleaning restrooms and showers, and cleaning human waste or bodily fluids. These services were initially requested or added to the established contracts based on emerging demands.

Soldiers collected laundry, which the contracting company returned throughout the week based on demand. Evacuees gathered their bedsheets before departing and deposited them in a collection bin located in their buildings. Soldiers took the bins to laundry trucks parked at the DPC central processing building. Clean laundry would return to the DPC to be unloaded by soldiers and for further use. Assigned CORs handled any delays in laundry processing or dissatisfactory laundering.

Contractors who provided restrooms and showers also provided daily cleaning services for their units. The servicing rates were detailed in the initial contracts and adjusted to address fluctuating demand. Whether units were cleaned and replenished once or three times a day, their CORs would ensure the

arrival of the cleaning crews and then synch with camp leadership teams to ensure quality control of the services. If services were dissatisfactory, they would follow the same procedures to address issues as the laundry service.

Human waste and bodily fluid cleaning emerged as a requirement as the operation matured, and many evacuees became long-term tenants. Since the MCB's Soldiers were not consistently trained for this type of waste disposal, contract adjustments were necessary to ensure clean living spaces and proper site closeout. This occurred mainly at the DPC because it was the only camp to use preexisting hardstand buildings extensively. However, biohazardous disposal functions were performed at other locations.

All 39th MCB's efforts, ranging from performing its traditional mission set to adapting to execute novel functions, culminated in the successful execution of Task Force Home. This effort included two component services, three battalions, 15 companies, and several interagency organizations. It constituted seven encampments' missions commanded by a central tactical operations center, which provided critical life support functions to more than 12,000 evacuees. The entirety of the operation cost more than \$24 million and covered a wide array of contracted services and assets, which 39th MCB leveraged to provide safety, security, and comfort to its tenants.

By the mission's end, ROB emptied and the units that led their camps had completed their recovery tasks. While this operation rests in the past, the likelihood of similar calls to action looms large in the near future. Across the globe, as governments falter and authoritarian aggression spikes, units like 39th MCB may well be called to provide life support to Americans and America's allies fleeing danger. From places in Europe, the Middle East, East Asia, and Sub-Saharan Africa, the need to learn from Operation Allies Welcome and Task Force Home become increasingly relevant to the U.S, keeping its promise of leaving no one behind.

Lt. Col. Matthew Rivera currently serves as the 39th MCB commander and commander for Task Force Home. He holds a master's degree from Kansas State University in supply chain management.

Maj. Michael McCrory currently serves as the battalion executive officer for 39th MCB and the deputy commander for Task Force Home. He holds a master's degree from the Naval Postgraduate School in supply chain management.

1st Lt. George Ngoh currently serves as the 1st Inland Cargo Transfer Company executive officer and was the deputy commander for the DPC during Operation Allies Welcome. He holds a bachelor's degree from West Point in Chinese- Mandarin.

*Featured Photo
Capt. Emily Copple, 23rd Modular Ordnance Ammunition Company Commander, 18th Combat Sustainment Support Battalion, leads the Operation Allies Welcome Female Engagement Team made up of Soldiers from the 18th Combat Sustainment Support Battalion, 16th Sustainment Brigade and 39th Transportation Battalion, 21st Theater Sustainment Command on Sept. 14, 2021, at Rhine Ordnance Barracks and Ramstein Air Force Base. The FET ensures a female Soldier presence at the temporary housing facilities for Afghan travelers at all times, helping to bridge cultural gaps and provide a supportive environment for men and women. (Photo by Spc. Elliott Page)*

Institutional to Operational

Doctrine Guides Collective Training

■ By Lt. Col. Seneta Burns, Maj. Lehman Smith, and Capt. David (Chad) Moll

The primary mission of the United States Army is to organize, train, and equip its forces to conduct prompt and sustained land combat to defeat enemy ground forces and seize, occupy, and defend land areas per Field Manual (FM) 3-0, *Operations*. The Army uses doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy (DOTMLPF-P) as a lens for examining problems and developing solutions. A structured approach validates the problem statement and corresponding solution to a specific issue. This article aims to provide an overview of what doctrine is and how it is operationalized into collective training products.

Army doctrine is a collection of fundamental principles, tactics, techniques, and procedures on conducting operations. Doctrine is an ever-evolving collective body of professional knowledge that guides Soldiers in performing military operations in the land domain. It must be applied using sound judgment based on the circumstances of an operational environment. Changes to doctrine are driven by the operational environment, observations, insights, lessons learned, force structure, advancing technology, and numerous other influences. Many of us within our ranks know doctrine publications exist, yet there are probably more of us who

do not understand doctrine's value to the development of collective training products that impact the operational Army.

Army doctrine publications (ADP) contain the fundamental principles on how the Army operates as a force and those elements of the institutional force that directly support operations. FMs include principles, tactics, procedures, and other doctrinal information to help organizations conduct and train for operations. Army techniques publications (ATP) contain techniques on accomplishing missions, completing functions, and performing specific tasks according to ADP 1-01, *Doctrine*

Primer. All levels of doctrine have the potential to trigger changes to collective training products. The Combined Arms Support Command (CASCOM) Doctrine Division develops the sustainment doctrine (less medical) used by the force. It can be found at the Army Publishing Directorate website, <https://armypubs.army.mil>, and the Army Sustainment Resource Portal (ASRP) at <https://cascom.army.mil/asrp/>.

Doctrinal updates directly influence the collective training products developed by CASCOM's Collective Training Development Division. The Collective Train-ing

Development Division operationalizes doctrine through analysis, design, and development of current doctrinal publications to develop unit training products in support of the active and reserve components for Quartermaster, Ordnance, Transportation, and multifunctional logistics units. If doctrine outlines a new collective technique or tactic for a unit to implement, be it a crew or as high as a theater-level, that task will require a training and evaluation outline. Depending on the level of importance of these tasks, such as having a direct link to a unit's doctrinal mission or capability, they could be added to the unit's Mission

Essential Task List (METL) as a Mission Essential Task (MET). A MET, of course, directly feeds the unit's readiness rating as reported through the unit status report. This is just one example of a doctrinal change triggering both needs and mission analysis by training developers.

Updates in doctrine also impact unit's combined arms training strategies (CATS). Per Army regulation 350-1, *Army Training and Leader Development*, "Unit combined arms training strategies (CATS) are METL-based training strategies which support readiness reporting requirements. They are



Sgt. Marquies Cotton and Spc. Devin Reyes, Army Motor Transport Operators from 51st Composite Truck Company, 18th Combat Sustainment Support Battalion, deliver Meals, Ready-to-Eat (MREs) to 1st Air Cavalry Brigade Troopers on Jan 26, during Allied Spirit. (Photo by Sgt. Jason Greaves)



Soldiers of 2nd Battalion, 12th Infantry Regiment, 2nd Infantry Brigade Combat Team, 4th Infantry Division offload a vehicle during a training exercise on Sept. 24, 2019, at Training Area 5 at Fort Carson, Colorado. The Soldiers were transported to their helicopter landing zone by vehicles of Soldiers of 68th Combat Sustainment Support Battalion, 4th Sustainment Brigade, 4th Infantry Division prior to an air assault exercise. (Photo by Sgt. James Geelen)

designed to train a unit to perform its missions, employment, capabilities, and functions, and contain all the collective tasks designed to train the unit." Naturally, an update to a unit's METL would trigger an in-depth analysis of the training strategy. The updates mentioned above also will impact the unit task list (UTL). Per the training FM 7-0, *Training*, the UTL is a list of every collective task and battle drill the unit is designed to perform. The tasks on the UTL are specifically tailored to the unit and updated regularly based on mission and needs analysis by the collective training developers. These products are accessible through multiple locations online.

