How to Do Logistics in EABO

It's a MAGTF, not a MAGLTF

by Capt Paul S. Panicacci

Force Design 2030 discussed Expeditionary Advance Base Operations (EABO) at length and provided guidance and insight into decisions to tailor the Marine Corps' GCE and ACE units. However, it gave no more than a passing nod to logistics and did not mention the restructuring of any units of the LCE. It was noted near the end of the paper that while logistics was not "[a]n afterthought by any means, I do not believe our Phase I and II efforts gave logistics sufficient attention."[1] While it may not have been an afterthought in practice, it appeared to be so in the perspective of the average reader. If we do not actively incorporate logistics into our planning for as intricate an operation as EABO, we can expect preventable casualties as a result.

In the current anti-access/area denial (A2/AD) environment, specifically in the South Pacific, the Joint Force will need to become significantly smaller, lighter, and more maneuverable in order to make the concept of EABO viable in execution. (See Figure 1.) This is particularly applicable to units of the LCE. To make EABO logistically supportable, modular force packages need to be developed and implemented, and the current model of the MLG, a highly centralized and unwieldy structure, needs to be abolished to close this capability gap. Because of the necessity for low-signature units occupying individual islands and providing the numerous logistics capabilities that will be required, it is not realistic to train and employ Marines in teams of 300-man combat logistics battalions or even larger transportation support battalions.

The intent of this article is to begin the conversation about restructuring the MEF to integrate the LCE with the GCE. This will be done through the historical lens of the Falklands Conflict to cage the extreme level of detail and intricacy required of a concept of logistics for an EABO campaign. From this, we will draw out essential logistics capabilities that must be incorporated into EABO planning, identify those that must be expanded or modernized, and present a proposed structure of logistics elements organic to GCE units.

Currently, the MAGTF is structured to fight the Global War on Terror. Its Major Subordinate Commands (MSCs) are distinct from one another in their capabilities and mission sets, and its ground logistics capabilities are centralized within the MLG. This posture is inflexible and unresponsive, but it is effective for conducting predictable and risk averse resupply missions to forward operating bases and combat outposts. "Risk averse" in this context is not meant to be derogatory. It denotes a concept of operations that is so force protection-centric that it is nearly combat-ineffective because of its micro-specific mission set and lack of offensive assets, avoiding decisive enemy contact by all means necessary.

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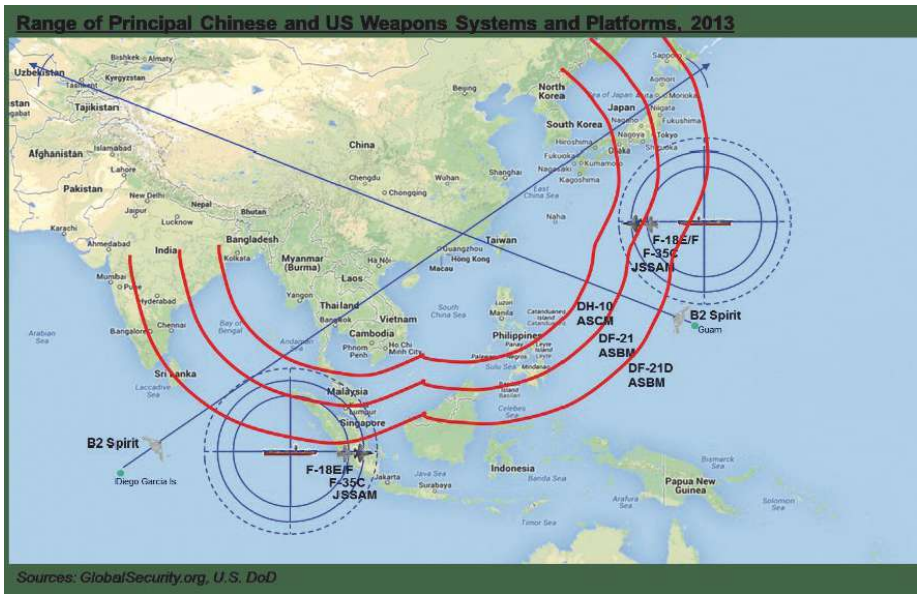

Figure 1. The weapons engagement zone in the South Pacific. *(Figure provided by author.)*

If the Marine Corps is serious about committing itself to the approved mission sets of Distributed Maritime Operations, Littoral Operations in a Contested Environment, and EABO, it is critical that it fundamentally reorganize the way it employs its logistics assets and capabilities in light of these problems.

