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CONCEPTS**

**SPECIAL FEATURE: THE LOGISTICS
OF PACKAGING**

MBDA FOCUSES SUPPORT

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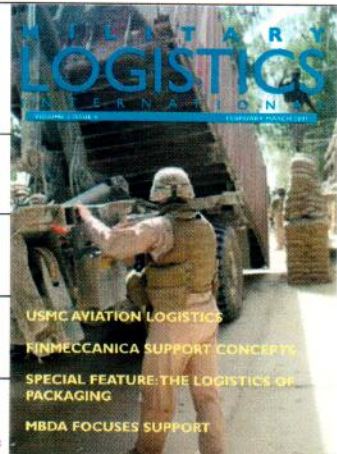
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RE-CRAFTING EXPEDITIONARY LOGISTICS: USMC AVIATION PREPARES FOR THE FUTURE

MLI's Murielle Delaporte and Robbin Laird interview Colonel Pierre Garant of the United States Marine Corps Aviation Logistics Support Branch. Col Garant and his team discuss the challenges that they face in the drive to transform USMC aviation logistics.

Based on their experiences of the past few years, the USMC has had to rethink their operations, their strategy, and the central role which logistics plays in both. Because the USMC is an engaged force – “There are two types of Marines: those in Iraq and those going to Iraq”, says Col Garant – the rethinking is done in the context of a fluid, global situation. Their service places the integration of the ground and air forces at the heart of their doctrine and operations, and as a maritime expeditionary force, which is part of the US Department of the Navy, it does so in the context of support from the sea. The operations in Afghanistan and Iraq have also pushed the Corps beyond short-term intervention scenarios, and have faced them with the necessity of operating longer-term logistic support operations, a tough reality.

As the Marine Corps use their Marine Air-Ground Task Force (MAGTF) structure to craft flexible units of operation, so the logistics challenge has shifted. Rather than creating and deploying blocks of capability, now the challenge is to support on a sustained and integrated basis MAGTFs deploying worldwide. This can be in places without significant permanent support

structures, or from such structures into more fluid and evolving operational areas. To support this shift, the USMC aviation support structure is shifting from a “hard wired” logistic supply chain concept to one of a logistic network, with flexible nodes or buffers able to function as elements of spider web providing deployed support to flexible forces.

Also, because the USMC's aviation units are central elements of the combat power of the ground forces – both kinetic and non-kinetic – their span of support to distributed ground units grows as well.

And with the introduction of new capabilities – notably the V-22 and the JSF – the air elements will be able to expand the line of defence and support to deployed and distributed ground forces. To provide for such capability requires accelerating the change in the logistics approach, so that a real spider's web with key buffer supply capabilities can sustain operations.

RESHAPING THE BASELINE CONCEPT

The Marine Corps framed their current approach to logistics in 1989. The Marine Aviation Logistics Support Programme (MALSP) was built around the concept of supporting USMC deployments from CONUS,

from overseas fixed depots/bases, or from sea-based capabilities. The goods and services were pushed from the depots/bases to the deployed forces. Stockpiling in-place was a key requirement for the deployed forces to provide capabilities for in-theatre operations. Maintenance of many elements of the aviation assets could be provided due to the relative short-duration deployments characterizing USMC operations. A 30 day deployment hardly needs much as regards forward deployed depth maintenance support centres.

The MALSP is a concept for propositioning: deploying in phases and layers, and integrating aircraft support elements in “building block fashion”, so as to provide for all areas of expeditionary aircraft sustainment. The key elements of the MALSP are area Fly-In Support Package (FISP), Common Contingency Support Packages (CCSP), Peculiar Contingency Support Packages (PCSP), aviation logistics support ships (T-AVB), and the Maritime Pre-positioning Force (MPF) ships. In other words, the MALSP is an umbrella programme that encompasses a number of different programmes. The MALSP enables aviation logisticians to rapidly task, organize, deploy and sustain an expeditionary MAGTF Aviation Combat Element (ACE).

