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MASTER OF MILITARY STUDIES

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**LOGISTICS IN 2030 AND BEYOND: TRAINING CONSIDERATIONS FOR  
DISTRIBUTED MARITIME OPERATIONS**

SUBMITTED IN PARTIAL FULFILLMENT  
OF THE REQUIREMENTS FOR THE DEGREE OF  
MASTER OF MILITARY STUDIES

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AY 2020-21

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## *Preface*

This research topic was undertaken at the request of the Deputy Commandant for Installation and Logistics (I&L) but was completed with the help of several individuals. I wish to thank Chief Warrant Officer 5 Chris Aragon from I&L who helped guide my initial research, Dr. Nathan Packard for his mentorship and invaluable feedback throughout, and my wife Kerry, who provided countless reviews and moral support over these past few months. Just as service in the Marine Corps has taught me, supporting relationships are essential and I could not have completed this work without them.

The research included herein, particularly my recommendations, are reflective of a broader conversation that is currently taking place across the Marine Corps. Some concepts are still being tested, namely employment of the Marine Littoral Regiment as a proof-of-concept for Expeditionary Advance Base Operations (EABO). I fully appreciate that future environments and engagements are difficult to predict but I believe that the Marine Corps can modernize training before a 100% solution is provided, which is why I felt compelled to take on this topic. I am positive that leaders within this organization have the desire, the competence, and the talent to meet the challenges of the future, and it is my hope that my recommendations can contribute to their success in some small way.

## Executive Summary

**Title:** Logistics in 2030 and Beyond: Training Considerations for Distributed Maritime Operations

**Author:** Major Michael Mahoney, United States Marine Corps

**Thesis:** Formal training and education continuums in the logistics community must be restructured to address Expeditionary Advanced Base Operations (EABO), align with Force Design 2030 initiatives, and develop solutions to operating in a denied/degraded communications environment.

**Discussion:** The Marine Corps currently trains logisticians to support conventional Marine Expeditionary Unit (MEU) operations and sustained combat operations ashore. These operations rely upon existing global infrastructure, Navy/Marine Corps transportation platforms, command and controls systems, and task organizations. Force Design 2030 and the future operating environment are not in alignment with these resources, exposing a shortfall in how the Marine Corps trains and educates logisticians. The issue at hand is twofold: (1) there are force structure changes that are still being validated as the Marine Corps collects data from wargaming efforts at Marine Corps Warfighting Lab (MCWL) and real-world testing of the Marine Littoral Regiment concept by the 3d Marine Regiment; and (2) the current Training & Readiness (T&R) Manuals for Logistics/Supply Officers rely on Command and Control (C2) systems and equipment that are unsuitable in an EABO or communications denied/degraded environment. Both of these shortfalls are unaccounted for in the current logistics training continuum. This research aims to identify emerging requirements identified in Force Design 2030, by analyzing output from recent wargaming efforts, and by reviewing concepts from the experimental Marine Littoral Regiment.

**Conclusion:** The Marine Corps must update the logistics training and education continuum to meet the emerging requirements of the future operating environment. This should include incorporation of new equipment capabilities (actual or replica), employment of signature management practices, and departure from legacy C2 systems.

## Introduction

For nearly three years the Department of Defense and, to varying degrees, its subordinate agencies have been signaling a renewed urgency on a future fight; one that the United States is not manned, trained, or equipped to carry out today. Peer competitors and even non-state actors have realized the potential of Anti-Access / Area Denial (A2AD) weapons and the asymmetrical advantage they provide, particularly against conventional forces like the United States. The American response has been to focus in on a conceptual framework: operationally decentralized, geographically separated networks comprised of forces fighting across all domains. The complexities of such a construct are many, and the Marine Corps has been arguably the most aggressive of the services in its pursuit of this new warfighting concept, leaving many within the organization chasing down outputs from the last Operational Planning Team (OPT) as war-gaming continues in rapid succession. As one might expect at this juncture, there are several serious, unanswered questions about how the Marine Corps will look and fight in 2030, much less how it will support itself logistically in an active theater of war. However, developing concepts of support with incomplete data and unrefined plans is where Marine Corps logisticians thrive. By modernizing logistics training and education, the Marine Corps can better prepare its leaders for the uncertainties of the future operating environment.

The 2018 *National Defense Strategy* signed by Secretary James Mattis (a retired Marine General himself) conveyed a deliberate departure from the most recent wars fought in the Middle East. In no uncertain terms, Mattis stated that “long-range strategic competition with China and Russia are the Department’s principal priorities.”<sup>1</sup> Adding that every domain is contested in

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<sup>1</sup> United States Department of Defense. *Summary of the National Defense Strategy of The United States of America*. 2018, p 4.

today's environment, he went on to emphasize the importance of investment in new Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) capabilities, as well as advanced autonomous systems. The former represents a necessary shift in the Marine Corps' employment of new and existing technologies, one which continues to be tested across the organization. The latter, however, represents a paradigm shift; the Marine Corps to date has not fully fielded any autonomous systems and is still in the process of figuring out where these systems would best be utilized in a future fight. Mattis also emphasized the need for "forward-prepositioned logistics" and networks that are not commercially dependent, to ensure force sustainment under persistent, multi-domain attack.<sup>2</sup> While some observers may point to the current inventory of land and sea-based prepositioned stockpiles within the Department of Defense, they are not currently postured for the level of employment Mattis described.