These valuable collective training products, among others, also are located on the ASRP. The collective training tab on the ASRP provides a direct link to the unit's METL, CATS, and UTL. Additionally, it provides links to helpful products such as Sustainment Training Strategy, ATP 4-90.5, *Logistics Platoon Leader*, the Division Sustainment Brigade Playbook, and more. The ASRP also provides multiple training references to assist with the operations process (plan, prepare, execute, and assess). Finally, ASRP has links to various virtual training products from the CASCOM Training Technology Division, and the latest Quick

Logistics Estimation Tool and Operational Logistics Planner.

Lt. Col. Seneta Burns is currently the deputy director of training and doctrine for G-3/5/7, CASCOM, Fort Lee, Virginia. She has a Bachelor of Science in Bus. Admin. from Shaw University, North Carolina. She is a Master of Project Management degree candidate from the University of Arkansas Grantham.

Maj. Lehman Smith is currently a doctrine developer in the joint and multinational branch, CASCOM, Fort Lee, Virginia. He received his Bachelor of Science in Bus Admin. from Azusa Pacific University, California. He is a Master of Business Administration candidate at the William and Mary College, Virginia.

Capt. David (Chad) Moll is currently a senior collective training developer for the multi-functional training branch, CASCOM, Fort Lee, Virginia. He is a graduate of the University of Louisiana at Lafayette. He received a master's degree in logistics management from the Florida Institute of Technology.



Opinion: An Appeal to Survivability

Equip, Train Logistics Formations now to Fight,
Survive in Large-Scale Combat Operations

■ By Maj. Heath A. Bergmann

In 2020, Army Futures Command published Army Futures Command Concept: Brigade Combat Team Cross-Domain Maneuver – 2028, describing how future brigade combat teams (BCT) will conduct operations against near-peer threats. This publication’s framework for modernization depicts how the Army will organize, train, educate, man, and equip itself to fight under the multi-domain operations (MDO) concept. BCTs are employed within the MDO construct to conduct a range of military operations across the conflict continuum, from deterrence to large-scale combat operations (LSCO). Operating with ‘semi-independence’, BCTs fighting in a LSCO environment are likely to face resource constraints that make them more vulnerable to culmination. The lethality and survivability of logistics platforms are critical to preserving the endurance and extending the operational reach of maneuver formations. Regrettably, logistics formations within BCTs lack organic crew-serve weapons systems and the skills required to fight and endure during LSCO. Therefore, the Army must look to equip forward logistics formations with the tools and faculties to ensure lethality and survivability to sustain the operational tempo of the brigade combat team.

Multi-Domain Operations and Large-Scale Combat Operations

Training and Doctrine Command defines MDO as “how the U.S. Army, as part of the joint force (Army, Navy, Air Force, Marines, or Space Force), can counter and defeat a near-peer adversary capable of contesting the U.S. in all domains (air, land, maritime, space, or cyberspace), in both competition and armed conflict.” Importantly, MDO drives the Army’s operational and organizational structures, and modernization efforts. Within MDO, “conducting LSCO presents the greatest challenge for BCTs and represents the most significant readiness requirement.”

Executing logistics operations within a kinetic battlefield during LSCO requires resupply executed across contested and extended lines of communication. Sustaining the operational tempo of the BCT demands

logistics formations generate their own security and fight through enemy contact to defeat threats. Without proper weaponry and training, logistics formations are vulnerable to degradation and defeat, compromising the operational reach, freedom of action, and endurance of supported units. A logistics package (LOGPAC) failure to reach a supported element can jeopardize the tactical mission by causing the supported formation to reach a point of culmination prematurely.

Current Mitigations

In their current structure, brigade support battalions (BSB) and subordinate forward support companies (FSC) within BCTs are not equipped and trained to fight independently and survive across contested battlefields. These formations have had to improvise at combat training centers, receiving external augmentation from within the BCT, or redirect inadequately trained sustainment crews to protection platforms. Neither of these ad hoc solutions is without cost. In the former, commanders at echelon must compromise flexibility, firepower, or protection in other areas. In the latter, distribution assets are simply unable to carry doctrinally required basic loads, potentially compromising the unit’s ability to conduct one of its core missions: resupply. To alleviate this deficiency and sustain the endurance of BCTs, three critical areas require remedy.

The Issues

Army BCT logistics platforms, particularly the M978A4, Heavy Expanded Mobility Tactical Truck Fueler, and the M1075/M1120, Palletized Load System/Load Handling System, families of vehicles lack organic crew-served weapons platforms such as turret-mounted M2s, MK-19s, M240Bs, or M249s. Additionally, distribution and forward support companies are not allocated protection platforms to accompany LOGPACs. There are no turreted platforms listed in any modified table of organization and equipment for these most forward logistics formations. Crew-serve weapons systems are in short supply inside these formations in general. The doctrinal employment of these limited assets assumes a dismounted and stable area weapon used to defend perimeters instead of a turreted system securing mounted maneuver.

Lack of institutional training further exacerbates this dilemma. Enlisted logisticians receive insufficient training on the employment of crew-serve weapons during initial entry training (IET). Further, neither logistics officers nor non-commissioned officers receive training and certification in a mounted maneuver during professional military education (PME). In situations where the priority of fires may provide an opportunity for the protection of LOGPACs, logisticians across all ranks lack the call for fire skills necessary to employ indirect fires.

Finally, compounding the paucity of equipment and skill development is the stateside training calendar, where operational BCT logistics formations simply do not have the white space to conduct mounted maneuver training and complete the gates to exercises such as convoy live fire. Meaning even if logistics platforms had turreted crew-served weapons platforms, Soldiers were skilled in employing these systems, and leaders could orchestrate mounted maneuvers and employ direct and indirect fires;

current operational tempo and requirements to support combat arms training exercises make collective logistics maneuver training nearly impossible. In short, BSBs and FSCs rightfully sacrifice their readiness to ensure that supported combat arms formations can train free from the constraints of inadequate sustainment.

The Proposal

Creating logistics formations that can fight and survive in a contested LSCO environment re-

quires profound change. The first in a series of changes must occur within the Army’s organizational design and doctrinal framework. The Army must update the table of organization and equipment (TOE) to reflect organizational changes in equipment and capabilities for BCT logistics formations. This revised TOE must direct either the addition of protection vehicles (with requisite crew) or require logistics platforms to include a turret and crew-serve weapon system. Given the addition of this equipment, the amended TOE should direct that these logistics formations can secure themselves while conducting LOGPAC operations. Lastly, a revision of the organizational design of BSBs and subordinate FSCs necessitate changes across Army doctrine to account for the employment of these new capabilities.

