SUMMER 2024

THE ARMY'S OFFICIAL PROFESSIONAL BULLETIN ON SUSTAINMENT

ARMY SUSTAINMENT

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HIP-POCKET GUIDE

ARMY FUTURES COMMAND

Contested Logistics Cross-Functional Team

SUSTAINMENT IN INDOPACOM MARITIME ENVIRONMENT

PB 700–24–03 Headquarters, Department of the Army • Approved for public release; distribution is unlimited.

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ARMY SUSTAINMENT
SUMMER 2024 VOLUME 56, ISSUE 3

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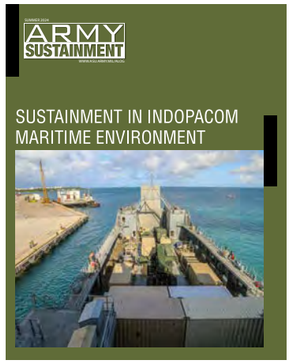

ON THE COVER

Sustainment in INDOPACOM Maritime Environment is the theme of the summer 2024 *Army Sustainment Professional Bulletin*. Soldiers from the 8th Theater Sustainment Command download equipment and supplies from U.S. Army vessel Lt. Gen. William B. Bunker in Saipan, July 15, 2021. (Photo by Staff Sgt. Kevin Martin)

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ARMY SUSTAINMENT
PB 700–24–03
VOLUME 56, ISSUE 03
SUMMER 2024

EMAIL: ARMYSUSTAINMENT@ARMY.MIL
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Army Sustainment (ISSN 2153–5973) is a quarterly professional bulletin published by the Army Sustainment University, 562 Quarters Road, Fort Gregg-Adams, 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.

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HR SUSTAINMENT: Defending a Free and Open Indo-Pacific

■ *By Lt. Gen. Douglas F. Stitt, Col. Barrcary J. Lane, and Lt. Col. Jason M. Behler*

The Indo-Pacific is pivotal to the U.S. national strategy, which requires multi-domain operations within a joint theater. Human resource (HR) sustainment operations are critical to executing the U.S. Army Pacific Command (USARPAC) mission, using more than 100,000 Soldiers and civilians spanning 9,000 miles from the U.S. West Coast to India. The art and science necessary to execute HR sustainment within this unique joint theater requires special attention for implementing HR core competencies. Joint HR operations facilitate sustainment in a maritime-dominate environment by enabling standard requirements code (SRC) 12 organizations to integrate sustainment plans with reception, staging, onward movement, and integration operations, along with personnel accountability, casualty, and postal operations.

The HR operations center, the theater personnel operation center, HR operations branches, and HR companies provide the necessary capabilities to perform joint operational sustainment. These organizations support the projection and sustainment of Army forces across the archipelagic land bridge to Australia and the first, second, and third island chains in the Pacific that constitute the region known as Oceania. Pacific Pathway and Warfighter exrcises incorporate SRC 12 organizations in rehearsing HR operations, given the challenges of the maritime environment. The HR concept of support is coordinated between HR planners at the U.S. Indo-Pacific Command (USINDOPACOM), USARPAC, the 8th Theater Sustainment Command, and the 25th Division Sustainment Brigade.

Operational rehearsals through Operation Pathways require the deployment of HR assets across multiple key locations in the Pacific theater. Sustainment theater distribution centers (TDCs) are meticulously placed in areas that empower force projection and freedom of movement of personnel and equipment.

To establish theater openings in the Pacific, USARPAC plays the lead role in forming forward-postured, ready-land forces. TDCs, aerial ports of debarkation (APODs), and seaports of debarkation (SPODs) are established across a multitude of time zones, creating staged land-based operations to allow inter- and intra-theater flow of personnel.

SRC 12 organizations within the Pacific overcome the challenge of executing their mission in remote, degraded, and contested environments across a vast span of open sea through detailed collaboration and meticulous planning with partner nations and Service components. To perform activities in the USINDOPACOM region, sustainers rely heavily on the established security cooperation agreements between the U.S. and partner nations. To minimize host nation restrictions, SRC 12 assets need country clearances and access to conduct personnel accountability at APODS and SPODS, joint postal operations, and accountability of casualties on land or sea.

To execute operations in the Indo-Pacific, HR enabling systems must align across all Services. The Deployed Theater Accountability System (DTAS) ensures accurate and timely personnel accountability for commanders to make informed decisions. DTAS permits commanders to generate, organize, and maintain operational endurance for the joint force. Across the first island chain, personnel accountability teams in the sustainment brigade use innovative tactics to perform the 24-hour operations necessary to maintain the daily requirements of the flow of forces.

The threats within the Pacific environment create the need to employ large-scale casualty operations. The Defense Casualty Information Processing System is another key HR system needed to combat the complexity of tracking and reporting casualties across the theater. The history of the Pacific teaches us that during large-scale combat operations, planning for mass casualties and evacuation is critical for all sustainers. Accountability of casualties at medical treatment facilities, whether on land or sea, is a vital task for HR sustainers. During wargames, planners simulate using naval assets to provide care and transportation and to embed casualty liaison teams for accountability and reporting.

Postal operations are essential sustainment tasks that require multiple transportation assets and multifaceted joint coordination across vast distances. The Indo-Pacific theater has three Army military mail terminals or equivalent organizations forward. Movement of mail across the island chains is another HR mission that requires host-nation support. Within a maritime-centric environment, SRC 12 organizations implement postal operations that capitalize on previously established postal networks, facilities, and routes by other Service components, allowing the freedom to operationally reach throughout the island chains.

HR sustainers are critical to enabling the Pacific campaign in a maritime-dominate environment. SRC 12 organizations plan and execute HR theater operations that allow U.S. forces freedom of maneuver and that maintain the defense of an open and free Indo-Pacific. The Pacific theater does not rely solely on air and sea domains because land is the adversaries' ultimate goal. Without sustainment to shape the war fight, U.S. deterrence and dominance will not be achieved.

Lt. Gen. Douglas F. Stitt serves as the U.S. Army G-1 Deputy Chief of Staff (DCS). He previously served as director, Military Personnel Management, Headquarters, Department of the Army (HQDA) DCS G-1; director, Officer Personnel Management Directorate, U.S. Army Human Resources Command; and executive officer, HQDA DCS G-1. He has two master's degrees, one in defense studies and one in strategic studies, from the Canadian Forces College, Ontario, Canada, and the Army War College, Pennsylvania.

Col. Barrcary J. (BJ) Lane serves as the U.S. Army Pacific G-1. He previously served as the director of the human resources operations center, 8th Theater Sustainment Command, Fort Shafter, Hawaii; commander, B Detachment, 502nd Personnel Services Battalion, Fort Cavazos, Texas; and commander, 16th Special Troops Battalion, 16th Sustainment Brigade in Baumholder, Germany. He has a Master of Science from the Army War College, Pennsylvania. He is a Lean Six Sigma Black Belt and received his Senior Professional Human Resources Certification.

Lt. Col. Jason Behler currently serves as the future operations and concepts division chief of the human resources operations center, U.S. Army Pacific Command G-1 at Fort Shafter, Hawaii. His major military assignments include serving as a tank platoon leader, battalion S-1, company commander, and an Adjutant General Captains Career Course instructor/writer. His military education includes the Armor Officer Basic Course, the U.S. Army Command and General Staff Officers College, the Common Faculty Development Program Developer Course, and the Human Resources Plans and Operations Course. He has a Master of Business Administration: Marketing degree from Liberty University, Virginia.

Adapting Sustainment to Meet Geographical Challenges

■ *By Lt. Gen. Christopher O. Mohan*

In a February 2023 talk at the American Enterprise Institute on the Army's role in the Indo-Pacific region, Gen. Charles A. Flynn, commander of U.S. Army Pacific, described the Indo-Pacific as "not only an air and maritime theater, this is a joint theater ... [with] joint challenges and joint problems, and it requires joint solutions," and called the Army the "linchpin force" that enables and sustains our joint and allied partners.

The ongoing conflict in Ukraine has provided several critical observations into modern warfare in a contested environment, chief among them is the importance of predictive logistics and precision sustainment on the battlefield. The effects we are observing on the battlefield today in Europe are helping to inform Army senior leader decisions as we modernize and prepare the future force for large-scale combat operations in a contested, multidomain environment. Nowhere is that preparation more important than in the Indo-Pacific, a theater with great economic and strategic importance.

As a region with extensive joint interior lines and complex geopolitical dynamics, the Indo-Pacific houses more than half of the world's population, seven of the world's largest militaries, 65% of the world's oceans, and 25% of its land. This tyranny of distance presents significant logistics challenges for the sustainment enterprise, and we must think and act differently when preparing and setting the theater. We must stay ahead of the need.

We must start with training as we fight and ensuring sustainment objectives are incorporated into overall exercise objectives. Tough, realistic training at the Joint Pacific Multinational Readiness Center and through Operation Pathways builds critical readiness within the sustainment warfighting function and forges relationships and interoperability with the strategic land-power network. This is especially important when we talk about campaigning and preparing the theater in competition to better transition to conflict. Last year's Talisman Sabre 23 (TS23) demonstrated and rehearsed the Army's ability to get troops and equipment to the fight rapidly and efficiently, from its installations to the tactical edge, in a realistic multinational training scenario.

Continuous transformation of sustainment capabilities includes seeing and sensing more, further and persistently. We evaluated and demonstrated these capabilities alongside joint and multinational partner decision-makers at the strategic and operational levels, not only at TS23 but also during Project Convergence Capstone 4. We did this by using various platforms, technologies, and data designed to move and resupply troops. This included testing the Army's watercraft. Our integration with Army Futures Command's Contested Logistics Cross-Functional Team aims to refine the watercraft strategy and give our service a mix of capabilities for next-generation sustainment systems.

While we can draw on valuable sustainment lessons and best practices from the ongoing conflict in Ukraine, we know sustainment in the Indo-Pacific requires constant practice, rehearsing, and deep coordination within the strategic land-power network. This includes positioning supplies, equipment, and munitions with redundancy near potential areas of operation, with a deepened emphasis on Army pre-positioned stocks (APS) and on using joint theater distribution centers. But the equipment is only as good as its upkeep. Effective execution of maintenance and repairs of equipment at APS sites, as well as our expanded remote maintenance and fix-forward capabilities, ensure that systems are quickly returned to optimal conditions.

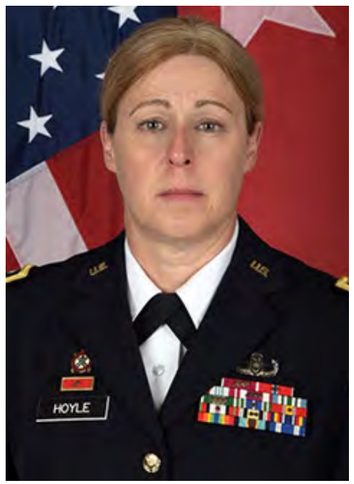
The Indo-Pacific region requires semi-independent maneuver elements with decentralized sustainment capabilities. While remote maintenance is not a new model, the use of an assortment of tactics during the fight to keep equipment operating where it is needed, rather than having to be shipped back to the depot and repaired, is one more solution to challenges we envision.

The sustainment enterprise continues transforming to deliver logistics at speed and scale in a contested environment while positioning equipment preemptively and adapting modernized capabilities to ensure readiness ahead of need. Land power provides positional advantage, and nowhere is this more important than in the Indo-Pacific. This is how we will remain the best trained, equipped, and sustained fighting force in the world.

Lt. Gen. Christopher O. Mohan currently serves as the deputy commanding general of U.S. Army Materiel Command. He also serves as the senior commander of Redstone Arsenal, Alabama. He was commissioned into the Army from Appalachian State University in Boone, North Carolina, where he graduated as a Distinguished Military Graduate with a Bachelor of Science degree in criminal justice. His military education includes the Ordnance Officer Basic Course, the Combined Logistics Officer Advanced Course, the Naval College of Command and Staff, and the Army War College. He holds a Master of Science degree in national security and strategic studies from the Naval War College and a Master of Science degree in military strategy from the Army War College.

The Indo-Pacific region requires semi-independent maneuver elements with decentralized sustainment capabilities.

Sustainment in USINDOPACOM and the Maritime Environment



■ *By Lt. Gen. Heidi Hoyle*

In March of this year, I had the opportunity to visit the U.S. Indo-Pacific Command (USINDOPACOM) area of responsibility (AOR) with senior logistics leaders from across the DoD. Our contingent included the Assistant Secretary of Defense for Sustainment, the Hon. Christopher Lowman; the Director for Logistics, Joint Staff, J-4, Lt. Gen. Leonard Kosinski; the Defense Logistics Agency Director, Lt. Gen. Mark Simerly; and the Service 4s. Over the course of 10 days, the group met with our military and with national government representatives from Japan, the Republic of the Philippines, and the Commonwealth of Australia.

This trip was a great opportunity to gain a first-hand look at operations in this important theater. Moreover, it was well timed because we take a closer look at the USINDOPACOM AOR and the maritime environment in this issue of the *Army Sustainment Professional Bulletin*. I imagine many of you reading this edition have already delved into this theater to some degree. I will share a few of my observations about the trip and the AOR that I think you may find interesting as you unpack this edition.

Allies and Partners

It should come as no surprise that as we look at USINDOPACOM, we do so through the lens of allies and partners. America has a long history of allying with and befriending like-minded nations who value democracy. In fact, our nation has never engaged in war in its history without allies by our side. Current operations in USINDOPACOM are no different. We saw firsthand how our partnerships in Japan, the Philippines, and Australia help maintain peace and security in the region. Whether it is through security cooperation, combined exercises, or simply access, basing, and overflight capabilities, our efforts with our allies and partners are paying off in the region.

Campaigning

Closely linked with allies and partners is the joint force's work being done in the Pacific with campaigning. A key part of the National Defense Strategy, the work that our sustainment Soldiers are doing to enable joint force and Army campaigning activities is tremendous. Last year, as a part of U.S. Army Pacific Command's (USARPAC's) Operation Pathways, the U.S. conducted over 40 exercises with more than a dozen allies and partners in the region. These exercises serve to assure our allies and partners while deterring potential threats from our adversaries. Continued training between U.S. Soldiers, our sister Services, and allied armies will allow us to retain our joint interior lines in the region and to strengthen our positions against threats. For decades, China has been practicing anti-access/area denial in response to our efforts to campaign. It is vital we continue our efforts to demonstrate integrated deterrence to counter Chinese influence in the Pacific. As the linchpin of the joint force, the Army remains a cornerstone piece of integrated deterrence.

Fighting in the Maritime Domain

Across the Indo-Pacific, partner nations' armies make up anywhere from 60% to 80% of national defense forces, from India to Indonesia and from Australia to Japan. Since governments have a fundamental duty to guarantee national sovereignty and territorial integrity, they must invest substantially in armies. That puts the U.S. Army in a critical position of serving as an essential connection for training, equipping, and developing relationships with leaders across the region. In addition, the Army is the Service responsible for operational-level (intra-theater) sustainment. These facts make it clear that our role in the Indo-Pacific is the cornerstone of the sustainment warfighting function for allies, partners, and the joint force. The 8th Theater Sustainment Command, Army Materiel Command, and USARPAC are doing a tremendous job enabling the joint force in the western Pacific and are demonstrating how the Army can function and thrive in marine environments. I encourage you to read their articles in the winter 2024 edition of *Army Sustainment Professional Bulletin.*

Posturing and Force Projection

As we traveled the region, I was reminded of the vastness of the AOR. While all AORs have their challenges, distance is certainly near the top of USINDOPACOM's list. Additionally, with most of our Army based in the continental U.S. (CONUS), it is apparent that we must become experts in deploying from the homeland with our personnel and equipment. This is a change from what we experienced over the last two decades in the war on terrorism, where we largely fell in on pre-positioned equipment. I encourage you to learn all you can about deployment operations and reception, staging, onward movement, and integration, and to incorporate them into your unit training.

Although most of our Army is CONUS based, we have made great strides in posturing ourselves in the theater through the Army pre-positioned stock (APS) program. In some cases, we are leveraging APS as activity sets as we conduct some of the previously mentioned exercises. We are also posturing APS in places that will allow us to assist our allies and partners with humanitarian assistance and disaster relief, which are common requirements in the region.

Think tanks, scholars, and news outlets are all paying close attention to the Pacific. It is important we as an Army stay vigilant in this region. Conflicts in Europe and the Middle East may seek to divert our attention, but it is imperative we remain cognizant of potential challenges in all corners of the globe. We can rely on resolute support from our allies in the region. I am proud of the work our sustainers are doing every day in the Pacific and around the world.

Be all you can be.
This we will defend.

Lt. Gen. Heidi J. Hoyle currently serves as Headquarters, Department of the Army, Deputy Chief of Staff, G-4, and oversees policies and procedures used by Army logisticians. A graduate of the U.S. Military Academy, she has a Master of Science degree in systems engineering from the University of Virginia and a Master of Science degree in national resource strategy from the National Defense University. She is a graduate of the Chemical Officer Basic Course, Combined Logistics Officer Advanced Course, United States Army Command and General Staff College, and the Eisenhower School of National Security and Resource Strategy.

Sustainment Challenges in the Indo-Pacific Theater

By Maj. Morgen Kiser

The U.S. Indo-Pacific theater possesses many unique sustainment challenges as a maritime environment, including tyranny of distance, limited infrastructure, and a contested environment. The land area scattered throughout the vast Pacific Ocean is minuscule, with islands making up a small fraction of the overall area and with vast swaths of water separating the main island chains. Since the Army is the primary ground combat force for Indo-Pacific operations, power projection and logistical operations are vital to the Army's success in the region. However, these unique challenges create a logistical problem that has not been tested in conflict since Gen. Douglas MacArthur's island-hopping campaign in World War II. Effective sustainment of U.S. forces in a maritime environment requires unity of effort with allies and partners across the joint force. The Army, specifically, is responsible for the provision of intra-theater lift.

Partner Operations

Beyond the U.S. military branches, the U.S. Indo-Pacific Command (USINDOPACOM) actively strengthens relationships with regional allies and partners. By fostering cooperation and building partnerships with island nations throughout the Pacific, USINDOPACOM contributes to a more stable and secure region. One way the U.S. fosters relationships is through joint exercises and capacity-building programs that allow for collaboration on security challenges and contribute to regional stability.

The Indo-Pacific Maritime Security Initiative plays a vital role in bolstering regional logistics capabilities. Through this initiative, the U.S. works with seven partner nations — Vietnam, Indonesia, the Philippines, Malaysia, Singapore, Thailand, and Sri Lanka — to enhance their maritime security and domain awareness. Additionally, there is a provision for personnel from Taiwan, Singapore, and Brunei to join training exercises with incremental funding. This collaboration strengthens regional infrastructure, facilitates joint exercises, and fosters a network of support for U.S. forces and allies operating in the region.

However, multinational operations do not come without their fair share of challenges. Some of these challenges include the following:

- Differing national interests: Countries may have varying priorities and objectives, requiring compromise and clear communication.
- Varying military capabilities: Participating nations may have militaries with different levels of training and equipment, necessitating adaptation and flexibility.
- Cultural differences: Effective communication and mutual understanding are crucial in overcoming cultural barriers and ensuring smooth operations.

Despite the challenges, multinational collaboration on sustainment is essential for USINDOPACOM to achieve its security objectives in the Indo-Pacific region. These operations provide opportunities for shared resources, burden sharing, and a united front against threats, adding weight to diplomatic efforts. USINDOPACOM must continue improving overall sustainment efficiency by working with regional allies and partners to leverage their infrastructure and capabilities.

Joint Operations

Joint operations are imperative to the logistical success of U.S. forces throughout the Indo-Pacific theater. There are considerable Service interdependencies when operating in a maritime environment. Unified land operations in the maritime environment require substantial planning and resources to accomplish the mission. There are several means by which the U.S. achieves jointness in the Indo-Pacific region:

- Unified command structure: USINDOPACOM establishes a single commander with oversight of all military activities in the region. This ensures all branches work toward the same goals. The key roles of USINDOPACOM are defense and security through partnership, presence, and military readiness, promoting regional stability, freedom of navigation, and adherence to international law.
- Joint task forces (JTFs): For specific missions, USINDOPACOM creates temporary JTFs that consist of personnel from all branches, promoting interoperability and effective communication. This allows for tailored responses to evolving situations.
- Standardized procedures and training: All branches adhere to common doctrine and training exercises, ensuring seamless communication and cooperation during joint operations.

By addressing resourcing challenges through cooperation and strategic planning, joint operations can leverage the unique capabilities of each military branch to achieve success in the vast Pacific theater within a multidomain environment.

One of the Army's unique capabilities is intra-theater lift. Joint Publication 4-09, Distribution Operations, specifies that intra-theater sealift is provided by Army watercraft units associated with waterborne operational maneuvers and the intra-theater sealift of units, equipment, and supplies. Furthermore, U.S. Code Title 10, subtitle B, Part I (chapter 7062) directs the Army to prepare for land combat and to provide watercraft support in a theater of operations in support of geographic combatant commands.

Army Watercraft

To support the combatant commander in large-scale combat operations, Army watercraft are called upon to conduct intra-theater movement of equipment and sustainment materiel, enable maneuver of unit-sized combat-configured forces, and distribute sustainment into an area of operations forward of the strategic or intermediate staging base. Army watercraft enable joint and combined sea-basing and logistics-over-the-shore operations during all phases of operations, they provide the requisite joint, interagency, intergovernmental, and multinational interoperability in ship-to-shore cargo transfers and harbor utility functions, at full fixed ports, partial fixed ports, austere ports, and on bare beaches.

In support of operations in a maritime environment, the Army has recently placed significant resources into increasing watercraft capabilities in range, speed, survivability, and payload, as well as command, control, communications, computers, cyber, intelligence, surveillance, and reconnaissance. This is necessary to meet joint all-domain operations requirements and, specifically, to answer the growing demand for enabling operational movement and the maneuver of combat-configured

Soldiers from the 5th Transportation Company participate in an activation ceremony at the Army's dock facility in Yokohama, Japan, Feb. 8, 2024. (Photo by Brian Lamar)

forces and enablers to locations in a theater of operations. The increased resourcing postures Army watercraft to perform the following functions in a multidomain environment:

- Enable operational maneuver.
- Conduct amphibious operations.
- Provide logistics to joint campaigns.
- Maintain organic capability to perform ship-to-shore operations in austere conditions.
- Provide intra-theater transport of critical material and personnel.

Recent resourcing increases have already led to the forward positioning and activation of the 5th Transportation Company (Composite Watercraft Company) in February 2024, stationed in Yokohama, Japan. This is the first permanent Army watercraft company stationed outside the U.S. in decades. The unit is and will be equipped with a mix of vessels, including Landing Craft Utility 2000s, maneuver support vessels (light), and tugboats. The Army also has future growth planned with the activation of two more composite watercraft companies in fiscal years 2027 and 2029. This will lead to a shift in the preponderance of Army watercraft alignment within the USINDOPACOM theater. Modernization, integration, and fleet management will continue to be strategic initiatives, ensuring Army watercraft are postured to perform critical functions and to provide increased capabilities for the Army of 2030 and beyond.

Conclusion

The U.S. military has not fought in a large-scale maritime campaign since World War II. The maritime environment provides significant obstacles and constraints that require substantial resources. Logistics is the unsung hero of any island-hopping campaign. By overcoming the challenges of distance, limited infrastructure, and vulnerability, meticulous logistical planning and execution pave the way for military success. By leveraging joint and partnered resources, and by increasing Army watercraft posture within the Pacific theater, the U.S. is postured to combat the unique challenges of the region.

Maj. Morgen Kiser currently serves as the U.S. Army Transportation School proponency officer. She graduated from the U.S. Military Academy and was commissioned a second lieutenant in the Transportation Corps. Her leadership assignments have included commander of 372nd Inland Cargo Transfer Company, Fort Campbell, Kentucky, and company executive officer of 542nd Support Maintenance Company, Joint Base Lewis-McChord, Washington, and forward Camp Buehring, Kuwait. She is a graduate of Combined Logistics Career Course, Transportation Basic Officer Leadership Course, and Air Assault Course. She holds a master's degree in supply chain management and analytics from Virginia Commonwealth University.

Bolstering Relations with Allies in the Pacific

■ *By 1st Lt. Matthew W. Buck*

The U.S. and the Philippines have a long history of cooperation, officially starting in 1951 with the U.S.-Philippines Mutual Defense Treaty. There have been diplomatic relations between the countries since 1946, and currently, both the U.S. and the Philippines are members of the United Nations, the Association of Southeast Asian Nations Regional Forum, and the Asia-Pacific Economic Cooperation Forum. With large-scale combat operations (LSCO) becoming the focus of the U.S. military along the spectrum of conflict, sustaining the force requires changes equivalent to those of the forward line of troops. The U.S. Indo-Pacific Command (USINDOPACOM) was established January 1, 1947, and is currently headquartered in Honolulu, Hawaii. Sustainment in this unified command covers over half the globe, 14 time zones, and some of the most contested waters and territories.

To truly project force and prepare the joint forces in a contested and difficult logistics environment, creating a new APS region for South/Southeast Asia would greatly improve on the current APS-4.

The 8th Theater Sustainment Command is the senior Army logistics command in the USINDOPACOM area of operations (AO). They are responsible for assigning priorities and disseminating tasks regarding sustainment operations. They also act as a touchpoint between USINDOPACOM and Army Material Command, U.S. Transportation Command, and the Defense Logistics Agency.

Sometimes described as opportunistic, logistical planning in the middle years of World War II was regularly contested between the Army and Navy. Each branch believed that its ideas and strategies were the better courses of action. In the Pacific theater, lines of transportation were largely waterways, as opposed to major ports, roads, and train lines in the European theater. Battlefields separated by hundreds or thousands of nautical miles made it challenging to maintain the steady flow of personnel and equipment necessary to keep the advantage.