And on the issue of over-reliance on the private-sector, Mattis was likely informed by a Defense Business Board (DBB) report in FY17 that found "Within the DoD logistics enterprise, over 90% of U.S. Transportation Command (USTRANSCOM) activity takes place on commercial networks with sub prime contractors and DoD has little to no visibility into USTRANSCOM's 3rd and 4th tier suppliers."<sup>3</sup> The raw materials and components that comprise major end items like transport aircraft, for example, are being purchased, tracked, and delivered using networks that are no better protected than the average commercial retailer. What this means is DoD has neither the ability to defend against network attacks aimed at their

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<sup>2</sup> United States Department of Defense. *National Defense Strategy of The United States of America*. 2018, p 7.

<sup>3</sup> Defense Business Board. *Logistics as a Competitive War Fighting Advantage*. Washington, D.C. 2017, p 5.

contractors, nor do they have the means to directly monitor or anticipate disruptions to the manufacturing process which could have strategic implications down the line.

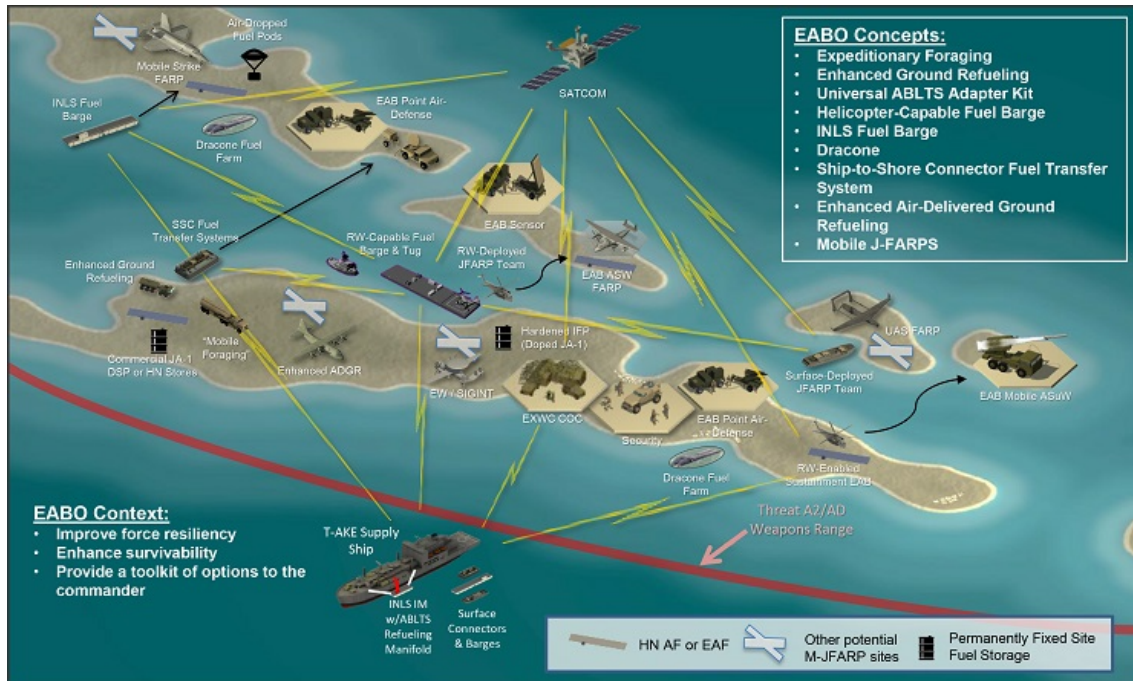
These fundamental concepts are not lost on the Commandant of the Marine Corps, General David Berger, who has been leading the effort to prepare his service for a peer-level threat. In his official *Commandant's Planning Guidance*, released in July 2019, he addressed the fact that Maritime Prepositioning Force (MPF) stockpiles were a great asset. But, like Mattis, he continued to emphasize the reality that they are vulnerable, would be targeted, and run the risk of being neutralized by persistent, multi-domain threats. The Department of Defense must place greater emphasis on strategic placement of stockpiles and protection of transportation assets if the joint force is to be successful in the future.

In an effort to shape force design, Berger describes one of the Marine Corps' many roles as that of a "stand-in force" operating in distributed fashion, spread across island chains and Expeditionary Advanced Bases (EAB), employing low signature, affordable platforms and payloads.<sup>4</sup> EABs would provide staging areas for anti-air missiles, C4ISR assets, expeditionary airfields, or sub/surface reconnaissance, all of which would enable naval sensing and shooting while complicating enemy targeting. They would also provide options for control of key terrain, chokepoints, and sea lines of communication (SLOCs), all from within the enemy's weapons engagement zone (WEZ). In effect, this concept deters first-strike actions and limits sea denial capabilities both before, and during, major conflict.<sup>5</sup>

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<sup>4</sup> United States Marine Corps. *Commandant's Planning Guidance*. July 16, 2019, p 10.

<sup>5</sup> United States Navy and Marine Corps. *Littoral Operations in a Contested Environment*. 2017, p 5.



(Figure 1. Depiction of EABO Concept)

This seems like a sensible answer to an evolving A2AD threat but, again, the Marine Corps has not yet settled on a model for logistically supporting these “distributed operations” as described by both Berger and Mattis. In addition to operational shortfalls, Berger also takes issue with the Corps’ training and education. He sees an urgent need to move away from the industrial model of instruction, to make training more realistic by engaging with a thinking enemy force, and to end the “increasing dissonance” between training scenarios and the real-world challenges that lie ahead.