Marine Aviation Logistics Support Programme Force Deployment Packages (Rotary Wing Aircraft)		
Package	463L Pallet Loads	Weight (tons)
Common Contingency Support Package	20	2021
Peculiar Contingency Support Package (36 CH-46E)	26	2240
Fly-In Support Package (36 CH-46E)	8	82.5
Peculiar Contingency Support Package (16 CH-53E)	14	138
Fly-In Support Package (16 CH-53E)	2	52.5
Peculiar Contingency Support Package (18 AH-1W/9 UH-1N)	16	199
Fly-In Support Package (18 AH-1W/9 UH-1N)	9	70.5

The MALSP, as practiced, is a push system. The current building blocks are pre-determined batches of logistics, constructed as 30, 60, and 90 day thresholds, shaped by historical demand. These blocks/batches do not change according to the possible impact of environmental or operational drivers. The system requires a large footprint of bases – sea and ashore – and is characterized as being part of a supply chain to the deployed forces. It is largely a reactive system.

But the experiences in Operation Iraqi Freedom (OIF), the operational logistics direction of the USMC shifted from the MALSP model. In the drive to Baghdad, the USMC aviation units created temporary “leap-frog” bases from which support was provided to ground forces moving forward in a circular manner, more than a linear straight line approach. The fixed and rotary wing aircraft were part both of the joint defensive perimeter as well as the offensive thrust forward. The “leap-frog” bases became cascading islands of support in an overall effort to capture Baghdad and to defeat Iraqi fielded forces. The “leap-frog” experience suggested a different logistics model: one based on network nodes of interactive support, rather than units in a chain reaching back to CONUS.

Forward Operating Bases (FOB) have become a key element of reshaping expeditionary operations. FOBs increase responsiveness through basing flexibility and aircraft dispersal by decreasing distances to areas requiring support. OIF demonstrated that the rapid advance of 1st Marine Division and Task Force Tarawa was enabled by the ability to establish forward operating bases and forward arming

and refuelling points. 21 forward arming and refuelling points (FARPs), 6 forward operating bases/air bases (including Kuwait) and 8 KC-130 tactical landing zones were used in their operations. Leap-frogging of FARPs every 40-50km enabled continuous rotary wing attack aircraft support to the ground forces. FOBs/FARPs shortened flight times en-route to the objective and reduced AV-8B dependence on refuelling tankers for supporting ground troops.

Although aircraft maintenance is usually not executed at FARPs, high tempo operations were supported through contract personnel from forward FOBS and even FARPs. But the operational experiences mean that for the USMC, basing and logistics are becoming parts of the distributed force structure and, as such, aim to provide on-going support that is more responsive to actual patterns of demand.

THE SPIDER'S WEB

The evolving spider web approach to support is reflected in the experience of Marine Aviation Logistics Squadron 26 (MALS-26) in Iraq. This squadron requisitioned munitions via email to MARCENT, which in turn, entered requisitions into the USN/USMC's Conventional Ammunition Integrated Management System (CAIMS), which will then be sourced by the Naval Operational Logistics Support Center (NOLSC). MALS-26 would then receive resupply from pre-positioned Days Of Ammunition (DOA) packages in Sigonella, Sicily and CONUS, based on physical assets available. Al Asad Ammunition Supply Point (ASP) stored 30 DOA for the aircraft there, and re-supplied FARP sites as required by available airlift.

Taqaddum ASP also stored 30 DOA for the aircraft there, as well as other FARP sites as required.

The OIF experience is leading to a shift in the maintenance strategy as well. Marine Corps aircraft utilization rates in current operations are, on average, double the normal peacetime rates. This requires the formation of a new long-term sustainment plan to maximize aircraft availability, both for forward deployed operations and CONUS-based training. The central components of the strategy according to Col Garant are:

- **AH-1W/UH-1N:** Integrated Maintenance Programme (IMP) events, scheduled on a 24-month interval, will be conducted at the Naval Aviation Depot (NADEP), Cherry Point, North Carolina. Airframes will be transported to/from Iraq via strategic airlift.
- **CH-46/CH-53:** Material Condition Inspections (MCI), a process of inspection, identification and recording of airframe degradation, and subsequent Material Condition Reconstitution (MCR); a process of corrective maintenance to optimise materiel availability will both be conducted in-theatre. The purpose of the MCI/MCR process is to proactively identify and correct material degradation and, if in compliance with engineering specifications, extend the fixed induction dates of the aircraft to stabilize forward based aircraft availability and continuity.
- **Contractor Support:** A combination of contractor-sourced personnel, including original equipment manufacturers (OEM's), Contractor Field Teams (CFTs), and Sustainment Technical Assist Teams (STATs), will provide vital augmentation to Marine logisticians to service, inspect, replace, and repair rotary wing aircraft.