This analysis still applies today. The distance between the center of USINDOPACOM and most potential points of friction are too far apart for the current logistics posture to truly be effective. Maj. Alice Bechtol posits that while all the branches of the U.S. Armed Forces are standing up new task forces in the Pacific theater, we should also implement a joint logistics command. This new form of command would help unify the fight and inform commanders at all levels so they could make quicker and more effective decisions. It would also prevent disruptions in the supply chain and implement a new standard of theater support.

In the 2022 National Security Strategy, partnerships with treaty allies in the Pacific were highlighted, including the Philippines. Secretary of Defense Lloyd Austin has visited the Philippines several times during his tenure but has had a larger focus on the Pacific theater since 2023. The two countries developed the Enhanced Defense Cooperation Agreement (EDCA). This agreement includes heightened interoperability between U.S. forces and Philippine forces. The Philippine constitution forbids foreign military bases on its land, but the recent EDCA has made exceptions to this by allowing U.S. forces to be indefinitely stationed at the four new bases on a rotating basis. The EDCA also includes U.S. financial aid to improve Philippine military posts. One such upgrade was a $24 million package to improve the runway at Basa Air Base.

Another major U.S. partner in South Asia is Thailand. In 2003, the White House designated Thailand as a major partner in the war on terror and a non-NATO ally. Thailand has gotten closer economically with China over the past few decades but has maintained positive relations with the U.S. Reinforcing ties with Thailand and providing economic and military assistance would help establish stronger relations with current partners in South Asia.

A superior method for analyzing the effect of logistics in any given region is through field training exercises (FTXs), during which Soldiers are given scenarios to test their training and decision-making skills. Logistics, however, continues to be a real-world mission during these training events. Balikatan is a joint-country FTX between the Philippine and U.S. armed forces. Working shoulder to shoulder and sharing the load, there have been 38 iterations of the Balikatan exercise designed to enhance both forces' abilities to work together efficiently and effectively in response to crisis operations, especially in the South China Sea. The French Navy has announced it will take part in Balikatan 2024. This shows an increased interest from other Western allies for closer military relations with the Philippines in response to growing tensions in the region.

Talisman Sabre is similar to Balikatan as a transnational FTX in the USINDOPACOM AO but is a much larger exercise executed biennially. The most recent iteration in 2023 was the largest ever, including more than 30,000 Soldiers from 13 nations. It was the largest iteration of Talisman Sabre since its inception in 2005. Many U.S. allies and partner nations were there. Most of them sent soldiers to participate in the training. A handful of countries—Papua New Guinea, Fiji, and Tonga—participated for the first time, while the Philippines did not (although they did send observers). Including the Philippines, our oldest treaty ally in the region, in the large-scale joint training, or other partners, such as Thailand, would be invaluable to demonstrate alliance, partnership, and cooperation in the Pacific theater.

Outside of establishing and maintaining secure supply lines, the DoD has used pre-positioned stock to increase force projection and to signal commitment to a region to the rest of the world. The Army pre-positioned stock (APS) program reduces deployment response times, allowing Soldiers to fall in on equipment as opposed to bringing their own organic property. These stockpiles can contain a whole brigade combat team's worth of equipment and are available to every combatant commander to support missions, major training exercises, and humanitarian aid. The Army has seven APS regions so commanders can utilize the equipment located within their theater. APS-4 is the designation for stock located within Northeast Asia. These countries include China, Hong Kong, Japan, Macau, Mongolia, North Korea, South Korea, and Taiwan.

USINDOPACOM is much larger than APS-4, however. To truly project force and prepare the joint forces in a contested and difficult logistics environment, creating a new APS region for South/Southeast Asia would greatly improve on the current APS-4. This eighth APS could be located with one of our major partners in southern Asia, such as the Philippines or Thailand.

As national security discussions continue to revolve around potential threats from China in relation to Taiwan and other disputes in the South China Sea, it is important to evaluate the current logistics standpoint, review historical examples, and strengthen our positioning with allies in USINDOPACOM. With the focus now on LSCO, we must be able to adapt and provide sustainment in a contested environment.

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Precision Sustainment and Predictive Logistics in USINDOPACOM

By Don Bates

Implementing precision sustainment and predictive logistics is critical to overcoming contested logistics and sustaining the U.S. Army in the Indo-Pacific region. Precision sustainment is delivering the right supplies and equipment to the right location at the right time, in the most efficient way possible—not too much and not too little. The ability to deliver precision sustainment at the tactical level in a contested logistics environment (CLE) depends on the capabilities and tools developed under the umbrella of predictive logistics. Predictive logistics is a set of transformative capabilities that collect, store, transport, and integrate platform and unit status data with predictive analysis and decision-support tools, enabling commanders to make more informed decisions more rapidly.

Before describing precision sustainment and predictive logistics in more detail, some background on the Indo-Pacific region, the People's Republic of China (PRC), and contested logistics is required.

The Indo-Pacific Region

The U.S. is an Indo-Pacific nation. The U.S. Indo-Pacific Command (USINDOPACOM) is the geographic combatant command responsible for integrating U.S. military forces in this region. The USINDOPACOM area of responsibility extends from just west of the U.S. Pacific Coast to the Indian Ocean and from the Russian border in the north to Antarctica in the south. It is home to more than half the world's population (more than 4 billion people) in 38 nations, includes 65% of the world's oceans, 25% of the world's land, and almost 66% of the global economy.

The distance from the U.S. West Coast to China is almost 6,000 miles, nearly double the distance from the U.S. East Coast to Europe. The distance to Guam is also 6,000 miles, and the distance to South Korea and Japan is more than 5,000 miles. These long distances lead to long transit times. An aircraft carrier can transit the Pacific in about one week. Army Soldiers, supplies, and equipment take 15 to 30 days to go from the U.S. West Coast to Australia, Guam, or Japan.

The Indo-Pacific is vital to U.S. security. Per the White House policy document, Indo-Pacific Strategy of the United States, dated February 2022, the U.S. is "committed to an Indo-Pacific that is free and open, connected, prosperous, secure, and resilient." Additionally, this "cannot be accomplished alone: changing strategic circumstances and historic challenges require unprecedented cooperation with those who share in this vision." With allies and partners, USINDOPACOM enhances stability in the region by promoting security cooperation, encouraging peaceful development, responding to contingencies, deterring aggression, and, when necessary, fighting to win. U.S. allies and partners in the region include Australia, India, Japan, New Zealand, the Philippines, Singapore, South Korea, and Thailand.

The People's Republic of China

Per the CIA's The World Factbook, the Indo-Pacific is home to the world's five largest militaries: the PRC, India, the U.S., North Korea, and Russia, with the PRC having the largest. Per the 2022 U.S. National Defense Strategy, the PRC is the most serious threat to U.S. national security. While the U.S. seeks a free and open Indo-Pacific, the PRC seeks to undermine our regional alliances and threaten other countries in the region. The PRC works to weaken U.S. partnerships and alliances in the region and uses its economic and military influence to pressure and intimidate our allies.

As described in the 2022 U.S. National Defense Strategy, the PRC's People's Liberation Army (PLA) is expanding its warfighting capabilities (including nuclear) and its global footprint with overseas bases. The PLA is modernizing its capabilities across all warfare domains so it can conduct the full range of operations, including land, air, maritime, and cyber. The PRC military strategy is based on the concept of active defense, which means to defend strategically while being on the offensive at the operational and tactical levels. Active defense is based on the principle of not starting armed conflict but responding if needed. The PLA's core operational concept—multidomain precision warfare—leverages its command and control/information technology network to identify weaknesses in the U.S. system and to respond with precision strikes against those weaknesses.

As described in the DoD's 2023 annual report to Congress on PRC capabilities, the PLA has about 1 million soldiers. The PLA Navy is the world's largest, with more than 370 ships and submarines. The PLA Air Force and PLA Navy combined have more than 3,150 aircraft. The PLA Rocket Force contains more than 3,000 missiles (some that can reach the continental U.S., Hawaii, and Alaska) and controls the PRC's land-based nuclear and conventional missile forces.

Contested Logistics Environment

As defined in Title 10, Section 2926 of the U.S. Code, a CLE is "an environment in which the armed forces engage in conflict with an adversary that presents challenges in all domains and directly targets logistics

operations, facilities, and activities in the United States, abroad, or in transit from one location to another."

The U.S. Army must be prepared for large-scale combat operations (LSCO) in the Indo-Pacific where its logistics operations will be contested and where Soldiers, bases, and operations can be observed, disrupted, delayed, and attacked. Our forces must be prepared for the following:

- Dis- and misinformation campaigns against Soldiers before and during deployments.
- Disruption (through cyber attacks) to networks and systems.
- Disruption of ports, power grids, fuel, and water.
- Delay, disruption, and attack on Soldiers and units as they transit to the theater.
- Disruption and attack on inter-theater and intra-theater lines of communication.
- Direct attack on sustainment forces.

During LSCO, U.S. forces will not have the luxury of a secure rear area and must anticipate that the enemy will detect and attack their sustainment capabilities. To prevent this, units must disperse and displace their assets. While dispersed operations make it less likely enemy artillery and missiles will destroy units and supplies, they complicate command and control and are less efficient than a massed and centralized approach.

To address these and related issues, the Army stood up the Contested Logistics Cross-Functional Team (CFT) in 2023. The Contested Logistics CFT's four portfolios are precision sustainment, multi-capable distribution platforms, demand reduction, and advanced power. Within the precision sustainment portfolio, the Contested Logistics CFT is investigating data-driven capabilities and leveraging artificial intelligence, specifically machine learning, enabling tactical precision sustainment and mission command decision support. The Contested Logistics CFT is currently leading the development of a predictive logistics capability development document, which will specify the requirements, criteria, and attributes for needed predictive logistics capabilities.

Precision Sustainment and Predictive Logistics

In a CLE during LSCO, delivering precision sustainment will be essential to meeting the maneuver force's operational demands. The high operational tempo and increased lethality of our maneuver force will significantly increase demands on fuel, water, ammunition, and equipment. LSCO will require the ability to move and distribute large amounts of supplies, people, and equipment to the right places at the right times.

Precision sustainment depends on the development and integration of the predictive logistics umbrella capabilities of collect, store, distribute, analyze, and visualize. High-level requirements are as follows:

- **Collect:**
  1. **Platform Data.** Platforms must have sensors to monitor maintenance conditions, fuel status, and ammunition status (as applicable). Many current platforms already have this capability to some degree. New platforms must also have sensors, and the data collected must be government owned. The platforms must have the ability to offload the data.
  2. **Logistics Status (LOGSTAT) Data.** The LOGSTAT data (status of a unit's ammunition, food, water, and fuel) must also be automatically collected. This data feeds the LOGSTAT report.
- **Store.** The platform sensor data must be stored locally, for both local use and for when the platform and unit are disconnected. The LOGSTAT data also must be stored locally to feed the LOGSTAT report.
- **Distribute.** The platform data and the LOGSTAT data must be transported through approved Army networks, such as the Integrated Tactical Network, to the next echelon.
- **Analyze.** All echelons, from the platform through the enterprise, require predictive analysis capabilities, to provide platform health and automate generation of the LOGSTAT report. At each echelon, this integrates platform data and LOGSTAT data to inform commanders of their unit's status. This drives anticipatory sustainment decisions.
- **Visualize.** This speeds the decision cycle for commanders at all echelons through decision-support capabilities. It uses LOGSTAT data to identify logistics requirements, provide visibility on critical shortages, forecast future support requirements, and provide the common operational picture to sustainment leaders, supported commanders, and staffs. It also provides tools for developing support concepts and echeloned sustainment support.

While the Contested Logistics CFT is working to develop and integrate these capabilities today, several existing and developmental programs could be integrated to provide minimally viable solutions:

- **Collect and Store.** Build on the Global Combat Support System-Army Aircraft Notebook, Stryker Tablet, and Digital Logbook to collect platform health information. Additionally, the Naval Autonomous Data Collection System (NADACS) is a government-owned capability designed to collect logistics data from the tactical edge. Within the NADACS Amazon Web Services GovCloud environment, data can either be visualized in a web application or forwarded into relevant Army systems for leaders at all echelons. NADACS has an authority to operate that includes passive radio frequency identification and mesh tags for marking material, data collectors (radio frequency identification scanners and mesh gateways), and a data repository. All data generated and collected in NADACS remains Army owned.
- **Distribute.** These networks must accommodate secure, large-scale, and rapid data transmission. Approved Army networks such as the Integrated Tactical Network and Next Generation Command & Control—a framework for prototyping a data-centric and transport agnostic network composed of modular, scalable applications—can fulfill these needs securely and reliably.
- **Analyze and Visualize.** The Army Artificial Intelligence Integration Center's Griffin tool is a web-based system for conducting predictive aviation maintenance management. It pulls data from existing Army systems to automate current aviation daily status report processes. Army Vantage and the Army Material Command Predictive Analytics Suite (APAS) allow users to view comprehensive Army-wide data, analyze trends, and make data-driven decisions. For ongoing operations in Europe, APAS provides visibility of repair parts and ammunition availability now and forecasts for the future.

While the collection, storage, and distribution of the platform and unit status data are vital, the integration of this data with predictive analysis and decision-support tools is critically important, because it allows Army sustainment leaders to anticipate and react to the maneuver force's requirements in an LSCO environment.

Conclusion

The U.S. is an Indo-Pacific nation, and the region is vital to U.S. security. The PRC, the most serious threat to U.S. national security, has the capability to disrupt U.S. Army operations, especially sustainment operations, in the Indo-Pacific. To mitigate PRC capabilities, the U.S. Army must continue implementing precision sustainment and predictive logistics, building on and integrating current and developmental programs while working to implement a predictive logistics program of record. These capabilities will collect, store, transport, and integrate required data with predictive analysis and decision-support tools to enable commanders to make more informed decisions more rapidly.

Don Bates is a retired Army civilian and currently serves as a program manager with LMI. Before retiring, he served as the chief of the Logistics Enterprise Support Agency under the Headquarters, Department of the Army, G-4. Before coming to the Army, he served as the director of the Joint Warfare System Office in the Office of the Secretary of Defense, Program Analysis and Evaluation. Before becoming a DoD Civilian, he served as a logistics officer in the U.S. Marine Corps. He holds a Master of Science degree in operations research from the Naval Postgraduate School, Monterey, California, and a Master of Science degree in supply chain management from Syracuse University, Syracuse, New York

Featured Photo
Assembled and newly packaged FIM-92 Stinger Missiles in a stockyard on October 25, 2023, at an undisclosed location in the CENTCOM Area of Operations. (Photo by Capt. Nick Beavers)

LEGITIMIZING AMMUNITION

LOGISTICS IN INDO-PACIFIC COMPETITION

By Chief Warrant Officer 4 Zachary J. Keough

In an environment composed mostly of air and sea, Army missions remain integral parts of joint and multidomain operations, and unified action, in the Indo-Pacific. Maintaining free and open access to the maritime domain in the Indo-Pacific remains a cornerstone of U.S. strategy and is paramount to its national security. U.S. Army Pacific remains committed to this strategy by providing ground forces to support security cooperation activities. These efforts align with the Army's overarching objectives in the regionally aligned readiness and modernization model designed for competition while posturing for crisis response and to prevail in conflict should the need arise.

Army, joint, and multinational cooperation activities in the Indo-Pacific continue to broaden. However, the current posture of ammunition logistics support in the theater will present challenges in the event of an exigency. Traditional practices of ammunition support to Army forces (ARFOR) participating in security cooperation activities are cumbersome and limit the commander's deterrence and sustainment options. These shortfalls present opportunities for U.S. Army Pacific to shape its theater munitions enterprise and to leverage U.S. Army Forces Command units to meet the dynamic challenges posed by a pacing threat.

Mobilizing Expeditionary Ammunition Support

Security cooperation activities are not a new concept for U.S. Army Pacific. In recent years, Army-sanctioned security cooperation activities occurred under the moniker of Operation Pathways. In this period, ARFOR became responsible for sourcing ammunition from either home station or Japan and the onward movement to the point of need. Before the advent of Operation Pathways, the former 83rd Ordnance Battalion in Japan delivered ammunition to the warfighter in a limited capacity. After the battalion's deactivation in 2013, the responsibility shifted to ARFOR to source ammunition accordingly. These practices overwhelmed ARFOR with logistical challenges and stultified the commander's freedom of action and prolonged endurance.

In 2024, the integration of modular ordnance (ammunition) teams will relieve ARFOR of these responsibilities and permit maneuver and fires units to focus on key security and training objectives with partners and allies. These small teams will establish an expeditionary ammunition supply point (ASP) and employ ammunition logistics information systems and emergent technologies to aid their efforts to support the force. They are also responsible for the reception and staging of ammunition at the point of need. After concluding the mission, the supported forces will turn in unused ammunition and associated materials to the ASP, which will prepare the assets for retrograde. This capability affords commanders convenient sourcing at the point of employment and increased flexibility in providing ammunition logistics support.

Defining a S'Pacifc Purpose in Competition

Security cooperation activities in the Indo-Pacific theater provide modular ordnance (ammunition) companies with opportunities to rehearse their craft, understand foreign environments, establish partner relationships, and maintain operational readiness. Since the drawdown of U.S. forces in support of counterinsurgency operations, modular ordnance (ammunition) companies witnessed fewer opportunities to provide support to the warfighter in foreign environments.

In recent years, the European theater established requirements for these specially trained units to support security cooperation activities. Unfortunately, the protracted missions in the European theater limit the amount and frequency of opportunities for modular ordnance (ammunition) units to hone their craft in support of real-world missions abroad. The quantity, duration, and frequency of missions in the Indo-Pacific provide increased opportunities to assign multiple teams from different modular ordnance (ammunition) companies, including the Army Reserve and National Guard. The shorter increments of supporting security cooperation activities in the region do not devalue these opportunities. The ammunition professionals who compose these small teams will support fast-paced

operations in a foreign environment while maintaining strict accountability of Army ammunition, missiles, and explosives throughout the mission.

Assured Sustainment and Talent Development

The integration of modular ordnance (ammunition) teams into security cooperation activities west of the International Date Line creates efficiencies in ammunition support, beginning at the source of origin. The gradual growth in security cooperation activities in the Indo-Pacific is stressing the workload of the supporting ammunition supply activities in Japan and warrants a corresponding increase in the workforce. The restationing of the 205th Ordnance Platoon to Japan provides assurance and insurance in sustainment. The platoon enables the supporting agency to seamlessly transition its support in the event of crises or armed conflict with minimal to no disruption in the volume of munitions throughput. Integrating the 205th Ordnance Platoon into the Japan support activities enables the supporting commander to surge capabilities when and where needed across the region.

Until now, ammunition Soldiers have had few opportunities to hone their craft on a consistent basis; the integration of the platoon into an ammunition supply activity will provide them with more such opportunities. Talent development enhances job satisfaction and retention while providing opportunities to shape future leaders in the field. This restationing effort provides a significant return on investment for the theater Army ammunition enterprise and the Army as a whole.

Adding Value

Recently, U.S. Army Pacific established a requirement for an ammunition warrant officer to perform functions as an observer coach/trainer (OC/T) for the Army's newest combined training center, the Joint Pacific Multinational Readiness Center (JPMRC). The assignment of the ammunition warrant officer to the 196th Infantry Brigade with the duty title of OC/T is the first among maneuver combat training centers. The OC/T is a seasoned professional who collects and communicates observations for the purpose of informing doctrine, collective mission essential tasks, and individual critical tasks managed in the institutional domain. The OC/T will perform these functions for JPMRC.

The titular nature of JPMRC implies another venue for security cooperation efforts but with the implementation of a live, virtual, and constructive (LVC) scenario. In select JPMRC rotations, the OC/T will have the opportunity to observe the practices of supply chain and distribution management of ammunition from the point of need to the point of employment. The observations collected and presented by the OC/T will enable the training audience to see themselves perform in stressful environments, encouraging ingenuity and resourcefulness. Additionally, these events provide an opportunity for seasoned professionals to coach and mentor junior leaders in environments in which they will expect to operate in the conditions of an exigency. The value of the OC/T cannot be overstated.

Experimenting with Emergent and Existing Capabilities

The Indo-Pacific is the preferred theater for experimentation. In concert with U.S. Army Futures Command, the teams will employ new automated systems as a proof of concept for the Set and Sustain the Theater for Ammunition initiative. Among these emergent capabilities are the Expeditionary Ammunition Site Planning Software and the Configured Load Planning Engine. These two systems comprise a suite of artificial intelligence-enabled capabilities designed to optimize ammunition management, planning, and distribution.

The modular ordnance (ammunition) teams will operationalize these capabilities in contested logistics environments to provide the Futures and Concepts Center with valuable feedback for refinement. In the future, these teams will operationalize other emergent capabilities with the intent to provide visibility of assets and operations at echelon through a virtual common operating picture. Feedback from these teams will inform the product engineers for improvement but will also inform the training developers for inclusion in the institutional curriculum.

Making the Most of an Opportunity

Army units require valuable training before any mission. The prioritization for skill-specific training for sustainers should correspond to the same priority afforded to the warfighter in anticipation of a real-world mission. Modular ordnance (ammunition) units are no exception but have little opportunity in garrison to prepare. The Joint Munitions Command (JMC) provides valuable training opportunities in concert with the organic industry base at multiple locations to help sharpen this perishable skill set. JMC refers to this training opportunity as modular ordnance-specific training.

This training is vital for modular ordnance (ammunition) units in preparation for deployment to operations in Central and Southwest Asia. With modular ordnance (ammunition) units supporting security cooperation activities in multiple theaters, organizational commanders should ensure their ammunition professionals obtain proficiency in training before arriving in theater. Otherwise, the teams are forced to learn in stride, compounding the stress already incurred by the nature of the mission, which lends itself to potential adverse effects. Depriving these modular ordnance (ammunition) teams of the opportunity to obtain essential, skill-specific training ahead of a real-world mission is a disservice to the force and hinders the team's ability to provide responsive, time-sensitive support. These teams must arrive in theater trained and prepared.

Conclusion

The U.S. Army Pacific theater munitions enterprise is setting a precedent for other sustainment-posturing initiatives to position forward capabilities west of the International Date Line. U.S. Army Pacific will present multiple venues for ammunition professionals to obtain proficiency in their craft while providing real-world support in competition. Security cooperation activities in the Indo-Pacific provide opportunities for modular ordnance (ammunition) units to support the Army, joint, and multinational forces in a manner congruent with operations and contingency plans. Meanwhile, U.S. Army Pacific is posturing its ammunition logistics support formation forward to surge capabilities at key joint theater distribution centers to meet the increasing demand for ammunition throughput in the region.

Additionally, the presence of an ammunition warrant officer performing OC/T functions during select JPMRC rotations ensures that junior leaders receive the coaching and mentorship presented in an LVC scenario. The observations collected and shared by the OC/T will help inform student curriculum and doctrinal precepts as they pertain to the uniquely vast and varied terrain of the archipelagos that constitute the theater. Concurrently, the ammunition professionals will have the opportunity to inform the U.S. Army Futures Command with vital feedback regarding its emergent automation.

Finally, training begets preparedness. Organizational commanders should prioritize formal pre-deployment training to ensure ammunition professionals are successful in performing ammunition logistics functions and mission-essential tasks in support of U.S. Army Pacific's theater security cooperation program.

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Joint Maritime Distribution Operations

Reflections of the Pacific Theater During World War II

■ *By Maj. Dan Burkholder*

Even within the vast maritime environment, control of land remains decisive in conflict. J. C. Wylie asserted the Soldier on the scene in control is a main component of strategic planning. In a maritime conflict, Soldiers can fulfill this role. Yet, Soldiers cannot control the scene on their own. They need the integrated joint effort to place them on the scene, and a sustainment network to support their ability to control the scene and win.

Historically, the Army played a critical role in the maritime environment, and Army logistics were vital during World War II. Today, the Army still has an important but less-practiced role in conducting maritime operations as the foundational joint enabler. However, the modern maritime environment creates unfamiliar obstacles for joint distribution. Building an understanding of these inherent obstacles through past reflections offers insight to approach the current logistical

challenges in a contested maritime environment. The analysis of these reflections assists in constructing an adaptive joint distribution framework that is integrated and synchronized to extend operational reach in a large-scale conflict. This article explores the Army's support of the joint maritime theater distribution network during World War II and offers implications for future conflicts.

"The great problem of warfare in the Pacific is to move forces into contact and maintain them. ... Victory is dependent upon the solution of the logistics problem." — Douglas MacArthur, as quoted in *Maurice Matloff, Strategic Planning for Coalition Warfare*

Allied Early Distribution System and First Joint Operations (1941-1942)

Following the attack on Pearl Harbor, the Arcadia Conference shifted the prioritization of resources—particularly troops, supplies, and shipping—toward Europe and away from the Pacific. However, as Japanese forces advanced across the Pacific, the security of the Allied sea lines of communication (SLOCs) became the acute strategic priority. Forced to improvise and accelerate their defensive plans, the War Department adjusted its strategy and scrambled to balance air and ground forces to reinforce the SLOCs and counter the Japanese attempt to isolate Australia.

The Pacific was divided into the South West Pacific Area (SWPA), under the command of Gen. Douglas MacArthur, and the Pacific Ocean Area (POA), under the command of Adm. Chester Nimitz. Within each area, the Allied distribution system was further divided between the Army and the Navy. The Navy controlled and supplied islands and bases garrisoned by the Marines, while the War Department or the Hawaiian Department directly supplied islands with predominately Army forces.

The Allies built advanced bases deeper into the Pacific to extend their operational reach, but the Army, Army Air Corps, Navy, and Marines each had their own separate supply systems and procedures. Lt. Gen. Brehon B. Somervell, the commander of the Army Service Forces (ASF), argued against the joint supply concept. He felt the Army needed to control the supply of the Army's forces and did not trust the Navy's logistical organization to control the joint enterprise.

Eventually, the Army and Navy compromised and worked out a joint logistical plan in July 1942 that more clearly defined the Services' roles. The Navy assumed responsibility for providing all petroleum requirements and supplying all items available from local procurement through the Joint Purchasing Board, while the Army supplied shore-based personnel in the South Pacific bases. Each Service still requested any needs beyond the locally procured supplies through their respective Service channels.