These complex issues have clearly caught the attention of individuals outside the Department of Defense. Thomas Mahnken, President and CEO of the Center for Strategic and Budgetary Assessments (CSBA), co-authored a report in 2019 that outlined a new strategy for

“Maritime Pressure” in the western Pacific.<sup>6</sup> In it, he highlights the need for new organizational structures within DoD that can form “operationally decentralized, geographically dispersed networks” with a forward posture differing greatly from the current expeditionary model. Mahnken argued that this construct could provide the “virtues of mass without the vulnerabilities of concentration” but he also makes clear that the sustainment of such a force is a major hurdle.<sup>7</sup> He advocates for new sustainment concepts, capabilities, and force structure; all three of which will require significant investments in time, training and resources. Mahnken also sees a clear need for small (likely autonomous) assets capable of providing resupply and mobility to deployed forces but, just like Berger, stops short of describing these platforms in fine detail.

As was the case with Mattis and Berger, Mahnken sees the demand signal for change and skillfully frames this particular problem, but leaves a significant number of questions unanswered; most of which will need to be addressed by military leaders. For example, Mahnken acknowledges China’s territorial expansion and the increasing likelihood that it may be a catalyst for hostilities, but offers little in the way of recommendations to avoid what seems like a foregone conclusion. He also fails to describe in detail the integration between “outside” and “inside” forces as it pertains to sustainment. There is some acknowledgement that sustainment of inside forces would come in the form of forward-prepositioned stocks, but that is belied by the fact that China would almost certainly target forward bases and supply depots during a major engagement. How then, do we avoid a scenario where the “inside force” is effectively cut off from the materiel necessary to conduct sustained operations? Finally, Mahnken discusses the procurement of used, foreign-built transport vessels as a means of “inter-theater transport” based

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<sup>6</sup> Mahnken, Thomas G., Travis Sharp, Billy Fabian, and Peter Kourestsos. *Tightening the Chain: Implementing a Strategy of Maritime Pressure in the Western Pacific*. May 23, 2019.

<sup>7</sup> Ibid, p 4.

on recommendations from a 2018 DoD Defense Science Board report.<sup>8</sup> Unfortunately, this proposal is presented as a “recapitalization effort” to be undertaken by USTRANSCOM that does nothing to address the threat environment. These legacy transport vessels would be practical and cost effective but highly susceptible to detection and attack, and Mahnken acknowledges as much.

To his credit, General Berger has initiated a force design process that aims to posture the Marine Corps for the future operating environment, undeterred by the many unknowns. The outputs of Phases I and II of *Force Design 2030* were released publicly in March 2020 and they set the foundation for enterprise-level changes, some of which have already been completed. Reductions and wholesale divestment of heavy, short-range platforms like M1 Abrams tanks did not come without controversy, but arguably drove home the urgency of the situation. The report also emphasizes the need to reconfigure the Marine Expeditionary Unit, the new Marine Littoral Regiment, MPF assets and logistics support to the Fleet Marine Force (FMF). In Berger’s assessment, the outputs from early war gaming efforts highlight a lack of refined capability when it comes to littoral maneuver and sustainment. He refers to logistics in this environment as both “a critical requirement and vulnerability”<sup>9</sup> and there is sound reasoning behind that description. A littoral unit, stranded in the WEZ without food, water, or ammunition is not just ineffective; it is a liability to the larger naval force. Without flexible and survivable sustainment methods, an MLR could quickly become be the achilles heel of the joint force. As additional rounds of war gaming continue and feedback trickles in from the Marine Littoral Regiment, leaders within the logistics community should be prepared for more difficult problems that will require creative solutions.

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<sup>8</sup> Department of Defense Science Board. *Task Force on Survivable Logistics Executive Summary*. Office of the Under Secretary of Defense for Science and Engineering. November, 2018.

<sup>9</sup> United States Marine Corps. *Force Design 2030*. March 26, 2020, p 5.

## Assessing the Threat

What we are seeing within the Department of Defense and the Marine Corps is not a product of paranoia or imagination run-amok. The South China Sea is one of the most likely environments for this type of future conflict, and leaders within the DoD have plenty of historical examples on which to base their assessment. In *The South China Sea Disputes: Past, Present and Future*, Nalanda Roy documents China's wrangling over islands and waters as part of a longstanding pattern of behavior.<sup>10</sup> Remarkably, Roy notes, China has been a party to every significant bilateral dispute over these territories since the 1800s. But she also argues that does not justify China's most recent behavior as normal, much less acceptable. In fact, Roy makes an argument that this is another example of opportunism, similar to the Battle of the Paracel Islands at the end of the Vietnam War. Recognizing the dwindling U.S. presence and the precarious military situation in South Vietnam, the PLA was discovered to have occupied this cluster of islands in January of 1974. With no friendly reinforcements, the South Vietnamese Navy struggled to defend the area and was eventually expelled by the Chinese. Roy uses other cases such as the reclamation of the Spratly Islands in 1945, which coincided with the Japanese surrender to the United States at the end of WWII, as examples of opportunism that has ultimately benefited China. So, is the logical conclusion that the U.S. "took its eye off the ball" in the Asia-Pacific region while it was consumed in Middle East conflict during the early 21<sup>st</sup> century? And did China view this as an opportunity to expand their territorial claims? Roy does not go so far as to make such an assertion, but it certainly does seem possible.

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<sup>10</sup> Roy, Nalanda. *The South China Sea Disputes: Past, Present, and Future*. Lanham: Lexington Books, 2017.

