Future Logistics and the Art of the Possible

Supporting naval expeditionary capabilities

by HQMC, I&L Futures Branch

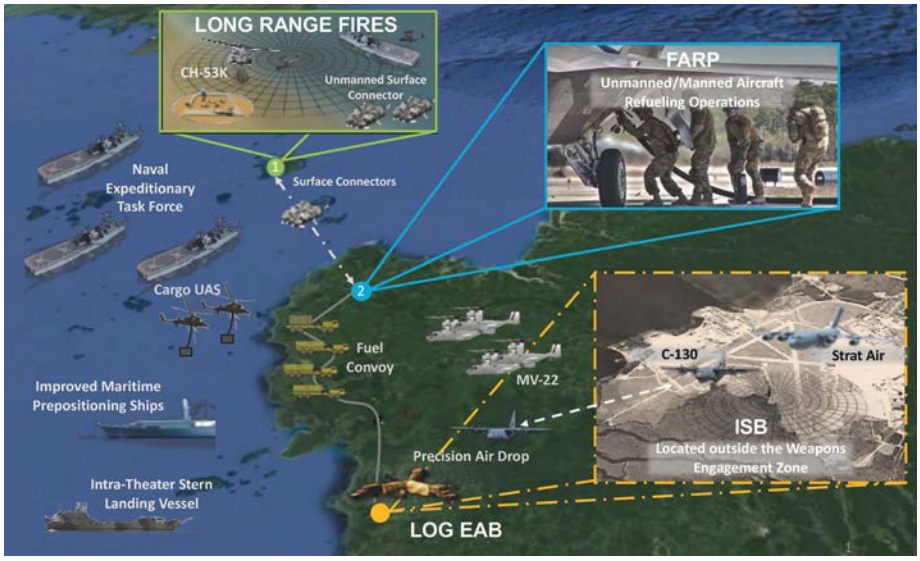
In recent articles and speeches, the Commandant has emphasized the need to divest in certain capabilities purpose-built for traditional sustained operations ashore in order to invest in naval expeditionary capabilities that support fleet operations.[1] Many of the capabilities in both the divestment and investment categories are, or affect, logistics systems. Prior to taking over as our 38th Commandant, General David H. Berger, then-Deputy Commandant Combat Development and Integration, published *Sustaining the Force in the 21st Century*. That functional concept supports future installations and logistics capability development. As the senior logistics subject matter expert, the Deputy Commandant Installations and Logistics has directed the alignment of legacy and future capabilities to four lines of effort: Enable Global Logistics Awareness, Diversify Distribution, Improve Sustainment, and Optimize Installations to Support Sustained Operations. To articulate the changes needed across the logistics enterprise, a vignette provides operational context to operations in 2030. The vignette highlights notional Fleet Marine Forces in a littoral environment in support of a Joint Force campaign. The vignette underscores how future capabilities might support and sustain distributed maritime operations (DMO). The capabilities described are technologically achievable today and available in many commercial industries; all are in line with the CMC's investment goals.

Situation

A task organized expeditionary force deployed in an archipelago is supporting the Joint Force Maritime Component Commander's (JFMCC) mission to provide sea denial and enable assured access for naval operations. An Expeditionary Advance Base MEU (EAB MEU)[2] deploys multiple combat support elements[3] (CSE) across distributed sites to provide logistics capabilities in support of DMO. The distribution of forces compounds the logistics support demand and requires improved organic unit logistics capabilities, improved point-to-point distribution, and reduced reliance on legacy supply chain methodologies.

Execution

CSEs deploy via surface and air connectors to a pair of islands with a mix of organic and leased transportation assets, locally purchased supplies, and prepositioned stocks. CSE Marines prepare or man EABs based on JFMCC requirements. In this case, the EAB MEU provides CSEs to support a long-range fire battery, a forward arming and refueling point (FARP), and a logistics EAB. The units at these sites have the organic capabilities to displace and relocate to new positions at random intervals with minimal physical and electromagnetic signature. CSE personnel are multifunctional logisticians, capable of performing multiple, previously uncombined, logistics tasks and activities.



Fleet Marine Forces supporting DMO in 2030. *(Image provided by author.)*

Notional Employment

CSE Marines receive and transfer all classes of supply from a mix of manned, remotely operated, and autonomous connectors, then they distribute logistics to the point of need.