The Falklands

When the Military Government of Argentina invaded the British-held territories of the Falkland Islands and South Georgia on 2 April 1982, it hardly expected the British Ministry of Defense to mount a campaign to protect their interests and retake the islands. After all, the Falklands were over 8,000 miles away from the United Kingdom. The political climate at the time was such that no South American countries were willing to defy Argentina by providing the British with an intermediate basing location.

Logistically, the British were faced with a nightmarish scenario. How were they to embark and sustain a force to a group of tiny islands 8,000 miles away in the South Atlantic? Faced with a three-week transit from Portsmouth to the Falklands, most of the Royal Navy ships left port within 96 hours of notification. This meant that many preparations were left undone, hastily thrown together, or altogether forgotten.

The answer that the British found to execute the Falklands Campaign was EABO. British planners identified Ascension Island as key terrain for their naval approach toward the Falklands. Lacking any alternatives for staging points closer to the Falklands than Gibraltar, it was necessary to establish an Expeditionary Advance Base (EAB) to support the deployed forces that were well forward of the maximum area of influence attainable directly from the United Kingdom. (See Figure 2.)

Ascension Island became so important to the British war effort that one planner later claimed, "If Ascension Island had not existed, we would have had to create it."[2] The establishment and smooth functioning of the EAB facilitated the logistics sustainment of the Amphibious Task Force, allowing it to build tempo instride. This denied the Argentinians time to build up defenses on the Falklands, enabling the Amphibious Task Force's prosecution of an amphibious assault on East Falkland on 20 May, and ultimately leading to the Argentines' unconditional surrender on 14 June.

Present MAGLTF

The Marine Corps possesses all the same capabilities that the British did during the Falklands Campaign, but they are poorly aligned to meet the approved mission sets. Currently, these capabilities are aligned across numerous units, none of which will operate as a fully aggregated unit in the execution of EABO. These MLG units must each be deconstructed and their capabilities realigned to their using or executing units.

Currently, Direct Support Combat Logistics Battalions (CLB) are aligned to individual infantry regiments. However, in effect, this is in name only. Deployments, training, and support are not integrated along the stated lines of direct support. Additionally, engineer support is compartmentalized within Engineer Support Battalions, and general support motor transport is compartmentalized within Transportation Support Battalions. Landing support is soon to be compartmentalized within Landing Support Battalions, and runway construction is confined to MAW units.

It is argued in favor of the MLG that specialized training of low-density MOSs requires these capabilities to be centralized, and that these capabilities can be task organized easily to support a mission set. These arguments are easily refutable. Training can be conducted at any level, and infantry battalions do not train in a vacuum from their higher headquarters or adjacent units. Logistics training can and should be no different. Additionally, the process of compositing a CLB is inherently wasteful and disorganized, and friction is regularly added to the process by internal components of the MLG.

It is also argued that the material readiness of MLG equipment will suffer if it is under the cognizance of a GCE commander. This argument does not take into account the redistribution of maintainers and supply personnel that will take place from the LCE to the GCE, the intermediate maintenance capabilities that will migrate closer to the end user, and the simplified supply chains inherent to a network with fewer nodes.