For the Guadalcanal campaign, there was no resupply plan for the 1st Marine Division beyond their initial 60-day supply, and no Army units were integrated into follow-on operations or prepared to relieve or resupply the division. On August 9, 1942, two days after the initial landings, the Japanese destroyed one of Rear Adm. Richmond Turner's transport ships, and he decided to withdraw with half of the Marines' supplies remaining on his cargo vessels. This severely limited the Marines' options, and resupply proved to be challenging because supply depots at Nouméa, New Caledonia, and Espiritu Santo were underdeveloped and not under the division's control. Because the supply consumption rates fluctuated at each base, the reserve stocks varied greatly, and there was no system to quickly respond to the massive, unexpected demands that Guadalcanal required. Army forces at Nouméa fulfilled some of the Marines' emergency requirements, but this depleted the reserve stocks in New Caledonia, and the Army was unable to support other combat operations elsewhere in the theater.

This shortsighted planning nearly prevented an Allied victory at Guadalcanal. The campaign unveiled and compounded issues related to the absence of a coherent joint logistics system and Army logistics integration into planning and operations. The emergency priority shift toward the Allied effort on Guadalcanal strained the whole distribution network. The developing ports could not keep up with the massive influx of troops and supplies. The few ships they did have were often delayed at ports because each Service unloaded their supplies separately and only as needed without coordination or management of the harbor. The inadequate number of port troops along with insufficient storage and discharge facilities intensified the situation. These conditions created such a long, costly backlog that by November 1942, 91 ships were waiting to be unloaded in the Nouméa harbor and could not be used elsewhere in the theater.

Evolution of Allied Distribution Systems and Shipping Crises (1943-1945)

The growing distribution problem motivated Somervell to send the ASF director of operations, Maj. Gen. LeRoy Lutes, to investigate the challenges and develop recommendations. Lutes recognized that the lack of inter-service cooperation between the Army and the Navy intensified the congestion at the port. He recommended a joint logistical staff to determine and manage the South Pacific's requirements, priorities, and unloading. The port congestion gradually subsided by May 1943, but the issue only moved forward in the supply chain as the Allies expanded their operations.

"The ultimate determinate in war is the man on the scene with the gun. This man is the final power in war. He is in control. He determines who wins."

J.C. Wylie, *Military Strategy: A General Theory of Power Control*

Lutes's recommendations reopened the unified logistics debate. The Navy stood firm with its decentralized logistical system that accommodated its mobile sea-based logistical support groups. Conversely, the ASF wanted to consolidate and control resources at advanced land bases through the Army's centralized logistical system. Based on these findings, the Joint Chiefs of Staff adopted the Basic Logistical Plan in March 1943. The Basic Logistical Plan charged each joint area commander with full responsibility for all logistical services and directed them to organize suitable unified logistical supply staffs and to submit priorities for troops and supplies.

Nimitz established the Joint Logistics Board in April 1943, which continued the Army-Navy independence in shipping. Disliking this approach, Somervell sent his subordinate, Brig. Gen. Edmond Leavey, to tour the POA supply facilities. Leavey found the POA did not adopt the Basic Logistical Plan directives and reported there was no staff officer with overall authority over logistics and supply. Nimitz abolished the Joint Logistics Board on September 6, 1943, formed a joint staff, and designated Leavey as the J-4 to manage the responsibility of the logistics division and integrated logistical planning.

In the SWPA, MacArthur's approach toward logistical coordination did not come from the Basic Logistical Plan but through his combined staff and centralized planning. He allowed the various national and Service components to manage their supplies separately and exercised control through prioritization and dictation. Without any organization or consolidation of his amphibious forces, MacArthur relied on the War Department to meet all of his landing craft requirements and competed heavily for port facilities and transportation assets. This led the SWPA toward a tendency to retain as many vessels as possible from the War Department.

In the fall of 1943 and again in the middle of 1944, the increased requirements for the Central Pacific offensive, combined with the SWPA's increased offensive operations, created a shipping crisis. The increased demand and heavy congestion in the Atlantic and Pacific began to take a toll on the Allied efforts. The crisis forced all theater commanders to make cutbacks in their fall and winter 1944-1945 requisitions, and they had to operate with less shipping capacity. As a result of the global crisis, President Franklin Roosevelt published a directive forbidding the use of vessels for storage, stopping selective discharge, and penalizing theaters for retaining vessels. The directive inspired change and reduced the emergency, but operations were delayed and drastically reduced.

In April 1945, the Joint Security Council (JSC) appointed MacArthur as Commander in Chief of Army Forces in the Pacific and Nimitz as the Commander in Chief Pacific Fleet to command all Pacific Naval resources while the JSC would be the unified command. Although this new plan allowed for a gradual transition, it voided the Basic Logistics Plan. Within the new command structure, each Service developed divergent proposals for managing common supplies and services to prioritize demands. Adm. King proposed a joint shipping agency, but MacArthur rejected it, wanting more control over Army resources. The war ended before a new revised method of separated logistical systems and direct shipments to assault areas was thoroughly tested.

Analysis

The Army attempted to integrate joint distribution in the Pacific. However, each Service and theater's logistical systems were complex and drastically different, leading to more logistical complications that delayed tempo and limited operational reach. The Basic Logistics Plan was a step toward integration, yet the directive did not establish one standard for Pacific logistical integration and was later dissolved.

To overcome the immense challenge of scale and sheer distances between sustainment nodes within the Pacific theater, the Allies built a chain of advanced bases to push air, land, and sea power closer to Japan. Although this allowed for deeper combat projection and decreased the movement time for supplies, it depended on the throughput capacity of ill-equipped ports. Farther down the distribution chain, transportation distances decreased, but the capabilities of each port also diminished. This seemingly inverse correlation between distance and throughput was most evident in Leyte and Nouméa where a tremendous backlog of ships hindered the build-up for future operations and forced action from Washington. Although closer is typically better, the throughput of each port sometimes delayed supplies longer than if they were shipped directly from San Francisco. Thus, the Allies experimented with a direct shipping method toward the end of the war.

Both the Navy and Army wanted control over segments of the distribution network. This inclination for control, combined with the differences in each Service's logistical system, created significant friction challenges within the network. The Navy's decentralized automatic push-based resupply logistical network focused on the fleet, whereas the Army's centralized demand and pull-based system focused on ground forces and bases. The struggle for control, combined with differing systems and lack of visibility, generated multiple inefficiencies. Moreover, the absence of a theater-based unified element that controlled the prioritization and management of distribution created more strain between each sub-theater to compete for limited logistical resources, such as vessels and common user supplies or equipment. This increased scarcity forced commanders in each theater to reduce their pace and downsize operations.

Relevance for Future Conflicts

Limited Resources. In a large-scale maritime conflict, limited lighterage and sealift assets at the tactical and operational levels hinder flexibility, tempo, and operational reach. Spreading these capabilities across each level is a traditional approach, but it decreases the adaptability of the force to change with the evolving battlefield conditions. Pooling joint sealift and protection capabilities similar to the Marine Corps idea of compressing the levels of logistics may alleviate this inevitable shortfall. Furthermore, adding the ability to dynamically shift between a more conventional model to a compressed arrangement generates additional joint flexibility. It allows the joint force to converge capabilities for emerging operational requirements and to shift back to a more diverged state that provides stability and tactical flexibility.

Integration. The modern U.S. military has made significant progress toward a joint mindset since World War II. However, Service parochialism and segregation still exist and must be overcome to synchronize joint force capabilities and requirements more holistically and efficiently. The Services have different approaches to confronting contested logistics, but a unified and agreed-upon framework to merge different services and levels of capabilities before a conflict occurs mitigates the risk of initial logistical struggles. Otherwise, each Service will only look inwardly to extend its operational reach, creating inefficiencies and generating additional scarcity in a resource-constrained environment, which will hinder all operations.

Dispersion/Concentration. Electronic warfare, long-range fires, and low-cost drones will continuously threaten key logistics nodes such as ports and lines of communication (LOCs). To mitigate these threats, dispersing and extending LOCs are necessary to reinforce the distribution network. However, greater dispersion and less concentration require not only more synchronization to orchestrate the additional nodes but also support and protection capabilities at each location. Thus, a balance must be made between using several dispersed nodes with limited protection capabilities and fewer larger nodes with higher levels of protection. A dynamic logistical hub-and-spoke model, where nodes can diverge and converge based on the changing requirements and evolving environmental conditions, may offer a solution to balance this tension.

Control/Flexibility. Centrally controlling logistical resources and capabilities at the operational or strategic level hinders the flexibility of tactical organizations to rapidly adapt to changed combat conditions. Conversely, decentralization with added flexibility to the tactical levels hampers the ability of operational and strategic levels to manage, prioritize, and converge toward emerging requirements. Under certain circumstances, merging tactical assets to support another higher-priority operation is required, and once that high-priority requirement is filled, the capabilities can shift back to support more decentralized tactical requirements.

Conclusion

In conclusion, land is a foundational element of all activities in other domains, and the ability to control it will be decisive. The Army has a vested interest in not only controlling the land in the maritime environment but also in sustaining the Soldiers who control it. Sustaining the Soldiers requires the integration and synchronization of the joint force. Although the Allies overcame a lack of integration with informal coordination and mass production to sustain their forces, in a future conflict, the U.S. probably will not have the same luxury. Thus, the Army has an opportunity to create shared understanding across the Services. Doing so merges the Services' different concepts of operating in a contested environment to adaptively balance the tensions between control and flexibility and between dispersion and concentration. Flexibility in shifting these scales, especially in the complex Pacific environment, is a significant challenge. Yet, if the Army integrates and synchronizes the joint distribution network, it cannot only function in the complex environment but also harness complexity to its advantage while adapting to the changing variables of the operational environment.

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Featured Photos
Left: Aerial view of the Allied invasion fleet at Leyte in Seeadler Harbor, October 1944. (San Diego Air and Space Museum Archive)
Right: Unloading supplies and ammunition in Nouméa Harbor, New Caledonia, January 1943. (National Archives photo no. 80-G-34552)

Hell On Wheels

■ *By Maj. Christopher Madden*

Ever since Russia and colluding rebels occupied Crimea, the Russians have built an extensive military network along Ukraine's borders. They built bases, staging areas, and military infrastructure, and ultimately, in late 2021, moved in a surge of troops, material, and equipment. Analysts became certain these actions were not simply another training exercise designed to intimidate when they noted the presence of equipment required for a major military operation, including medical units with surgical capabilities and fuel depots. Nearly all this equipment was moved with the assistance of the Russian military rail network, which is elite in size and capability.

There are myriad reasons the Russian military rail system is superior to that of the U.S. While the U.S. does not need to match the Russians in size and capability, there are lessons to be learned about why Army rail capabilities are still important. This article looks at why Russia values its rail system and the logistical shortfalls it creates. It then examines the current state of the U.S. Army rail network, the impediments to progress, and a proposed solution. Though it is not currently a high priority, failure to modernize the Army rail lines, fleet, and associated facilities, as well as training, policy, and sustainment structures, may render the mounted force unable to achieve overmatch against near-peer competitors.

Russia's view on national security is different than the U.S. view because the U.S. values the global force projection of its ground forces and the protection of global trade via the Navy. Russia has been invaded over 50 times in its history, and more often than not weather has evicted the invader, not the military. Russians are not ignorant of this fact and have developed a defensive strategy to keep potential invaders out. The strategy is reaching geographical barriers like the Caspian Sea or the Karakum Desert and forward positioning and slowly moving their army to plug the gaps. Since the fall of the Soviet Union, Russia, under Vladimir Putin, has been fighting to regain this level of security, leading to

conflicts such as the Georgian War and the Cossack Intervention.

The Russian Federation is nearly 6,000 miles in length across mostly impassable lands, which is where the rails come in. Their rail network allows them the flexibility to mass troops and equipment relatively quickly across swaths of land that cannot support paved roads. Ukraine finds itself in between the Russians and the control of one such gap, the area between the Black Sea and the Carpathian Mountains, otherwise known as the Bessarabian Gap.

When the first Russian rail line was built in the 1830s, Tsar Nicholas I deliberately chose the 5-foot track gauge for defensive reasons, knowing it was different than the standard gauge being adopted in most of Europe. Only former Soviet satellite nations and Finland still use the Russian standard. This logistical advantage would later be built upon by Josef Stalin during the interwar period and was critical in facilitating the transfer of Russia's war economy to the eastern region of the country during the early days of Operation Barbarossa in 1941. This logistical framework was so efficient that even unrelenting artillery strikes and aerial bombardment could not slow its movement. It seems Russia built an ideal infrastructure for its strategy of an active defense.

With this in mind, Russia can be forgiven for cultivating a military that is highly effective when fighting on their native soil and using indirect fires to inflict damage on their adversary's reserves. However, they are not proficient in sustaining a prolonged ground offensive when far from the safety of their railroads without a major logistical culmination. The point of departure from their railhead to the forward line of troops is where the Russian logistical issues begin. Conversely, the U.S. does quite well in maintaining supplies from the operational level to the tactical level but can learn from the Russians' use of their rail system.

In modern times, the U.S. has had the luxury of deploying brigades from within its borders to friendly ports over uncontested waters. However, were this not the case, the U.S. would have difficulty massing its forces globally with speed. A report published in August 2021 from the Government Accountability Office supports this opinion. The report concluded that due to a lack of trained rail crews and an inadequate system of maintaining the serviceability of the Army rails, the U.S. could find itself slow out of the blocks to project its forces abroad in support of a major conflict.

There are more than 120 defense installations and activities in the continental U.S. (CONUS) that require the use of rail to meet their assigned missions. The Army is responsible for 60 of these installations, which contain approximately 1,100 miles of track. These Army installations are linked to 33,000 miles of main railroad track that have been identified as important to national defense and designated as the Strategic Rail Corridor Network under the DoD's Railroads for National Defense Program. It is common knowledge that rail is the least expensive and quickest way to move equipment and material over long distances over land, and it is estimated close to 70% of the Army's equipment will move by rail. Approximately 1 million tons of material were moved by rail in support of Operation Iraqi Freedom, twice the weight of the Army's 6,300 main battle tanks.

In 2015, an Army analysis of its force structure led decision-makers to institute changes to their rail units. According to Army force developers, there was no requirement for Soldiers to act as rail operating crews, either in CONUS or overseas, during the global war on terror. In a future conflict, to carry the bulk of the load the Army would rely on civilian operators in CONUS and on host-nation contracted operators when they arrived in theater. This would also lead to a 70% reduction in the Army rail force structure, dropping the force from over 600 personnel to the single 180-person 757th Expeditionary Rail Center (ERC).

Army Techniques Publication 4-14, Expeditionary Railway Center Operations, states the ERC's mission is to plan, advise, provide capability assessment, and coordinate operating control for host-nation rail lines for a combatant commander. The ERC also focuses on improving strategic and operational throughput at the port of entry, and on contractor oversight. Despite this, the ERC has been put to work providing crews to facilitate rail activities as needed in CONUS at an ever-accelerating rate. Thus, as the available population of qualified rail crews has shrunk, the workload has multiplied. While the Soldiers of the 757th ERC assist here at home, they maintain their primary mission of advising overseas. Should there be a large-scale mobilization, these same Soldiers would be required elsewhere.

In 2019, Headquarters, Department of the Army, issued Execute Order 065-19, Total Army Unit Movement Readiness, and tasked the Surface Deployment and Distribution Command (SDDC) with researching the capability of the Army's rail fleet. While the SDDC acknowledged there was a gap between what the Army rail could provide and what would be required in case of mobilization, it failed to quantify the number of rail crews required to sustain 24-hour operations in CONUS.

Arguably, contractors could help fill the void, but that reliance has its own issues. As recently as 2022, rail unions were unable to negotiate their labor contracts with their employers. A strike was averted only by a vote in the House of Representatives to impose a tentative contract deal that was reached in September 2022. The law raised workers' pay by 24% over five years, including an immediate average payout of $11,000 upon ratification. However, the agreement was approved only by eight of the 12 transportation unions involved in negotiations. The lack of paid sick leave for railroad employers prevented the remaining four unions, which represented over 100,000 employees, from ratifying the agreement. The negotiations shined a spotlight on the present instability of the railway industry. Thus, it may not be a reliable option for the Army in the event of a mobilization, an issue with which Russia does not have to deal.

Another considerable challenge to the Army rail system is its state of disrepair and the lack of maintenance oversight. Over the past five years the U.S. Army Installation Management Command, which falls under the Army Material Command, has labeled over 550 miles, or nearly 60% of the total Army track available, as red track. Red track is track that failed its ultrasonic inspection and should be closed and repaired as soon as possible. In May 2017, rail inspections at Fort Campbell, Kentucky, revealed sobering safety concerns, prompting inspectors to recommend a certified track inspector conduct a 100% inspection and total replacement of all red track before it is used again. This incident is not unique. Based on inspection findings, it would cost close to $41 million to correct all known deficiencies, which in the realm of strategic movement is very little. These holistic issues are due to the Army's lack of central oversight of rail repairs and funding.

The U.S. military finds itself at an interesting and familiar time, facing possible large-scale combat in Europe and the Pacific. Decades of asymmetric warfare have degraded the ability of the mounted force to project in support of large-scale warfare where ports of debarkation and embarkation may be contested. If the Army wishes to be ready for when competition turns to conflict, it must bolster the funding and manpower of its rail fleet and earnestly begin working to repair its rail infrastructure. The number of expeditionary rail units should increase from one to four, and the Army Material Command should stand up a dedicated quality assurance and control section for the Army rail network. It is no coincidence railways have changed the nature of war; they were tailor-made for it with their precision and efficiency. From the Crimean War to the Korean War to Operation Iraqi Freedom, railways have been an integral part of the conduct of war. Indeed, without the rails, industrial large-scale warfare and large-scale carnage would not be possible.

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Featured Image
The Fort McCoy Logistics Readiness Center rail operations team moves railcars with an installation locomotive at Fort McCoy, Wisconsin, May 14, 2020. (Photo by Scott T. Sturkol)

Unveiling the Significance of the Army's Training with Industry Program

The Training with Industry Program and Why It Is Important to the Army

By Capt. James DiCarlo

Transformation in contact requires today's Soldiers to adapt to the advancements of technology and to modernize to maintain dominance against peer competitors. The Army's Training with Industries (TWI) program is a unique broadening opportunity that enhances a Soldier's knowledge of corporate capabilities and methods within their occupational specialty. The corporate Soldier advances the Army's readiness efforts of transforming in contact to meet the demands of a multidomain battlefield and move at the speed of technology. This unique opportunity provides engagement with cutting-edge innovation within the civilian sector while enhancing your warfighters' skills in leadership, management, and specialized corporate knowledge The program provides a holistic learning experience for Soldiers who serve as fellows for leadership roles in an evolving and dynamic military environment at the operational and strategic levels. Program fellows learn how industry supports military requirements and addresses critical gaps while cultivating a well-rounded, adaptable, and forward-thinking leader.

The Army's TWI program dates to the mid-1970s and was established to provide selected officers with the opportunity to gain valuable experience and exposure to civilian industry practices. In the 1980s, the Army analyzed corporate practices for answers to innovation questions and building solutions to materiel issues and processes. These processes included decision-making tools, risk management, just-in-time logistics concepts, incorporating artificial intelligence, automation of warehousing, and using data analytics. The insights from this analysis assisted in Army development and innovation. The program was so successful that NCO and warrant officer programs were developed in the late 1990s and early 2000s.

Today, the program continues to adapt to meet the evolving needs of the Army, serving as a vital component of officer professional development. It offers a unique amalgamation of civilian and military experiences, thereby enhancing the overall readiness and effectiveness of Army leadership.

Maximizing Success: The Mutual Benefits of the Army, Industry, and the Fellow

The industry gets access to some of the Army's most talented young officers. The TWI fellows bring unique perspectives and leadership abilities. Also, the industry partners benefit from the exchange of knowledge when fellows reintegrate into the civilian workforce, introducing new ideas and approaches. Lastly, hosting TWI fellows demonstrates a company's commitment to supporting the military community and can enhance its reputation as a responsible employer.

Officers benefit significantly from exposure to industry best practices in petroleum distribution, storage, innovation, and technical development, thereby expanding their knowledge beyond traditional military training. Specialized training opportunities with the host company and during utilization assignments could lead to courses such as the Petroleum and Water Officer Course, enabling the officer to pursue energy solutions relevant to their career aspirations and ultimately bring added value to the force. Additionally, this program gives officers the chance to explore career paths outside the military, enhancing their leadership versatility and adaptive skills for diverse environments.

The Army benefits from this program by enriching officers' career development through skill enhancement in petroleum distribution, storage, and logistics over-the-shore operations in the U.S. Indo-Pacific Command and Arctic areas. Furthermore, officers can bring back technology and best practices, including data analytics and machine learning, to keep the Army abreast of advancements. The program also provides a unique opportunity for officers to develop leadership skills in civilian contexts, thus enhancing their effectiveness as leaders. Participation in this program facilitates the establishment of valuable networks and connections with industry professionals, fostering collaboration and potential partnerships that can benefit the Army across various domains.

The Program with Crowley Maritime

In 2021, I was honored to be appointed as the TWI fellow at

Crowley Maritime in Anchorage, Alaska. This opportunity allowed me to delve into petroleum maritime operations, gaining insights into their role in supporting future Army requirements. The experience provided invaluable exposure to commercial industry practices, including joint logistics over-the-shore (JLOTS), at-sea replenishment, and collaboration with inter-service agencies worldwide.

I acquired extensive knowledge and experience in petroleum operations during my tenure at one of the leading petroleum distribution companies in the Pacific region. Additionally, I served as a project manager at Crowley, where I gained valuable experience in procurement, planning, and execution of global operations, including supplying over 58 million gallons of fuel to the DoD.

Upon joining Crowley, I participated in an onboarding process that involved meetings with the company's vice president and a program director. During these discussions, we outlined learning objectives and assessed my skill set. Before my arrival, mutually agreed-upon learning objectives were established between the Army and Crowley, focusing on areas such as over-the-shore delivery methods and commercial JLOTS operations conducted by Crowley in the Bering Sea and across the Pacific. Furthermore, my learning objectives included gaining insights into inter-service engagements and observing Crowley's conduct of at-sea replenishment operations. Within this scope, Crowley provided exposure to industry innovations, particularly in aircraft refueling, barge concepts, and floating storage capabilities.

Transitioning from my role as a post command logistics officer in a Stryker brigade to working at the defense fuel support point (DFSP) in the port of Anchorage exposed me to the significant scale of daily fuel operations and transactions. Managed by Crowley as a contractor-owned and contractor-operated facility, the DFSP provides 40 million gallons of aviation turbine fuel storage to the U.S. Defense Logistics Agency (DLA) Energy in support of nearby military operations at Joint Base Elmendorf Richardson. This experience provided valuable insights into corporate structures and the requisites for successfully securing and managing profitable contracts and a comprehensive understanding of Crowley's fuel management systems, technology, and procedures.

Furthering my understanding, I visited a newly established Crowley bulk fuel storage facility located in the interior of Alaska. The facility provides 21 million gallons of aviation turbine fuel storage for DLA Energy in support of Eielson Air Force Base and Fort Wainwright. This visit provided insights into pipeline operations, the construction of tank truck loading facilities, and the operations of railcar loading facilities.

I enjoyed going to Valdez, Alaska, to see how ocean-going tankers receive crude oil from the Trans-Alaska Pipeline. I then sailed on a Crowley Maritime crude oil tanker, the *MT California*, from Valdez to Long Beach, California, to see how Crowley Maritime conducts Pacific Coast bulk crude oil deliveries. The *MT California* is 251 meters long, 44 meters wide, and crewed by 21 Crowley Maritime workers. It has a maximum storage capacity of 36.2 million gallons of crude oil split across the 12 internal tanks. I was impressed by the loading of 700,000 barrels (29.4 million gallons) of crude oil from the Trans-Alaska Pipeline within a 22-hour window. All the while, 2 feet of snow fell on the ground and did not affect operations.

Furthermore, I observed a partial discharge of crude oil at El Segundo, California, at one of the few multi-point mooring terminals on the West Coast. These specialized terminals facilitate vessel discharge and/or cargo reception from the shoreline while maintaining a distance of up to 1 mile from the coast. During cargo transfer operations at such terminals, a vapor barge is used to capture fuel vapors generated in the process. Our discharge operation, which involved 12.6 million gallons of crude oil, took approximately 10 hours to complete, culminating in its delivery to the onshore refinery.

Crowley secured a multi-year contract from the U.S. Department of Energy to establish and manage a DFSP in Darwin, Australia, for the Australian Defense Force during my tenure in their technical workforce initiative program. The initiative, known as Project Camus, aimed to construct a 50-million-gallon fuel support facility catering to aviation-grade JP-5 and commercial Jet A-1 fuel products. Additionally, the facility was designed to accommodate vessel support, tank truck loading operations, and on-site fuel additization. This experience provided me with valuable insights into developing business plans and devising solutions tailored to military requirements.

International Challenges

In the petroleum industry, I gained insights into the formidable challenges encountered by U.S.-based companies involved in the transportation, storage, and distribution of petroleum products across Europe and the Pacific, in contrast to their operations within the U.S. One primary hurdle arises from the disparities in regulations and standards governing the oil and gas sector. In Europe, adherence to a multitude of European Union regulations is imperative, characterized by their rigorous and intricate nature compared to the comparatively simpler U.S. standards. Navigating this diverse regulatory landscape demands significant time and resources while ensuring profitability remains intact.

Europe's geopolitical landscape comprises 44 countries, each with its own unique political and economic dynamics. Negotiating these geopolitical intricacies and fostering relationships with numerous governments pose considerable challenges compared to the centralized governance structure within the U.S. Additionally, European nations often prioritize environmental conservation and sustainable practices, necessitating U.S. companies to adapt their operations and technologies to meet stringent European environmental standards. Consequently, this introduces an additional layer of complexity to their operations.

Taxation presents a notable challenge, because tariff structures vary across Europe, significantly impacting the cost of conducting business. For U.S. companies operating in multiple European jurisdictions, understanding and adhering to diverse tax laws and tariffs pose a complex task. Additionally, the petroleum industry in Europe boasts well-established local entities, which may pose stiff competition for U.S. companies. Adapting to this competitive landscape and establishing market share present significant complexities.

