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)