China has not hesitated to clash with rival claimants over these areas, and does not appear to be deterred by even the most powerful nations. Roy highlights the 2001 Hainan incident where a US EP-3 “ARIES” aircraft was downed after a collision with Chinese fighter-interceptor aircraft approximately 70 miles offshore from the mainland, and she documents the tense negotiations between the two countries that followed. The crux of the issue, unsurprisingly, was a disagreement about boundary restrictions. China maintains to this day that the EP-3 in question was violating overflight permissions by conducting reconnaissance within its Exclusive Economic Zone (EEZ), which can extend up to 200 miles offshore.<sup>11</sup> For its part, the United States claimed to be operating legally outside the 12-mile territorial boundary but, given the EP-3’s primary function of electronic warfare and reconnaissance,<sup>12</sup> it is easy to see how China could be provoked by this type of flight activity regardless of the explanation. Were the “shoe on the other foot” it would be understandable, if not wholly expected, for the United States to respond in kind to Chinese military activities within 12 miles of their coast. But one need not take sides on this issue to see how this is precisely the kind of thing that could lead to escalation in the region.

The Chinese Communist Party (CCP) makes clear its seriousness when it comes to these disputed areas. The 2019 release of their defense strategy *China’s National Defense in the New Era* accuses unnamed countries of “illegally entering China’s territorial waters and the waters and airspace near China’s islands and reefs, undermining China’s national security.”<sup>13</sup> Referring to these areas as “inalienable” parts of China, the likelihood of a future dispute seems all the

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<sup>11</sup> Murphy, Sean D. "Aerial Incident Off the Coast of China." *The American Journal of International Law* 95, no. 3 (07, 2001): 630-633. <https://www-proquest-com.lomc.idm.oclc.org/scholarly-journals/aerial-incident-off-coast-china/docview/201130010/se-2?accountid=14746>.

<sup>12</sup> Sherman, Jason. "DOD: NAVY SUSTAINING EP-3E ARIES II AIRCRAFT TO SUPPORT COCOMS' NEEDS." *Inside the Pentagon* 29, no. 13 (Mar 28, 2013).

<sup>13</sup> State Council of the People’s Republic of China. *China’s National Defense in the New Era*. July 24, 2019.

more real. Whether one should take this English-translated version of China's defense strategy at face value is up for debate, but this document describes the country's ambitions, including the desire to build and deploy *defensive* capabilities on the islands within the South China Sea.<sup>14</sup> One can see how this type of force deployment could serve to disrupt opposing forces or, at a minimum, further extend China's already extensive A2AD zone. Is there a possibility of a Hainan-type incident today, with the increased military presence around the South China Sea? It certainly seems possible. Would it end in the same fashion, or possibly lead to military escalation? That is more difficult to answer but, if nothing else, China seems to be posturing itself to oppose the United States' "Maritime Pressure" strategy before it can be fully realized.

Given the history of conflict in the region, the growing A2AD threat, and the shift in strategic focus by both the Department of Defense and the Marine Corps,<sup>15</sup> the question is simply: what might this potential future conflict actually look like? One plausible, if not likely, scenario involves a dispute between China and Japan over the Senkaku Islands (Diaoyu Islands to the Chinese) in the East China Sea. This collection of small, uninhabited islands has been under Japanese control since they were annexed in 1895,<sup>16</sup> but they have been a source of contention for the last half century. Since the discovery of energy deposits in the area by a United Nations committee in 1969, Chinese claims of sovereignty over the islands have only intensified.<sup>17</sup> Given the CCP's aggressiveness in establishing control over territory with strategic significance, this seems like the type of situation that could quickly move into military conflict with Japan. If that occurs, it seems only a matter of time before the United States finds itself fighting alongside its ally in the East China Sea.

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<sup>14</sup> State Council of the People's Republic of China. *China's National Defense in the New Era*. July 24, 2019.

<sup>15</sup> United States Marine Corps. *Commandant's Planning Guidance*. July 16, 2019.

<sup>16</sup> Loja, Melissa. "Status Quo Post Bellum and the Legal Resolution of the Territorial Dispute Between China and Japan over the Senkaku/Diaoyu Islands." *European journal of international law* 27.4 (2016): 979–1004.

<sup>17</sup> *Ibid.*

The nature of the confrontation described by Mattis and others will be defined by “persistent, multi-domain attack” that leverages China’s proximity while disrupting the Americans’ ability to command and control a counteraction. And in an East China Sea (Senkaku) scenario,<sup>18</sup> time and distance clearly favor the Chinese due in large part to the establishment of an Air Defense Identification Zone (ADIZ) and forward basing on the Nanji Islands north of Taiwan.<sup>19</sup>



(Figure 2. China’s ADIZ and Proximity to Senkaku Islands)

As illustrated in this example, China is already reasonably postured to pull off a *fait accompli* described by Mahnken and others.<sup>20</sup> Though no universal definition has been agreed upon, the *fait accompli* in military terms generally refers to a quick, decisive action that dramatically changes the situation, leaving the opposing party little time to respond. They can then either accept this new reality or prepare for a costly conflict in an attempt to restore the

<sup>18</sup> Loja, Melissa. “Status Quo Post Bellum and the Legal Resolution of the Territorial Dispute Between China and Japan over the Senkaku/Diaoyu Islands.” *European journal of international law* 27.4 (2016): 979–1004.

<sup>19</sup> Hsu, Szu-chien and Hsiao-Chi Hsu. "Domestic Motivation and the Case of the East China Sea ADIZ: Diversion Or Mobilization?" *Asian Perspective* 41, no. 3 (Jul, 2017): 455-480.

<sup>20</sup> Mahnken, Thomas G., Travis Sharp, Billy Fabian, and Peter Kourestsos. *Tightening the Chain: Implementing a Strategy of Maritime Pressure in the Western Pacific*. May 23, 2019, p 1.

status quo.<sup>21</sup> If the United States is to avoid this scenario, then deterrence (in the form of the aforementioned Maritime Pressure strategy) seems the best possible course of action given the current disposition of military forces. With that in mind, General Berger and others within the Marine Corps continue to test and evaluate future force design models that will maximize the Marines' contribution to the Joint Force in this type of environment.