Summary

Through my extensive tenure at Crowley Maritime, participation in the TWI program has facilitated a diverse array of skill enhancements. These include opportunities for networking, cross-pollination of ideas, familiarity with civilian practices, honing decision-making abilities, adeptness in technology integration, promoting innovation, and fostering mutual understanding between the industry and the U.S. military. Civilian sectors serve as pioneers in technological advancements, enabling us to assimilate and tailor their latest innovations to military applications.

Moreover, the TWI program affords invaluable insights into the operational challenges encountered by corporations on both national and international scales, while simultaneously fostering a deeper comprehension of the military's distinctive needs among civilians. The enduring impact of TWI manifests itself in returning Army personnel who are equipped with enhanced skills, knowledge, and perspectives that significantly bolster the overall efficacy and modernization of the Army.

Capt. James "Jimmy" DiCarlo serves as the deputy director of the Petroleum and Water Department at Fort Gregg-Adams, Virginia. He is a 2015 graduate of Eastern Kentucky University, where he received his commission as a second lieutenant in the Quartermaster Corps. He will be finishing his master's degree in the summer of 2024 from the Florida Institute of Technology. He served as the first fellow in the Training with Industries program with Crowley Maritime in 2021-2022. His military education includes the Quartermaster Basic Officer Leader Course, the Logistics Captains Career Course, and the Petroleum and Water Officers Course.

Featured Photos
Far left: Crowley tanker MT California transports petroleum from Alaska to refineries on the West Coast, May 20, 2021. (Photo by Judy Patrick)
Middle left: Crowley orchestrates one of the nation's most complex fuel delivery systems at Little Diomede Island in the Bering Strait between Alaska and Siberia, an example of Crowley's strategic equipment placement. (Photo by Spencer Proctor)
Middle right: Capt. James Dicarlo supervises a fuel delivery from a Crowley tanker truck at Joint Pacific Multinational Readiness Center 22-0 training exercise around the Donnel Training Area in March 2022. (Photo by Wesley Revel)
Far right: Crowley's tugboat Sesok and barge DBL 165-2 deliver heating oil to Utqiagvik (Barrow), Alaska, via beach landing. (Photo by Patrick Burns)

Honoring Tradition & Adapting to the Future

The Joint Force Award for Water Excellence Program

By Sgt. Maj. Eduardo I. Carranza

As we delve into the dynamic field of liquid logistics, it is crucial to recognize the rich history of the Sgt. Maj. John C. Marigliano Award of Excellence competition, better known as the U.S. Army Forces Command's (FORSCOM's) Reverse Osmosis Water Purification Unit (ROWPU) Rodeo. This is a tradition that symbolizes the unwavering commitment to excellence in water support operations. The threat of conflict and instability remains ever-present, requiring us to be prepared to operate in austere and challenging conditions. Extreme events like the global pandemic disrupted supply chains, causing shortages of critical supplies and equipment. Moreover, many scientists believe climate change may be leading to more frequent and severe natural disasters, which may devastate water infrastructure and disrupt the supply of clean, safe water.

As the Army continues to prioritize readiness in water support operations, it is important to note the transformation of quartermaster petroleum, oils, and lubricants (POL) groups into theater petroleum and water groups (TPWGs), which will take place in the near future. This shift recognizes the critical importance of water in support of large-scale combat operations (LSCO) in a multidomain environment, and the need for a dedicated focus on water production, storage, and distribution. TPWGs will be responsible for ensuring troops have access to clean, safe, and reliable water in support of operation plans and concept plans. The transformation of POL groups into TPWGs is a testament to the growing recognition of the importance of water in military operations. It also underscores the need for continued investment in training, equipment, and technology to ensure we are ready to meet the challenges of the future.

This article celebrates the ROWPU Rodeo's past while emphasizing the need for innovation and preparedness in a continuously evolving landscape. The objective of the ROWPU Rodeo is to train and educate water production teams and foster confidence and esprit de corps within the professional water community.

The Legacy of the ROWPU Rodeo

The ROWPU Rodeo, an event that goes back to 1997, is steeped in military tradition. It has long served as a testament to the dedication and expertise of water experts within the armed forces. Originally conceived to showcase the skills of military water production units, this event has evolved over the years to become a forum for knowledge sharing, innovation, and camaraderie. Today, the ROWPU Rodeo stands as a symbol of the enduring commitment to delivering clean and safe water to troops in the most challenging environments, whether in times of conflict, humanitarian missions, or disaster response.

Transforming the battlefield challenges of liquid logistics remains rooted in the ever-evolving nature of modern warfare and the critical role of water supply and distribution in military operations. These challenges have undergone significant changes over the years and continue to present new complexities. The water community continues to make progress in transforming liquid logistics across the key areas discussed below.

Changing Operational Environments

Modern military operations encompass a wide range of environments. Bulk water sustainment in the Arctic has been the Achilles' heel of the Army and is considered extremely challenging. Equipment readiness is a key determinant for overall mission success in LSCO. Although -60 Fahrenheit (F) is at the lower end of temperatures, the Army's new strategy touches on operations below -60 F and more specifically on having the right mobility assets able to operate under these extreme conditions. A common theme in historical literature dealing with military operations in extreme cold weather conditions is the lack of infrastructure and its impact on operations. Access to road networks, airfields, seaports, and shelters for personnel, power grids, communications assets, fiber optic networks, water, and all classes of supply is typically constrained well beyond all normal planning guidelines.

Bulk water production: Water-based systems are typically rated for -25 F with the ability to store empty at colder temperatures. Water

Soldiers from 127th Quartermaster Company, 3rd Expeditionary Sustainment Command, Fort Liberty, North Carolina, recover the raw water intake/dolphin strainer at the 2023 Reverse Osmosis Water Purification Unit Rodeo at Fort Story, Virginia, May 2023. (Photo by Master Sgt. Benari Poulten)

equipment specifications normally stay in the range of -25 F. For example, the HIPPO 2,000-gallon water tank rack contains an integrated freeze protection system rated to -25 F. Additionally, the CAMEL II 800-gallon water pod system contains an integrated freeze protection system also rated to -25 F. Each environment presents unique challenges for sourcing, purifying, and distributing water. Adapting liquid logistics to these diverse conditions is essential.

Therefore, observations from previous Arctic Warrior exercises led to the development of the arctic fuel glove technology from the Quartermaster Corps' board of directors, which defined Arctic as -60 F, not -25 F. Adapting to these transforming battlefield challenges requires a combination of comprehensive training, technological integration, strategic planning, and a deep understanding of the operational environment. Liquid logistics experts within the military must continuously evolve their approaches to ensure clean and safe water remains readily available in the complex and dynamic landscape of modern warfare.

Transition to the Joint Force Award for Water Excellence Program

In response to Headquarters, Department of the Army, G44S Troop Support's proposal for establishing a comprehensive joint water sustainment training and competition, FORSCOM has concurred and decided to rebrand the ROWPU Rodeo as the Joint Force Award for Water Excellence (JFAWE) Program. This strategic shift allows for broader joint force participation in sustainment training, promoting the use of interoperable water purification equipment. The eventual incorporation of the JFAWE into Army Regulation 700-136, Tactical Land-Based Water Resource Management, will solidify its place within the military framework. Embracing a total joint program approach, the JFAWE extends its reach to encompass the Army (Regular Army, Army National Guard, and Army Reserve), Marine Corps, Navy, and Air Force.

The primary objective of the JFAWE program is to elevate water readiness and effectiveness by acknowledging and honoring outstanding performance in water purification operations across all branches. This initiative serves as a positive motivator, recognizing superior contributions made by military components to water operations within the DoD. Additionally, the program aims to heighten awareness of and adherence to water operations guidelines, fostering a sense of camaraderie and dedication within the joint force water community.

Training and Readiness: Back to the Basics

While the JFAWE provides a platform to demonstrate technical skills, true expertise as a water treatment specialist encompasses a broader spectrum of proficiencies. Participating in the JFAWE competition is undoubtedly a valuable component of showcasing competency and expertise as a water treatment specialist, yet it is just one facet of the comprehensive skill set necessary for success in this field.

Success in water treatment operations demands a commitment to ongoing learning and professional development. While the JFAWE highlights current competencies, true expertise requires staying updated on emerging technologies, regulations, and best practices through continuous education and training. The history of the water treatment specialist role, much like the NCO Corps, boasts a legacy of diligence, adaptability, and technical expertise. Amid the modern complexities and advancements in water treatment technology lies a crucial aspect that is often overlooked: a deep understanding of the foundational history and principles shaping this essential profession.

Presently, many water treatment specialists might possess surface-level knowledge acquired during advanced individual training or through routine military education. However, this gap raises concerns about potentially repeating past mistakes or failing to optimize systems due to a lack of historical context and understanding. Fostering a deeper appreciation for the historical evolution of water treatment could pave the way for enhanced proficiency, innovation, and problem-solving within the field. Much like the camaraderie and unit cohesion built on understanding NCO history, water treatment specialists can benefit from a shared heritage, enabling them to face contemporary challenges more effectively.

Leveraging Advanced Technology for Water Purification and Storage

While technology offers solutions, it also introduces complexities. Advancements in water purification and storage technology provide more efficient methods but require well-trained personnel to operate and maintain these systems effectively. Integrating these technologies into military operations is crucial.

Innovations in technology offer unprecedented opportunities to enhance military liquid logistics capabilities. Advancements in water purification technologies, encompassing new methods for treating contaminated groundwater, seawater, and even wastewater, present more efficient and effective solutions. By encouraging personnel to think creatively and work together, we can develop new solutions to complex challenges and improve overall readiness. This requires strong leadership and a willingness to embrace new ideas and approaches. Moreover, the development of robust and resilient water storage and distribution systems is pivotal in ensuring a consistent water supply, even in the face of operational disruptions. Investment in research and development can greatly enhance our preparedness to face future challenges.

One key area where we can improve readiness is in the development of new technologies and techniques for water purification, distribution, and storage. By investing in research and development, we can find more efficient and effective ways to purify water from a variety of sources, including contaminated groundwater and seawater. Additionally, we are exploring atmospheric water extraction, or water from air, to be able to have water available at the

point of need and reduce the need for water distribution, which will be challenging in multidomain operations. We are also developing new approaches to water storage and distribution that are more resilient to disruptions and better able to respond to changing conditions. Systems like the Marine Corps' Lightweight Water Purification System and the Army's 3,000-gallons-per-hour ROWPU are systems that work and that operators can fix without requiring more advanced training or more specialized tools.

Training and Education

Another critical area of focus is training and education. We must ensure personnel have the skills and knowledge they need to operate and maintain complex liquid logistics systems. This means providing regular training and refresher courses and developing specialized training programs for specific scenarios and environments. We now have reach-back sustainment training tools that can go after individual and team proficiency.

The experience of recent global events has further highlighted the imperative of well-prepared, resilient logistics systems. Training is not a one-off endeavor but an ongoing commitment. Water purification teams must constantly refine their skills, staying updated on the latest technologies and methodologies. No technological advancement can replace the value of a well-trained military workforce. Ensuring personnel possess the skills and knowledge required to operate and maintain complex liquid logistics systems is an absolute necessity. Water teams must have access to regular training and refresher courses tailored to address the scenarios and environments they may encounter.

Nurturing a Culture of Innovation and Collaboration

In the realm of military liquid logistics, innovation and collaboration are paramount. By cultivating a culture that fosters creative thinking and teamwork, we develop adaptive solutions to complex problems. Water experts should be encouraged to think outside the box, embrace new ideas, and work collectively to attain shared objectives. Collaboration across military units and allied forces is essential, tapping into the wealth of collective knowledge and expertise. Integrating Army Virtual Learning Environment modules into training programs or offering online courses on the evolution of water treatment could serve as the cornerstone for a more robust, well-rounded training regimen. Leveraging FORSCOM's water purification sustainment training courses, which are already a part of contemporary military education, offers a viable and cost-effective means to disseminate historical knowledge across the community.

Conclusion

In essence, the resurgence of historical education within water treatment training not only enriches the understanding of its evolution but fortifies the profession's legacy. By arming today's water treatment specialists with a comprehensive understanding of the historical context, we equip them to be more adaptable, innovative, and efficient in safeguarding the world's most vital resource: water.

Our responsibility to deliver clean and safe water underpins operational success and troop well-being. The challenges we face today require enhanced readiness, technological innovation, and collaborative efforts. The JFAWE and its rich tradition serve as a reminder of the enduring commitment to excellence in liquid logistics. Investment in training and preparedness, the use of the latest technologies, and the cultivation of a culture of innovation are vital for ensuring military readiness in an ever-changing world. Together, we can confront the fluid challenges of today and those that await us in the future, carrying forward the legacy of the ROWPU Rodeo. Our joint force continues to move forward in Force Design 2030 to design the right capability needed in LSCO. Our armed forces stand ready to meet these future demands.

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Featured Photo
Soldiers from the 10th Mountain Division Sustainment Brigade, 10th Mountain Division, Fort Drum, New York, prepare to conduct a turbidity test at the 2023 Reverse Osmosis Water Purification Unit Rodeo at Fort Story, Virginia, May 2023. (Photo by Master Sgt. Benari Poulten)

Premature Battery Failure in Maintenance

A Costly Battle Against Time

By Chief Warrant Officer 2 Matthew Swift

In the dynamic world of maintenance and operations, time is a nonrenewable resource that dictates the efficiency and effectiveness of processes. Among the numerous challenges that plague readiness, premature battery failure stands out as a significant contributor to operational inefficiencies, costing organizations over $75 million annually in lost time and resources. On average, the typical vehicle battery in the Army must be replaced every 12 months.

The Value of Time in Maintenance

In maintenance, time equates to productivity and cost efficiency. Each minute saved in maintenance operations leads to substantial cost savings and increased operational uptime. Conversely, unplanned downtime due to equipment failure, such as batteries in critical equipment, results in a direct loss of mission accomplishment. This loss is not just measured in the immediate downtime but also in the ripple effect it causes, such as delayed schedules, increased workload, and the rush to catch up once the issue is resolved.

Premature Battery Failure: A Core Issue

Batteries, often critical components in many pieces of equipment, are susceptible to a variety of failure modes. These range from manufacturing defects to improper usage (operator error) to underlying parasitic draws. When batteries fail prematurely, they not only necessitate immediate replacement but also cause unplanned downtime for repairs. This scenario is especially problematic in training and wartime scenarios that rely on combat platforms, transportation, or uninterrupted power supply systems, where battery failure can halt entire operations.

Cost Implications of Battery Failures

The financial implications of premature battery failure are profound. It costs the DoD over $75 million per year,

confirming this issue's severity. This figure encapsulates not just the cost of replacing batteries but also the indirect expenses associated with downtime, such as lost production, labor costs for troubleshooting and repair, and potential penalties. In a world where time-sensitive operations such as logistics and sustainment are critical, the impact is even more pronounced.

Loss of Man-Hours and Productivity

One of the most significant impacts of premature battery failure is the loss of valuable man-hours. Maintenance teams spend countless hours identifying, diagnosing, and resolving battery-related issues. This time could be used for preventive maintenance or other productive tasks. The diversion of resources to address battery failures also leads to a backlog of other maintenance activities, creating a cycle of inefficiency and decreasing overall productivity.

One of the most significant impacts of premature battery failure is the loss of valuable man-hours.

The issue of premature battery failure in the maintenance world is a multifaceted problem with far-reaching implications. It is not just a matter of replacing a faulty component; it represents a substantial drain on both time and financial resources. So what can be done about it? Addressing this challenge requires a holistic approach that includes not only better training and maintenance practices but also the adoption of new technologies with longer lifespans and more robust performance. By tackling the root causes of premature battery failure, maintenance Soldiers can reclaim the valuable time and resources currently lost to this pervasive issue, ultimately enhancing operational efficiency.

So Why Are Batteries Failing?

In military operations, the reliability of equipment is paramount. However, premature battery failure in military equipment is a recurring issue, compromising operational readiness and safety. This problem is predominantly attributed to parasitic draws, inadequate charging practices, and a lack of operator knowledge.

Parasitic Draws: A Silent Culprit

Parasitic draws, or the small amounts of electric current that devices consume when they are switched off or in standby mode, are significant causes of battery drain in military equipment. These draws, although minimal in isolation, can cumulatively lead to substantial battery depletion, particularly in complex military systems with numerous electronic components. As a result, batteries can be drained unexpectedly, even when the equipment is not actively in use, leading to failure when the equipment is most needed.

Inadequate Charging Practices

Proper charging is crucial for battery longevity. However, in the demanding and often unpredictable environment of military operations, charging protocols can be overlooked or improperly executed. Frequent partial charges, overcharging, or using incorrect chargers can significantly reduce a battery's lifespan. This situation is exacerbated in remote or harsh field conditions where access to appropriate charging facilities may be limited.

Sulfation

Sulfation is a prevalent issue that occurs when batteries are left in a discharged state for an extended period. This process involves the accumulation of lead sulfate crystals on the battery plates, which can significantly hinder their performance and longevity. When a battery is not fully charged, sulfate crystals form and harden, making it difficult to dissolve back into the electrolyte. This crystallization reduces the battery's capacity and its ability to hold a charge, leading to weakened performance and, ultimately, failure. Preventing sulfation involves regular charging and maintaining batteries at an optimal charge level to ensure longevity and efficiency.

Lack of Operator Knowledge

The role of operator knowledge in preventing premature battery failure cannot be overstated. Often, operators may not be fully trained on the battery maintenance requirements of their equipment. This lack of knowledge can lead to mishandling, such as incorrect installation, exposure to extreme temperatures, or neglecting signs of battery wear, all which can precipitate early failure.

How Do We Fix It?

Three things maintenance warrant officers will never have enough of are time, manpower, and money. In a perfect world, maintainers would come out of advanced individual training with all the knowledge needed to accurately troubleshoot battery issues. Tank-automotive and Armaments Command, Communications-Electronics Command, Aviation and Missile Command, etc., would incorporate battery and charging system checks into their Optimized Equipment Service Plans checklist. Operators would learn all the knowledge needed to properly perform operator-level maintenance before driving out of the motor pool. However, that may never be an attainable goal. So, what does that leave? Other than employing a rigorous battery maintenance management program, which in itself is a very time-consuming program when implemented properly, solar may be a solution.

Department of the Army Pamphlet 750-1, Army Materiel Maintenance Procedures, states, "Commanders will use approved solar maintainers for equipment in the LUP (low-usage program), NCOMP or in outdoor storage." Looking at what solar maintainers are approved, options are very limited: 6- to 12-watt panels with pulse-width modulation (PWM) controllers. Research shows PWM controllers max out at about 65% efficiency on a perfect day, converting energy gathered from the sun to your batteries. Maintainers are also only designed to maintain the current charge; they are not chargers. They are designed to maintain your battery's existing percentage of charge, and on a perfect day, they are only doing that with a maximum efficiency of 65%. A study published by Combat Capabilities Development Command in 2021 for four-battery vehicle systems indicated solar input wattage is recommended to be in the range of 25 to 60 watts to even put a dent in our battery failure problem.

Solar technology has improved substantially over the last 20 years and continues to evolve with green initiatives, reducing our carbon footprint. Civilian manufacturers make solar charging systems ranging from 20 to 80 watts using maximum power point tracking controllers that are about 90% efficient at converting energy gathered from the Sun to your batteries. We tested many of the systems at Fort Liberty from 2019 to 2022 on everything from Humvees to 3 kW generators and from M777 howitzers to Joint Light Tactical Vehicles. The average infantry division spends roughly $1.2 to $1.5 million annually on battery replacement; we were able to reduce that by 70% by testing alternative solar charging solutions. We conducted an electro-spectrum test to ensure the systems were not emitting any radio frequency signals and constantly monitored the voltage for spikes and drops. We found a 100% success rate over three years—zero batteries failed. We had batteries as old as seven years that were still in perfect working condition.

So that leads to the next questions: What is actually approved by the Army? Who dictates that? How can we make use of better technology than what is currently available within the Army supply system?

In a world where our enemy is rapidly evolving and adapting to technological advancements, it is naïve to think we can just continue to use what we have without evolving and adapting ourselves. There is so much available technology out there, continually pushing the limits of what we think is possible. It is up to us to take the initiative, do our homework, and develop solutions for problems.

Chief Warrant Officer 2 Matthew Swift currently serves as the ground maintenance officer for the 94th Army Air and Missile Defense Command. He was a maintenance technician for multiple battalions in 1st Brigade Combat Team, 82nd Airborne Division. He has a master's degree in business administration from American Military University, West Virginia.

Petroleum Quality Analysis System-ENHANCED

A Critical Enabler for the Army

■ *By Staff Sgt. Shanice Walker*

The Army uses the Petroleum Quality Analysis System-Enhanced (PQAS-E) for analyzing and assessing the quality of petroleum products consumed in military operations. The system is typically deployed and operated at echelons below brigade level. It serves as a critical enabling asset for commanders at the tactical level, supporting their decision-making processes related to petroleum. The PQAS-E encompasses a range of advanced apparatuses that can detect impurities and contaminants in petroleum, ensuring only high-quality fuel is used. It also offers the capability to monitor fuel storage conditions, such as temperature and humidity, to prevent degradation and ensure optimal performance.

In 2018, the 590th Quartermaster (QM) Detachment petroleum liaison received official endorsement from the Army Petroleum Center to oversee the inspection of PQAS-E correlation testing within the 18th Airborne Corps. This endorsement granted the 590th QM Detachment the necessary authority and responsibility to conduct thorough inspections and evaluations pertaining to the PQAS-E system, its operators, and its correlation-testing activities.

The primary objective of correlation testing is to verify the results obtained by the PQAS-E and ensure their alignment with established standards. As a petroleum liaison, the 590th QM Detachment plays a critical role in facilitating effective communication and coordination between the Army Petroleum Center, U.S. Army Tank-automotive and Armaments Command, U.S. Army Forces Command, and 18th Airborne Corps units. They provide technical expertise, guidance, and support to ensure accurate and efficient correlation testing of the PQAS-E.

Through many years of correlation inspections, the 590th QM Detachment has found the PQAS-E to be a critical asset for the Army. The system enhances operational readiness by ensuring military equipment receives optimal-quality fuel, thereby maximizing performance and minimizing the risk of equipment malfunctions. This leads to increased combat efficiency and mission success. The PQAS-E also reduces maintenance costs by preventing fuel-related issues that can lead to engine failures, equipment damage, and increased downtime. By eliminating the use of degraded or contaminated fuel, the PQAS-E significantly extends the lifespan of military assets, saving valuable resources.

Issues and Recommendations

The PQAS-E system, while highly advanced, faces certain apparatus issues that can impact its effectiveness. Specifically, the apparatuses that commonly experience failures are the Jet Fuel Thermal Oxidation Tester, the viscometer, the analytical balance scale, the 25kW generator, and the environmental control unit. Although the Army is currently investing in research and development efforts to improve the design and durability of apparatuses, the following recommendations may mitigate some of the common challenges with them.

Regular and proactive maintenance schedules should be established for all apparatuses in the PQAS-E. This includes routine inspection, cleaning, and calibration to identify and address any potential issues before they lead to complete failures. Additionally, implementing redundancy measures by having backup apparatuses readily available can minimize downtime and ensure continuous operation in the event of a failure. Furthermore, comprehensive training programs should be provided to operators and should include knowledge of supply functions, the ordering process, proper handling, and maintenance of the apparatuses.

To achieve the optimal system performance, there must also be engaged leaders at all echelons who can prioritize the readiness of this vital piece of equipment. This includes not only 923A Petroleum Systems Technicians, but also chains of command at the company, battalion, and brigade levels. Essential players such as supply, maintenance, and supply support activity personnel are also critical to the operational readiness rate of the PQAS-E. Key personnel must ensure inoperable equipment is documented and reported on the equipment status report. This information highlights the immediate issue at hand and demonstrates the potential risks and consequences of neglecting the system's maintenance and repair. This increased visibility promotes a sense of accountability and drives action toward allocating necessary resources, prioritizing repairs, training, and ensuring the operational readiness of the system.

During deployment, it is crucial to have personnel who are knowledgeable about the supply chain and who can efficiently manage the inventory of spare parts and apparatuses. These personnel should be well-versed in the ordering process for replacements and repairs. Operators with a comprehensive understanding of supply functions can anticipate and plan for potential apparatus failures, ensuring non-mission-capable apparatuses are swiftly addressed and minimizing system downtime. By implementing these measures, the PQAS-E system can effectively overcome its apparatus issues and maintain its accuracy and reliability in analyzing fuel quality.

The deployment/redeployment of the system also presents a challenge related to certifications/shipping methods that should be carefully considered. One significant issue is ensuring the system is certified and compliant with transportation regulations and safety standards. This includes obtaining the necessary certifications and documentation to transport the apparatuses, fuel samples, and associated equipment safely and legally. The apparatuses and fuel samples require specialized packaging and handling to ensure their integrity and functionality upon arrival at the deployment location.

Failure to comply with these requirements can lead to delays, logistical complications, and potential legal issues. In the current operating environment, units must deploy with their PQAS-E labs. Effective planning is critical to the successful deployment of this system.

Conclusion

The PQAS-E, with its advanced apparatuses and capabilities, serves as a critical asset for the Army. By ensuring the use of high-quality fuel, the PQAS-E enhances operational readiness, reduces maintenance costs, and extends the lifespan of military assets. However, overcoming the current issues associated with the system's apparatus is crucial for large-scale combat operations. With continuous improvement efforts and investment in research and development, the PQAS-E will continue serving as a key enabler for the Army, ensuring reliable fuel-quality analysis and supporting mission success.

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BUILDING A DATA-/EVIDENCE-BASED DECISION-MAKING CULTURE AT ARMY SUSTAINMENT UNIVERSITY

■ *By Maj. Brian Johnson*

The Army's investment in technical capabilities in collecting, storing, and disseminating data has dramatically increased. Advancements in the volume (size and scope), velocity (speed of data generation), variety (different types), veracity (degree of trust), and value (usefulness)—or the 5 Vs of data—have created challenges and opportunities that will only continue to grow. With the advent of generative artificial intelligence, the need to equip sustainers with skills to leverage data is imperative.