Figure 2. The British naval approach toward the Falkland Islands. *(Figure provided by author.)*

Proposed MAGTF Logistics Company

A contemporary infantry bat-

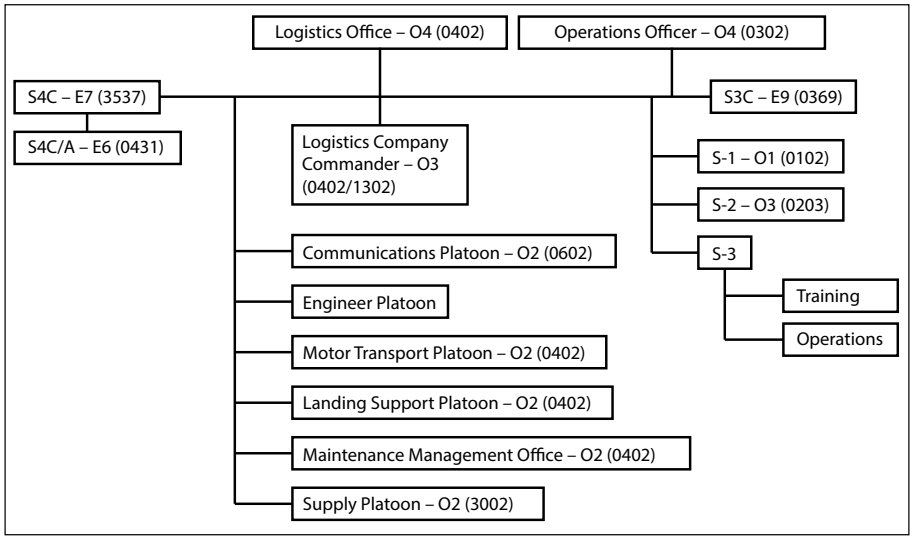

Figure 3. A proposed organization for the logistics company organic to a standard infantry battalion. (Figure provided by author.)

talion consists of three rifle companies, one weapons company, and a headquarters and service (H&S) Company. The H&S company commander is a captain infantry officer, MOS 0302. Within the battalion, the subject matter expert in logistics affairs is a captain logistics officer, MOS 0402.

H&S Company should be replaced with a logistics company. (See Figure 3.) The company commander should be a captain, MOS 0402 or 1302 (engineer officer). A logistics officer that has experienced multiple duty assignments will have been exposed extensively to each of the capabilities that will be discussed below and is arguably more qualified to command the activities of the company as opposed to an infantry officer who has been exposed to solely infantry-centric tasks for the entirety of their career.

The S-4 of an infantry battalion should be a major, MOS 0402. This officer will serve adjacent to the operations officer (S-3) as the subject matter expert advising the battalion commander on all functions of logistics. It is often forgotten that logistics is the pacing function of an infantry battalion, and by having a major logistics officer serving in a role virtually equivalent to the operations officer, logistically nonviable courses of action can more easily be brought to the attention of the operations officer or commanding officer, as necessary.

An engineer platoon should be established within each logistics company. This should approximately reflect the Engineer Platoon of a GS CLB. Capabilities organic to the platoon are a limited combat engineering capability, water production, bulk fuel, material handling equipment, and mobile electric power.

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As well, a Landing Support Platoon should be added to each Logistics Company. This will allow for more effective throughput and embarkation of an infantry battalion and will double as a ready-made Unit Movement Control Center regardless of the method of transportation.

In the following paragraphs, we will extrapolate the specific logistics capabilities that were required to facilitate the British efforts on Ascension Island, discuss where these capabilities are currently maintained in the MAGLTF construct, and present more appropriate locations for them in a MAGTF committed to executing EABO. By creating smaller packages of logistics capabilities as close as possible to the end user, we automatically build in a modular effect to our concept of logistics. Ultimately, a local GCE commander will have cognizance over each of these capabilities during EABO regardless of the organization of the MEF, so it is antithetical to the ethos of "train as you fight" to separate these capabilities in a separate MSC.

Airfield Construction

In fairness, one item that the British were not tested with was the defense of Ascension Island. Apart from an Argentine merchant vessel and a Soviet spy trawler coming within the vicinity, there were no enemy actions on or around Ascension. This meant that the British did not have to be concerned with constructing, repairing, or maintaining the runway.