The central focus of this larger force design effort is the Marine Littoral Regiment (MLR). Originating from the conventional infantry regiment, this newly-formed unit will be comprised of three main elements: a Littoral Combat Team (LCT), a Littoral Anti-Air Battalion, and a Littoral Logistics Battalion.<sup>22</sup> The LCT takes the bulk of its design from a traditional infantry battalion, but personnel are reduced by an estimated 15 to 20 percent and long-range anti-ship ballistic missile batteries become the primary combat capability. Broken up into these small units, the LCTs are responsible for occupying expeditionary advanced base (EAB) sites and providing long-range precision fires, intelligence, surveillance, and reconnaissance (ISR), air-defense and early warning, and re-arming/refueling of aircraft. The Littoral Anti-Air Battalion new in both concept and structure, but borrows defensive employment tactics from the Marine Air Wing's Low Altitude Defense Battalion. Whereas the LCT provides the bulk of the Marine Littoral Regiment's offensive strike capability, the Anti-Air Battalion provides air defense, air control, surveillance and early warning, and forward rearming and refueling. Finally, the Littoral Logistics Battalion provides tactical logistics support to the MLR by managing the interconnected sites across the EAB network, providing on-call resupplies along with medical and maintenance support, while serving as the liaison between the MLR and higher

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<sup>21</sup> Tarar, Ahmer. "A Strategic Logic of the Military Fait Accompli." *International studies quarterly* 60.4 (2016): 742–752.

<sup>22</sup> Feickert, Andrew. "New U.S. Marine Corps Force Design Initiatives." *National defense* (Washington) 105.801 (2020): p 2.

headquarters support agencies. Situated atop these three functional battalions is a regimental headquarters which, much like today, provide an additional cadre of personnel that specialize in enhanced intelligence, reconnaissance, communications, cyber, information operations, and civil affairs.<sup>23</sup>

This new unit concept has just started a three-year testing and evaluation period in Hawaii, but the initial design is a good approximation of what should follow.<sup>24</sup> This MLR, with its unique capabilities and assigned responsibilities, is expected to assume a leading role not just in III MEF, but across the Marine Corps. Both I MEF (based in Camp Pendleton, CA) and II MEF (based in Camp Lejeune, NC) are expected to provide forces to the Marine Littoral Regiment,<sup>25</sup> making this a Corps-wide issue that will require deliberate effort and collaboration.

Fighting in this new distributed construct will be inherently challenging, and providing logistics support will be no easier. Autonomous delivery systems like the ones expected to be used to support the MLR are still extremely rare across the Marine Corps today. Some assets like Kaman Aircraft's K-MAX, first employed by Marines in Afghanistan in 2011, are not fully autonomous and have been slowly fading from employment over the past five years. The harsh reality is that, in the near-term, logistics training will need to focus on Distributed Military Operations (DMO) without the luxury of having the assets and capabilities. The Marine Corps' *Tentative Manual for Expeditionary Advanced Base Operations*, released in February of 2021 has chapters dedicated to maneuver and sustainment, along with concepts of employment for the MLR, to include the subordinate Littoral Logistics Battalion. However, it refers to transportation platforms in general terms such as "manned/unmanned assets" in what seems to be an

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<sup>23</sup> Ibid, p 2.

<sup>24</sup> Feickert, Andrew. "New U.S. Marine Corps Force Design Initiatives." National defense (Washington) 105.801 (2020), p 2.

<sup>25</sup> Ibid, p 3.

acknowledgement that the Marine Corps is still far from identifying, testing, and ultimately fielding said equipment. Add this to the glacial pace of programming and procurement within the DoD and one can safely assume that the Marines Corps' timeline for delivery of these assets will be measured in years, not months. This situation is certainly not ideal but, by maintaining focus on the nature of DMO, leaders across the logistics community can modernize training in ways that are both iterative and effective, while avoiding the trappings of platform-oriented training that may prove unnecessary or inaccurate.

### **Updating Training and Readiness Standards**

For all the discussion surrounding emerging A2AD capabilities and expected changes in force design and employment, the Marine Corps' logistics training and education continuum appears to be stuck in a state of suspense. Just over a year after Secretary Mattis signed the National Defense Strategy, General Berger made the decision to divest of legacy platforms; yet logistics training still calls for the use of conventional communications systems that will likely not work in an A2AD environment.<sup>26</sup> Less than six months after Berger issued his Phase I/II Force Design update, every Abrams tank in the Fleet Marine Forces was gone, yet logistics convoy training events still list performance steps such as “integrate counter IED into planning” (a holdover from Iraq/Afghanistan).<sup>27</sup> Leaders within the logistics community must recognize that training standards built around IEDs and conventional communications are a good indication that we are “fighting the last war” when we should be focusing on the future.

Updating training manuals is not simple, but a focused approach to how training events are built could prove to be more efficient and effective. Most people familiar with curriculum or

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<sup>26</sup> Suggs, Travis. *Overcoming Degraded Communications Under A2AD: A Doctrinal Solution*. N.p, 2014.