It can be argued the Army has always been a data, or evidence-based, organization as highlighted in many doctrines, including Army Doctrine Publication 6-0, Mission Command: Command and Control of Army Forces. The expectation of transforming data into understanding to inform decision-making is not new. The challenge is the growing gap between the modernization of tools and systems and the training and capability of people to leverage the 5 Vs of data to ensure timely and accurate insights. Equipping and empowering people to work with data to derive insights will foster a more data-/evidence-based decision-making culture.

Since the Army Sustainment University (ASU) published "Future of Data Education within Army Sustainment" in February 2023, ASU has refined efforts in implementing sequential and progressive levels of data education embedded in professional military education (PME) for officers, NCOs, and civilians throughout their careers. An iterative and evolving process, this practice of qualitative and quantitative reasoning takes time and must be related appropriately to the sustainment warfighting functions (WfFs) to gain buy-in from the community to foster a more data-centric culture.

Pilot Modules and Curriculum

During the summer and fall of 2023, ASU piloted its foundation modules (16 data modules) for the Basic Officer Leader Course and intermediate modules (an additional 24 data modules) for the Logistic Captains Career Course. These modules are not taught in a single block but are dispersed among the entire curriculum to augment existing sustainment WfF requirements. ASU will look at the warrant officer and NCO PME curriculum in 2024 to pilot the appropriate data analytic modules that align with their requirements. Starting in fiscal year 2024, four hours of the Sustainment Pre-Command Course are focused on blending the art of decision-making (decision science) with the analysis of data (data science) within their organizations. The desired outcome is for commanders to effectively shape and consume analysis produced by their staffs using data-driven questions.

ASU also offers a standalone 10-day Data Analysis and Visualization (DAV) course through their Army Training Requirements and Resources System. It is open to civilians who are GS-9 and above, NCOs who are sergeants first class and above, warrant officers, and officers. The course assumes students are familiar with the basics of spreadsheets and have a working knowledge of basic high school algebra, but it is designed as an introduction to statistics, data visualization, and data analysis. The DAV course aligns with Army G-4's desire to develop analytic talent that can produce information from data using descriptive and predictive statistics and that can present findings using visualization techniques.

Modernizing Educational and Training Resources

Besides embedding instruction within PME and a standalone course such as DAV, ASU understands the importance of modernizing educational and training resources. ASU is currently developing 16 hours of synchronous interactive multimedia instruction (IMI) to educate the operational Army and new civilian hires on basic data literacy and math concepts, standard data visualization fundamentals, and tools used to input and pull required data. The primary purpose of IMI is to bridge the knowledge gap for sustainers who did not receive the data education modules before PME. However, IMI also provides a baseline of sustainment WfF data competencies for both Army and new civilian sustainment personnel.

Additionally, ASU has partnered with the Center for Army Analysis to conduct an ASU data science study. This study will deliver a collection of data education resources using the Army Resource Cloud and tools such as the Air Force's R2D2 GitLab to enable version control and collaboration. Leveraging cloud resources enables ASU to provide continuous data education resource development using programming languages such as R and Python for data specialists while also connecting ASU to the larger data science community across the Army.

While having the systems, equipment, and tools in relation to data is important, investment in sustainers to work with data is critical to getting the most value from it. Data without analysis is meaningless. Success in gaining insight to inform decision-making will be determined by the sustainment community's desire and ability to work with it. Part of cultivating a data-centric culture for sustainers is ensuring they have education and skill with analysis, which are vital for effective and skeptical consumption of data. ASU serves as the education epicenter for the Army sustainment community, developing a data education approach to drive evidence-based decision-making. Part of this strategy calls for sustainers to continue their data education progression throughout their careers.

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Logistics Evolution at the National Training Center

Sustainment in a Communications-Constrained Environment

■ *By Col. Kirby R. Dennis and Maj. Timothy J. Swanton*

"Amateurs talk about tactics, but professionals study logistics."

This maxim — once spoken by Gen. Robert H. Barrow, onetime commandant of the U.S. Marine Corps in the late 1970s — holds true on today's battlefield. No other place on Earth reinforces this sentiment more than the National Training Center (NTC) at Fort Irwin, California, an 1,800-square-mile battlefield that stresses all facets of the sustainment warfighting function (WfF). Recently, the 1st Armored Brigade Combat Team (ABCT), 1st Armored Division, faced a unique logistics challenge in its training rotation at NTC, which laid bare both the challenges and opportunities associated with sustainment in large-scale combat operations (LSCO). More specifically, the BCT fought sustainment without server-based upper tactical internet (Upper TI) to reduce the physical and electromagnetic signature of its command posts. In this communications-constrained environment, units at echelon communicated only through frequency modulation (FM) and the Joint Battle Command-Platform (JBC-P).

The successful adaptation of the sustainment WfF's systems and processes to a lower tactical internet (Lower TI) apparatus proved that BCTs can operate and sustain without the more cumbersome and signature-heavy Upper TI systems that were hallmarks of the last decade. This article aims to detail the BCT's

approach to sustainment planning and execution in a communications-constrained environment and to offer organizational lessons learned to inform future efforts.

The Mission Support Site

With respect to sustainment organization, it is important to start with the mission support site (MSS), a mission command node well beyond the brigade's area of operation. Simply stated, BCTs must have an Upper TI tether to their higher headquarters to succeed in LSCO. This reality was reinforced time and again during 1st ABCT's NTC rotation. Based on this fact, coupled with the tactical imperative to shrink command posts and improve mobility, 1st ABCT removed its Joint Network Node (JNN), Command Post Node (CPN), and Satellite Transportable Terminal capabilities from command posts and placed them at the MSS, making JBC-P, FM, and high-frequency systems the primary methods of communication. Importantly, the BCT MCP employed limited client-based Upper TI systems to preserve a stable link to both the MSS and its higher headquarters; however, this capability did not extend to lower echelons.

In an Upper TI-constrained environment, the MSS is an essential node because it provides a brigade's connection to its higher headquarters, ensuring that the information necessary to fight and win is readily accessible. More specifically, the MSS provides real-time information and analysis to forward-deployed formations through a unique mix of personnel and equipment such as the JNN and CPN. The BCT quickly realized that a sustainment personnel package at the MSS was critical to mission success, and therefore assigned leaders to the JNN to preserve uninterrupted communications with both the division headquarters and echelon-above-brigade (EAB) assets. Moreover, aligning sustainment expertise at the MSS enabled the BCT to aggregate battalion logistics status reports (LOGSTATs) and to conduct the analysis necessary to regenerate combat power; these two functions could otherwise be slowed without Upper TI integration in forward command posts.

With respect to technical capabilities, the MSS was equipped with the Secret Internet Protocol Router Network (SIPRNet), the Non-classified Internet Protocol Router Network (NIPRNet), and the JBC-P, thus allowing sustainment personnel to quickly transition between Upper TI and Lower TI systems, which ultimately increased information dissemination. In summary, the MSS's technical and personnel capabilities enabled the BCT to develop a sustainment common operational picture (COP) through LOGSTAT aggregation and to facilitate combat power regeneration through accurate Class VII reporting. These two core sustainment missions are vital to success on the fast-paced and dynamic battlefield that is the NTC and should be retained at the MSS in a Lower TI-dominant environment.

The Brigade MCP

While necessary attention was given to sustainment roles and responsibilities at the MSS, the BCT prioritized the main command post (MCP) as the central hub for sustainment activity. Given the nature of communications during NTC 24-04, the BCT weighted the MCP with the brigade S-1, S-4, AS-4, the medical plans officer, and the surgeon. This personnel configuration was designed to address the fundamentals of logistics management, namely, analyzing and approving the brigade LOGSTAT, conducting long-range logistics planning, synchronizing planning efforts and operations with the support operations (SPO) officer, and maintaining a logistics COP (LOGCOP) for the commander.

Furthermore, by centralizing sustainment planning activities in the MCP, sustainment leaders were aligned with the efforts of the brigade's operations cell; this departed from the traditional administrative and logistics operations center structure, which was often segregated from the operations cell. This structural change ensured that sustainment leaders understood the commander's intent and provided logistics analysis, risk assessments, and constraints to maneuver planners. Beyond the specific roles, responsibilities, and functions of these leaders at the MCP, 1st ABCT's experience at NTC underscores the need for commanders to reconsider and, more importantly, adjust the sustainment composition of the MCP when operating in a communications-constrained environment.

Adaptation to Lower TI

Within the context of NTC 24-04, it is important to emphasize the task and purpose given to sustainment planners with respect to the LOGSTAT: to collect, aggregate, and reflect data on essential elements of friendly information to enable the commander to make informed decisions. This core task and purpose provided the impetus for establishing a sustainment framework and system that limited guesswork and increased accuracy. On this point, the role of the LOGSTAT cannot be overemphasized, since it is the mechanism by which brigades request the type and quantity of supply necessary to meet tactical requirements and enable offensive and defensive operations.

LOGSTAT data collection requires a robust, clearly understood, and stable communications architecture that supports multi-echelon reporting. This architecture, however, does not depend on more systems or a larger signature but on fewer systems and a smaller signature. Current table of organizational equipment Lower TI systems combined with leaner and more modern Upper TI-like capabilities provide a communications solution that not only enables sustainment operations but does so without increasing command post signature. In 1st ABCT's case, organizational energy was focused on the JBC-P and FM radios, which resulted in more efficient and effective staff work. In other words, by removing the Upper TI server-based systems from the BCT architecture, staffs experienced an increased capacity to dialogue internally and externally, maintain accurate running estimates, analyze data, and provide recommendations.

Why did this dynamic emerge during NTC 24-04? Simply put, staffs did not have to allocate time to Upper TI system management and product development. Moreover, 1st ABCT's adaptation to a Lower TI-centric NTC rotation forced adjustments to systems and processes that historically were tailored to an Upper TI environment, such as rapid data exchange of files via SIPRNet/NIPRNet and establishing video conferences for synchronization between staffs and/or commanders. Without the ability to rapidly share substantial amounts of information, the BCT prioritized critical sustainment information requirements and defined the method by which these requirements would be reported.

Sustainment Systems and Processes

At NTC 24-04, 1st ABCT faced the unique challenge of ensuring LOGSTAT flow by using a system and method that was not ubiquitous across the organization. This challenge was manifested in the fact that the on-time LOGSTAT submission rate was below 50% during the first 96 hours of force-on-force training. How did this happen? To be sure, organizational discipline accounted for some portion of the deficient reporting, but much more of it was attributed to technological issues. Using the JBC-P free-text message and chat room features, sustainment leaders encountered friction partly because some platforms sent LOGSTATs via secure means but were intended for an unclassified end-user platform. Moreover, many users sent LOGSTATs using an Excel-based report that often did not make it to the end user due to bandwidth limitations. Realizing that the sustainment WfF had to adapt to both the fast-paced nature of the battlefield and the organizational limitations associated with LOGSTAT reporting, the BCT implemented immediate changes.

First, the BCT dictated a JBC-P free text report for all LOGSTATs so that information flow was not stymied by large, data-heavy files that slowed transmission. This step improved on-time LOGSTAT reporting by 35% from day 5 through day 12 of force-on-force training. Second, units were required to submit LOGSTATs via FM within a mandated time period if the initial JBC-P report was unsuccessful. Third, the BCT employed client-based Upper TI systems at the MCP and combat service support (CSS) Very Small Aperture Terminals (VSATs) at the brigade level to ensure that the requisite detail, analysis, and collaboration between the BCT, the division, and the division service support battalion were achieved. Fourth, the BCT extended communication capabilities by integrating the

internet JBC-P system into forums such as sustainment WfF chat rooms and working groups. This web-based application provides capabilities similar to those of a JBC-P tactical operations center kit, and thus directly improved sustainment collaboration at the brigade level. Fifth, the BCT expanded and enforced its JBC-P distribution list standard operating procedure (SOP) to all sustainment nodes across the force. This was done to avoid fratricide associated with NIPR-SIPR and SIPR-NIPR reporting. Finally, and perhaps most importantly, the BCT reemphasized the purpose of the LOGSTAT with leaders at echelon. More specifically, the BCT reinforced roles and responsibilities to ensure that company-level leaders were unencumbered with the business of projecting future logistical needs, since this was the domain of sustainment staff members who have the experience, resources, and planning process proximity necessary to drive predictive sustainment.

When it comes to the sustainment mission, process is paramount. This concept drove action throughout 1st ABCT's NTC rotation. This operating philosophy led the BCT to address the issue of JBC-P LOGSTAT recipients and ultimately resulted in a flattened process that ensured successful status submissions to the brigade logistics officer, the brigade support battalion's (BSB's) SPO officer, and the MSS, just to name a few. Once the issue of personnel was addressed, the BCT turned its attention to technical considerations. Realizing that shared information was the key to success, the BCT leveraged the CSS VSATs at the brigade support area to ensure maximum visibility, namely with the SPO officer who had real-time LOGSTAT visibility. As a result, the SPO officer was able to observe updates, conduct analysis, and initiate priorities of work within the BSB. Similarly, the brigade S-4 leveraged NIPRNet via client-based Upper TI technology to also observe LOGSTAT updates as they were submitted, which directly enabled logistics planning and resulted in a LOGCOP that informed commander decisions. To complete the process, the brigade S-4 and SPO officer submitted a vetted and approved LOGSTAT to the MSS, where it was submitted to the division and EAB entities.

Using the same communications architecture, battalions reported combat losses incurred during force-on-force operations. The MSS sustainment team, using a swing-shift strategy, was postured to rapidly submit reconstitution packets to the division G-4. This system resulted in the successful regeneration of over 730 combat and combat support platforms. Moreover, by placing reconstitution responsibilities with the MSS, the sustainment staff at the MCP could focus efforts on logistics planning and synchronization.

Sustainment Challenges and Opportunities

While systems and processes conducive to a Lower TI environment were implemented across the BCT, the exclusive reliance on FM and JBC-P systems required a much broader change in thinking. To be sure, home station training necessitated this shift in thinking through events such as combined arms live fire and command post exercises, but not to a level commensurate with the rigors of NTC. For example, units were either untrained on, or uncommitted to, the full suite of JBC-P capabilities, namely, the LOGSTAT reporting tool, an application that rapidly compiles and sends sustainment reports to a unit's higher headquarters. This powerful tool requires a high JBC-P operational readiness rate and is uniquely suited for squad, platoon, and company logistics reporting. It provides the necessary data for battalion logistics officers to assess sustainment shortfalls, forecast supplies, and submit accurate LOGSTATs to the brigade.

In 1st ABCT's case, inaccurate sustainment reports were partly a consequence of not integrating this JBC-P application into unit SOPs, which resulted in Class III shortages during critical points in the battle. More specifically, initial consumption forecasts did not fully account for environmental factors. As a result, many fuel projections were less than half of what was required for a combined arms battalion. The disciplined and proficient use of JBC-P reduces the high degree of error associated with methods that rely on human experience, inference, and bias. It simplifies reporting processes and eliminates many of the inaccuracies associated with logistics reporting. Thus, units should aggressively integrate this reporting mechanism into their sustainment communications architecture.

A unique feature of Upper TI systems is the interactive tools that make coordination and synchronization attainable on a battlefield; without these tools, battlefield collaboration is nearly impossible. In 1st ABCT's case, these tools did not exist, which required holding in-person meetings. Given the proclivity to fight from battalion command posts, key leaders were naturally reluctant to displace from their forward positions and travel long distances to attend meetings, even though the meetings were critical. This unique dynamic initially resulted in low participation in key brigade-level sustainment events, and ultimately translated into reduced parts flow and sub-optimal parts distribution.

Adaptability proved to be decisive to the BCT's ability to sustain the fight. Specific measures were taken to mitigate the risks associated with the lack of collaborative communication tools. First, the BCT adjusted the location of sustainment events based on current operations, which minimized disruption to battalion sustainment leaders. Second, the BCT mandated JBC-P tactical-operations-center kit placement at all battalion combat trains command posts so that critical maintenance and sustainment correspondence could be sent and received. Finally, the BCT integrated VSATs and Voice over Internet Protocol technology into the sustainment communications plan. In summary, perceived challenges associated with not having Upper TI can be mitigated through creative thinking, deliberate planning, and resource allocation.

Conclusion

"Talking is not fighting, but if you can't talk, you can't fight" is a refrain heard often in the Army profession. It perfectly captures the communications imperative that has been witnessed on battlefields past and present. As Gen. Robert H. Barrow articulated so many years ago, operational success in both combat and training is directly correlated to a unit's ability to sustain itself, and successful sustainment requires effective communication. On a degraded battlefield, execution of the sustainment WfF must be thought through carefully and executed with precision. In 1st ABCT's experience, the rigors of a combat training center experience will also force modifications to the sustainment systems and processes that are imperative to mission success. This said, it is important to underscore the unique capabilities that Upper TI assemblages bring to the modern fight. Commanders would be wise to harness their capabilities.

In this vein, the Army's approach to client-based Upper TI capabilities is both appropriate and needed, and it must be incorporated into BCT communications suites moving forward. To be sure, the tactics, techniques, and procedures associated with fighting the sustainment WfF in a Lower TI environment are nascent, but they deserve additional experimentation and attention. Whether it be CPN composition, client-based technology integration, LOGSTAT management, or the full exploitation of JBC-P sustainment capabilities, NTC 24-04 made clear that creative options exist for commanders to consider when it comes to fighting the sustainment WfF in a communications-constrained environment.

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Feature Photo
A modernized M2A4 Bradley Fighting Vehicle, assigned to the "Spartan Brigade," 2nd Armored Brigade Combat Team, 3rd Infantry Division, stops to receive fuel from a M969 5k Fuel Tanker before a convoy at the National Training Center, Fort Irwin, California, March 8, 2023. (Photo by Spc. Duke Edwards)

Closing the Gap

Army Aviation and the Sustainment Warfighting Function

By Lt. Col. Steve P. Sevigny, Chief Warrant Officer 3 Rudy Mendez, and Chief Warrant Officer 3 Jacob Moore

At a U.S. Army Forces Command (FORSCOM) Monthly Aviation Readiness Review (MARR) in the fall of 2023, various combat aviation brigade (CAB) commanders and division and corps deputy commanding generals-support (DCG-Ss) briefed the FORSCOM DCG, Lt. Gen. Paul Calvert, on the status of a list of NMC-100s. NMC-100s are helicopters that are undergoing maintenance for 100 calendar days. At the conclusion of the meeting, the DCG-S directed division and corps G-4s to do more to help with aviation maintenance.

This is a simple directive, but as career aviation officers (one of us is an aviation support battalion commander), it made us wonder why there is a lack of emphasis on aviation logistics at the division and corps levels. The FORSCOM MARR takes place monthly, so clearly this provides a degree of leadership emphasis. However, this pales in comparison to the emphasis given to other pacing items such as Abrams, Bradley Fighting Vehicles, Strykers, and Paladins.

It is common practice for a division-level maintenance meeting to take place two or more times per month, where brigade combat team (BCT) executive officers painstakingly brief their DCG-S on their pacing items and other critical items based on their equipment status reports. The authors have observed that helicopters are absent from these meetings and do not receive the same level of emphasis, even though helicopters are pacing items. This monthly touchpoint is simply not enough to address challenges in readiness for Army aviation. (Pacing items are major weapon systems, aircraft, and other equipment items that are central to an organization's ability to perform its designated mission.)

Another example of this is that the III Armored Corps sustainment assessment does not include any helicopters on the critical fleet readiness common operating picture (COP). In addition, the extended estimated ship date actions COP does not include any Class IX air parts for combat aviation brigades.

Finally, also based on the authors' experiences, division and corps G-4s are not regular attendees at the division, corps, or the FORSCOM MARR. In many cases, this is the only venue where aviation readiness is discussed in any level of detail above the CAB. Therefore, this creates a lack of emphasis between these critical echelons and makes it difficult to address aviation readiness challenges.

The Distance Between Army Aviation and the Greater Sustainment Warfighting Function

There are, of course, other factors affecting this observation. For starters, there are significant gaps within the greater sustainment warfighting function in understanding Army aviation maintenance. Naturally, at the division and corps level, G-4s are career logistics officers with an absolute wealth of knowledge and experience. However, unless they have been assigned as support operations officers in a CAB, they are very likely unfamiliar with aviation maintenance. This lack of experience, combined with the separate process of how aviation readiness is addressed through the FORSCOM MARR, greatly contributes to this problem. To help close this gap, division and corps G-4 officers should prioritize attending the FORSCOM MARR or send a trusted agent, such as their division aviation maintenance technician (AMT), to attend in their absence and receive a back brief.

A lack of shared understanding and communication between critical systems exacerbates this problem. Until very recently, Army aviation operated exclusively on the Aircraft Notebook (ACN) system. ACN replaced the outdated Unit Level Logistics System-Aviation system for tracking aviation maintenance, processing work orders, reporting statuses, and ordering parts in fiscal year 2017, around the same time the rest of the Army fielded the Global Combat Support System-Army (GCSS-Army). When implemented, these systems were not designed to communicate with each other, missing an opportunity to create shared understanding and visibility between Army aviation and the rest of Army sustainment.

The Army is resolving this problem through the fielding of the GCSS-Army Enterprise Aviation (EAVN) system to CABs. As reported by Erika Christ of the Strategic Communication Directorate in October 2021, according to Lt. Col. Bill Reker, product manager for GCSS-Army, at the start of fielding, GCSS-Army EAVN was "the Commanding General of the Army Materiel Command's 'number one GCSS-Army priority.'" Ms. Christ added that "EAVN connects the Aircraft Notebook (ACN) to the Army's tactical logistics ERP system in order to standardize business processes, move ACN data from the flight line to GCSS-Army's enterprise systems, provide a single logistics data center for aviation data, and provide senior leaders and combatant commanders with 'near-real-time views' of Army aviation assets."

To overcome these challenges, aviation maintainers must communicate problems and challenges in readiness to sustainment professionals at the division and corps echelons to provide leadership emphasis and improve aviation readiness.

This ongoing fielding is a massive step forward for how the Army can better integrate Army aviation sustainment into the rest of the sustainment warfighting function. However, GCSS-Army EAVN is not without typical fielding friction points. For example, ACN is still the interface for data entry on the flight line. ACN transfers data to the aviation integration services system (a sort of middle man), which recodes data into a format that is understandable by GCSS-Army. This data transfer through the aviation integration service serves as a choke point and causes up to a four-hour delay from requisition in ACN to processing in GCSS-Army on a typical day.

Since the FORSCOM DCG-S directed division and corps G-4s to do more to help Army aviation maintenance, Army aviation also bears some of the responsibility for this problem. With Army aviation operating separately through ACN, aviation maintenance personnel and leaders have not done enough to bridge this gap, effectively bypassing division and corps G-4 offices to solve problems.

Each CAB's highly dedicated aviation maintenance test pilots and AMTs have a wealth of experience and work tirelessly to overcome parts-flow issues. They and logistics assistance representatives (LARs) from the U.S. Army Aviation and Missile Command (AMCOM) connect daily with item managers, Defense Logistics Agency customer support specialists, warehouse managers, other support operations officers, and many other parts of the supply chain to resource parts. This work is done every day with extremely limited visibility at the division and corps levels. For as long as the authors

have been in Army aviation, this has been an effective process, but recent scarcity issues with the supply chain have caused significant increases in non-mission-capable supply time. To overcome these challenges, aviation maintainers must communicate problems and challenges in readiness to sustainment professionals at the division and corps echelons to provide leadership emphasis and improve aviation readiness.

Recommendations

Fortunately, there are simple solutions to help close this knowledge gap between division and corps G-4s and aviation maintenance. AMTs (151A) are the subject matter experts (SMEs) who are perfectly positioned to help solve this problem. They exist in the modified table of organization and equipment (MTOE) at battalion and division level, at FORSCOM, and at Headquarters, Department of the Army, G-4. They are the experts with the knowledge and skill sets readily available to advise division and corps G-4 officers on all the nuances of Army aviation maintenance. At the division level especially, they are the critical link from the CAB to the division and corps staff. Army Techniques Publication (ATP) 3-04.7, Army Aviation Maintenance, defines AMTs as "technical experts and managers responsible for directing daily aircraft system maintenance, component repair, technical and property supply, and armament operations for their assigned units." Their duties are quite extensive in any CAB, but more importantly, "aviation maintenance technicians serve as key aviation maintenance advisors to the commander from the maintenance company/troop, support company, and serve in key maintenance positions such as assistant support company PC officer, Division G-4, Corps G-4, FORSCOM G-4, HQ DA G-4 ..." Although specified by ATP 3-04.7, the Army recently changed the MTOE for corps headquarters, eliminating AMTs from this critical position and echelon. The significance of this decision will become more apparent later in this article.

Despite the importance of this position, ATP 3-04.7 does not go into sufficient detail as to how these experts can help division and corps G-4s be better engaged and do more to help aviation maintenance. To improve in this area, the authors propose that division G-4 AMTs should do the following:

- Attend all division, corps, and FORSCOM MARRs.
- Attend weekly and/or monthly brigade aviation maintenance meetings and command aviation maintenance meetings.
- Receive a copy of the CAB's daily status report.
- Communicate regularly with the CAB support operations (SPO) aviation officer and be fully aware of all long-lead-time parts issues in the CAB.
- Communicate regularly with the corps G-4 to raise parts flow and readiness issues.
- Engage with item managers, AMCOM, and other stakeholders in the supply chain on behalf of the CAB.
- Prioritize parts requests and readiness challenges from division to corps and FORSCOM.
- Monitor the CAB's flight hour program and flying hour projections.
- Regularly visit CAB production control meetings to maintain good relationships and help work through friction.
- Have access to GCSS-Army to maintain visibility on CAB maintenance and operations.
- Serve as SMEs and advisors for the execution of contract aviation maintenance.
- Coordinate directly with the division sustainment brigade (DSB) SPO cell. There are currently no aviation SMEs assigned to the DSB SPO cell. Absent a decision to resource the DSB SPO cell with an AMT, division G-4 AMTs must bridge this knowledge gap in the sustainment warfighting function between these critical echelons.

