Re-Shaping Distributed Operations: The Tanking Dimension

03/10/2015 – *In an interesting piece published in the Air and Space Power Journal, Dr. Robert C. Owen takes a look at how to rethink tanking support for deployed forces..*

In such a rethink, the role of C2 and of aircraft like the KC-130J and A400M which can operate off of austere airfields, tank and provide support is of growing significance for distributed operations..

2015-03-10 In an interesting piece published in the *Air and Space Power Journal*, Dr. Robert C. Owen takes a look at how to rethink tanking support for deployed forces.

We have focused in our book The Remaking of American Military Power in the Pacific and in various analytical pieces and interviews on *Second Line of Defense*, the emergence of what we have called deterrence in depth.

Technology is emerging which can allow for innovations in C2 to allow for distributed operations, and new air platforms such as the F-35 and the Osprey certainly facilitate dispersal and aggregation of force.

And the former head of the Pacific Air Force introduced the concept of Rapid Raptor in part to ensure that a dispersed force could enhance its survival and contribute to a significant increase in lethality.

The Marines have been following a dispersed operations strategy for some time, and the KC-130J has been a key facilitator of such operations.

Functioning as tanker, supply ship, C2 and weapons carrier, the Marines have leveraged this versatile platform for provide for a very flexible and dispersible force.

In fact, the entire MAGTF concept is one of scalable force.

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Another key development is the addition of new tanker assets by allies as well.

In the Pacific, the Aussies and Singaporeans are adding up to 13 new KC-30A tankers, the tanker of choice in the current Iraq operations, and the new A400M is coming to the Pacific as well and can perform lift and tanking functions as well and can be considered part of rethinking distributed operations in an area like the Pacific.

And it is also the case that the deployment of significant numbers of A330MRTT tankers in the Middle East allows the GCC states to operate a flying air base to support various nations combat capabilities.

The deployment of such capabilities broaden significantly the assets available for the tanking of allied air forces, and of course, tankers can land and provide fuel for land based systems as well.

KC-130Js attached to Special Purpose Marine Air-Ground Task Force Crisis Response from Marine Aerial Refueler Transport Squadrons-352 (shown) and 252, fly together in formation by the USS Bataan, Mediterranean Sea, June 15, 2014. (Official Marine Corps photo by Staff Sgt. Tanner M. Iskra, SP-MAGTF Crisis Response, 2nd Marine Division Combat Camera/Released)

Owens develops a concept of sea land basing of tanking support, somewhat like a spider's web concept.

Essentially, SLB is a concept for the agile disaggregation of air refueling forces among austere military and civil airfields possessing minimal support facilities for large aircraft other than runways.

The signature characteristic of SLB would be the dedicated integration of at least one "missionized" base ship with an expeditionary air refueling unit of up to about 20 aircraft. This ship

would house the command, logistics, maintenance, personnel, and other elements needed to support dispersed expeditionary air refueling operations at several airfields simultaneously.

At a given time, one or two of those airfields would serve as forward operating locations (FOL) able to service and protect aircraft and crews assigned to the SLB unit and/or those transiting through from bases or aircraft carriers located further to the rear.

In addition to the FOLs, an SLB ship would service a small number of "hide" airfields, providing protection and limited services only. The main difference between FOLs and hides is that the former would offer robust, expeditionary aircraft refueling support while the latter would not.

Otherwise, both types of base would be manned and resourced on a minimal and highly mobile basis, capable of being disembarked and set up or packed up and reembarked in just a few hours.

A key aspect of enabling such an operation is highlighting the role of aircraft which can both tank and lift in austere conditions.

As the following figure indicates, tanker aircraft capable of operating from austere airfields could disperse more widely than airliner-derived designs and operate further forward—with good effects on their survivability and off-load capacities at their points of need.

It may also be useful, as the Marines have done with their KC-130 fleet, to consider the secondary airlift and other uses of aircraft matched to the SLB mission.The austere airfield characteristics of these aircraft would fit them well for logistics operations and for support of maneuvering land forces as well as combat air units operating at forward locations or at main bases with damaged runways or limited parking areas.