The second series of changes must occur in both the institutional and operational training realms. Within the institutional Army, the program of instruction (POI) for all officers, NCOs, and initial entry logistics series Soldiers requires revisions to

include mounted land navigation and maneuver, crew-serve weapon systems employment, and call for fire training. Operationally, logistics and supported unit planners within BCTs must carve out adequate calendar space or incorporate logistics formations into maneuver training to ensure ample time for logistics formations to build proficiency in the areas of mounted maneuver and employment of fires. Most profoundly Army logisticians must adopt a new mentality that embraces proficiency within both the maneuver and

The lethality and survivability of logistics platforms are critical to preserving the endurance and extending the operational reach of maneuver formations.



A Soldier with 325th Brigade Support Battalion, 25th Infantry Division, reacts to indirect fire during a convoy movement as part of a Home Station Combat Training Center brigade level collective training event on Oct. 20, 2021, at the Joint Pacific Multinational Readiness Center, East Range, Schofield Barracks, Hawaii. JPMRC Rotation 22-01 is a Home-Station Combat Training Center (HS-CTC) rotation that will build combat readiness in America's Pacific Division. (Photo by Pfc. Matthew Mackintosh)

support realms; a frame of mind that truly embodies the idea of warrior logisticians.

A significant weakness in this proposal is that its entire premise hinges on a material solution. Without fielding protection platforms or turreted crew-serve weapon systems to forward logistic formations, there are no cascading requirements to change doctrine or reimagine training for the security of LOGPACs. The

execution of this proposal is sequential and necessitates the appropriate platforms and tools be fielded to formations and institutions before any significant changes are made to doctrine, POI, or unit training plans.

Lastly, it is important to acknowledge the challenges of adding requirements to institutional POIs. Time is a limited resource, and new requirements must

come at the expense of some existing requirements. The discussion here is one about tradeoffs and risk. Fortunately, a significant portion of the POI across logistics IET and PME is directly replicated in everyday garrison operations and can be trained 'on the job.' Conversely, as discussed above, support requirements and operational tempo make collective logistics training extraordinarily challenging. Therefore, Soldiers and leaders must receive this training in an institutional setting free from competing requirements, enabling time for instruction and replication. The skills gained in this institutional setting will pay dividends in the operational setting, where experience and expertise can help maximize limited collective training opportunities.

The Unmanned Vehicle Conundrum

The Army Vision calls for the Army of 2028 to employ "modern manned and unmanned" platforms, to include "ground combat vehicles, aircraft, sustainment systems, and weapons." The appeal of unmanned resupply convoys has attracted the attention of the Army's Combined Arms Support Command, where some have projected a "fully automated convoy system" to be employed later this decade. There are generally two arguments in favor of unmanned systems. The first argues that unmanned systems will free Soldiers to complete other tasks. The second, and more popular, revolves around the protection of the force. In other words, the use of unmanned vehicles will reduce the risk of injury or death to Soldiers in the event of enemy contact. In essence, we are talking about force protection.

The difference between force protection and survivability is often lost in the discussion about unmanned systems. Force Protection refers to "preventive measures taken to mitigate hostile actions against DOD personnel (to include family members), resources, facilities, and critical information." However, force protection and survivability are not synonyms. Survivability is defined as "a quality or capability of military forces which permits them to avoid or withstand hostile actions or environmental conditions while retaining the ability to fulfill their primary

mission." The last part of this description is critical; survivability demands fulfillment of the mission.

In a LSCO environment, survivability must take precedence over force protection. This, of course, does not mean the abandonment of prudent risk. But it does mean that future logistics formations must fight through contested battlespaces to reach their objective. If leveraging unmanned platforms can enhance survivability, then the Army should requisition and employ these assets to complement logistics formations. But if unmanned systems simply heighten force protection at the expense of survivability, then these platforms may be counterproductive during LSCO.

Conclusion

Modernization and the pivot from counterinsurgency to LSCO brings complexities and dilemmas to the battlefield unseen since World War II. The future battlefield will see the Army contested by near-peer enemies across all domains, with the idea of a linear battlefield unlikely to match reality. BCTs will face resource constraints in this emerging environment while operating in non-contiguous battlefields distant from traditional supply nodes. To ensure victory, Army logistics formations must be capable of fighting and surviving across contested lines of communication. To this end, it is time we equip forward logistics formations with the tools and faculties to ensure lethality, survivability, and sustainment of the operational tempo.

Maj. Heath A. Bergmann is a student at the United States Army's Command and General Staff College. His formal education includes a Master of Arts in Public Policy from the University of Michigan; a Master of Science in Safety, Security, and Emergency Management from Eastern Kentucky University; and a Bachelor of Arts in General Studies from Eastern Kentucky University.

Feature Photo
Soldiers with 325th Brigade Support Battalion, 25th Infantry Division, reacts to indirect fire during a convoy movement as part of a Home Station Combat Training Center brigade level collective training event on Oct. 20, 2021, at the Joint Pacific Multinational Readiness Center, on East Range, Schofield Barracks, Hawaii. (Photo by Pfc. Matthew Mackintosh)

Sustainment for Echelons Above Brigade

Engineer Operations

▪ *Capt. Garrett M. Curry*



As the Army continues to refocus its efforts towards conducting large-scale combat operations (LSCO) in a conventional warfare environment against peer or near-peer actors, two essential capabilities of the combatant commander are the capacity to breach enemy obstacles and conduct wet gap crossings at a division-level or higher. These capabilities are provided by the echelons above brigade (EAB) engineer battalion, which may be deployed to conduct these activities to enable mobility of maneuver forces on the battlefield. These operations may prove decisive if the Army fights another major conflict overseas.

While the Army continues to refine its doctrine for engineer operations, the ability of Army logisticians to sustain these operations becomes essential to their success. Most of the internal sustainment capability for EAB engineer operations comes from the forward support company (FSC) assigned to each battalion. These FSCs are tasked with maintaining Headquarters and Headquarters Company/FSC vehicles and possess a distribution platoon responsible for transporting Class (CL) I, III, IV, and V to engineer forces. Engineer FSCs operate under a heavy workload as the only internal sustainment elements within an engineer brigade. However, it is important to note that for a division-level breach or wet gap crossing operation to be successful, additional sustainment assets will be participating within the task force.

The sustainment implications for a breach or wet gap crossing are similar. They both involve large maneuver elements moving quickly through a limited, defined space on the battlefield to rapidly expand the forward line of troops on the far side. Army Techniques Publication 3-90.4, *Combined Arms Mobility*, focuses primarily on the operational procedures necessary to complete these maneuvers successfully. However, several listed sustainment tasks within the publication include movement control, bulk petroleum distribution, recovery operations, maintenance, and field trains are responsible for crossing the gap and returning to the near side in coordination with the task force engineer and crossing area commander. Most of these sustainment capabilities are provided by forces that are external to the engineering element.

Movement Control

Movement control is perhaps one of the greatest sustainment assets for the maneuver commander while the task force prepares to conduct a breach or gap crossing. Movement control teams work at the direction of the crossing site commander to ensure a steady flow of traffic from the near side to the far side of a gap. They help the crossing area commander determine the number of crossing sites established based on terrain and the number of forces to be moved across. These assets prevent a backlog of traffic at the crossing site, which is necessary to push the correct maneuver elements forward and enable field trains to cross

the gap while conducting logistics package (LOGPAC) operations.