Furthermore, there is currently no clear and easily understood system in place to prioritize scarce parts across all of Army aviation. Facing scarcity of critical parts, FORSCOM and corps commanders must establish clear priorities to rapidly drive decisions and generate aviation readiness at echelon. Each division has only one CAB; therefore, division G-4s cannot use tools like GCSS-Army directly within their own division to prioritize parts and generate readiness, similar to BCTs in the same division. The lowest echelon that can prioritize Class IX air parts flow is the corps headquarters, where multiple CABs are competing for parts. The decision to remove AMTs from the corps G-4 also removes the only aviation maintenance SMEs to advise the corps G-4 on these matters. The authors believe this is a mistake, due to the exceptionally technical nature of aviation maintenance.

In the absence of clear priorities, aviation maintenance managers across the Army and their LARs work feverishly to generate readiness by contacting personnel at every part of the supply chain to resource parts. Some are more effective in these endeavors than others through the use of well-developed networks. This type of lateral coordination is a credit to the initiative of aviation maintenance managers, but it is not a substitute for making decisions within the framework of a clearly defined list of priorities or the commander's intent to maximize readiness in Army aviation where it is most critical.

A recent incident helps illustrate this problem. The 4th CAB recently needed an aft fuel cell for an AH-64D Apache as part of a 500-hour phase maintenance inspection. This is an incredibly scarce part. It was not available at Fort Carson, Colorado, but there was one available in the technical supply warehouse for the 7th Squadron, 17th Cavalry Regiment, 1st Air Cavalry Brigade (1ACB), at Fort Cavazos, Texas. After lateral communication between SPO aviation officers for each CAB, 1ACB graciously shipped the fuel cell to the 4th CAB. Regrettably, in a matter of a week, 1ACB then needed their own aft fuel cell and experienced delays in completing their own maintenance.

The purpose of this vignette is not to say that 1ACB made the wrong decision to send the aft fuel cell to the 4th CAB. The purpose is to highlight the daily lateral coordination between aviation maintenance managers trying to generate readiness in the absence of clear guidance. In this case, since both CABs are in the III Armored Corps, a clear list of priorities may have generated a different outcome that would have helped mitigate risk for the corps. The same concept applies between the Army corps, FORSCOM, and AMCOM to prioritize the release of parts and more rapidly generate readiness for the Army where it is needed most. This is where division- and corps-level G-4 AMTs can help advise the development of clear priorities to best generate readiness at the division, corps, and Army levels.

Conclusion

Leaders at all echelons should make every effort to help generate readiness for Army aviation. Over recent years, Army aviation maintenance functioned in a very isolated manner from the rest of the Army. EAVN provides the visibility and shared understanding necessary for division and corps G-4s to better understand aviation maintenance, and to help address these challenges at their respective echelons. AMTs at all echelons are the SMEs who can easily help solve this issue and create a shared understanding of aviation maintenance. Together with clear priorities to address scarce-parts issues and drive rapid decisions, it is possible to achieve Lt. Gen. Calvert's directive for division and corps G-4 teams to do more to better generate aviation readiness.

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Feature Photos
Staff Sgt. Luther Snell, with Delta Company, 2-104th General Support Aviation Battalion, 28th Expeditionary Combat Aviation Brigade, and Staff Sgt. Derek Arroyo, with the Eastern Army National Guard Aviation Training Site, perform maintenance on helicopters at Muir Army Heliport at Fort Indiantown Gap, Pennsylvania, Aug. 1, 2023. (Photo by 1st Lt. Samantha Gabriel)

DIVISION SUSTAINMENT

at National Training Center Rotation 24-03

By Maj. David B. Ellington

The 1st Armored Division (1AD) conducted a division-level National Training Center (NTC) rotation to stress artillery, aviation, and sustainment. In this exercise, 1AD set conditions in the division deep area and built combat power before the 1st Armored Brigade Combat Team (ABCT), 1AD, conducted a forward passage of lines. The 1AD Division Sustainment Brigade (DSB) supported the division during the rotation. Sustaining 1AD and its enablers posed a challenge, and the DSB provided sustainment with 25% of the brigade's sustainment capability. I designed the concept of support that outlined how the 142nd Division Sustainment Support Battalion (DSSB) would function and execute sustainment. This article explains how the 1AD DSB sustained America's Tank Division during NTC Rotation 24-03 in real time and in the simulated exercise environment, discusses the friction we encountered, and shares the lessons our team learned.

U.S. Army Forces Command 350-50-1, Training at the National Training Center, sets the requirements for an ABCT rotation, but no standard exists for division rotations. An ABCT must be capable of moving 350 pallets of supplies, 25,000 gallons of water, 100,000 gallons of fuel, and 24 heavy-tracked vehicles in one turn.

The initial planning estimates determined the exercise would require a minimum of 12 palletized load system crews to support the 2,885 Soldiers and 1,072 pieces of rolling stock that 1AD units and enablers would use. These crews would move bulk water, bulk fuel, and palletized supplies to multiple nodes, and support the movement of the division command post (CP) throughout the exercise. A maintenance platoon would provide vehicle recovery and pass-back maintenance. The support requirements for field feeding, theater gateway, and signal support were based on historical requirements for NTC rotations.

The DSB aligned capabilities to provide sustainment at doctrinal distances during the NTC rotation. The DSB headquarters would command and control sustainment executed by elements from the division sustainment troops battalion (DSTB) and DSSB. The DSTB would provide field feeding, theater gateway, and signal support, while the DSSB would conduct the distribution of supplies as the execution arm of sustainment operations. The DSB would split three field feeding teams among the division to support 1AD units and enablers. The human resources company would provide two teams capable of receiving personnel at two nodes. The signal company would establish communications at the DSB CP and DSSB CP. The DSSB would receive classes of supply and execute logistics package (LOGPAC) missions to support 1AD units.

On its surface, this is not a complex problem, but the 142nd DSSB had only a fraction of its capability: the composite truck company was deployed; the maintenance company was deploying; and the heavy equipment transporter company (identified to support NTC Rotation 24-04), the 3rd ABCT's gunnery, and the 5th Army Reserve Mobile Force Generation Installation were all unavailable. Therefore, the only available assets the 142nd DSSB had for the rotation were their headquarters and headquarters company, 40% of Alpha Company, 23 motor transport operators, and 19 mechanics from Fort Cavazos, Texas. To overcome this lack of capability, the DSB resupplied units before moving into the box, maximized internal sustainment capabilities, and used logistics release points (LRPs). By all accounts, we had a solid plan going into the exercise, but never stopped planning. As President Dwight D. Eisenhower once said, "Plans are worthless, but planning is everything."

When the rotation started, the DSSB could move 144 pallets of supplies, 10,000 gallons of water, and 30,000 gallons of fuel. We established a forward logistics element (FLE) in the northwest corner of the training area to stage supplies forward and overcome the capability shortfall. We also coordinated with the 916th Sustainment Brigade to stage and resupply 5,000 water and fuel tanks at key locations, increasing Class I (B) and Class III (B) capacity. The FLE, equipped with a 5,000-gallon water tank, a 5,000-gallon fuel tank, a Role II medical team, a maintenance team, and a field feeding team, enabled the DSSB to drop supplies for units, reducing the time spent at an LRP.

On Day 0, the first LOGPAC set out to meet at LRP1, located in the central corridor, and units were

tracking the time and place for their initial resupply. The enemy cast their vote without delay, preventing the DSSB from moving to LRP1 and forcing them to LRP2, located in the western corridor. The DSSB pushed this link-up change over the joint battle command platform, but it did not reach all the supported units, causing some to miss their resupply. This was our first friction point, and it took 48 hours to deliver the first resupply to every 1AD unit. On Day 2, the DSSB pushed supplies to LRP1 again, and all but one unit received their resupply. The unsupported unit misunderstood their pickup instructions and took only a portion of their resupply. This caused them to nearly run out of rations, a situation we resolved by Day 4.

We traced the failure of the LOGPACs and units to fully resupply to a communication breakdown. Sustainment during a typical rotation moves through a brigade support battalion (BSB) to a forward support company (FSC) and to the supported unit. For this exercise, the DSSB delivered to supported units at LRPs with no BSB or FSC in between. Before Day 0, I assembled all the supported brigade support operations (SPOs) officers and S-4s to conduct a sustainment rehearsal to review the plan for the first 96 hours. The brigade-level leaders clearly understood the plan, but the convoy commanders and those receiving the LOGPACs did not. Conducting a more thorough rehearsal with convoy commanders could have prevented these issues.

Another inhibiting factor was a lack of communication. Some units did not have upper tier tactical internet. As a result, once deployed into the division close area, they could not communicate with the rear command post (RCP). This stopped them from sending logistics status reports and from attending daily logistics synchronization meetings. Units had liaison officers in the RCP, but some either did not understand their task and purpose or could not communicate with their unit. To solve this, we pushed the supplies we estimated each unit would need based on running estimates and made sure the DSSB knew each unit's allocation. We continued to refine this process and hit our stride in the second half of the exercise. No unit ran out of food, fuel, or water at any point, but they ended up backhauling a significant amount of supplies on each LOGPAC because we only had HIPPO water tanks and M969 fuel tanks to move Class I (B) and Class III (B).

The difference between the virtual exercise and the live operation was another source of friction. The DSB had a fully manned DSSB and a combat sustainment support battalion in the simulation, capable of distributing 120,000 gallons of bulk water, 550,000 gallons of bulk fuel, and 2,000 pallets of supplies. We conducted operations with the same assets in War Fighter 23-04, Command Post Exercise 1 (CPX1), and CPX2 that we had in the simulation in NTC Rotation 24-03. These assets allowed us to carry out any required support mission, but they also required personnel from the SPO to track and manage them. This meant personnel in the SPO were tracking and managing the live missions and requirements, and that other personnel were managing the virtual missions. To avoid confusion between live and virtual missions, capabilities among the SPO sections were split. This required each section to work harder and communicate more.

In NTC Rotation 24-03, 1AD conducted a division-level rotation that emphasized artillery, aviation, and sustainment. The DSB sustained 1AD and its enablers throughout the exercise with a fraction of the DSSB and support from the 916th Sustainment Brigade. The SPO team successfully tracked and coordinated sustainment in both the virtual and live environments, overcoming numerous friction points. This was only possible after splitting SPO into two teams, one for the live environment and one for the virtual. We refined our daily syncs, mission trackers, reports, and other products that will be codified in standard operating procedures to drive success in future exercises. The key to our success was that we strove to improve each day and continued to refine our products and systems.

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Materiel Support Command-Korea
Combat Power Generation Center

Modernizing Kinetic Maintenance at the Edge

By David Pack

Materiel Support Command-Korea Combat Power Generation Center Mission

The 2022 National Defense Strategy has prioritized focus to the Indo-Pacific region due to the escalation of rhetoric and efforts to destabilize the region by the Democratic People's Republic of Korea (DPRK), the People's Republic of China, and Russia. Peace on the Korean Peninsula has been maintained by United Nations Command since the 1953 armistice that ended the Korean War. The Eighth Army has served at the tip of the spear since the Korean War and remains as relevant today as it was in 1953. Our ironclad commitment to the Republic of Korea (ROK)-United States (U.S.) alliance remains strong and postured to fight tonight if the armistice fails on the Korean Peninsula.

The bedrock of the forward-deployed Eighth Army and U.S. Forces Korea (USFK) rests on operational-level sustainment meticulously provided by the 19th Expeditionary Sustainment Command (ESC), a subordinate command of Eighth Army. Furthermore, the center of gravity for the 19th ESC is the U.S. Army Materiel Support Command-Korea (MSC-K), a brigade-level command. This vital command consists of several key components: the 498th Combat Sustainment Support Battalion, providing theater level sustainment; the 6th Ordnance Battalion, providing strategic joint ammunition support to USFK; the 25th Transportation Battalion, providing movement control; and the Korean Service Corps (KSC) Battalion, a paramilitary organization that was born in the Korean War. The KSC Battalion maintains 20,000 paramilitary members who are ready to execute sustainment missions in armistice and contingency.

What is MSC-K's Combat Power Generation Center?

The Combat Power Generation Center (CPGC) is at the heart of MSC-K readiness capability and is the main driver for readiness within Eighth Army. The CPGC is a military industrial operation whose mission is to provide below-depot and pass-back field maintenance support to Eighth Army forces and to USFK. During conflict, MSC-KCPGC provides support to the joint force in the Indo-Pacific. Additionally, the CPGC is the largest U.S. Army military industrial operation outside the continental U.S. in the Indo-Pacific area of operation.

For years, the CPGC has cemented itself as the center of gravity for readiness and is the model for generating and delivering combat power for Eighth Army and USFK. It is a forward-deployed table of distribution and allowance organization within MSC-K, consisting of emergency-essential civilian and mission-essential civilian employees. CPGC civilians are tasked to execute below-depot-level sustainment and pass-back field-level maintenance, assist coalition and joint forces, conduct rapid repair of Class VII equipment, provide maintenance support teams (MSTs), and repair battle-damaged equipment for return to theater sustainment stocks. The CPGC workforce comprises over 600 Korean nationals. The Directorate for Maintenance, the Directorate for Supply & Transportation, and the Directorate for Quality Management constitute the organizational structure. Each civilian in the CPGC is fully committed to transition to conflict if the environment changes.

How MSC-K's CPGC Supports Eighth Army Readiness

The MSC-K CPGC serves as the backbone for maintaining a diverse array of tactical and combat assets vital to Eighth Army and USFK. With a focus on bolstering readiness, the center spearheads the theater sustainment maintenance programs, consisting of two key initiatives: the Theater Sustainment Repair Program (TSRP) and the Theater Sustainment Repair and Return (TSRR) program. The TSRP, a flagship Eighth Army maintenance program, adopts the inspect-and-repair-only-as-necessary approach to prolong the lifespan of Class VII equipment. Uniquely tailored to the peninsula's needs, TSRP is overseen by the CPGC and ensures the optimal functioning of essential assets. Meanwhile, Eighth Army's TSRR program offers comprehensive sustainment solutions, encompassing unscheduled below-depot-level maintenance, field-level support, painting, fabrication, and repair services for various equipment categories. Together, these programs epitomize MSC-K's commitment to enhancing combat readiness and operational effectiveness throughout the theater.

Maintenance at the Edge in a Contested Logistics Environment

The Indo-Pacific region covers the Indian Ocean and both the western and central Pacific Ocean, totaling nearly 100 million square miles. Within this expansive area, military operations face diverse challenges and threats. According to 10 U.S. Code § 2926, Operational Energy, the term contested logistics environment refers to "an environment in which the armed forces engage in conflict with an adversary that presents challenges in all domains and directly targets logistics operations, facilities, and activities in the United States, abroad, or in transit from one location to the other." In uncontested waters, traversing the Indo-Pacific by water takes weeks, and by air, it takes 12 hours or more, depending on the destination from the continental U.S. (CONUS). Defending and maintaining any supply routes or supply cargo spanning this vast area in a contested logistics environment requires a massive number of dedicated resources and large amounts of time. The sheer scale of the region underscores the complexity of sustaining operations and the need for robust logistical strategies to ensure mission success for all parties.

This vast geographical expanse between CONUS and the South Pacific, coupled with the intricate sustainment demands spanning joint and allied forces in the Indo-Pacific region, firmly position MSC-K's CPGC at the forefront of sustainment support. Operating in such a complex environment requires the MSC-K CPGC to seamlessly conduct maintenance operations, spanning from its military industrial base to the tactical points of maintenance and manufacturing needs. This dynamic landscape also entails navigating potential anti-access and area denial activities initiated by the DPRK, including threats posed by asymmetric forces, special operations, drone incursions, theater ballistic missiles, disruptions to logistic communication systems, and attempts to sabotage sustainment inventories and infrastructure.

The MSC-K CPGC's objective, to conduct sustained successful maintenance operations and to thrive in a contested logistics environment, has required its leadership to exercise pragmatic innovations in their approach to maintenance operations support through the competition continuum. Through this continuum, the MSC-K CPGC will continue to conduct sustainment and below-depot-level repair programs to maintain Eighth Army readiness and to shift, when needed, to quickly conduct battle damage assessment and repair operations on Eighth Army and USFK damaged equipment. The CPGC has further expanded their portfolio, supporting regional Marine Corps forces stationed in Japan and supporting ROK partners on critical combat systems. This validates the CPGC to execute its wartime mission.

MSC-K's CPGC must drive Eighth Army materiel availability, achieved by providing a robust and sustained maintenance operations presence in a contested logistics environment, both on the move or static. This maintenance capability is an Eighth Army combat enabler, and significantly impacts the combat operational readiness rate of Eighth Army and USFK critical combat systems. Additionally, this capability diminishes Eighth Army's need to quickly supply Class VII assets from CONUS. The CPGC's robust military industrial base operates in the space needed by both Eighth Army and USFK for the CONUS strategic industrial base to activate resupply of critical Class VII major assemblies and combat platforms. This requirement is achieved through the MSC-K CPGC's kinetic maintenance concept of operations (CONOP).

Kinetic Maintenance Concept of Operations

The MSC-K CPGC leadership's kinetic maintenance CONOP expects the following capability from its modernization. Envision maintenance operations seamlessly conducted from remote locations, employing advanced techniques to troubleshoot and swiftly triage the necessary actions essential for salvaging and repairing damaged assets in conflict scenarios. Picture an operator or maintainer seamlessly transmitting vehicle sensor data, complete with fault codes extracted from the damaged vehicle's controller area network (CAN) bus, while directly linked to the electronic control units (ECU). Now, imagine this data, summarized, being

transmitted instantaneously through a secure DoD-approved application to a mobile MST responding to the necessary maintenance action, and simultaneously being relayed to a military industrial operation specializing in below-depot and pass-back field maintenance, capable of swift validation and efficient resolution of maintenance issues.

Now envision that same military industrial operation equipped to deliver kinetic maintenance operations support in a contested logistics environment (CLE), facilitating the rapid maintenance response required at the speed of war and providing tactical maintenance and manufacturing capability precisely where and when it is needed. Furthermore, visualize that same military industrial operation providing extended forward support to joint and allied forces in a CLE during the competition continuum, through that same DoD-approved application and providing support through maintenance repair, overhaul, and forward operations to those same joint and allied forces.

MSC-K CPGC Kinetic Maintenance Modernization to Meet Speed of Need

An example of a CLE in the Indo-Pacific was seen during the Philippines campaign of 1941, where Allied troops held out for almost six months before they were forced to surrender to Japanese forces due to lack of replenishments of crucial warfighting supplies. To prevent a repeat of history, the MSC-K CPGC must be able to sustain maintenance operations for prolonged periods without constant resupply.

The modernization's purpose is to enable MSC-K's CPGC to conduct prolonged mobile maintenance operations under intermittent conditions, at best, and under a zero-support condition for extended periods by focusing on the Korean Peninsula, in support of Eighth Army assets, and further extending the support framework to the larger Indo-Pacific through the regional sustainment framework concept of maintenance, repair, and overhaul forward. This encompasses the integration of four maintenance needs: tele-maintenance and special tools in support of Korean Peninsula forward support and extended Indo-Pacific forward support; condition-based maintenance; Expeditionary Fluid Analysis Capability (EFAC); and Advanced Manufacturing (AdvM). By combining these needs, MSC-K's CPGC enhances its ability to conduct effective maintenance operations efficiently, ensuring optimal readiness across diverse operational environments and challenging conditions.

Tele-Maintenance in the ROK

The MSC-K CPGC's tele-maintenance execution on the Korean Peninsula, micro scenario, is accomplished via registering Eighth Army organizations' maintenance leads in a DoD-approved secure application. The MSC-K CPGC's tele-maintenance capability allows real-time maintenance information sharing for troubleshooting (i.e., pictures, texts, videos, etc.).

To visualize what tele-maintenance in the ROK looks like, picture the scene from the movie Apollo 13 where experts on Earth improvise a solution to purify the air for the crew in orbit using available parts. Similarly, maintenance support can be shared with maintainer subject matter experts equipped with critical asset schematics, interactive authoring and display software, special tools, supported interactive electronic technical manuals, and expert experience in maintaining Eighth Army assets. Moreover, through combining tele-maintenance support with needed special tools, MSC-K's CPGC can perform repairs and provide extended forward support, macro scenario, to joint forces and allies in the Indo-Pacific.

The micro and macro scenarios follow identical processes, thereby reducing uncertainty regarding maintenance support. This mitigation occurs when MSC-K's CPGC possesses the necessary schematics, experience in maintaining the platform, or the capability to access experienced maintainers for the asset, along with the technical manuals required for maintenance support.

MSC-K CPGC Condition-Based Maintenance

Condition-based maintenance, as defined by Army Regulation 750-1, Army Materiel Maintenance Policy, is executed with Maintenance Support Device Version 4, wireless AT-platform test set, and DS Viper software. The diversity of maintenance support equipment allows our MST to interrogate the Eighth Army assets' CAN bus that is connected to the ECU. This connection enables MSC-K's MSTs to access central diagnostics, configuration information, and sensor data (fault codes) that can be shared from operators and MSTs to maintenance operations.

EFAC

This capability is required to support the prolonged use of fluids in support of battle damage assessment and repair activities and to salvage the life fluids of our mobile fighting fleet. Oil and other fluids perform several functions for the engine: lubricating parts, dissipating heat, maintaining cleanliness, and preventing corrosion. When exposed to the heat of an operating engine over a long period of time, oil begins to break down, altering its viscosity, producing sludge, and making it progressively less effective as a lubricant. Under the conditions expected in conflict on the Korean Peninsula, coupled with a CLE across the Indo-Pacific, the ability to discern oil and fluid integrity accurately and expeditiously is a combat requirement.

AdvM

AdvM serves as a critical mitigation strategy in a CLE to address maintenance supply challenges. During conflict in a CLE, the flow of parts from the strategic supply chain will be disrupted at best, and once bench stock, shop stock, controlled exchange, and local purchase are no longer available, the ability to manufacture replacement parts at the point and speed of need is a direct combat materiel-availability driver. The longer the MSC-K CPGC can manufacture approved parts from the Joint Additive Manufacturing Model Exchange or the AdvM Data Repository while operating in a CLE, the longer sustained maintenance operations can be supported. Such capability will be the difference in MSC-K's ability to provide its supported warfighters with freedom of action and to extend the operational reach of commanders at echelon.

Two Nations, One Team

The modernization of the MSC-K CPGC marks a significant milestone as the 19th ESC commemorates 60 years of sustainment within the Indo-Pacific since July 19, 1964. This milestone underscores the MSC-K CPGC's enduring commitment to readiness and excellence in maintenance operations. MSC-K's CPGC stands as a shining example of excellence, with a track record of success validated by prestigious awards. Notably, MSC-K clinched the Army Award for Maintenance Excellence in both 2022 and 2023 and won the Chief of Staff, Army, Supply Excellence Award in 2023. These accolades underscore the unwavering dedication and expertise of the remarkable U.S. and ROK civilian workforce within MSC-K. Each member's steadfast commitment plays a pivotal role in enhancing Eighth Army readiness, reinforcing the MSC-K CPGC's status as a cornerstone of USFK and Eighth Army combat preparedness at Camp Carroll, Korea. A modernized MSC-K CPGC enables the command to execute sustainment at the speed of war, providing tactical maintenance and manufacturing solutions precisely when and where they are needed. This modernization effort supports readiness to fight tonight even in a CLE, solidifying MSC-K's position as the premier center for maintenance excellence in the Indo-Pacific region and its commitment to two nations, one team.

David Pack currently is the deputy to the commander for U.S. Army Materiel Support Command-Korea after serving as the director for maintenance for U.S. Army Materiel Support Command-Korea. He has served over 15 years as a logistics management specialist working for Headquarters, Department of the Army, Deputy Chief of Staff, G-4, Maintenance Directorate, and within Army Materiel Command. He has a Master of Business Administration and Master of Project Management from Keller Graduate School of Management, and a Master of Business Administration from Texas A&M University-Texarkana. He has completed Civilian Education System Advanced, Army Materiel Command Fellowship, Mobilization/Deployment Planning Course, and University of Texas Post Graduate Course Data Science and Business Analytics. He is a certified National Society of Logistics Engineers Demonstrated Master Logistician, Naval Sea Systems Command Backfit Reliability Centered Maintenance for Practitioners Certified, and a Department of the Army American National Standards Institute Master Logistician.

Feature Photos
Top Left: Directorate for Maintenance Mechanics receive rapidly emplaced bridge system maintenance training at Camp Carroll, Waegwan, South Korea, on Jan. 9, 2024. (Photo by Mr. Kim, Son Hyon)
Top Right: Directorate for Maintenance Mechanics receive field level maintenance equipment training for the M1150 Assault Breacher Vehicle at Camp Carroll, Waegwan, South Korea, on Jan. 9, 2024. (Photo by Mr. Kim, Son Hyon)
Bottom: Directorate for Maintenance Mechanics receive CAT ET2023B diagnostic training at Camp Carroll, Waegwan, South Korea, on Jan. 9, 2024. (Photo by Mr. Kim, Son Hyon)

The Indo-Pacific

Division Sustainment Support Battalion

Division and Garrison Support Responsibility

■ *By Maj. Paula Heap*

Commanders delegate appropriate authority to deputies, subordinate commanders, and staff members based on their capabilities and experience. Delegation allows subordinates to decide and act for their commander in specified areas (Army Doctrine Publication 6-0, Mission Command: Command and Control of Army Forces). Commanders underwrite risk by empowering others to make decisions and execute missions on their behalf. What happens when commanders are unaware of the degree of risk they are underwriting?

From Combat Sustainment Support Battalion to Division Sustainment Support Battalion

The reflagging of combat sustainment support battalions (CSSBs) to division sustainment support battalions (DSSBs) occurred to provide clear command and support relationships to logisticians and warfighters. This organizational change aligns with the Army's shift from counterinsurgency operations to large-scale combat operations and the shift from a brigade-centric to a division-centric force (Field Manual 4-0, Sustainment Operations). This change resulted in clear command and support relationships for the 10 former CSSBs in the active component Army. However, on the island of Oahu, the conversion of the 524th CSSB to DSSB was not as clear and brought about unique challenges and opportunities due to its location in the Indo-Pacific.