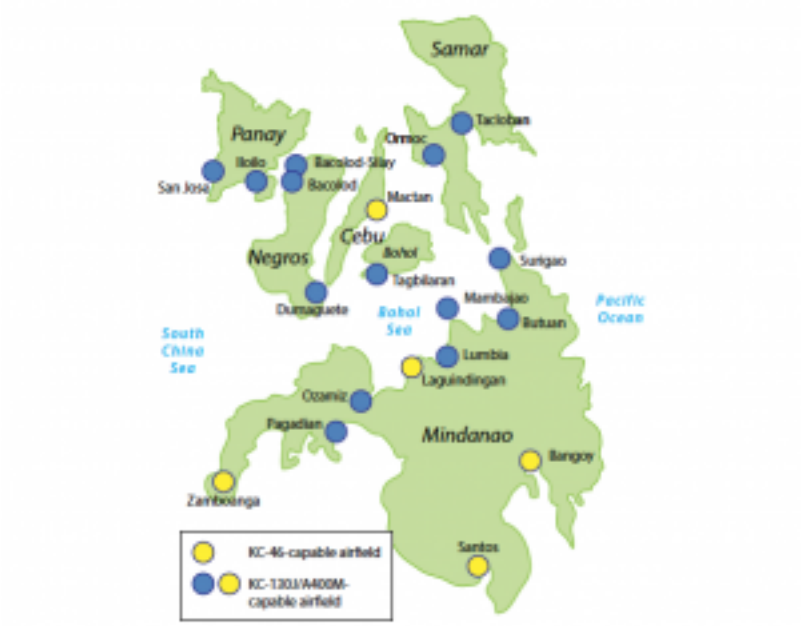

Figure. Airfields in the southern Philippines capable of accommodating KC-46s (yellow) and KC-130s/A400Ms (yellow and blue). Importantly, all are located near—sometimes within yards of—waters navigable by a base support ship and/or its amphibious craft.

And it is from this perspective that Owens considers the importance of the coming of the A400M to the global fleet.

Despite—or perhaps because of—its international pedigree, the A400M offers performance compatibilities worthy of serious consideration by US planners. Operationally, it can utilize virtually the same runways and parking areas as the KC-130J but with markedly better characteristics of range/off-load, speed, and cargo capacity.

Depending on range, the A400M will deliver from two to three times more fuel to receiver aircraft than the KC-130J. It is significantly smaller than the KC-46A, but in the context of SLB, the A400M can offset its relative limitations through forward basing.

Airbus Defence and Space has formally delivered the first of four Airbus A400M military transport ordered by the Royal Malaysian Air Force. The handover also marks the first delivery of an A400M to an export customer outside the original launch nations. The aircraft was accepted at the A400M Final Assembly Line in Seville, Spain on 9 March by Chief of Malaysian Defence Force General Tan Sri Dr. Zulkifeli. Credit: Airbus Defence and Space, March 10, 2015.

For example, in the scenario of supporting a refueling orbit 250 nm west of Manila, a KC-46 operating from Tinian would have 113,000 pounds of fuel available for off-load while an A400M operating from Tacloban would offer about 90,000 pounds. Moreover, the KC-46 would burn about 100,000 pounds of fuel performing its mission—a ratio of about .88 burn/off-load. The A400M, meanwhile, would consume 48,000 pounds for a .53 burn/offload ratio.

Depending on operational circumstances, then, an SLB fleet element of A400Ms could greatly reduce the logistical costs and fuel infrastructures required to support combat operations. Once again, the aircraft's probe-and-drogue capabilities would limit it to the support of Navy and Marine Corps aircraft, but it generally would do so more effectively than KC-130Js and with significantly improved flexibility and resilience over KC-46s.

Finally, the aircraft's large cargo box and 41-ton cargo capacity would make it a better airlift partner to the C-5/C-17 fleet than either of the currently programmed tankers. At the moment, Air Force and Army planners contemplating movements into austere airfields confront the reality that C-130s can get into a wide range of airfields but can carry comparatively little while C-17s carry much more but also rut, gouge, and otherwise render unpaved surfaces unusable after only a few passes.

A fleet element of flex-role A400s could fill that gap. They could provide substantial lift over strategic and tactical distances in support of main air bases degraded by enemy attacks; furthermore, they could deliver combat-relevant mechanized, engineering, and air defense units

closer to their points of need than any aircraft or combination of aircraft in the Air Force program-of-record fleet.

It is a pleasure to see an analyst who thinks about evolving concepts of operations up against new technologies to sort through ways to think about the way ahead.

We have argued that no platform fights along, and in Owens analysis this is clearly understood.

He concludes in part as follows:

The article noted that a modest fleet of A400Ms would increase the number of bases available for air refueling operations, optimize the operational opportunities presented by SLB, and provide valuable augmentation to the airlift fleet.

The costs of such an aircraft could be offset by earlier retirements of geriatric KC-135 and aging C-130H aircraft, and by reduced purchases of other tankers following the current KC-46A program.

Taken together these considerations of conceptual viability, capabilities of alternative aircraft, and the availability of cost offsets suggest that the Air Force would do well to carefully examine and test SLB with an eye toward achieving initial operational capability in the four-to-six-year midterm.

Accordingly, the Air Force should initiate an aggressive study-and test program for SLB in the near term.

SLB of Air Refueling Forces

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