

Modernization or Containerization

Subject Area Logistics

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Author Captain Nathan Frye, USMC

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Expeditionary Maneuver Warfare (EMW) and seabasing operations challenge Marine Corps logisticians to support future maneuver forces ashore from sea bases located in excess of one-hundred miles from forward combat units. Current operations, such as Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF), challenge logistics as forces require support over extreme distances for extended lengths of time. These operations require more streamlined distribution, which will be enabled by the fielding of improved intermediate containers¹. The existing containers do not meet current or future strategic, operational, and tactical requirements.

The future calls for an increased Navy and Marine Corps capability under the auspices of Seabasing and EMW. However, any changes made to containerization must take current requirements under consideration in order to avoid making changes for the future that will negatively affect the way the Marine Corps currently operates. "Not all Marine operations will be sea-based. Marine forces will be 'seabasable', not just seabased. As situations and conditions dictate, particularly given the distance operations may be conducted from the sea, Marines will adapt operations basing accordingly."² Essentially, the current capability needs to be maintained with the additional capability to conduct Seabasing and EMW, which presents enormous challenges at all levels. Requirements will necessitate changes in the

size/shape, weight, composition, functionality, and nature of containerization. Furthermore, future naval containerization must be compatible with other services and Department of Defense (DOD) organizations to ensure effective distribution at all levels.

Strategic Level

Many of the challenges and considerations at the strategic level are unique and different from those at the operational and tactical levels. There tends to be a focus on efficiency at the strategic level, which often causes challenges at the operational and tactical levels. Currently, because the twenty and forty foot International Standards Organization containers (ISO containers) and the Air Force's 463L Pallet (88 x 108 inches) offer efficiency at the strategic level, therefore some may argue that the status quo is sufficient. However, distribution at the strategic level has an enormous impact at the lower levels, and these effects will increase into the future. The argument is not necessarily to change the current strategic containerization and palletization, but to offer an intermediate intermodal container that can be effectively integrated at the strategic level.

At the strategic level, the Defense Logistics Agency (DLA) has taken steps to facilitate distribution at the operational and tactical levels. DLA started to build 'pure pallets' for Marine Corps units shortly after commencement of the Global War on Terrorism (GWOT). These pure pallets contain supplies for like

units and may also be sorted and marked for direct delivery to certain geographic areas. "This process ['pure pallet'] change addressed a significant lesson learned during OIF... don't handle cargo more than once. The building of 'pure pallets' by unit allows forward logistics units to quickly transship sustainment cargo and maintain tempo in the distribution process."³ This same process is now happening at the 1st and 2d Marine Expeditionary Forces (MEFs) as these units continue to deploy in support of the GWOT.

The 'pure pallet' concept has worked superbly, reducing delivery times and manpower at the operational and tactical levels; however a new or improved intermediate container will improve the process by changing the way items and supplies are packaged/containerized and placed on or within strategic distribution modes, such as ISO containers and 463L Pallets. Currently DLA places items on pallets and in containers as break bulk or consolidates them into intermediate cardboard boxes or tri-walls. However, the intermediate tri-wall box utilized by DLA cannot withstand long term exposure in austere environments and is not durable enough for effective delivery to the 'last tactical mile'. The result is that Marines are often unable to deliver such boxes down to the user level, which means there is the additional requirement to unload or reinforce tri-walls just to stabilize them for the 'last tactical mile'.

Strategic Level Requirements

A properly designed intermediate container could effectively be utilized at the strategic level and would add to the efficiency and effectiveness of the distribution chain at the operational and tactical levels. In order to ensure compatibility at the strategic level certain essential design characteristics will need to be integrated into new intermediate containers.

In order to be effective a new intermediate container would have to be compatible in size with ISO containers and 463L Pallets. In addition to compatibility, they would also need to optimize current strategic modes. For example, they might be approximately the size of basic warehouse pallet (48" x 48" inches). Thus, four to eight could be placed on a 463L pallet and twenty to forty, if double stacked, could be placed into twenty and forty foot ISO containers. These intermediate containers would also have to be compatible with current and future automated retrieval systems, such as DLA warehouse automation and Maritime Pre-positioned Force-Future [MPF-F] warehouse automation, as well as current DOD and commercial tracking systems including Remote Frequency Identification (RFID) and Global Positioning System (GPS). Compatibility with these systems will allow for both tracking of the actual items being shipped within the container and the containers themselves.

A new, more capable, intermediate container will make the premise of 'factory to foxhole' far more achievable for both current and future operations. The idea of packing items into a container that is deliverable all the way to the end-user is something that naval forces and the DOD continue to strive towards. In his article entitled 'Future MAGTF Logistics and Support from the Sea (2010+)', Nick Linkowitz notes that: "The goal is to maximize preconfigured packages from the Supporting Establishment for transshipment through and storage on the seabase to be on call for operations ashore as needed-directly to the units."⁴ Therefore, "maximum use will be made of Naval intermodal packaging that can be delivered directly to using units precluding the need for extensive dedicated materials handling equipment (MHE) and line haul capabilities ashore."⁵ In order to allow for such improvements in overall distribution, logisticians at the strategic level must have full buy-in and participation in the development of a new intermediate container.