Customer Support

With the transition from CSSB to DSSB, the scale and scope of the 524th DSSB's logistical support to the 25th Infantry Division (ID) and U.S. Army Hawaii (USARHAW) remain the same, with the 524th DSSB supporting several general officer (GO)-level commands. As the primary echelon above brigade (EAB) sustainment support battalion on the island of Oahu, the 524th DSSB is responsible for providing tactical-level sustainment support to the 25th ID while simultaneously providing sustainment support to all major tenant units that constitute USARHAW.

Support includes the supply support activity (SSA) via the composite supply company (CSC), maintenance via the support maintenance company (SMC), and transportation via the composite truck company. GO-level supported units (outside the 25th ID) include the 8th Theater Sustainment Command (TSC), the 9th Mission Support Command, the 18th Medical Command, the 94th Army Air and Missile Defense Command, the 311th Signal Command, and U.S. Army Pacific Command. Maintaining support and readiness for both the 25th ID and USARHAW, in addition to the 524th DSSB's internal readiness, is not without risk. Commanders at echelons inside and outside the division are assuming risk, either knowingly or unknowingly, because of a capacity gap and throughput shortfalls due to a DSSB performing the function and supporting the customer workload of essentially two battalions. Although the DSSB's efforts are admirable, and the Soldiers take on the daily challenge, keeping everyone's preparation and maintenance at an acceptable combat readiness level with the number of units the 524th DSSB supports is a nearly impossible task.

The SSA supports 116 non-divisionally aligned units, and the SMC supports 50 non-divisionally aligned units. Although the brigade combat teams (BCTs) on the island are Category A organizations that have brigade support battalions (BSBs) manned at 95%, the 524th DSSB provides weekly transportation and lift assets to the BCTs for platoon-, company-, and battalion-level training on the island.

Based on fiscal year 2023 external work orders, the SMC requires 180,328 man-hours to complete 4,630 work orders annually to support the non-divisionally aligned units. However, the SMC, per its modified table of organization and equipment, is supposed to complete 117,312 annual man-hours, which creates a 63,016-man-hour deficit. The 524th DSSB delivers daily support to hundreds of customers inside and outside the 25th ID while operating as any other active component Army unit with administrative, maintenance, and individual/collective training requirements.

Training Engagements and Support

Due to its strategic and isolated geographic location, to meet both internal and external training objectives/exercises, the battalion often finds itself dispersed and postured to support multiple sustainment nodes. Although a great training opportunity, whenever this is the case, the logistical support available to USARHAW (and its several GO-level commands on the island) is limited, unfortunately affecting readiness across non-divisionally aligned units.

With regional engagements and training rotations, the 524th DSSB is consistently involved in yearly training exercises in the Indo-Pacific. These commitments impact the availability of forces and equipment to provide steady-state logistics support to USARHAW. Involvement includes sending support packages to several countries and providing transportation and lift support for moving personnel and equipment to and from the seaports of debarkation and the aerial ports of departure on the island. Additionally, the DSSB provides sustainment task forces to Operation Pathways yearly, provides a bi-annual sustainment task force to Talisman Saber, supports Joint Pacific Multinational Readiness Center (JPMRC) rotations annually, and participates as a JPMRC rotational training unit every other year.

Whereas other active duty DSSBs go to the National Training Center (NTC) or the Joint Readiness Training Center (JRTC), the 524th DSSB's combat training center (CTC) is the JPMRC, which has training areas on Oahu and Hawaii. It is beneficial to conduct training in the jungle environment, unique to the Indo-Pacific theater, but it is not without its challenges. When other DSSBs (and their supported BSBs) execute a CTC rotation, their training center (NTC or JRTC) has a pre-positioned fleet available. Units bring a combination of organic equipment and pull equipment from the pre-positioned fleet. On the

island of Oahu, rotational training units use their organic equipment, and when there are shortfalls in lift, liquid logistics, transportation, or refrigeration assets in the BSBs, those equipment gaps are filled by the 524th DSSB. This is executed either by signing over the property to the BCT, providing equipment and personnel to the BCT, or receiving more movement and life support requests during the rotation.

U.S. European Command Support and Sustainment Impacts to U.S. Indo-Pacific Command

The 524th DSSB has also been called on to serve in the European theater. The battalion has supported the U.S. European Command (USEUCOM) for the past five years by sending the battalion's CSC to Poland twice. The CSC performed phenomenally in support of the mission set. However, when the CSC deploys, significant shortfalls occur in the SSA and the fuel and water storage/distribution capability on the island of Oahu. For instance, when the CSC deployed to USEUCOM from 2022-2023 for a nine-month rotation, U.S. Indo-Pacific Command (USINDOPACOM) did not have access to that critical equipment for 16 months. Additionally, the cost to train and employ 36 contracted civilians to run the island's SSA during the deployment was $1.7 million for 12 months.

Regarding liquid logistics, when the CSC deploys in another theater, the 25th ID pulls liquid logistics assets from the BCTs and the 25th Combat Aviation Brigade to equip the DSSB with fuel and water storage/distribution capability to fulfill annual responsibilities such as sustainment contingency response and JPMRC, impacting the division's overall sustainment capacity and capability to respond to crises. Ultimately, pulling the CSC out of theater to support another theater creates significant risk for commanders to meet training, regional engagement, humanitarian assistance and disaster relief, and homeland response mission requirements in support of USINDOPACOM.

The Way Ahead

The battalion's workload is impressive, and it consistently does more with less—quite the professional organization with a reliable and results-delivered reputation. The scope of support requirements unique to USARHAW exceeds the capacity of the organic DSSB, and sourced solutions are required to fill the gap.

Proposed solutions include the following:

1. Task organizing additional modular logistics companies under the DSSB to solely support USARHAW.
2. Activating an Army Reserve or National Guard logistics unit already on the island to focus on USARHAW support.
3. Attach an SMC or maintenance support team to the 8th TSC, which is responsible for providing USARHAW support.
4. Task organize a CSSB under the 25th Division Sustainment Brigade or the 8th TSC that is outfitted to meet daily USARHAW support requirements.

The 524th DSSB is unique because it is the primary active component DSSB responsible for the daily sustainment support of a division and all Army tenant units on the island of Oahu. Despite the complexity and consistency of the mission set, the Hannibal Battalion always finds a way to sustain the 25th ID and USARHAW. To achieve and maintain steady sustainment support to the Indo-Pacific region, the 25th ID, and USARHAW, and for the DSSB to be able to train on all its mission essential task list tasks, the deliberate sourcing of solutions is required.

Maj. Paula Heap serves as the support operations officer for the 524th Division Sustainment Support Battalion (DSSB), 25th Division Sustainment Brigade (DSB). Previously, she was the executive officer for the 524th DSSB, 25th DSB. She has served as the commander of Seattle Recruiting Company, Seattle Recruiting Battalion, Seattle, Washington. Previous to that assignment, she served as the commander of the 523rd Composite Truck Company (Light), 13th Combat Sustainment Support Battalion, Joint Base Lewis-McChord, Washington. She has a master's degree in procurement and acquisitions management from Webster University, Missouri, and a master's degree in operational studies from the Command and General Staff College, Kansas.

CONTESTED LOGISTICS IN A JUNGLE ENVIRONMENT

A Back-to-Basics Approach at the Joint Pacific Multinational Readiness Center

■ *By Lt. Col. Brandon Grooms*

In a jungle environment, mission success is measured not only in terms of efficiency and timeliness, but also in the ability to adapt, innovate, and outmaneuver an enemy through terrain arguably the most demanding on Earth. Dealing with winding rivers and muddy trails, sustaining military formations in a contested jungle environment has challenged some of the greatest military minds for centuries. During the Joint Pacific Multinational Readiness Center (JPMRC) rotation 24-01, the 325th Brigade Support Battalion (BSB), 3rd Brigade Combat Team (BCT), 25th Infantry Division (ID), was faced with such a challenge. Established training objectives that would test logistics from the brigade support area (BSA) to the canteen at the forward line of troops put the 325th BSB on a journey that explored how to overcome challenges of contested logistics in a jungle environment.

The 325th BSB executed JPMRC 24-01 in the fall of 2023. The exercise included Soldiers from the U.S. Army, Thailand, Indonesia, the Philippines, New Zealand, and various joint partners. JPMRC was established in 2022 as the Army's Indo-Pacific combat training center: one in Hawaii, one in Alaska, and one that is exportable with a partner west of the International Date Line.

JPMRC 24-01 was designed as the capstone exercise for the 3rd Infantry BCT. For the 325th BSB, JPMRC provided an excellent venue to conduct tactical-level sustainment operations while sustaining a BCT across ground and sea lines of communication. For a support battalion, there is no better way to validate the brigade sustainment enterprise in an island chain scenario than integrating and synchronizing combat support across multiple echelons in a multidomain environment. In the jungle environment, logistics challenges include limited visibility, restricted mobility, and degraded communication, with a hostile enemy presence.

Our Approach

In preparation for JPMRC 24-01, the battalion executed three field training exercises (FTXs) that prepared the battalion to conduct seamless and dedicated support to the brigade while preparing to defend against a Level II enemy threat in a contested environment. The first FTX, coined Mustang Stampede I, focused solely on base defense operations. Oftentimes, units focus on too many facets while training the unit's mission-essential tasks. The end state of this FTX was to work on the basics, that is, to focus on the fundamentals to prepare the battalion to win and to ensure Soldiers are confident in the core tactical competencies to defend their assigned area at all times. Do Soldiers know how to apply individual camouflage daily? Are vehicles masked by cover, camouflage, and signature? Do Soldiers have range cards at every fighting position with alternate fighting positions identified? To use a football analogy, this FTX was about blocking and tackling and building a strong offensive line that could fight and win in the trenches of the jungle. The base defense focus was on understanding the basics before adding receivers, the run game, or trick plays to the offensive scheme.

The next FTX was Mustang Stampede II. It built on the success of Mustang Stampede I. It focused operations on sustainment and distribution integrated with the addition of forward support companies (FSCs) and with establishing a combat trains command post (CTCP). This FTX integrated the BSB with FSCs and built proactive relationships that proved pivotal during the JPMRC rotation. To build on the football analogy, Mustang Stampede II added the running backs behind the offensive line as the battalion continued to build the offensive scheme.

Finally, the brigade executed Bronco Rumble, which was a brigade-level exercise intended to prepare Task Force Bronco to fight in large-scale combat operations and win at JPMRC. Bronco Rumble included a dynamic medical scenario that identified vehicles for casualty evacuations (CASEVACs) and included a daily logistics synchronization (LOGSYNC) meeting that incorporated the battalion intelligence and operations officers to synchronize enemy actions with the maneuver and sustainment plan. The battalion received a liaison officer (LNO) from the 25th Division Sustainment Brigade (DSB) into the battalion's support operations (SPO) cell and integrated an LNO into the 25th Division Sustainment Support Battalion SPO cell.

Establishing LNOs enabled the battalion to identify friction with division enablers early and to understand assets available in support of the brigade. Starting the LNO relationships early on proved successful; the LNO who was incorporated into Bronco Rumble remained for JPMRC 24-01. To complete the football analogy, Bronco Rumble now incorporated the offensive line, running backs, and all skill players to be successful during JPMRC 24-01. The synergy initiated at Bronco Rumble continued throughout the JPMRC rotation. The battalion continued to put all the pieces together in support of this game plan.

The Will to Prepare

To provide uninterrupted support and irreversible momentum to the 3rd BCT, the 325th BSB developed training objectives that served as the foundation of the unit's training plan leading up to the rotation. Training objectives exercised during JPMRC 24-01 included base defense operations using the base cluster concept, light and mobile command post functions, sustainment integration from DSB to BSA to CTCP, non-standard CASEVACs, medical evacuation (MEDEVAC) operations, and multimodal distribution operations. In addition, the battlefield geometry in Hawaii required a detailed concept of support synchronized on multiple islands with Army and joint partners.

Base Defense Using Base Clusters

In a contested jungle environment, sustainment units must be able to displace, disperse, and defend during day and night operations, while being able to self-secure, jump, and operate light and mobile. Such demands require units to adapt and innovate. One initiative the 325th BSB pursued during JPMRC 24-01 was establishing a multimodal base cluster concept incorporating FSCs and a field-trains command post. The base cluster design considered the protection and survivability of each node, dispersion of sustainment assets (fuel, water, recovery, distribution, medical), mission command system redundancy, and command and control dispersion. The base cluster design used terrain features between the two clusters while ensuring they could mutually support each other while considering commodities and capabilities available at each node.

Experimenting with such a concept was only possible because of the building blocks laid during Mustang Stampede I, Mustang Stampede II, and Bronco Rumble. Deliberate fighting positions, range cards, and camouflage were already tested and established in the 325th BSB's tactical standard operating procedure (SOP). Accordingly, systems codified during daily LOGSYNCS and LNOs interoperating at echelon ensured sustainment remained synchronized. The 325th BSB's ability to adapt and innovate for a few days during JPMRC took months of preparation throughout all levels in the BCT's sustainment enterprise.

Light and Mobile Command Post Functions

Sustainment formations are challenged to minimize their signature with large vehicle platforms that do not allow for maneuverability in restrictive jungle terrain. These challenges compound given the advances in loitering munitions and drone technology, which require BSBs to be light and mobile given how vulnerable they are to enemy targeting Although the increased demand for being light and mobile likely requires a closer look at how the Army equips conventional sustainment units operating in the jungle, there are ways to combat it organically. For now, sustainment units must get comfortable with being uncomfortable and move away from large tents previously used in counterinsurgency environments. The 325th BSB reduced the command post from a medium tent to a high-back high-mobility multipurpose wheeled vehicle covered with camouflage and incorporated analog tracking boards to maintain sustainment operations and to understand the operating environment during JPMRC 24-01. The BSB prioritized training with analog systems that were redundant and that could accurately track friendly elements and enemy contact.

Units should prioritize and enforce the use of the battalion's tactical SOPs and planning SOPs to train the staff and enforce systems that are pivotal in a degraded and contested environment. A key to executing in the austere jungle environment is the development of standardized fighting products such as operational graphics, synchronization matrixes, execution checklists, commander critical information requirements, and medical and logistics common operating pictures to anticipate and integrate sustainment operations.

Sustainment Integration from DSB to BSA to CTCP

Close coordination between the brigade executive officer, the brigade operations officer, and the SPO officer helps the BSB commander identify opportunities, culmination points, and risks in support of the maneuver plan. Deliberate and rehearsed logistical release-point operations ensure units and supplies are in the right place, at the right time, with the right personnel. These operations must be rehearsed during day and night operations and codified in the battalion tactical SOP. Success requires maximum understanding of the operations from the DSB down to the FSC, which requires an enterprise approach from the division down. Maximum synchronization and integration of sustainment and protection assets enabled the buildup of combat power and prevented the culmination of Task Force Bronco during the initial stages of the operation when tempo and speed were key.

Multimodal Distribution Techniques

The jungle environment requires multimodal distribution methods that can sustain combat units by land, sea, and air. JPMRC 24-01 tested these nodes when the 325th BSB provided support from the island of Oahu to the island of Hawaii. Pre-postured and preconfigured loads were essential to the success of the rotation through synchronization with the DSB, BSB, and FSCs during the division's daily LOGSYNC meeting. The BSB was able to leverage pre-packaged Class IV and V packages with the support of 11th Airborne Division riggers from Alaska. Units must also consider defensive operations while still on the offensive to ensure responsive and proactive sustainment support. Units should consider historical consumption rates coupled with a detailed synchronization matrix using the daily logistical status report to coordinate tailorable and precise sustainment through multiple distribution methods.

CASEVAC and MEDEVAC Operations

JPMRC 24-01 focused on CASEVAC and MEDEVAC operations to stress casualty and replacement operations by limiting administrative reconstitutions. Before the JPMRC rotation, the Bronco Brigade held a leader development program (LDP) session with all company command teams. The LDP focused on identifying non-standard CASEVAC vehicles, who was responsible, and where assets would be positioned from the point of injury to the Role I, Role II, and higher medical treatment facilities. Also discussed was the integration and exchange of casualties at the ambulance exchange points. This approach generated shared understanding of medical operations throughout the brigade.

Furthermore, the success of the 25th ID's Jungle Medicine Course, led by the 325th BSB, focused on prolonged field care in a jungle environment, increasing the clinical competence of all medical Soldiers. The two-week course incorporated hands-on skills validation for critical tasks using perfused cadavers along the continuum of care from the point of injury to the medical treatment facility using helicopter landing zones and static Role I/Role II facilities. The further integration of the 8th Forward Resuscitative and Surgical Detachment into the BSA Role II operations was an integral part of the medical training objectives during JPMRC 24-01. It built on the success of the Jungle Medicine Course.

Key Sustainment Innovations Partnerships. The battalion partnered with the 2nd Combat Service Support Battalion (CSSB) from the New Zealand Army's 1st Brigade Combat Team during JPMRC 24-01. The 2nd CSSB embedded five soldiers (junior soldiers through lieutenant) into the battalion during the rotation to build interoperability and share lessons learned. One output of this partnership was that the 325th BSB participated in the Royal New Zealand Army Logistics Regiment's annual trade competition in April 2024.

Fix Forward Additive Manufacturing at the Point of Need. The maintenance company service and recovery team completed pass-back maintenance of a High-Mobility Engineer Excavator. The team used acetylene cutting torches to remove a pin used to secure the equipment's hydraulic arm and bucket. The team used additive manufacturing with the metalworking and machining shop set to create a replacement pin. This saved the Army over eight months of readiness since the pin was out of stock in the DLA inventory.

Fuel Interoperability. Leading up to the rotation, the 92F Petroleum Supply Specialists attended the division's Liquid Logistics Handler course and conducted fuel accountability and aqua glow training with the 25th Combat Aviation Brigade (CAB). The battalion capitalized on this training during JPMRC 24-01, becoming the first non-aviation unit in the division with a fuel-ready M978 Heavy Expanded Mobility Tactical Truck fueler ready to deliver aviation-grade fuel to the CAB upon request. Interoperability of fuel assets is vital to sustainment forces to prevent the delay of critical supplies.

Test Zero-Water Footprint Capabilities. The battalion partnered with the U.S. Army Combat Capabilities Development Command (DEVCOM) to experiment with the atmospheric water generator system and a small-unit water purifier as part of the zero-water footprint modular system. The goal of this technology integration is to remove or significantly reduce the logistical burden of water resupply and waste hauling in a contested environment by using key technologies: atmospheric water generation, graywater recycling, on-site wastewater treatment, and small-unit water purification. Experimenting during the exercise provided valuable feedback to DEVCOM to develop a zero-water footprint to extend operational reach.

Conclusion

JPMRC 24-01 demonstrated the complexity of synchronizing multiple division and below sustainment assets on multiple islands. Contested logistics in a jungle environment requires a tailored command-and-support relationship that prioritizes limited air, sea, and ground resources for the right size and place. BSB commanders must be able to weigh sustainment support efforts based on the maneuver plan and provide the right resources to make it happen. Sustainment commanders must weigh support relationships on economy of effort versus economy of command. This framework will be pivotal as the division becomes the unit of action and as BSBs convert to light support battalions.

The Indo-Pacific region has many unique challenges, and the jungle will remain a challenging environment where synchronization of sustainment support from the DSB to the canteen will remain key. Moreover, a back-to-basics approach with an innovative mindset will continue to provide mission success, whether in the jungle environment or the European theater.

Lt. Col. Brandon Grooms currently serves as a Senior Service College Secretary of Defense Executive Fellow. He previously served as the battalion commander of the 325th Brigade Support Battalion, 3rd Brigade Combat Team, 25th Infantry Division, Schofield Barracks, Hawaii. He is a graduate of Hampton University where he was commissioned into the Army Transportation Corps. He holds a Master of Science degree in management of technology from Murray State University, Kentucky. He is also a graduate of the University of North Carolina-Chapel Hill Kenan-Flagler Business School's advanced program in logistics and technology.

Feature Photo
Spc. Samuel Perez, a welder with the 84th Engineer Battalion, 130th Engineer Brigade, 8th Theater Sustainment Command, waits for orders to move a Heavy Expanded Mobility Tactical Truck to a better location on Schofield Barracks, Hawaii, Nov. 2, 2023. (Photo by Staff Sgt. Tristan Moore)

SYNCHRONIZING RELATIONSHIPS AND ENHANCING MATERIAL READINESS ACROSS THE DIVISION AREA

By Chief Warrant Officer 5 Michael Theroux

The division sustainment brigade's (DSB's) support operations (SPO) maintenance section stands as the division maintenance section's primary support arm, entrusted with the critical task of ensuring materiel readiness across the area of support. Achieving synchronized materiel readiness remains a persistent challenge despite nearly a decade since its conversion. This article explores the complexities and importance of synchronized relationships within the DSB, particularly focusing on the integration of materiel readiness enablers to enhance operational effectiveness.

Effective Coordination

The relationship between a division maintenance section and the DSB SPO maintenance section involves coordination and support to ensure the division's overall equipment effectiveness. Teamwork within and between these sections produces the integration essential to synchronize operations. Achieving this requires a shared understanding of these roles and responsibilities within each section and their respective leadership. We elevate and fortify this strategy by fostering trust, promoting a supportive workplace culture, and actively participating in boards, bureaus, centers, cells, working groups (B2C2WG), maintenance terrain walks, materiel readiness reviews, and sustainment review and analysis.

Roles

Understanding and employing efficiently within their respective positions are imperative to the success of brigade combat teams, multifunctional and functional brigades, and units in the area of operations (AO). If the DSB SPO maintenance section is focused down and in, it increases the risk to commanders at echelon who operate within the assigned AO. Internal maintenance management of the DSB and its assigned units is an inherent task within the DSB S-4, not the DSB SPO maintenance section, as detailed in Army Techniques Publication (ATP) 4-91, Division Sustainment Operations. When understanding roles and responsibilities as sustainers, Lt. Gen. (Ret.) Gustave "Gus" Perna described it best in the May-June 2015 issue of *Army Sustainment* when he wrote, "The bottom line is that maneuver commanders should never have to worry about or be constrained by sustainment."

The DSB SPO officer and staff in the maintenance section face a significant challenge. They must report to a DSB commander while relying on external sources, specifically the division G-4, for their current, future, and emergent requirements. Success also hinges on their ability to integrate with echelons above brigade (EABs), Army field support brigades/battalions (AFSBs/AFSBns), and expeditionary/theater sustainment commands (ESCs/TSCs).

Trust and Support

Failure to establish trust and understanding of roles and responsibilities can lead to breakdowns in support. The DSB SPO maintenance section performs a crucial role in identifying shortfalls and recommending solutions based on division priorities. It ensures compliance with maintenance plans, policies, and priorities set by division G-4, as outlined in ATP 4-91. When trust falters, the division maintenance section often reallocates personnel and resources, borrowing military manpower from a career management field 91/94 warrant officer or NCO, since they can no longer rely on the DSB SPO maintenance section. This reallocation has cascading effects, depleting unit commanders of manpower and straining the relationship between the division maintenance section and the DSB SPO maintenance section. It essentially severs the trust, because the division maintenance section then uses that individual for some of the efforts the DSB SPO maintenance section would have been providing.

Materiel Readiness Expertise

The DSB SPO maintenance section comprises personnel with specialized knowledge of The Army Maintenance Management System and extensive expertise in various equipment employed across the AO. By assisting the division maintenance section, they offer valuable technical insight to identify and address maintenance issues that affect multiple organizations that require support to enhance readiness. The DSB SPO maintenance section faces a unique and challenging requirement. Unlike any other Army unit, they are tasked with establishing maintenance support policies and plans for units across the AO. This responsibility demands the DSB SPO maintenance section operate at a higher level, serving as the crucial link between the EAB and the division, and with the AFSBn/AFSB.

In fiscal year 2022, a change to the DSB modified table of organization and equipment replaced the 913A Armament Systems Maintenance Warrant Officer with a 915A Automotive Maintenance Warrant Officer. This change resulted in a knowledge gap because the 913A was a functional area subject matter expert who was crucial for supporting the division's external requirements. Despite this change, the DSB SPO maintenance section retains a significant amount of tacit knowledge and experience. Therefore, their focus should not be solely on addressing specific internal brigade issues. It is important to note there are considerable differences in manning between the division maintenance section and the DSB SPO maintenance section.

Their role extends to aiding in the development of the installation maintenance support plan, a plan

that many installations lack. This is due to the dissociation of the materiel readiness enterprise; it requires collaboration to outline the relations between EAB tactical field-level maintenance and the tenant units within the AO that rely on other maintenance activities for support.

The division maintenance section focuses on resourcing, assessing, monitoring, determining, and coordinating maintenance-related actions to achieve the division's objectives. They also assess the sustainment task organizations to identify gaps and develop recommendations to mitigate them. In addition, they determine the maintenance workload requirements. Suppose they are focused on the day-to-day materiel readiness tasks inherent in the DSB SPO maintenance section. Can they resource, assess, and monitor holistic maintenance operations?

Synchronization of Maintenance Efforts

Close coordination between the DSB SPO maintenance section, the division maintenance section, AFSB, and AFSBn SPOs, including the supporting ESC/TSC materiel readiness branch, ensures synchronization of maintenance efforts with the overall operation plans and contingency plans. This helps minimize equipment downtime and ensures maintenance activities align with the division's mission objectives. This is done by resourcing those activities for their missions, coordinating, synchronizing, and sequencing their operations in time and space. The division maintenance section staff can only accomplish what they are required to do when they are fully supported by the DSB SPO maintenance section.

Lines of Effort

The DSB SPO maintenance section assists division G-4 in generating accurate equipment readiness reports. This includes tracking the status of maintenance and repairs, which is crucial for assessing the overall readiness of the division's equipment and making informed decisions regarding equipment deployment and usage.