Predictive maintenance and supply support is augmented by additive manufacturing at the logistics EAB, afloat with the EAB MEU, and at intermediate support bases outside the weapons engagement zone. The equipment outfitted with predictive maintenance capabilities are automated and networked. During operations, condition-based maintenance plus processes implemented in the 2020s allow equipment to autonomously identify potential failures, transmit requirements, and autonomously select the best source of supply. An imminent failure is detected on one of the long-range firing battery vehicles and the information is directly transmitted to the logistics EAB. The needed part is unavailable within the required delivery date to support mission requirements, so requisitioning from the supply network or the original equipment manufacturer is bypassed. The requirement is delivered to a 3D printer collocated with the EAB MEU with the expeditionary naval task force; by using additive manufacturing, the part is locally produced. The EAB MEU maintenance element quality checks the part and the S-4 coordinates delivery to the using unit. The S-4 loads the part on an unmanned air system for delivery along with specialized tools needed to make the repair. The multifunctional logisticians receive the part and realize they are unable to perform the required maintenance. In the past, the unit would have had to wait for a maintenance contact team to arrive; however, virtual enhancement capability links the Marine to a senior maintainer at the intermediate support bases who guides the Marine through the repair using virtual reality technology. With the repair complete, the battery is now able to conduct their displacement, ensuring continuous sea denial mission support to the Navy. Virtual enhancement reduces the number of senior maintainers required across the deployed force while increasing logistics responsiveness, flexibility, and overall unit readiness.

As the long-range firing battery initiates its displacement to an alternate site, the fuel cache located at the midway point is destroyed. Thanks to the fuel management decision support dashboard, the loss of the fuel cache is immediately identified and the EAB MEU S-4 directs a remotely piloted surface connector with fuel bladders to an alternate landing site. The multifunctional logisticians with the long-range firing battery move to the drop site and collect the fuel bladders allowing the battery to refuel and finish establishing the next firing position. The empty bladders are returned to the connector and the connector returns to its loiter position where a stern landing vessel intercepts the craft and refills the bladders for the next on-call mission. While the EAB MEU S-4 is managing fuel distribution at the tactical level, the MEF G-4 sees that fuel status in the area is lower than planned and dynamically retasks fuel stores from the Defense Logistics Agency to the area of operations. This information is updated on the fuel management decision support dashboard and logisticians at the EAB MEU and individual CSEs see new sources of supply for this pacing commodity.

Improving the visibility of all supply commodities and the addition of new sources of supply and foraging techniques were implemented in 2025. Logistics decision support tools coupled with improved operational contracting support improved sustainment of deployed forces. As the CSEs conduct their assignments, Class I resupply is requested by the FARP. The logistics EAB is unable to respond due to network attacks, but the logistics EAB is able to identify Class I availability in a nearby partner-nation unit. Using an existing acquisition cross-service agreement, the FARP draws the rations. Unfortunately, the partner-nation unit can not provide 100 percent of the requirement. The FARPs organic operational contracting support Marine procures local food stuffs to augment the rations drawn from the partner-nation unit. This 21st century foraging process ensures continuous support when the network is contested or denied. When the network is re-established, the logistics EAB resupplies both the partner-nation unit and the FARP with remotely piloted, unmanned ground systems.

The FARP receives a new task from the EAB MEU S-3, the JFMCC requires the FARP to be prepared to support joint aircraft the next day and needs the FARP expanded. In the early part of the 21st century, engineer equipment was too large and heavy to rapidly deploy into an emerging EAB mission. Fortunately, in late 2028, the Marine Corps restore a page from history and replaced several heavy, earthmoving machinery with lighter, unmanned capabilities. Using a small bulldozer modeled after the Clark Airborne (CA)-1 tractor[4] from World War II, FARP engineers expanded the FARP and provided necessary refueling points to meet the JFMCC task. Unmanned rapid expeditionary deployable tractors arrive on unmanned surface craft with additional combat engineers. Augmenting the FARP engineers, the team expands the FARP in time. With the mission complete, the engineer augments from the EAB MEU retrograde with the tractors to the expeditionary task force via a stern landing vessel operating nearby.

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The scenario outlined in the Fleet Marine Forces supporting DMO in 2030 vignette is just one of many notional situations Marines may find

themselves operating in. The future is full of uncertainty, but what is certain is that resisting the transition necessary to support the change needed to succeed in the future operating environment will surely set the Marine Corps up for failure. Improving capabilities in an incremental manner (capability and capacity) will not suffice to resolve challenges, nor will connecting new platforms to old, with minor changes to our methods: none of those will suffice.[5] To paraphrase our Commandant:

> The Marine Corps is initiating a 10-year evolution. We have two to three years to initiate the changes that are required or we will fall behind. We cannot and will not get this wrong.[6]

Notes

1. Gen David H. Berger, "Notes on Designing the Marine Corps of the Future," *War on the Rocks*, (December 2019), available at https://warontherocks.com.

2. Pending final force design efforts, for the purpose of this article the EAB MEU is a MEU-sized, task organized unit focused on EAB missions.

3. Pending final force design efforts and unit of employment determination, the authors are using the generic term combat support element interchangeably for battalion- and company-sized organizations.

4. In March 1944, 30 gliders carrying CA-1 tractors and other engineer capabilities landed behind Japanese lines in a jungle clearing in Burma. In less than a day, they constructed a 300 by 5,000-foot runway to handle combat forces to reinforce the position. See https://amcmuseum.org.

5. Gen David H. Berger, "Comments at the MCA&F Ground Dinner," (Washington, DC, November 2019).

6. Ibid.