The adjustment of the logistics strategy of USMC aviation, which has been done on the fly in response to OIF and wider operations, is leading to the re-crafting of MALSP into MALSP II. Here the USMC aviation logisticians are focusing upon shaping a more agile system, better aligned with the evolving strategy of the USMC. Leapfrog basing and clusters of support nodes, which have to become responsive with demand, pull

rather than supply push are the new realities. A flexible “time buffer” is also the focus of activity as well as the redesign of metrics. And an agile footprint which can be adjusted to flexible operations, is seen as crucial.

FRAMING MALSP-II

According to the director and staff of the USMC Aviation Logistics Support Branch, within the framework of AirSpeed – a US Navy streamlining process designed to identify and correct the weaknesses of the logistic chain – the Marine Corps has been working since 2005 on MALSP-II. As of today, the system in place is a transitional MALSP, with the introduction of MALSP-II pilot projects, allowing testing of the long-term framework of operations. MALSP-II should be fully operational by 2015.

Application of MALSP-II is having to take place while continuing to support current operations. But operations do allow for dynamic testing of MALSP-II, showing troops on the ground how they can be supported better. And the feedback loop allows the MALSP-II concept to be refined and improved.

The USMC Aviation Logistics Support team is keen on the need to gain active support from the wider USMC community for any changes to the logistics system. As “Three Block Warriors” seeking to operate in a global system where interdependence and variability is the norm, there is a need support where no Wal-Mart would go. On top of this is the need to protect the supply chain in a way no Wal-Mart needs to worry about.

The Marine Corps logisticians are therefore sceptical of fatuous examples being drawn from civilian logistic experiences. They are moving from being depot managers and travel agents to becoming core participants in all aspects of the global engagement. But this requires the articulation of the relevant logistical models for the new global logistics conditions.



USMC technicians undertake a 200 hour check on an AH-1W operating from Taqqadam operating base in Iraq. Maintenance practices for USMC aircraft are being changed to allow for more “on condition” maintenance, thus increasing operational availability rates.

The logistic system is evolving from a chain to a network defined by “nodes” and the reorganization of the En-route Support Base. In that context, a global ammunition network is being implemented with the global re-positioning of ordnance. In order to cope with the variations inherent to the nature of the mission, a system of buffers is being set in place to make sure the flow remains uninterrupted. MALSP-II identified one key bottleneck – the repair node – and two crucial buffers – one at the repair node itself to correct its variation and one just before the warfighter (i.e. delivery stage).

MALSP II defines buffers as “shock absorbers” aimed to:

- Protect from up-stream variation
- Give a proactive management tool
- Give a global view of the health of the system
- Tears down the complexity of the system.

Buffer management facilitates the shift from a push to a pull system defined by demand as opposed to a fixed allowance system which is outdated. A buffer, however, is not determined by demand averaging, but by a “pattern of demand” and the “Time to Reliably Replenish” (TRR). The idea is to “move away from dense pack to mission pack”, according to the Aviation Logistics Support team.

New ways to achieve similar or better support are currently under development in order to prevent the vulnerabilities implicit to the previous system, including leaner approaches such as faster repair cycles. Hence the shift towards a more dynamic approach and a global lay-down based on FARPs and FOBs, rather than a linear logistics pattern.

As long as buffers are built, the logistics footprint can be more limited and progress has already been made across the board: for example, in the engine repair business, the Marines have seen where they can achieve better engine repairs by moving to more effective repair nodes. This is occurring while improving overall engine support as measured against a global requirement at peak wartime demand. Also, in Iraq, they have demonstrated a singular logistics command and control that spans seven outlying sites and effectively allocates logistics in fuel, ordnance, maintenance capability, and aircraft.