Operational Level

Naturally, as containers move into the operational level of the distribution chain there is concern for their compatibility with operational level conveyances (i.e. MPF/MPF-F shipping, amphibious shipping, high speed vessels, and theater distribution motor transport assets). The significance of their eventual compatibility and maneuverability within the Sea Base will also

become evident as the Marine Corps and joint services move into the future. Operational level conveyances essential to present and future operations are not compatible with the twenty/forty foot ISO containers and 463L Pallets, thereby reinforcing the requirement for an intermediate container.

Naval amphibious shipping is not designed to handle the twenty-foot ISO container or 463L Pallet. Ships elevators are too small, passage ways are too narrow, and underway replenishment (UNREP) weight capacities are too restrictive. The result is that items, including warehouse pallets, must be removed from containers or taken off of 463L pallets before being moved on to shipping.

Current containerization does not enable selective off-load or at-sea transfer of containers on MPF (and MPF-Future) shipping, which hampers current operations and makes EMW and Seabasing impossible. The following is taken from the Seabasing Joint Integrating Concept (JIC): "Sea-based logistics entails sustaining forces through an increasingly anticipatory and responsive logistics system to support forces afloat and select joint/multinational forces operating ashore...Seabasing uses selective off-load to assemble and deliver tailored sustainment packages directly to joint forces operating ashore."⁶ Current MPF shipping moves the majority of supplies via twenty foot ISOs or twenty-foot equivalent units (TEUs). However, full

TEUs will not move easily throughout the sea base and are cumbersome once ashore, even in today's operations. It is true that break bulk such as warehouse pallets and miscellaneous gear, from ISO containers may be moved via UNREP, but there becomes a challenge with integrating break-bulk into automated warehousing systems. Automated warehousing on MPF-F and future Naval amphibious shipping will be essential for the success of selective off-load and effective timely support to units ashore. A standard sized, more manageable intermediate container is essential for effective selective off-load and movement throughout the sea base.

Bringing current containers ashore and moving them once ashore creates challenges. No helicopters in the Marine Corps inventory can transport a fully loaded TEU, and only the future CH-53X will be able to handle a full sized 463L Pallet. Therefore, there is little to no capability to fly these conveyances ashore. Even if TEUs are moved ashore they still can not be transported by the majority of the Marine Corps motor transport inventory. This essentially equates to a Marine Corps' reliance on Army-level theater transport, which may not be present in a sea-based environment.

Operational Level Requirements

A standard set of intermediate containers will negate many dilemmas outlined above. They should have the capability to move from a strategic level conveyance, into a sea based (MPF-F or

Amphibious shipping) or land based automated warehousing system, and move to tactical forces at the right time and place.

Certain capabilities will be necessary at the operational level. First, intermediate containers will need to be the right size so that they can flow through Naval and MPF shipping. This means that while they might be the approximate size of a standard warehouse pallet, they should also offer the capability to be linked together so that they can carry outsized cargo, such as missiles. Intermediate containers will also need to be durable enough to move throughout the sea base and ashore, which includes UNREP operations and combat off-load from aircraft. They will also need to be collapsible and stackable so that they can be efficiently stored in limited space.

Tactical Level

It is essential that any changes to Marine Corps containerization take into account Marines at the tactical level. Today's organic USMC containers (primarily the Quadcon and Palcon) are satisfactory for certain current operations. However, current containerization falls short of the mark when it comes to future tactical level operations.

There are several recurring complaints with Quadcons, including their high tare weight and inefficiency when being embarked on aircraft, amphibious shipping, and motor transport vehicles. One of the most significant problems with Quadcons is

that only two containers can be loaded to a regular sized Medium Tactical Vehicle Replacement (MTVR). The MTVR happens to be the vehicle that Marine Corps logisticians most heavily rely upon and that compose a majority of USMC ground lift. Logisticians find themselves wasting a significant amount of space on MTVRs due to the fact that a third container cannot be loaded to the vehicle.

The Palcon also has numerous shortfalls. The most significant, according to Marines, is their lack of durability. Palcons do not perform well in austere environments and break quite easily. In fact, they are often damaged permanently by forklifts or from being dropped. Because they are constructed of a fiberglass type material, once Palcons are broken they cannot be effectively repaired and are often disposed of or used only for functions such as warehouse storage. Though they are a convenient size for storage, Palcons do not give Marines the capability they need.

Tactical Level Requirements

Certain tactical level requirements will be essential in the design of a future intermediate container. Intermediate containers will need to have the ability to move smoothly from operational level to tactical level conveyances with minimal handling and manpower, while being durable enough to withstand the vigor of harsh environments. Similar to the requirement at the operational level, intermediate containers will need to be the

right size to optimize the majority of tactical conveyances and must have the capability to be connected to optimize larger vehicles such as the MTVR, MTVR long bed, the Logistics Vehicular System (LVS), and the LVS-Replacement.