Bulk Petroleum Distribution

Bulk petroleum distribution remains an essential task in crossing site development as well. Refueling points are established in battalion-level staging areas leading to the crossing sites. These refueling points will need to be established by brigade support battalions within the brigade combat teams preparing to conduct a crossing. Fuel points must also be made available at the crossing sites themselves to refuel bridging vehicles and rafts utilized to build a bridge or to transport forces across a gap. The petroleum distribution section typically establishes these fuel points within a multi-role bridge company, internal to the EAB engineer battalion.

Maintenance Operations

The field maintenance team is the commander's most effective maintenance asset on the far side of a breach or crossing. These teams can repair vehicles on-site using parts on hand. Once a vehicle has crossed the far side of a gap, it must either be repaired by the field maintenance team or recovered to the rear for any fault requiring additional equipment or parts to repair. Ensuring the proper CL IX is on hand before crossing will maximize the number of repairs that can be completed without significant hardship.

On the near side of a wet gap crossing, rapid maintenance of bridging vehicles and rafts is

essential to preserve traffic flow to the far side. While the field maintenance team can conduct the majority of this within a multi-role bridge company, this also means that sustainment planners must prioritize CL IX parts required to repair these vehicles. They must be readily available on the near side of a gap crossing to ensure these repairs can be rapidly completed on site. Ensuring these systems remain mission capable is crucial to maximizing the number of forces that can be positioned forward.

Recovery Operations

Recovery operations will need to be prioritized according to battlefield conditions by the maneuver commander. A return trip across a breach or gap crossing will prevent another element from utilizing that crossing site to push forward simultaneously. Recovering an armored vehicle from the far side of a gap to the near side for field or sustainment level maintenance has the potential to be a timely endeavor. It may need to wait for the bridgehead to expand in depth beyond the crossing site to be worth the investment in time needed to complete it. Once the bridgehead is established, the maneuver commander will have an opportunity to conduct recovery and maintenance operations for non-mission capable vehicles and equipment damaged during the wet gap crossing or breaching operation.

Field Trains

Field trains perform the backbone of sustainment op-

erations delivering all supply classes on the far side of the gap following a successful breach or wet gap crossing. These field trains must be carefully coordinated with the crossing area commander. They must be prioritized based on battlefield conditions relative to all other friendly elements that must make a crossing. Field trains may also have the added requirement of a return trip to the near side of the gap following a successful LOGPAC mission, providing a further consideration for movement control planners. This return trip requirement will last for a wet gap crossing until the bridgehead on the far side of a wet gap crossing or a breach extends 12 to 19 miles. At that time, the crossing brigade combat team would have the depth required to jump its brigade support area to the far side of a gap.

Higher Echelon Sustainment Planning

Each of the above sustainment tasks are performed by elements spread throughout various echelons, from brigade combat teams, sustainment brigades, EAB engineer battalions, and others. The sustainment coordination of these elements must be carefully planned by the G-4 section within the headquarters conducting the crossing, whether at the corps or division level. They must also be carefully coordinated by the support operations officers within the sustainment brigades and brigade combat teams at the echelons conducting a breach or a wet gap crossing. These sections

provide recommendations to the crossing area commander regarding sustainment priorities relative to the situation on the battlefield.

Breaching and wet gap crossing operations will become necessary during any continental conflict the Army may have to fight, whether in Europe or the Pacific. Planning sustainment for these EAB engineer operations will prove essential to the success of division or higher-level maneuvers within a LSCO environment. Sustainers will play an active role in ensuring operational success for maneuver elements forging across barriers, whether manmade in breaching operations or terrain based as in wet gap crossings. As sustainers, it is key we continue to plan to support maneuver forces as they prepare to forge these obstacles on tomorrow's battlefield.

Capt. Garrett M. Curry serves as the commander of Forward Support Company, 5th Engineer Battalion, 36th Engineer Brigade at Fort Leonard Wood, MO. He previously served as a 12B Combat Engineer before commissioning as a logistics officer through Army ROTC at the University of North Texas. He holds a Master of Business Administration from West Texas A&M University.

Feature Photo
U.S. Army Reserve engineers with the 671st Engineer Company and 301st Maneuver Enhancement Brigade cross the Columbia River aboard an Improved Ribbon Bridge raft system during a wet gap crossing exercise on Aug. 17, 2021, at the 555th Engineer Brigade's Yakima Strike exercise, Yakima Training Center, Washington. (Photo by Sgt. John Weaver)

Supply Chain Management in a Data-Driven World

Army Logistics University's Approach to Supply Chain Education

■ *By Capt. Matthew G. MacDonald and Dr. Robert Neeley*

The production and transportation of goods and services to those who need them has evolved over the centuries. However, at its most basic, supply chain management (SCM) relies on converting data about the availability of materials and the associated demand for said supplies into plans of action to ensure the conveyance of the materials when and where the end-user needs them.

In June of 1812, Emperor Napoleon Bonaparte led his Grande Armée in an invasion of Russia. By the end of the year, he abandoned the campaign. In 1975, Steven Sasson, an engineer working for Eastman Kodak, invented the first digital camera. The company filed for bankruptcy in 2012. In both of these examples, improperly executed SCM led directly to failure.

Napoleon's invasion of Russia is a classic case study in the failed planning and execution of SCM. After a summer and fall of campaigning through Russia, his army, starving and freezing, retreated during the harsh Russian winter because there was no supply chain capable of supporting them. The French planned a long-distance campaign focused on operational goals without considering the inherent challenges of establishing supply chains over vast geographical distances.

The lesser-known story of Eastman Kodak's demise communicates a cautionary tale at the opposite end of

the supply chain spectrum. Eastman Kodak placed too much emphasis on supply chain optimization and not enough on operational needs. In the 1970s, Kodak was a behemoth of a company that owned every part of the print photography industry. Their supply chains enabled vertical integration that allowed them to profit in every aspect of the photography industry: the cameras, the film, the chemicals that developed the film, the photo paper, the printing kiosks, etc. Despite pioneering digital photography in 1975, Kodak was reluctant to alter their historically strong supply chains to adopt digital photography. As a result, Kodak incrementally ceded market share until the company's products became obsolete as print photography gave way to digital. The failures of Napoleon and Kodak highlight the importance of having leaders knowledgeable of supply chains and capable of managing them.

Supply Chain Balance

Efficiency and effectiveness are often at odds with each other in SCM. Simply put, efficiency targets reduced costs, and effectiveness targets high availability rates. It is important to strike a balance best suited toward the goals of the organization that the supply chain supports. As in the Eastman Kodak example, an organization can fail if it focuses too heavily on efficiency. An overreliance on effectiveness can lead to failure resulting from unmanageable costs or an assumption that supply chains will be effective under all circumstances,

such as Napoleon's Grande Armée. It is important for the Army to develop leaders with an awareness and understanding of its supply chain needs. The Army tends to prioritize effectiveness over efficiency. This is both important and correct. While the Army has an obligation to be good stewards of taxpayer dollars, Army sustainers also need to ensure warfighters have the supplies they need at the right time and place to complete any mission. However, this does not mean we should not search for improved efficiency. Increased efficiency and effectiveness are mutually exclusive in an already optimized supply chain. Only then is it impossible to improve efficiency or effectiveness without sacrificing the other.