<sup>27</sup> United States Marine Corps. *Logistics Training and Readiness Manual*. NAVMC 3500.27D. May 7, 2019, p 4-13.

doctrine development will attest to the slow pace and bureaucracy involved in the implementation of significant changes, and the Marine Corps is certainly not exempt from these procedural hang-ups. I do not propose a comprehensive re-write of all applicable training publications, though that day may eventually come. Rather, the logistics continuum can be modernized by updating performance steps and, in some cases, eliminating systems-based requirements that will more accurately reflect the operating environment described by General Berger.<sup>28</sup>

The *Logistics Training and Readiness Manual, NAVMC 3500.27D* lists “supervise tactical logistics operations” as an individual training event for Logistics Officers (MOS designator 0402). Within that event are eleven performance steps, two of which are “monitor communication with higher/adjacent/supporting units” and “monitor common operational picture of logistics support utilizing C2 systems.”<sup>29</sup> Currently, these steps are performed using a combination of government network infrastructure, radio communications, and commercial communications systems.<sup>30</sup> This does not lend itself to Berger’s description of “persistent, multi-domain attack” and it is not the only example. A cursory review of the NAVMC 3500.27D produces phrases like “automated information systems (AIS)” and “given a computer and network access” just to name a few. The fact that these are the very systems that will be targeted by adversaries does not necessarily render performance steps obsolete, but it should compel leaders to re-think how they will assess individuals and units to be “combat ready” in the future. Removing the requirement for the use of modern C2 systems does not negate the overall training standard, but it does provide flexibility in scenario-building. Logistics Officers will still

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<sup>28</sup> United States Marine Corps. *Commandant’s Planning Guidance*. July 16, 2019.

<sup>29</sup> United States Marine Corps. *Logistics Training and Readiness Manual*. NAVMC 3500.27D. May 7, 2019, p 4-4.

<sup>30</sup> *Ibid*, p 4-4.

need to “supervise tactical logistics operations” for obvious reasons, but the method of supervision needs to reflect the demands of the future operating environment.

The use of long-range unmanned air, sub, and surface vessels are critical to both maneuver and sustainment of forces in an EABO construct, yet the term “unmanned” is absent from the *Logistics Training and Readiness Manual* and the term “autonomous” appears once in the nearly 400-page document.<sup>31</sup> Platoon-level events such as “Conduct Embarkation Support” and “Conduct Landing Support Operations” are inextricably linked to transportation assets and it would serve logistics personnel well to train to future operating concepts. This is not simply a matter of getting modern terms into the vernacular, but a matter of framing the operating environment in a way that facilitates the most effective training.

Recommended changes at the unit level (think platoon or larger) within logistics commands involve incorporating electromagnetic spectrum considerations into command-and-control events. Leaders can be selective with their use of conventional communications systems and still be in accordance with the T&R manual, but signature management considerations are wholly absent from collective training events as they are currently written. This must change, because the operating environment already has. Leaders can internally monitor readiness within their respective units but, when it comes time to transmit or receive reports, the information should be limited to prescribed communications time windows, networks (like satellite communication), or perhaps a combination of the two.

### **Building Scenario-based Training**

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<sup>31</sup> United States Marine Corps. *Logistics Training and Readiness Manual*. NAVMC 3500.27D. May 7, 2019.

At the service level, the Marine Corps is currently executing live, force-on-force littoral exercises to validate the MLR force design.<sup>32</sup> Outputs from these exercises are sure to trickle in over the coming months and years, but that does not mean the entire organization should remain in a holding pattern. General Berger's planning guidance and Force Design concepts have already provided adequate information to get Marines thinking (and training) with an eye towards the future fight. And while the training bases of California and North Carolina will likely never be able to replicate the East China Sea, for example, Marines across the Corps can still train for distributed operations and multi-domain threat environments.

The beauty of Marine Corps logistics is that there has never been a "one size fits all" solution to supporting operations. Since 2000, the Marine Logistics Groups within each MEF have reorganized multiple times in order to provide the most effective and responsive support to operations. The most notable shift came in 2005, when the Force Service Support Groups (FSSGs) were reorganized from a functional structure to standing, task-organized commands that would provide direct and general support to specified units, particularly those in the Ground Combat Element of the MEF.<sup>33</sup> In doing so, the change from "FSSG" to "MLG" was less about perceptions and verbiage, and more about providing enhanced support capabilities to the remainder of the force. And when a new mission arises, the MLG still retains the personnel and equipment to task-organize additional units and generate on-call support capabilities. So whether it is a Marine Expeditionary Unit conducting amphibious operations, a Brigade executing sustained operations ashore in places like Afghanistan, or an infantry battalion conducting cold weather training in Norway, logistics support will often be task-organized with

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<sup>32</sup> Feickert, Andrew. "New U.S. Marine Corps Force Design Initiatives." *National defense* (Washington) 105.801 (2020): 6-. Print.

<sup>33</sup> Commandant of the Marine Corps. Marine Corps Administrative Message 335/05, "Realignment and Renaming of the FSSG." 22 July 2005.