They will also need to be durable like the Quadcon and ISO container, but be in more manageable size increments so they are easily handled by forces ashore. "Reducing or eliminating the logistics footprint ashore will be the primary thrust of sea-based logistics"⁷ and Marine Corps logisticians do not want the seemingly endless streams of ISO containers ashore as is the case with modern day operations (i.e. Southwest Asia and Operation Iraqi Freedom). Ideally, once intermediate containers are ashore they will no longer be the need for the current robust material handling equipment (MHE) capability to move them.

If intermediate containers are to be re-used they will need to be easily retrograded. Essentially, this means they will need to be collapsible and easily stacked for efficient movement. The current containers (i.e. ISOs, TEUS, Quadcons, and Palcons) cannot be collapsed and are very difficult to retrograde.

Counter Arguments

Even though a new and improved intermediate container will make the distribution chain more seamless and appears to be a capability our forces must have, there remain skeptics. Some may argue that such a solution will be impossible to achieve for an

economical price. For example, if new containers are used to carry sustainment from organizations such as DLA, it will be very difficult to recover and re-use containers, therefore the argument is that the status quo (i.e. use of cardboard or wooden boxes) is most economical. The answer might be that there are both disposable and re-usable containers. This would allow for organizations, such as DLA, to ship certain items in disposable containers without an expectation for their return. On the other hand, actual units might have robust versions of the container for continued re-use, similar to today's Palcom and Quadcon.

Another counter-argument is that the design of a family of containers that will be both compatible with all platforms and be of adequate size to carry a majority of items is impossible. This is a legitimate argument in that it is an impossibility to satisfy 100 percent of this requirement. However, a seventy to eighty percent solution would be better than the current situation where the Joint services and DOD use of differing types of intermediate containers in their operations. The Joint Chiefs, in a 2005 memorandum state that: "We agree that a common approach and set of standards must be adopted as quickly as possible. Common containers reduce cargo handling which results in faster distribution with less in-transit losses."⁸

There also is an argument that new size standards will require certain military and DOD organizations to re-engineer

internal processes. For example, DLA facilities focus their automation efforts around the traditional warehouse pallet. The bottom-line is that a new size standard for intermediate containers will mean some re-engineering, which equates to the expenditure of a significant amount of money. However, this expenditure may be mitigated if all DOD organizations actively participate in design efforts in order to ensure the utmost compatibility with current facilities.

Conclusion

Current and future operations require more streamlined and flexible distribution. Marine Corps doctrine states that: "We seek logistics capabilities that extend our operational limits...while remaining flexible, adaptable, and responsive to the changing conditions in the battlespace."⁹ Existing containers do not meet strategic, operational, and tactical requirements to enable a streamlined and flexible end-to-end distribution chain. The Joint Chiefs and the Secretary of Defense's Defense Science Board (DSB)¹⁰ give strong support to the premise that improved container design will enable more effective logistics. Furthermore, the Marine Corps through its Logistics Modernization (LM) has begun exploring changes in containerization to streamline distribution, but it will take the effort and buy-in at all levels to make this change a reality.

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Notes

¹ Intermediate Container refers to containers that can be used to carry supplies and unit items. Once items are placed in an intermediate container, the container may be placed directly into or onto a transportation mode (i.e. truck, aircraft) or they can be linked together and placed on larger pallets (i.e. 463L) or within containers (i.e. ISO containers, Quadcons).

² Corbett, Arthur, "The Family of Concepts," *Marine Corps Gazette*, October 2003, 34.

³ Wissler, John E., "Meeting the Mandate for Change in Marine Corps Logistics," *Marine Corps Gazette*, August 2005, 25-28.

⁴ Linkowitz, Nicholas, "Future MAGTF Logistics and Support from the Sea (2010+)," *Marine Corps Gazette*, Aug 2003, 23.

⁵ Linkowitz, Nicholas, "Future MAGTF Logistics and Support from the Sea (2010+)," *Marine Corps Gazette*, Aug 2003, 23.

⁶ Task Force on Seabasing, "Seabasing Joint Integrating Concept (Version 1.0)," August 2003.

⁷ Linkowitz, Nicholas, "Future MAGTF Logistics and Support from the Sea (2010+)," *Marine Corps Gazette*, Aug 2003, 23.

⁸ Memorandum for the Secretary of Defense, Chairman Joint Chiefs of Staff, Services, COCOMs, Acquisition Commands, and Agencies, 21 March 2005.

⁹ U.S. Marine Corps, Marine Corps Doctrinal Publication 4 (MCDP-4), Logistics, Washington, DC: Headquarters Marine Corps, Department of the Navy, February 1997.

¹⁰ Office of the Secretary of Defense of Acquisition, Technology, and Logistics, Defense Science Board Task Force on Mobility," September 2005.