Army Logistics University (ALU) offers a Defense Supply Chain Management course that examines the effective and efficient balance and mechanics of the Army's supply chain. The course provides enterprise-to-tactical defense SCM instruction to qualified military and civilian personnel assigned to operational DOD supply chain positions. Students learn how to analyze the management and operations of the defense supply while studying its competencies and major functions. The primary audience for this course is Army Civilians assigned, or on orders to, a management assignment requiring knowledge of defense supply chains and distribution management. Exposing students to a broad view of the Army's supply chain enables them to make decisions that are in

line with optimizing the Army’s overall supply chain rather than sub-optimizing within a silo of excellence. The SCM course is a key component of the educational opportunities provided by ALU to broaden career development and enhance the performance and skills of mid-level managers working within the DOD supply chain environment.

Supply Chain Visibility

Visibility and understanding of supply chains are vitally important to sound decision-making. Without a clear comprehension of what is happening within the supply chain, leaders can’t make informed decisions. This idea is so important that Army Doctrine Publication 6-0, *Mission Command: Command and Control of Army Forces*, specifies creating a shared understanding of the operational environment as one of the seven principles of mission command. Possessing a shared understanding of Army supply chains

is equally important. Organizations develop programs and implement procedures to maximize this understanding to enable and enhance supply chain visibility. For example, as part of the military response to COVID-19, the Countermeasures Acceleration Group (CAG) developed a comprehensive tracking and analytics system to maintain visibility of all activity involving the CAG mission. The CAG system provides real-time tracking visibility and data analytics of all aspects of their operation, including CAG planning, vaccine and therapeutics development, supply chain management, distribution, real-time tracking and analytics, vaccine control, security, and assurance to every stakeholder.

In 2016, Airbus launched its Digital Control Room. Like the CAG system, this Digital Control Room provides Airbus with visibility throughout their entire supply chain. Total supply chain

visibility enabled CAG to identify vaccine manufacturers experiencing potential issues and respond with subject matter experts for assistance and problem resolution. The Digital Control Room does the same thing with parts manufacturers for Airbus. Having these systems in place enables organizations to maintain a holistic view of their supply chains and identify/address bottlenecks before they become an issue.

Civil-Military Supply Chain Links

Many supply chain principles carry over from the civilian sector to the military. Due to the military’s reliance on the industrial base, there is an inherent link between military and civilian supply chains. Therefore, incorporating supply chain principles developed in the civilian sector into the military is important when developing synergy and efficiencies. To accomplish this, the Combined Arms Support Command (CASCOM) maintains

a collaborative academic relationship with the Virginia Commonwealth University (VCU).

Every year, CASCOM sends Army captains to VCU to complete a master’s degree in Supply Chain Management, a program centered on global supply chain management, innovation, and analytics. For the conclusion of this program, VCU professors guide the students through a capstone project centered on a real-world problem that an Army organization is facing. Upon graduation, the officers serve in a utilization assignment where their organizations directly benefit from the institutional knowledge gained at VCU. The VCU master’s program ensures that the Army has a steady supply of leaders on the edge of emerging SCM techniques and practices, vital for a military operating in an environment facing constant supply chain challenges.

Data Analysis in SCM

Data production and gathering are more prevalent in an increasingly digital world than ever. Supply chains produce massive amounts of data in every aspect of their operations. However, data is useless without the ability to process and analyze it. This holds true in the Army and the civilian sector and is why ALU is developing new strategies to teach Army logisticians how to analyze data. In fiscal year 2020, ALU began offering the Data Analysis and Visualization (DAV) course. The DAV course is intended for civilian and military students who collect or analyze data regularly or personnel who use data

to communicate to others. The course aligns with the Army G-4’s desire to build analytic talent and create a smart data culture. Graduates of the DAV course can garner information from data using descriptive and predictive statistics and present findings using visualization techniques. Having knowledge of these tools arms graduates of DAV with the skills they need to see what is happening in their supply chain and present recommendations to their leadership.

Supply Chain Risks

New and emerging threats to military operations also threaten military supply chains. For example, cyber-attacks can shut down a supply chain just as quickly as they degrade operational security. The ransomware attack on the Colonial Pipeline in May 2021 is a recent reminder of this. The attack shut down the largest pipeline system supplying fuel to the Southeast United States for nearly a week. The COVID-19 pandemic has also revealed a plethora of potential areas of supply chain vulnerability. Labor issues, transportation shortages, and the non-availability of sole-source supplies because of lockdowns are just a few examples. There also are unpredictable supply chain disruptions, such as the container ship Ever Given running aground in the Suez Canal in March of 2021, resulting in the complete closure of the canal for a week, effectively cutting the supply chain from and to a large portion of the world.

The military is not immune to these potential disruptors. Supply chain risk management is

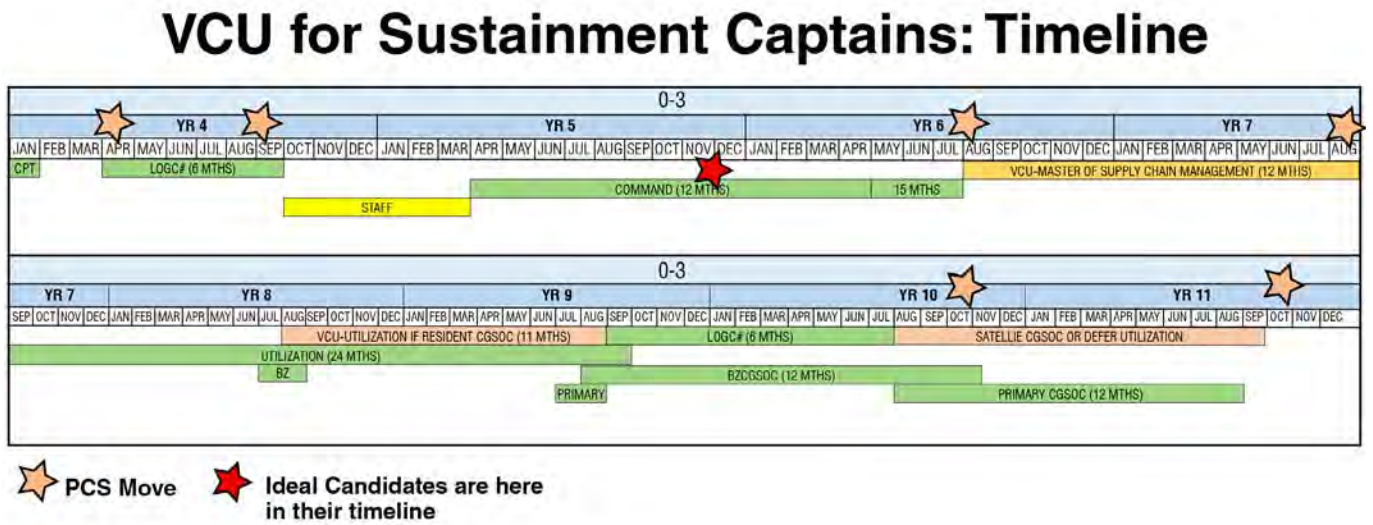
a key concern for the U.S. military. The Defense Logistics Agency, Joint Munitions Command, and Army Futures Command all have deliberate processes in place to analyze their supply chains and detect potential risks within them. Military organizations increasingly use many of the same innovative techniques as civilian companies, such as machine learning, to manage their supply chains.