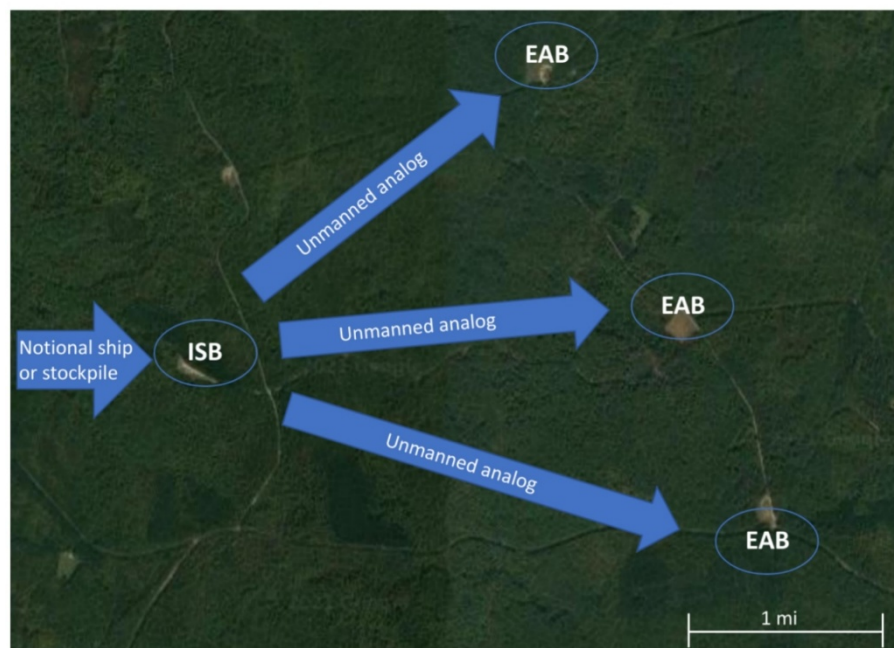
flexibility and efficiency in mind to maximize effectiveness.<sup>34</sup> This should also be the case for EAB, and the next few years of testing and wargaming in the Pacific will be critical in refining operational requirements for the logistics community. For these reasons, developing training scenarios that test the mettle of logistics support may be challenging, but should certainly be possible regardless of the environment.

Training for distributed operations can begin at home station, at any level of command within a MEF, using some of the following concepts to replicate a distributed maritime environment. First, the headquarters element and subordinate units are established in geographically separate locations. These locations need not be in coastal or littoral areas, but they should be clearly isolated from one another. In the spirit of contested environments, these units should be taking every possible precaution to manage their visual and electromagnetic signatures. Gone are the days of higher headquarters' sprawling antenna arrangements (aka "ant farms") that make for easy detection and targeting. Second, all communications among units should be regulated by the designated Exercise Control (EXCON) agency. Communication among units only occurs briefly, via satellite communications or other specified non-commercial means, during prescribed time windows to replicate the challenges of multi-domain attack. Attempting to transmit messages by electronic methods outside of these prescribed windows should result in simulated attack, loss of equipment, or other deterrent measures. Finally, employment of tactical vehicles between sites would be prohibited. Logistics support vehicles would be controlled by EXCON to serve as surface/sub analog vehicles, and the training unit would not have the ability to communicate with these notional vessels once they are "underway."

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<sup>34</sup> United States Marine Corps. *Marine Corps Doctrinal Publication (MCDP) 4, Logistics*. 1997, p 24.

For an added layer of realism, units may choose to reconfigure cargo beds or limit the payload/capacity to better replicate emerging autonomous assets.



(Figure 3. Example of a land-based EAB training scenario)

The most challenging but arguably most important modification to logistics training will be the replication of materiel and personnel losses. The nature of EABO requires imposing cost upon the adversary while minimizing losses in the contact layer, but Berger himself has stated that attrition will be unavoidable.<sup>35</sup> Sustainment areas, transportation assets, and personnel have always been targeted by opposing forces, but logistics units will now need to test their ability to absorb significant losses and continue to sustain a force in a distributed environment. This goes

<sup>35</sup> United States Marine Corps. *Force Design 2030*. March 26, 2020, p 6.

beyond calculating casualty rates and equipment degradation, which are academic exercises for logistics units. Rather, new methods of employment will need to be tested so that training can best replicate the threat environment. If, for example, an adversary is destroying or denying a large percentage of sustainment vessels within a certain engagement zone, then how do planners ensure the fighting force can be sustained? If in the first phase of operations the main industrial base is destroyed, how do logistics units at lower echelons continue to provide throughput and sustainment to the most forward elements? These are difficult problems that are not going away, but logistics training that accounts for them will be key to the success of the future force.

### **Equipment Assessment**

Not only will home-station training prepare individuals for the future fight, but it can provide much-needed insights and recommendations during what is clearly a period of operational transition. Throughout the course of the next few years, outputs from both the MLR training exercises and the Marine Corps Warfighting Lab (MCWL) will drive efforts to develop and procure equipment to support distributed operations. But the vast preponderance of the Marine Corps' logisticians find themselves on the "outside looking in" at those efforts due to the fact that they currently don't work for MCWL or III MEF. This is where home station training can generate ideas and recommendations to the force design effort. The Marines of I and II MEF cannot build islands or EAB sites off the coast of the United States, but it is certainly possible for them to recreate the challenges of hostile, communications denied, geographically dispersed environments aboard places like Camp Pendleton or Camp Lejeune.

According to the Marine Corps' *Tentative Manual for Expeditionary Advanced Base Operations (TM-EABO)*, the type of vessel required to make EABO effective is known as the

Light Amphibious Warship (LAW).<sup>36</sup> A search through this manual yields no less than twenty references to the asset, described as “the principal littoral maneuver vessel of the littoral force.”<sup>37</sup> However, this warship currently exists only in the minds of Marine Corps planners and shipbuilders. The smallest amphibious ship that the U.S. Navy currently operates is the Whidbey Island class dock landing ship, which is a full three-times larger than the average LAW estimate.<sup>38</sup> There is simply nothing in the current naval inventory that can replicate the LAW, but the vision laid out in TM-EABO gives Marines a clear planning factor for training: approximately 75 Marines per vessel with an average movement speed of 15 knots.<sup>39</sup> As the Navy, Marine Corps and Congressional leaders continue to debate over cost per platform and total ship requirements, those basic design specifications have remained relatively constant.