They are outlined in ATP 4-91 and summarized here:

- Collect and analyze maintenance materiel status data and perform liaison functions with the brigade support battalion, the AFSB, and the ESC/TSC.
- Forecast maintenance requirements and coordinate sustainment maintenance support to the division.
- Conduct fleet management projections on equipment to determine the root cause of its inability to meet the Army's standard operational readiness rate.
- Conduct trend analysis of the division's vehicles and equipment to identify systemic problems.

The ability to adapt to the complex environment during my tenure with the 25th Infantry Division (25ID) DSB and the 8th TSC (8TSC) amplified our ability to achieve success in areas while laying a foundation for future growth. The synchronization between the 402nd AFSBn, the DSB, 25ID G-4, and 8TSC led to several achievements:

- The precursor to the Modernization Displacement and Repair Site with its divestment unit support team, a 60-plus Soldier-manned centralized team that prepared, repaired, and processed over 650 tactical wheeled vehicles.
- An integrated installation support plan that laid out the support relationships and requirements of maintenance enablers across the U.S. Army Garrison Hawaii AO.
- A comprehensive theater sustainment review and analysis that gained greater visibility of materiel management and operational readiness across the U.S. Army Pacific Command AO (read more in the summer 2022 edition of *Army Sustainment*).
- Fleet management and trend analyses that identified root causes and gaps in field and sustainment resources on the M777A2 howitzers, the M105 Deployable Universal Combat Earthmover, and the M149A2 Water Buffalo.
- The first-of-its-kind DSB maintenance section standard operating procedure.

As you can understand, these tasks require experience and technical skills that can challenge the norms and establish effective relationships and lines of communication. To pull this together contextually, then-Col. (now Maj. Gen.) Ronald R. Ragin, in the May-June 2017 issue of *Army Sustainment,* wrote it best: "... a shared understanding will greatly enhance the ability of the joint force to generate readiness, project power, anticipate requirements, sustain readiness, and ensure operational endurance." He made this statement while the 4th ID was designing the Division Materiel Readiness Center to offset the previous decentralization of key materiel integrators.

Transforming Support in the U.S. Indo-Pacific Command

As the Army transforms to a division-led approach, materiel readiness efforts must transform as well. The DSB SPO maintenance section's support to the division maintenance section is essential for maintaining and enhancing the operational readiness of the division's equipment in the AO, requiring technical expertise, fleet management, trend analysis, and reporting capabilities. Within the Unified Pacific Wargame Series (UPWS) and the DSB, efforts must emphasize synchronized relationships for operational readiness. The UPWS consists of events such as Operation Pathways, a joint/coalition logistics warfighting exercise at scale across the vast non-contiguous AO that stresses the logistics and sustainment enterprise at the operational level. Similarly, the DSB focuses on materiel readiness, emphasizing cohesive staff relationships and integrating enablers for operational effectiveness. Both stress coordination, teamwork, and trust to ensure consistent equipment readiness and to support joint operational endurance. Strengthening these relationships and enhancing synchronization will improve readiness and military operational effectiveness in large-scale contested combat operations.

Conclusion

In the pursuit of achieving peak materiel readiness, the collaboration and synchronization between the division maintenance section and the DSB SPO maintenance section are paramount. Their technical expertise, fleet management, trend analysis, AFSBn/AFSB-ESC/TSC synchronization, and reporting capabilities are critical elements in ensuring equipment is consistently ready to meet the requirements of commanders. This partnership mirrors the support that an ESC provides to the corps and that a TSC offers to the Army Service Component Commands. When these sections and their leaders understand and execute their roles effectively and adopt change management principles, they minimize the disruptive effects inherent to change, which can guarantee the division's area of support equipment remains consistently ready for operational requirements.

Individual and organizational change must facilitate transition into the future state. Unique perspectives, biases, motivations, behaviors, and resistance must be addressed to increase acceptance and commitment. Strengthening these relationships and enhancing synchronization will increase readiness across the division's area of support. As the Army implements Total Army Analysis 2025-2029, which will analyze the Army's force structure, we must continually assess, assign, and codify sustainment roles and responsibilities at echelon. A mutual understanding of roles and responsibilities, coupled with codified B2C2WG inputs and outputs, with an effective change management strategy, vision, and implementation plan, will enable increased materiel readiness efforts to continue without interruption through transitions.

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It's Time to Move the Goalposts

A Recommendation for Bringing Sustainment Readiness Metrics in Line with Reality

■ *By Lt. Col. Eric Shockley*

Army leaders face constant pressure to keep a wide variety of readiness metrics at the highest possible levels, including several sustainment-specific metrics. Given the need to be ready for war, taking action to keep readiness high makes complete sense. With that said, some of the metrics take an inordinate amount of time to maintain and add unneeded stress on Soldiers and junior leaders, while arguably adding nothing to actual readiness. I am recommending senior sustainment leaders take a comprehensive look at our metrics and adjust those that simply do not make sense. I will provide two examples of goalposts that could be moved as a starting point.

Customer Wait Time

The first example has to do with customer wait time (CWT), which is how long it takes a unit or activity to receive an item from the time of order to the time of receipt. Army sustainers will recognize this metric from our supply warehouses, or supply support activities (SSAs). There are multiple elements of CWT, and almost all must be done in one day or less. The central question is a simple one: where did the one-day standard come from?

The staff action to clear certain elements of CWT and release strategy (RS) typically happens every day, but at the end of the fiscal year, there are usually delays due to overall funds availability. Those CWT elements are referred to as ZPARK, based on the transaction code associated with the action. RS essentially involves releasing funds to match the orders that have been approved in the ZPARK step.

Since holding orders at either stage, ZPARK or RS, negatively impacts CWT, staff personnel typically cancel all open orders that do not get passed through the ZPARK and RS gates. This keeps CWT low, but it also means supply or maintenance clerks will need to re-order all the canceled parts the next duty day, instead of completing other tasks.

Moving to the SSA itself, the same one-day standard exists for post goods issue actions (issuing a part to the unit from an inbound shipment) and post goods receipt (PGR) actions (the unit acknowledging receipt of the item). Again, this standard does not account for the reality on the ground.

Good clerks understand the importance of high-priority parts for our most important pieces of equipment, and they will diligently head to the SSA to pick up a critical item no matter how late in the duty day it is. But that often means hours of waiting behind many other people, since every supply clerk and maintenance clerk is expected to pick up parts and supplies every single day. If their assigned bin of parts is empty, they do not need to visit the SSA, but they have no latitude beyond that. This means a clerk will spend hours away from the supply room or motor pool, time that could be spent updating hand receipts, conducting parts inventories, and conducting administrative tasks.

Clerks put in those hours at the SSA so their PGR numbers stay under one day, even if they are picking up a routine order of our ubiquitous green notebooks or other similarly low-priority items. Extending the standard timeline for these metrics to three or four days would be more realistic, and it would support other unit requirements such as weapon qualification, mandatory training, unit standdowns, and other missions.

Not Mission Capable Equipment

The second example has to do with our expectations surrounding dead-lining faults that make a piece of equipment not mission-capable. I do not know who writes the technical manuals (TMs) for our equipment, but anecdotally the maintenance tables sometimes seem designed to make any fault a dead-lining one. The problem with this is that in many cases the equipment itself can still be used for its primary mission. The United States often shares equipment with other countries around the world, and there are some reports on maintenance of that equipment that show high usage rates even while sustaining multiple dead-lining faults.

One example involved equipment that was still partially mission capable, meaning, hypothetically, it could still move, shoot, provide power, etc., even though it had faults, such as a non-functioning headlight. In this example, the logisticians in the room sensed that the equipment should be pulled from usage, even though it was significantly needed on real-world missions. We would be wise to remember one of the oft-quoted Murphy's Laws of Combat: "If it's stupid and it works, it isn't stupid." Instead of being hung up on our maintenance tables in the TMs, maybe we should take a hard look at those tables. The solution could be a collective effort, using a process that already exists: the option at the back of nearly every publication to submit recommended changes. However, instead of conducting this in a piecemeal fashion, the leading entity could establish a review schedule, similar to the process that exists for reviews of updated doctrinal publications.

These are two examples, and there are likely others we could examine (frequency and depth of maintenance checks are ripe for analysis). In looking at these examples, I am not saying we should abandon readiness metrics in their entirety. I am saying we should determine if they make sense instead of berating ourselves over not measuring up. I am confident our leaders are not the type who willfully remain in a "we've always done it that way" mentality. With that in mind, let us collectively set some realistic goals, and then find a way forward.

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SUPPLY TEAM CERTIFICATION

Sustainment Tables for Supply Certifications

By Maj. Mikhail Jackson

Sustainment requires simultaneous and continuous synchronization at all echelons of command. The sustainment warfighting function can be both complex and complicated when not handled appropriately. Sustainment warfighting requires a holistic and balanced viewpoint at all echelons for a unit to be successful. Looking at sustainment throughout the years, specifically property accountability, there are multiple challenges and a lack of synchronization at the company supply level. Company supply rooms must have trained supply personnel who stay nested with each other on day-to-day responsibilities to be successful. Supply teams must understand and share a balance of roles and responsibilities. To better set conditions for success, units need to invest time in developing company supply teams with the appropriate training and certification/qualification. Sustainment team certification establishes a common language and understanding of standards, allowing commands to understand the risk they are assuming in their supply rooms.

Supply Team Certification

A company supply team typically consists of a company commander, supply sergeant, supply clerk, and executive officer/supply officer. Given that the Army is commander-centric, and that the Command Supply Discipline Program is a commander's program, a commander must stay involved with daily supply transactions to enforce appropriate supply measures. The commander and his small team of Soldiers can be fully functional if all Soldiers get the appropriate training and know their roles and responsibilities.

Considering that the workload of a supply team can sometimes be overwhelming, each supply representative must be diligently involved with their day-to-day supply contributions consistently. A supply team certification model similar to the Integrated Weapons Training Strategy (IWTS) certification concept could be extremely beneficial to company supply teams. IWTS tables build relationships, increase maneuver understanding of how to provide sound guidance, and improve understanding of the capabilities and limitations of maneuver unit systems. Training Circular 3-20.0, Integrated Weapons Training Strategy (IWTS), states, "Fundamental Soldier and military occupational specialty specific skills serve as the foundation of IWTS and must not be overlooked. Soldiers, crews, teams, squads, platoons, companies, and battalions achieve the highest level of proficiency when building upon mastery of those foundational skills." A similar supply team certification concept like that of IWTS would help synchronize needed training for supply teams and provide a shared experience for Soldiers to be better involved as sustainment leaders.

Though some might think the notion of supply team certification is a bit unconventional, it is not too farfetched to lean toward the unusual process of table certification for supply teams, especially given that supply teams will have more supply transactions in future modernization efforts, such as StoreFront, changing the way sustainment does business. Supply team certification would further prepare supply teams for success by giving them the experience they would need for future supply transactions.

So, what does a supply team certification table look like? My theory is it would incorporate all the essential elements of supply. A supply team would need to understand the basic knowledge of sustainment within their unit to be successful. This concept would include the knowledge, training, and understanding of cyclic inventories, change-of-command inventories, lateral transfers, the Total Equipment Management Strategy, and maintenance operations. I recommend a two-week (81.5-hour) certification block consisting of supply course sustainment tables where supply teams would go to get trained and certified.

Supply Team Certification Training and Resourcing

Supply team certification is not a bridge too far, given that the Army had a similar proficiency program concept in the late 1970s called the Skill Qualification Test. It might not be too hard to even fathom a similar proficiency military occupational specialty (MOS) testing concept

Sustainment Tables (ST) I through VI	
Table	Description
ST I	PBO/BN S4 TM In-brief (1 hour) and GCSS-Army Supply Management Course (40 hours)
ST II	ARIMS Filing Systems (2 hours) Unit Level Publications (2 hours) eFLIPL (2.5 hours) TMDE (2 hours)
ST III	OCIE and Initial Inventories (2 hours), GCSS-Army Change of Command Inventory Class (2 hours),
ST IV	MTOE Class (1 hour) GCSS-ARMY BOMS/PB01/Documenting and Ordering Component Shortage (2 hours)
ST V	GCSS-Army Class IX Management & CMDP Success Course (24 hours)
ST VI	GCSS-Army Hand Held Terminal (HHT) (2 hours)

Suggested classes for supply team certification. (Table by Maj. Mikhail Jackson)

extending to all the other MOSs across the Army. Professional military education (PME) is not something that should be taken lightly, especially if we intend to have leaders lead effectively at the speed of war. Though resourcing may have hurt previous program concepts, resourcing for supply certification training would come from the battalions (BNs) to the companies with assistance from command maintenance evaluation and training (COMET) team reps. COMET team reps would conduct training and BN S-4s would do the final certification after training were completed, with hands-on vignette testing consisting of supply reports, financial liability investigations of property loss, the Army Records Information Management System, and normal supply transactions for the certification test. A more internalized resource concept might prove to be a move in the right direction.

Final Thoughts and Considerations

By focusing on synchronization, we can change the cultural misunderstandings at the company supply level. Synchronization at all echelons is critical when understanding required training. I recommend that company supply teams receive training when they arrive at their unit and be certified immediately following their arrival with supply team certifications. If a Soldier fails certification, they retrain; if they fail again, they may need to be reclassed or flagged. Also, given the frequency of personnel changes, supply teams would need recertification annually. The consistency of required training on a routine basis ensures the supply synchronization needed for unit sustainment success. Furthermore, it is time to ask the hard question: If Soldiers cannot demonstrate proficiency in their MOS, especially with something as extremely technical as sustainment, do Soldiers need more self-development, or does the Army need a stronger stance on PME certifications?

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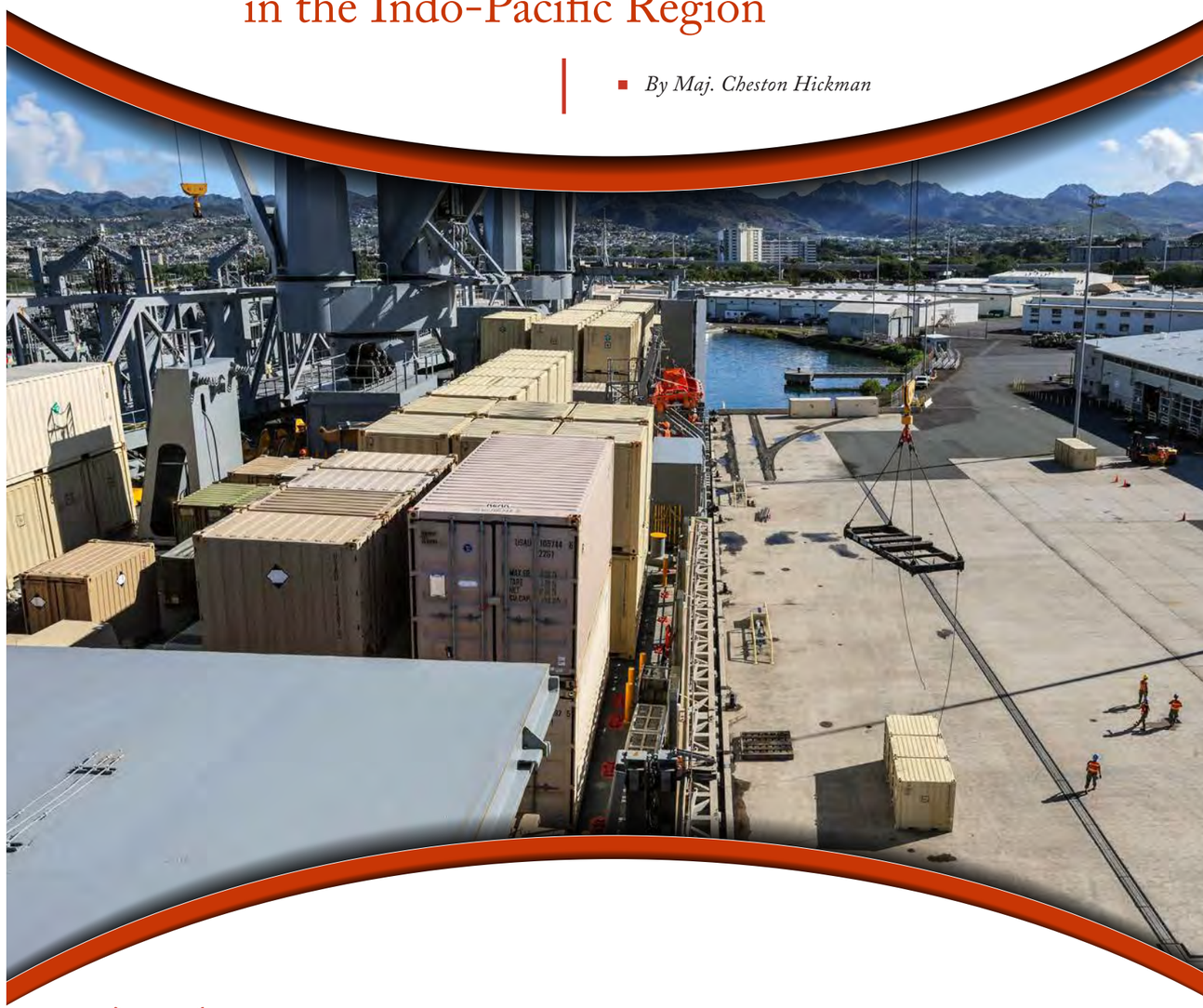
BENEFITS
of the Forward Logistics Element Concept in the Indo-Pacific Region

■ *By Maj. Cheston Hickman*



The Army's fight in a widely dispersed and geographically diverse Indo-Pacific presents many logistical complexities to sustain the high operational tempo required for campaigning and warfighting in the region. The Indo-Pacific is the most consequential region in modern history. U.S. Army Pacific Command (USARPAC) maintains its campaigning momentum through Operation Pathways while generating joint warfighting readiness through Joint Pacific Multinational Readiness Center (JPMRC) rotations. The 8th Theater Sustainment Command (TSC) provides sustainment

command and control to support USARPAC, including deterrence initiatives to prevent and prevail in crisis and conflict.

The 8th TSC actively campaigns to set the theater and develop sustainment networks to enable joint force operations. The Army's current construct relies on the echelon above division (EAD) sustainment capability to execute mission-essential tasks for theater opening, theater distribution, and theater sustainment. The problem is that nearly 83% of the Army's EAD units reside in the Reserve Component, degrading the Army's ability to project strategic deterrence through readily available sustainment capability. Key decision makers often rely on Division Sustainment Brigades (DSBs) and Division Sustainment Support Battalions (DSSBs) to fill this operational gap to support reception, staging, onward movement, and integration activities; basing operations; line-haul transportation; etc.

Link Between Operational and Tactical Levels

In addition to fulfilling sustainment requirements to support the campaigning objectives of the theater Army, DSBs and DSSBs must remain prepared to support their division's fight during the conflict. According to Army Techniques Publication (ATP) 4-91, Division Sustainment Operations, the DSB and its subordinate units provide sustainment support to all units assigned or attached to the division. The DSSB is a multifunctional battalion that is organic to a DSB and provides logistics support to a division. Supporting a division during conflict charges DSBs and DSSBs with the first step in the link of tactical logistics. In other words, getting bulk water into the canteen of the individual Soldier starts with the DSSB.

DSBs and DSSBs serve as the link between the operational and tactical levels of sustainment in the Indo-Pacific. With fluid requirements to support both levels, employing several forward logistics elements (FLEs) across an assigned area of responsibility would enable the agility and flexibility of these units. ATP 4-90, Brigade Support Battalion, highlights the primary use of an FLE to support fast-moving offensive operations in the early phases of decisive action. However, an FLE's overarching concept of task-organizing multifunctional logistics assets for an assigned purpose is an extremely beneficial way for DSBs and DSSBs to increase responsiveness at the operational and tactical levels.

Sustainment during Operation Pathways

During the 2023 Land Forces Pacific Symposium, Lt. Gen. Xavier Brunson expressed that I Corps will fight in the Indo-Pacific "with a postured data-driven force that assures its allies, partners, and friends they are ready to respond to any conflict or crisis" Operation Pathways is USARPAC's primary approach to strengthen defense partnerships through training to increase capability and procedural interoperability. Subordinate units across USARPAC participate in several exercises and train with allies and partners in Australia, Indonesia, the Philippines, Thailand, South Korea, Japan, and many other countries along the region's first and second island chains. Many of these exercises come with operational sustainment requirements, including port operations, line-haul support, area support maintenance, fuel distribution, and basing operations. Launching an FLE to support operational sustainment requirements for Operation Pathways offers plenty of opportunity for units to enhance training readiness on deployment/redeployment mission-essential tasks, validate infrastructure and port capacities, exercise command and control (C2) across their organic formations, and build partnerships with host nation sustainment organizations.

Talisman Sabre 23 is a great example of how the 8th TSC leveraged an FLE package from the 524th DSSB, 25th DSB, to execute operational sustainment tasks. During this exercise, the 524th DSSB FLE added, inventoried, and maintained Army pre-positioned stock, conducted convoy operations for mission-essential equipment, and ran the mayor's cell for basing operations in support of (ISO) of the exercise. The 524th DSSB FLE also cultivated relationships with their Australian Defense Force (ADF) counterparts, the 1st Combat Sustainment Support Battalion, by conducting joint convoy operations,

Soldiers assigned to 8th Theater Sustainment Command, 25th Infantry Division, 599th Transportation Brigade, 402nd Army Field Support Brigade, DoD Contractors, and elements from the U.S. Navy download military vehicles and containers as part of the Army Pre-positioned Stock 3 Fix-Forward (Afloat) from the U.S. Naval Ship Watson at Honolulu, Hawaii, Nov. 29, 2022. (Photo by Sgt. Maj. Shelia L. Cooper)

driver training, and fuel training. These training events allowed the Soldiers of the 524th DSSB FLE to familiarize themselves with the northern Australian road network, along with ADF transportation and fuel capabilities. Lastly, the unit stressed its C2 capability between the FLE and main command post while hosting commander update briefs, conducting military decision-making process sessions on its upcoming field training exercise, responding to missions ISO civil authorities, and receiving a redeploying organic unit's equipment. Deploying an FLE element west of the international date line (IDL) offered the best realistic and relevant opportunity to exercise the mission command systems in preparation for future deployment operations in the Indo-Pacific.

Multiple Functions of an FLE

Many senior leaders may argue the employment of FLEs is only for tactical levels of war. FLEs are doctrinally suited for quick tactical actions such as displacing brigade and division support areas to continue the momentum for the warfighters. However, during Operation Freedom Sentinel, leaders within the 101st DSB (Air Assault) cited circumstances where FLEs were augmented with Soldiers across several battalions and had a distinct structure with a direct connection to the 1st TSC to execute a wide variety of missions, including mortuary affairs, Army Post Office, and bulk fuel storage. There is a lot of value when DSBs and DSSBs apply this concept within the Indo-Pacific similarly.

Future exercises under the Operation Pathways umbrella,

such as Valiant Shield and Garuda Shield, present opportunities for the DSSB FLEs to fulfill sustainment requirements ISO international partners in the region with joint petroleum over-the-shore, port support activities, and logistics C2 elements. Additionally, exercises such as Balikatan and Keen Edge are calling for FLEs to provide transportation observer coaches/trainers and joint sustainment cell planners to facilitate relationship-building and sharing sustainment expertise among the region's allies and partners. The use of DSSB FLEs during Operation Pathways is congruent with Brunson's comments on increasing capability and procedural interoperability. DSBs and DSSBs receive extra repetition on deployment tasks, mission command, and sustainment support activities in preparation for any potential conflict in the region.

Tactical Sustainment in the Region

Not only are FLEs beneficial at the operational level, in the event of conflict, Army divisions across the Indo-Pacific will face challenges maintaining supply lines during large-scale combat operations. A division's area of operations could be within an archipelago that requires an FLE for each island to support brigade combat teams (BCTs). The 524th DSSB tested this concept during the JPMRC 24-01 rotation by launching an FLE to support 3-25 BCT troops and the 11th Airborne Division on Hawaii's Big Island while maintaining C2 and supporting the main-effort troops back on Oahu. This FLE package consisted of retail fuel, bulk water, troop transportation, maintenance and recovery, and breakbulk transportation assets. During the decisive action, the FLE's capabilities were key to supporting 3-25 BCT's requirements for casualty evacuation and emergency water resupply along the 11th Airborne Division's airdrop operations. During JPMRC, the 524th DSSB FLE enabled the supported warfighters to maintain a high operational tempo by reducing the time required for resupply and the logistical burden on external supply lines.

Getting water from the port or production site down to the canteen of the Soldier relies heavily on DSBs, DSSBs, and brigade support battalions. The vast amounts of water will require Army watercraft, and aircraft will be pertinent in transporting equipment and supplies between islands. With the possibility of a division's tactical fight spreading across many islands, commanders will consider medium- and long-range fires and air-defense capabilities to facilitate ground assaults and airstrikes. FLEs will be necessary to operate forward arming and refueling points, ammunition supply points, Role II medical care, and logistical release points as units become more dispersed at the tactical level.

Supporting Warfighting and Campaigning

FLE elements are increasingly beneficial to support warfighting and campaigning across the Indo-Pacific. From a tactical perspective, a division can employ several FLEs to stockpile essential supplies, conduct maintenance and repairs, and provide medical support. This concept ensures the division's sustainability in prolonged operations to prevail during war. At the operational level, FLEs fill gaps caused by the lack of operational sustainment units and help foster stronger partnerships with regional allies and partners to support Operation Pathways exercises. They also offer opportunities for increased interoperability and building sustainment networks. Ultimately, employing FLEs to provide operational and tactical-level sustainment during competition, crisis, or conflict is an optimal strategy to achieve USARPAC lines of effort and U.S. Indo-Pacific Command theater strategy.

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Feature Photo
Soldiers assigned to 8th Theater Sustainment Command, 25th Infantry Division, 599th Transportation Brigade, 402nd Army Field Support Brigade, DoD Contractors, and elements from the U.S. Navy download military vehicles and containers as part of the Army Pre-positioned Stock 3 Fix-Forward (Afloat) from the U.S. Naval Ship Watson at Honolulu, Hawaii, Nov. 29, 2022. (Photo by Sgt. Kyler L. Chatman)

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