Conclusion

It is vital that the Army continue training leaders to understand its supply chains and stay abreast of current SCM techniques. Doing so can help avoid crucial SCM errors such as the ones that led to the demise of Napoleon Bonaparte’s Grande Armée and the Eastman Kodak Company. Proper supply chain management enables the Army to maintain agile and secure supply chains that are always ready to support the next mission.

Capt. Matthew G. MacDonald currently serves as the course director for the Supply Chain Management course at the Army Logistics University. He holds a Bachelor of Arts in Economics from Binghamton University, New York, and a Master’s in Supply Chain Management from the Virginia Commonwealth University.

Dr. Robert Neeley currently serves as the chairman of the Enterprise Management Committee in the College of Applied Logistics and Operational Sciences at the Army Logistics University. He holds a Bachelor of Arts in History from the University of North Carolina at Charlotte, a Master of Art in Organizational Management from the University of Phoenix, Arizona, a Master of Arts in National Security and Strategic Studies from the U.S. Naval War College, and a Doctorate of Business Administration from Walden University, Minnesota.



Arctic Winter Conditions Effects on Tactical Field Maintenance

By Lt. Col. Raphael Jimenez, Capt. Alexander Banks, and Chief Warrant Officer 4 Brian Cox

Maintenance operations in Arctic winter conditions carry unique challenges. This article will present what distinguishes extreme cold weather (ECW) maintenance from temperate field condition maintenance. The specific methods and requirements mentioned in this article for conducting maintenance in ECW are primarily based on feedback and experience of subject matter experts currently operating in Alaska. There are multiple variables, such as the need for heated maintenance shelters, thawing vehicles, and longer work-rest cycles due to ECW exposure which can affect the speed and throughput of repair for any piece of equipment. Understanding these challenges will help better prioritize personnel and equipment to support maneuver operations in the Arctic winter. This article is intentionally focused on performing maintenance at the brigade support battalion (BSB) level and, therefore, does not address vehicle recovery and its associated

mobility limitations and constraints. As the U.S. Army pivots to the Arctic strategy, it is critical that maneuver and logistics professionals understand the cascading effects of ECW on personnel, equipment, and planning sustainment timelines.

Heated Maintenance Shelters Heated maintenance shelters are required to conduct maintenance in ECW field conditions. Heated maintenance shelters prevent cold-weather injuries to maintenance personnel, bring equipment up to safe

ARCTIC WORK-REST CYCLES WITHOUT HEATED WORK AREA		
WORK/REST TIME BASED ON COLD WEATHER SMART CARD FRM NWTC AK		
TEMPERATURE RANGE	WORK/REST CYCLE	PLANNING FACTOR TO INCREASE MAC CHART MAN HOUR (MH) REQUIREMENT
0°F TO -10 °F	30 MIN ON, 30MIN OFF	2 X MAC CHART MH REQ
-11 °F TO -20 °F	20 MINN, 40 MIN OFF	3 X MAC CHART MH REQ
-21 °F TO -39 °F	10 MIN ON, 50 MIN OFF	6 X MAC CHART MH REQ
-40 °F AND BELOW	5 MIN ON, 55 MIN OFF	12 X MAC CHART MH REQ

Figure 1. Arctic work-rest cycles without heated area. (Contributed Graphic)

handling temperatures, and enable efficient and timely maintenance without the interference of wind-borne debris and extreme cold. The BSB utilizes light-weight maintenance enclosures (LME), commonly referred to as Field Maintenance tents. In addition to the LMEs, the BSB has a forward repair system (FRS) that can act as a limited heating enclosure. The FRS itself has a heating capability, but external tentage is required to contain the heat sufficiently to support maintenance operations in ECW. The LME and FRS systems do not provide insulation and require two to three 120,000 British thermal unit (BTU) heating systems to keep internal ambient temperatures above freezing. Without these heating systems, the LME will not stay warm enough to conduct larger jobs such as engine swaps for High Mobility Multipurpose Wheeled Vehicle,

Light Medium Tactical Vehicle, and Load Handling System. The FRS on their own provide the capability for small repairs such as battle damage assessment and repair but leave maintenance personnel exposed to colder temperatures. The absence or presence of heating sources in LME and FRS shelters will determine work-rest ratios and man-hours, affecting repair throughput.

Equipment Thawing Time Understanding equipment thawing time (ETT) is essential to conducting field maintenance in ECW. ETT is an important limiting factor in conducting maintenance in ECW. Thawing can take 2 to 12 hours, depending on shelter temperature. Thawing time refers to bringing a piece of equipment into a heated maintenance area and allowing it to warm up to ambient temperature. Doing this prevents

damage to the equipment due to “cold induced brittleness” of the materials. Also, it reduces the risk to maintenance personnel of incurring contact frostbite from handling equipment and materials initially at sub-zero temperatures. It should be noted that the BSB’s current available LMEs require the use of commercial off-the-shelf heaters. No matter how many LMEs you have in a field environment, ETT will reduce repair throughput in Arctic winter conditions. This extremely critical factor is not accounted for in the Army maintenance allocation chart.

Cold Weather Work-Rest Cycle Finally, in ECW, maintenance personnel should conduct shortened work iterations followed by rest and rewarming cycles to prevent cold-weather injuries. These work-rest cycles are dependent primarily on

ARCTIC WORK-REST CYCLES WITH HEATED WORK AREA AND HAND WARMING STATION PRESENT FOR MECHANIC TO PERIODICALLY WARM GLOVES AND HANDS		
WORK/REST TIME BASED ON DATA PROVIDED BY THE WORKPLACE INJURY PREVENTION GUIDE, SASKATCHEWAN OIL SAFETY BOARD		
INTERIOR TEMPERATURE OF HEATED SHELTER	WORK/REST CYCLE	PLANNING FACTOR TO INCREASE MAC CHART MAN HOUR (MH) REQUIREMENT
0°F TO 10 °F	1 HR ON, 10 MIN OFF	1.2 X MAC CHART MH REQ
11 °F TO 20 °F	1.5 HR ON, 10 MIN OFF	1.15 X MAC CHART MH REQ
21 °F AND ABOVE	2 HR ON, 10 MIN OFF	1.1 X MAC CHART MH REQ

Figure 2. Arctic work-rest cycle with heated work area and hand warming station. (Contributed Graphic)

the wind-chill computed real-feel temperature, type of equipment being repaired, and the level of acclimatization of the service member performing the maintenance task. Once temperatures drop below freezing, the risk of cold weather injuries increases; once temperatures drop below zero, the risk increases exponentially. Conducting maintenance in outdoor ambient temperature poses the highest risk of cold weather injury, and service members conducting repairs must wear contact gloves to safely touch vehicle parts. Even with the best personal protective equipment, the prescribed work-rest cycle for sub-zero temperatures, shown in Figure 1, substantially increases to the man-hour requirement for any given job. The purpose of Figure 1 is to act as a guide for safe work-rest cycles for maintenance personnel operating in ECW and highlight the impact

on work throughput. The table specifically addresses maintenance conducted in the open without shelter or heat source. The work-rest cycle describes the maximum safe time a mechanic can work “ON” the equipment followed by the minimum required time “OFF” they need to warm up before resuming work. The third column on the chart shows how the required work-rest cycle impacts the established man-hour requirement detailed in the Man-hour Allocation Chart (MAC) located in the Technical Manual for that specific piece of equipment.