At this point, enough actionable information exists to build forward-thinking training plans. Current estimates have the first LAW being delivered to the Navy in the next two-to-five years, but fleet-wide delivery will likely push the service closer to the 2030 horizon. There is simply no reason to wait that long to execute realistic training. Whether it be through groups of ground or air transportation assets, training for EABO can be built today using existing vehicles to replicate these movements. If the Light Amphibious Warship is to be the principal maneuver vessel for EABO, it only makes sense to start training to its capabilities as soon as possible with the tools available.

### **Costs of Maintaining the Status Quo**

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<sup>36</sup> United States Marine Corps. *Tentative Manual For Expeditionary Advanced Base Operations*. 2021, p 7-9.

<sup>37</sup> Ibid.

<sup>38</sup> United States Navy, Sea Systems Command. Fact File: Dock Landing Ship – LSD. 19 July 2019.

<sup>39</sup> Eckstein, Megan, USNI News. *Navy Officials Reveal Details of New \$100M Light Amphibious Warship Concept*. 19 November 2020.

At first glance, implementing something that looks like the current MEU training and certification cycle<sup>40</sup> may seem like a natural answer to how the Marine Corps should generate forces and prepare units for deployment, to include future MLRs. If the Marine Corps already takes individuals and units through a continuum that prepares them for expeditionary operations, why should the MLR be any different? The answer lies in the method of employment. To a large degree MEUs, while task-organized to operate afloat, are comprised of Marines who are doing the same job they would do while at home station under relatively permissive C2 conditions. The MLR construct, as we know it right now, fundamentally changes the way Marines will shoot, move, communicate and sustain themselves. Waiting until an individual or unit is six-to-nine months out from deploying before they are introduced to new platforms, networks, and threat capabilities is not just short-sighted, it is a liability. Marines of all ranks, occupations, and commands need to be leaning into the future threats to the greatest extent possible.

If General Berger's vision for the Marine Corps is correct, then the organization needs to be "fluent" in EABO regardless of their assignment in the FMF. Months long training and slow, deliberate buildups from distant industrial bases will likely not be effective in the future fight. The A2AD threat continues to evolve around the globe, and the concept of employment requires forces to be forward-positioned or ready to surge support to the stand-in forces on a moment's notice. If Berger believes that EABO provides the opportunity to "turn the sea denial table" on potential adversaries and deter fait accompli actions<sup>41</sup> then the Marine Corps needs to be trained and postured in a way that doesn't explicitly undermine that effort. There are no "half-measures" called for in his *Planning Guidance and Force Design 2030*, as evidenced by a

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<sup>40</sup> United States Marine Corps. *Amphibious Ready Group and Marine Expeditionary Unit Overview*.

<sup>41</sup> United States Navy and Marine Corps. *Littoral Operations in a Contested Environment*. 2017, p 13.

contentious decision to divest from tanks and tube artillery for the sake of being smaller, lighter, and more lethal. The Marine Corps needs to be “all in” on EABO or it will cede the advantage he believes is critical to its success.

### **Conclusion**

General Berger’s Force Design guidance was intended to get Marines of all rank and experience engaged in thinking ahead to the future fight. By no means is the brain trust of the Marine Corps limited to Quantico, nor should experimentation and modernization be limited to the MLR or III MEF. This is an “all hands” effort, as indicated by the fact that I and II MEF will be expected to provide forces to the MLR/MEU in the future.<sup>42</sup> And never in our history have Marines been expected to fight, and win, while under persistent, multi-domain attack. To overcome these challenges will require creative thinking and focused effort, and General Berger has set a good tone for the organization. But it will also require time, training, resources, all of which are in high-demand across the Marine Corps. None of these endeavors promise to be easy but, then again, few things about distributed operations are.

In order for Marines in the logistics community to be successful in the next fight, their training needs to reflect the challenges of the future operating environment. It must challenge

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<sup>42</sup> Feickert, Andrew. “New U.S. Marine Corps Force Design Initiatives.” National defense, Washington, 2020, p. 6.

their way of thinking, it must present realistic problems and it should, quite frankly, be disruptive. Training should push concepts to the point of failure, and Marines should absorb and share as many lessons as possible. To do so would not only align with Berger’s vision for the future force, but it would demonstrate to our allies and adversaries that the Marine Corps is fully committed to EABO as a means of deterring China and others.

In its *National Defense White Paper* from 2019, China set a goal to comprehensively modernize its national defense and military by 2035.<sup>43</sup> Pair this with a healthy 6.2% defense budget increase for 2020<sup>44</sup> and it seems clear they mean business. As such, it is easy to see why Berger and other leaders within the Marine Corps view 2030 as a critical time to have force design and new warfighting concepts fully aligned and implemented. China is continuing to develop its military capability as the one true “pacing threat” for the United States,<sup>45</sup> and the existing gap will likely continue to shrink over the next decade. Despite stagnation in GDP, China’s defense spending has steadily increased for the past two decades, with a significant jump of \$50 billion between 2014 and 2019. In preparing for the future fight, time is arguably the most critical resource.

Fortunately, the Marine Corps has the tools, the equipment, the talent within its ranks, and the imperative to start training for 2030 today. Leaders within the logistics community are proven problem-solvers who are constantly developing concepts of support for expeditionary operations, and there is no doubt they can be ready to meet General Berger’s intent. By modernizing logistics training and education, first at home station and then in formal school

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<sup>43</sup> State Council of the People’s Republic of China. *China’s National Defense in the New Era*. July 24, 2019.

<sup>44</sup> Office of the Secretary of Defense. *Annual Report to Congress: Military and Security Developments Involving the People’s Republic of China*. 2020.

<sup>45</sup> United States Department of Defense. *National Defense Strategy of The United States of America*. 2018

environments, the Marine Corps can better prepare its leaders to win in the future operating environment.

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