Regardless, the British encountered a severely constrained parking area for aircraft. The capacity of the airfield aboard Ascension was restricted to a maximum of 30 planes. There were no parallel taxiways on the airfield, which prevented concurrent staging of aircraft to prepare for takeoff. Because of volcanic dust, helicopters were precluded from operating in areas adjacent to the runway. This forced the EAB to operate the airfield aboard Ascension Island on an extremely tight timeline, with very small margins of error for the processing of aircraft. One Royal Sailor described running the airfield during that time as like "operating a large aircraft carrier."[3] This difficulty could have been prevented by establishing an airfield construction capability aboard Ascension Island.

The Marine Corps possesses capability to build Expeditionary Airfields (EAFs) with relative haste. AM-2 matting, large aluminum sheeting, is included on every Maritime Pre-positioning Force ship. The problem encountered with the accessibility of the AM-2 is that it is stored towards the bottom decks of the Maritime Pre-positioning Force, which requires significant reconfiguring of the ship to access, sometimes requiring a large de-

barkation of equipment from the vessel. A fully functioning EAF can take between two and three weeks to construct, so it cannot be something established on a whim.

If it takes three weeks for an Aviation Engineer Company to construct an EAF, then with the combined output of the four Marine Wing Support Squadrons (MWSSs) in a MEF, we can expect an average of just over one EAF per week to come online. This is not sufficient to support an entire EABO campaign when time is of the essence.

Each of the ten active duty MWSSs has an aviation engineer company that specializes in runway construction, but this capability must be extended to allow for the maintenance of as many air fields as may be established during EABO. Nor can we confine the runway construction capability to the wing. The MAW does not typically deploy as an operational formation, which means that its MWSSs will not be aligned to any specific unit until they are explicitly tasked to attach to them. Eight additional aviation engineer companies should be generated and aligned with infantry regiments. The infantry regiment has a significantly more flexible ability to task organize capabilities to the individual battalions that will occupy individual EABs than an entirely separate MSC.

Transportation Support

The introduction of material handling equipment on Ascension Island, including forklifts and container loaders, allowed the airfield to become one of the busiest airfields in the world for several days in 1982. On a single day in April, more than 250 sorties landed and took off, making Ascension Island busier than Chicago O'Hare during the same time period.[4]

In EABO, Material Handling Equipment, MHE, and medium-to-heavy lift motor transportation will be necessary to load and unload aircraft as well as to transport supplies between beach landing sites and airfields. These assets will be used in support of the overall operation while supporting Marines distributed across the EAB. If rocket batteries are present, heavy-lift motor transportation (LVSRs) will be necessary to resupply HIMARS.

The logistics company of each infantry battalion should absorb sufficient medium-lift motor transport assets from the CLBs to transport and sustain at minimum one rifle company at a time. This is equivalent to eleven MTVRs. At minimum, three LVSRs with three PLST trailers should be absorbed for use as HIMARS resupply vehicles and Forward Armament and Refueling Points (FARPs), which will be discussed in a later section of this article. The remaining heavy-lift assets of the CLBs should be absorbed by infantry regiments. Transportation support battalions as a whole should be reallocated as division-level motor transport units.

Light and Medium MHE assets such as the Light-Capacity Rough-Terrain Truck Forklift (LRTF, or 5k) and Extendable Boom Forklift (EBFL) should be organic to the infantry battalion engineer platoon. Heavy MHE assets such as the TRAM, MAC-50 Crane, and Rough Terrain Cargo Handler (also known as the KALMAR) should be organic to the infantry regiment or division.

Ship-to-Shore

As a result of departing Portsmouth on such a compressed timeline, British ships en route to the Falklands were loaded rapidly and haphazardly with all classes of supply. Storage areas were frequently packed so tightly that critical stores, such as ammunition loaded toward the rear of the holds, could not be brought forward due to the quantity of other items in their way. Upon arrival at Ascension, landing craft were required to bring stores ashore in order to make space for re-organizing and re-stowing priority items.