Conducting maintenance in LMEs with a heating source reduces the risk drastically, but this depends on what temperature you can maintain inside the LME. Another factor in considering the work-rest cycle while conducting maintenance in an LME is the addition of

a hand-warming heater station for maintenance personnel. The improvement of productivity using a heated shelter is shown in Figure 2. The information on Figure 2 acts as a guide for safe work-rest cycles for maintenance personnel operating in ECW and highlight the impact to work throughput. This table specifically addresses maintenance conducted in some type of enclosure or shelter with a heat source that raises the ambient temperature of the enclosure above environmental and provides an additional nearby heat source to allow the mechanic the ability to periodically warm their hands in order to continue working. The work-rest cycle column describes the maximum safe time a mechanic can work “ON” the equipment followed by the minimum required time “OFF” they need to warm up before resuming work. The third column on the chart shows how the

required work-rest cycle impacts the established man-hour requirement detailed in the Man-hour Allocation Chart (MAC) located in the Technical Manual for that specific piece of equipment.

Whether maintenance is conducted outside or in an LME, leaders who are not hyper-vigilant on work-rest cycles expose service members to cold weather injuries. The loss of personnel will affect equipment repair timelines.

Logisticians planning for operations in the Arctic winter must understand the cascading effects of ECW on personnel, equipment, and planning sustainment timelines. As discussed, variables such as heated maintenance shelters, thawing vehicles, and work-rest cycles due to ECW exposure can affect repair speed, man-hour requirements, and equipment repair throughput. Furthermore, the Army maintenance allocation chart does not capture ECW planning factors that increase man-hour requirements. As the Army pivots to the Arctic strategy, maneuver and logistics professionals must understand the increased planning factors ECW to deliver the required effects to maneuver commanders.

Recommendations

Although there is limited research on Army maintenance in ECW, we have gained first-hand knowledge on the subject as the senior sustainer for our Arctic brigade. A battalion task force was utilized for our 2020 extreme cold-weather exercise. We

concluded that LME maintenance was critical for conducting larger repairs while increasing the speed of repair throughput. Small repairs could be conducted in our FRS; however, the curtain system does not trap the heat well and is not optimal for repair. We concluded that our forward logistics element had a rate of repair of nine vehicles per day based on the BSB organic assets (two LME and one FRS). We eliminated one vehicle space of the 10 available for battery pallet chargers because the extreme cold temperature conditions necessitated additional battery charging capabilities.

Based on our experience in an arctic airborne BSB, there are three general points that all Army leaders must consider for operating in ECW environments:

- The Army Maintenance Allocation Chart does not account for repairs in extreme cold weather temperatures. It should include general consideration for repairs inside an LME and in the open. This is critical for leaders to account for the significant reduction in maintenance throughput due to ETT and work-rest cycles.
- The Army must add a program of record for bullet heaters, improve heating systems for our LME, improve the FRS curtain system, and upgrade the FRS heater with higher BTUs.
- BSBs and forward support companies require additional ground support equipment

mechanics to support the repair of heating ventilation, air conditioning systems, quartermaster machinery, heaters and other related equipment enabling adequate personnel replacements due to cold weather work-rest cycles. Equipment thawing time (ETT) is a planning factor in repairing combat power for maneuver commanders. ETT must be understood by all echelon leaders while considering that conducting any operation in extreme cold weather takes 30 up to 1200 percent more time than operations in temperate weather.

Lt. Col. Raphael Jimenez is currently serving as the commander of the 725th Brigade Support Battalion (Airborne), 4th Infantry Brigade Combat Team. Jimenez’s military and civilian education includes the Armor Officer Basic Course, Captains Logistics Career Course, Major’s Intermediate Level Education, bachelor’s in marketing from Inter-American University Puerto Rico, Master of Business Administration degree from the prestigious Major General James Wright Fellowship Program at the College of William and Mary, and Lean Six Sigma Green Belt.

Capt. Alexander Banks is the deputy support operations officer of 725th Brigade Support Battalion (Airborne), 4th Infantry Brigade Combat Team. His military education includes Ordnance Officer Basic Course, Cold Weather Leader’s Course, and Captains Career Course and Lean Six Sigma Black Belt. Capt. Banks holds a bachelor’s in Mechanical Engineering from the University of Idaho.

Chief Warrant Officer 4 Brian Cox serves as the senior ordnance ground maintenance officer for the 4th Infantry Brigade Combat Team. Cox is a graduate of all Warrant Officer Professional Education Courses and is a Demonstrated Master Logistician. Cox has completed the Capabilities Developers Course, Industrial Business Based Logistics Course, Operational Contract Support, Contracting Officer Representative, and Joint Logistics Course.

DEFENDING the BSA in an Island Fight

▪ *By Capt. Jesse Nelson*



In October 2021, the 3rd Infantry Brigade Combat Team (3rd IBCT) 25th Infantry Division conducted the first-ever home station Joint Pacific Multinational Readiness Center (JPMRC) scenario designed as an island-hopping campaign. The exercise scenario featured an invasion by a northern army on its southern neighbors, where the U.S. needed to prepare a counter-offensive on the peninsula. The 3rd IBCT was tasked with seizing an archipelago made up of five islands to protect sea lines of communication (SLOC) to the division's western flank.

For ten days, 3rd IBCT moved from island to island first to clear opposing forces (OPFOR) and then to retain the terrain. The 325th Brigade Support Battalion (BSB) established a brigade support area (BSA) within the archipelago by the third day to sustain the fight. We found that the current doctrine and the modified table of organization do not provide the proper guidance or assets required for the BSA to be successful in large-scale combat operations (LSCO) in a non-contiguous environment.

Where To Place the BSA?

From the start, the island concept presents both the brigade and support battalion commanders with a new set of issues not adequately covered in multi-domain operations. The current doctrine states that BSAs should be established approximately 20 to 40 kilometers (km) from the forward line of troops (FLOT). This can be challenging or even impossible in a non-contiguous environment,

such as an archipelago. Commanders must decide where to establish the BSA. One option is to establish the BSA on the nearest landmass to the area of operations. While providing greater security for the BSA, this can dramatically increase supply line lengths. The alternative is to place the BSA significantly closer to the FLOT. This can decrease or eliminate required SLOCs potentially exposing the BSA to more danger. While there are ways to mitigate some of the dangers of having the BSA farther away (i.e., aerial resupply, more robust forward logistics elements, etc.), we will focus here on how mitigating the risks of having the BSA located closer to the FLOT.