One of the major developments of the recent years has been the standardization of the equipment used, and the emergence of specific policies to manage standardization. Relevant issues concerning refuelling and rearming points are now being identified, while major progress has been made, for instance, in transportation container layouts, as well as the containerization of supplies, such as the fast-pack system for munitions.

Lots of standards remain to be created so the process become leaner and leaner, but the trend is set. The

goal is to push such standardization for both the sea and the shore pillars, as opposed to having to function with two separate sets of logistics equipment. Indeed the way the support packages are shaped is as crucial as the way they are being transported.

New IT and the resulting decentralization have tended to improve in-transit visibility, and a by-product is that both also tend to enhance the efficiency of the general decision-making process as regards logistics. These, working alongside new technologies such as RFID, offer the promise that the TRR will be reduced and that the buffers will be right-sized.

FACING THE FUTURE

New equipment such as the V-22 Osprey and the Joint Strike Fighter (JSF) will play a major role in simplifying the network and reducing the number of nodes necessary. In the case of the V22, its longer-range is the key enabler, while the JSF “brings the opportunity of autonomic logistics”, says Col Garant. But the USMC is clear on one core development: contractor support comes to the operations and a new doctrine for logistics is emerging before the new equipment is added, and not the other way around. Indeed, their approach towards logistic support for JSF is very reminiscent of how the UK’s RAF looks at its requirements: deployment of equipment and support stick together.

A key question, as ever in logistics, is the definition of metrics. Until now, these have tended to be more a measure of the “availability rate”, as opposed to a “real need at a given time”. According to MALSP-II, “new metrics will drive down shelf stock” by reducing TRR and increasing reliability.

By being more pro-active, the logistics support branch now needs to define better contracting practices and develop, “better industry logistics partnerships (such as performance based logistics contracts)”. To do so it is in the process of collecting data at the unit level, which will contribute to establish mission capacity rates as accurately as possible. The industrial sector response to the surge has been,

“quite good”, according to Col Garant. In some cases, industry’s response has seen to major improvements in equipment support: Rolls Royce has worked hard and proactively to improve the longevity of aircraft engines for the USMC as one example.

Another aspect of readiness is the manpower needed to fulfil all the tasks required in ensuring an efficient logistic network and the management of the flexibility necessary. So far, contractors have been hired on-site (which is less risky than flying the equipment in and out), but here too establishing accurate measurements and a predicable pattern is a rather daunting task.

The USMC is thus currently in a transition from an established MALSP practice and doctrine to what will become a new global expeditionary integrated air-ground logistics practice. MALSP II is viewed as the bridge to the new concept.

“The AvLog Future Concepts strategy involves three main pathways that take us from the transitional situation to the new capability”, says the USMC Aviation Logistics Support Branch. One path is from MALSP to MALSP II, a spiral development of the core doctrine for USMC Aviation logistics. Another pathway is the adaptation of

AIRSpeed to USMC logistics requirements, notably with regards to air and ground integration. The third pathway is to more effectively draw on the enablers and accelerators of the new approach by taking advantage of emerging technologies and industry partnerships.

THE DYNAMICS OF CHANGE

The USMC aviation logistics approach is undergoing serious change. The challenge of operating in multiple global areas at once with limited assets which are inherently joint requires a new logistics strategy. This strategy is expeditionary at its core, and involves placing logistics as a key element within an integrated capability.

To get there requires reshaping doctrine and approaches. It requires re-crafting the relationship with contractors and requires contractors to be able to sustain their equipment with the aviation community wherever the USMC is tasked to deploy. New matrices are needed to measure the capabilities in the buffers rather than supplies in the depot/base.

“Our ultimate definition of success must not be that we created a vision and strategy, but that we executed and implemented them. All else is just mesmerizing glitter”, says Col Garant. ■



It isn't just the work rates that have been impacting the availability of USMC aviation assets: here, a sand storm rolls over the Iraqi desert towards a USMC Forward Operating Base, where CH-46 Sea Knight helicopters sit in the open.