Landing Craft Utility, Landing Craft Air Cushion, and Amphibious Assault Vehicles/Amphibious Combat Vehicles will undeniably be crucial assets used as logistics platforms for ferrying troops, equipment, and supplies to, from, and between islands. The recommendation in *Force Design 2030* to reduce the number of assault amphibian companies from six to four is antithetical to the lessons learned in blood due to failures in logistics during Guadalcanal and the Solomon Islands.[5]

A platoon of Landing Support Marines (also known as red patchers) will be essential for tracking these throughput operations and for establishing beach and port operations groups. A landing support platoon will bring the added capability of conducting Helicopter Support Teams for vertical replenishments of ships and inter/intra-island transportation of supplies and equipment.

Water Production

Initially, the number of personnel on Ascension had to be limited to a strict force cap of 200 personnel because of supply limitations. The volcanic island had no significant sources of potable water, which required Royal Engineers to build a completely new desalination plant to provide a reliable source of potable water on the island.[6]

In an environment such as the South Pacific, potable water is scarce. The Lightweight Water Purification System (LWPS) is, as the name implies, a reverse-osmosis system that can purify contaminated water or desalinate salt water. It can produce up to 75 gallons of fresh water per hour from a salt water source. Under ideal conditions, this is sufficient to support a battalion reinforced with potable water. However, these systems are old and unreliable with a large number of delicate parts frequently requiring maintenance. An investment in a newer, more reliable system will prove to be essential to the success of an EABO campaign in the future. At minimum, two LWPS and six water purification specialists, MOS 1171, should be organic to the engineer platoon of an infantry battalion.

Bulk Fuel

On Ascension Island, oil tankers moored offshore and connected to a floating pipeline to distribute fuel. However, originally the pipeline did not extend all the way to the airfield, and there was limited fuel storage capability there. In response, Royal Engineers built a three-mile long pipeline and installed additional pumping stations, connecting the floating pipeline to the

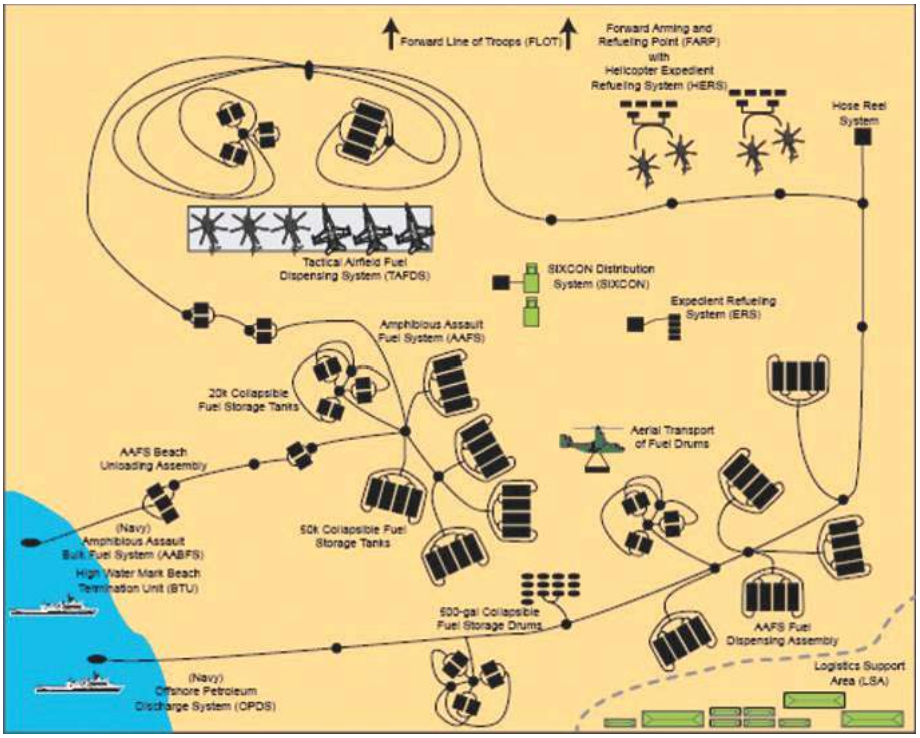

Figure 4. A proposed expeditionary fuel network for amphibious operations, utilizing multiple tactical airfield fuel dispensing systems and AAFS. (Figure provided by author.)