The BSA is, by definition, a large, cumbersome element not easily concealed or well suited for rapid movement. In the past, BSA security was often supplemented by nearby reserve elements or was established in areas with a large number of friendly forces separating it from the enemy. What the 325th BSB found during JPMRC was that as friendly forces displace from island to island, the BSA can very easily find itself isolated, quite literally alone on an island. This becomes especially dangerous when planning for a fight against the Chinese army, the most likely force the U.S. will face in an island campaign such as this. Army Techniques Publication 7-100.3, *Chinese Tactics*, states that in a conflict, the Peoples Liberation Army (PLA) will focus on targeting networks instead of shooters, sensors instead of aircraft, and command

and communication nodes instead of maneuver forces. In practice, this means the PLA will strive to achieve victory by isolating U.S. forces and placing them in a situation where defeat is inevitable rather than attempting to destroy maneuver forces in direct conflict. Therefore, being vital to continuous operations, the BSA becomes a high-value target. As a high-value target, the BSA faces three main threats: close air attack (CAA), indirect fire (IDF), and direct fire from special purpose forces.

Defending the Sky

Since the Vietnam War, the U.S. has enjoyed air supremacy in its military operations. During this time, the U.S. Army has had little need to develop assets to defend itself from CAA or prevent aerial envelopment. The 325th BSB found this to be a significant weakness when, on two separate occasions, enemy aircraft were able to disrupt operations with CAA. In the training scenario OPFOR could only use small arms fire from a UH-1 helicopter door gunner. However, in a real-world LSCO scenario, the enemy could deploy a Hind D or similar helicopter gunship, and one attack run could render the entire BSA combat ineffective. The rest of the IBCT would acutely feel the effects of such attacks within 72 hours as resupplies of food, ammo, and water ceased, and the Role II no longer functioned.

Mitigation of this threat is fairly straightforward. The FIM-92 Stinger Man-Portable Anti-Air Defense System (MANPADS)



Lt. Col. John M. Roy, commander, 325th Brigade Support Battalion, and Capt. Jesse O. Nelson, battalion S-2, discuss where to emplace the Brigade Support Area on Oct. 20, 2021, at the East Range, Honolulu, Hawaii. (Photo by Sgt. Julio Hernandez)

has a proven combat record against even the most heavily armored gunships. Fortunately, emplacement of the Stinger does not require a MANPADS operator. To become qualified, any military occupational specialty can attend a 3-week course at Fort Sill, Oklahoma. After that, the unit would only have to resource the weapon system itself. It is recommended that a BSB send four Soldiers. This would provide the battalion (BN) with two qualified teams, giving the base defense operation commander a key asset to incorporate into their defense plan 24 hours per day.

Defending from IDF

The second main threat a BSA faces, particularly when closer to

the FLOT, is IDF. In a conventional battlespace, it is possible to place the BSA about 18 miles behind the FLOT thus allowing the logistics node to be outside of the range for most tactical level IDF assets. In an island campaign, that is not always feasible. Therefore, it is critical that several steps be taken to increase the BSA's survivability. The first is dispersion and cover. Ensuring the spacing of vehicles and equipment helps ensure survivability by dramatically increasing the required number of rounds the enemy must expend to achieve effects.

Additionally, having protection obstacles such as berms around key assets helps them survive in the event of an IDF attack. The

325th BSB was quite successful in this realm by using engineer assets to emplace berms around the Role II and the fuelers, thereby increasing survivability. The BSB commander and staff must work with the brigade staff and engineer battalion to request priority for engineer assets while the BSA is being established.

Another way to mitigate the risk of IDF is to incorporate the use of counter-fire radars into the defense plan. Every brigade has 3 to 5 radars available, but they are generally tasked organized to help protect maneuver BN tactical operations center (TOC)s. The brigade commander must weigh the criticality of protecting the BN

TOCs and the BSA and distribute the counter-fire radars accordingly. This can be accomplished by either co-locating a radar at the BSA or ensuring a nearby system is always within range to provide coverage. One of the issues the 325th BSB experienced was that without any Soldiers trained in the use of artillery, there was a knowledge gap about the capabilities and value of counter-fire radars. This can be mitigated by classes and training provided by the aligned fires BN or even a BN fire support officer. In reality, a base defense operations center commander cannot successfully employ a weapon system they do not know exists or how to use properly. As an added benefit, the enemy could potentially expose its IDF assets by firing at what it assumes is an unprotected soft target allowing friendly fires to engage and destroy enemy artillery before it can be massed against maneuver forces.

Taking the Fight to the Enemy

While counter-fire radars are excellent defensive measures, bolstering the BSA's offensive capabilities could also prove vital. The main direct fire threat the BSA will typically face is a special purpose forces type threat: small teams of highly trained infantrymen equipped with small arms, explosives, and the ability to call for fire from mortars and artillery. While the BSA can protect itself by blocking and reinforcing obstacles and crew-served weapons, the BSA would dramatically increase its combat power with the addition of

IDF capabilities. While any good base defense plan must integrate fires and have pre-planned targets, this usually requires artillery assets, given the traditional distance and placement of the BSA. While a good tactic technique and procedure (TTP), the reality is that the BSA will almost always be lower in the priority of fires resulting in delays to fire missions if they even get processed at all. To give the BSA the ability to place accurate and timely fires without disrupting the brigade information collection/fires plan or pulling too much combat power from the fight, one or two 60mm or 81mm mortars should be placed within the BSA. While these mortars are valuable weapon systems to maneuver companies, these companies possess enough other fires assets to augment the loss of 1-2 tubes. Meanwhile, this one small addition provides the BSA with the ability to conduct a more in-depth engagement area development at the BSA. The ability to bring indirect fire on a target in seconds instead of the 20 to 30 minutes an artillery mission can take fundamentally alters the dynamic of the fight around the BSA.

Conclusion

Where to place the BSA and when to place it is always a vitally important question for any IBCT. This becomes even more critical when operating in a non-contiguous environment. In such an environment, the brigade and the BSB commanders must determine where they are willing

to assume risk to their logistics. Placing the BSA farther away increases its security but lengthens supply lines. Placing it closer to the FLOT shortens the supply lines but exposes the BSA to a greater threat of direct and indirect fire from the enemy. Therefore, the BSA must be able to protect itself. To do this, the BSA must have the ability to defend from aerial threats; poses the assets, knowledge, and ability to have an effective counter fire; and finally, to be able to coordinate its own indirect fires. These measures are not comprehensive, and each of them requires prior planning, training, and integration to be used effectively. What they do provide is the BSA the ability to be a significantly harder target than it often is. This allows the brigade to shorten its supply lines while ensuring the survivability of logistics assets, thus enabling the continuation of the fight across multiple domains regardless of the operational environment.

Capt. Jesse Nelson currently serves as a military intelligence officer assigned as the battalion S-2 for 325th Brigade Support Battalion, 3rd Infantry Brigade Combat Team, 25th Infantry Division. He has a Bachelor of Science Degree in International Relations from the United States Military Academy.

*Feature Photo
Soldiers from 3rd Brigade Combat Team, Brigade Support Area prepares for night-time operations on Oct. 21, 2021, at the East Range, Honolulu, Hawaii. (Photo by Sgt. Julio Hernandez)*

ARMY SUSTAINMENT

The Army's Official Professional Bulletin on Sustainment
www.alu.army.mil/alog



www.facebook.com/ArmySustainment



www.linkedin.com/company/armysustainment



www.alu.army.mil/alog/

Get published. Get connected. Join the conversation.

ISSN 2153-5973
DEPARTMENT OF THE ARMY
ARMY SUSTAINMENT
US ARMY LOGISTICS UNIVERSITY
2401 QUARTERS ROAD
FORT LEE VIRGINIA 23801-1705

Official Business