airfield. Royal Engineers also installed 30,000 gallon fuel bladders at the airfield, increasing the storage capacity to 180,000 gallons.[7]

The 322 Aircraft of a MEF conducting sustained combat operations have a projected fuel consumption rate of more than 1,000,000 gallons of fuel per day.[8] That is a figure that is entirely unsupportable within current capabilities. Considering that MPSRON-3 has a distribution capability of only 5.3 million gallons, that is sufficient for only five days of combat operations at sustained rates. To put contemporary storage and distribution systems in context, the Amphibious Assault Fuel System (AAFS) receives, stores, transfers, and dispenses up to 1,120,000 gallons of bulk fuel with sufficient pipeline material, hoses, and pumping stations for extensive distribution capability. The Tactical Airfield Fuel Dispensing System is fed by the AAFS and can supply up to twelve aircraft refueling points. (See Figure 4.)

Figure 5. Dracone Barge. *(Figured provided by author.)*

The Tactical Airfield Fuel Dispensing System should be redistributed to infantry regiments, and the AAFS should be held as a division-level asset.

However, it must be borne in mind that these assets have massive signatures and are not even remotely "risk-worthy." Instead, the Marine Corps should invest in dracone barges. Dracones are massive (but scalable), flexible fuel bladders, towed behind a watercraft while mostly submerged. Typically used for cleaning up petroleum spills, these sea-mobile fuel tankers can transport and store up to 250,000 gallons of fuel. More importantly, they can be moored off the coast of an EAB, disguised or masked, and activated as necessary to supply a FARP. (See Figure 5.)

Conclusion

Developing a concept of logistics to support EABO will be extremely intricate. This means that the logistics capabilities currently held by LCE units must be restructured to be infinitely more flexible and responsive by placing them as close to the using unit as possible. Namely, within the logistics company of each infantry battalion, Infantry Regiments are significantly

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The FARP aboard each EAF will be the critical vulnerability of an EABO, and for the infantry battalion, no fewer than six Flatrack Refueling Capability units containing 2,500 gallons of fuel each, transported on the three LVSRs with PLST trailers, should be organic. One of these should be dedicated to support ground assets, specifically HIMARS, which burns no fewer than 3.8 miles per gallon of F-24. The other five will provide just over 80,000lbs of aviation fuel, distributed via 125gpm filter separators and issue points repurposed from the Helicopter Expedient Refueling System. It cannot be overstated how critical of a vulnerability the FARP is during EABO, as this 80,000lbs of aviation fuel is only sufficient to generate one combat sortie for one flight of four F-35B aircraft.

better postured to task organize and allocate capabilities to battalions and, therefore, should be the recipient of the majority of heavy logistics equipment that will be used to augment organic capabilities during EABO. This may require a fourth battalion to be added to the infantry regiment, a *logistics battalion.*

The Marine Corps' contemporary logistics capabilities are generally suited to conduct disaggregated operations at numerous locations. However, the size and scope of an entire EABO campaign will massively outpace their output quantity if they are centralized in their current posture. The Marine Corps should examine expanding the capabilities outlined in the manners listed above in order to allow for logistics support on potentially dozens of islands during sustained combat operations. Aging and unreliable equipment sets must be replaced or upgraded.

All this will require a dedicated and detailed wargaming effort focused solely on tangible logistics metrics to determine cost/benefit analyses of decentralized logistics capabilities. Ultimately, the larger structure of the MLG should be considered obsolete and its capabilities redistributed to end-users in order to be effective in supporting units ashore.

Notes

1. Gen David H. Berger, *Force Design 2030*, (Washington, DC: 2020).

2. Air Marshal Sir John Curtiss, "Operation Corporate: The RAF in the Falklands Campaign," *Air Clues*, (Buckinghamshire, UK: Royal Air Force Safety Centre, December 1982).

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