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FORWARD...FROM THE SEA: SEA BASED LOGISTICS IN SUPPORT OF CANADIAN ARMED FORCES OPERATIONS

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Exercise *Solo Flight*

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INTRODUCTION

Renowned military strategist and counterinsurgency expert Dr. David Kilcullen espouses that the world must adapt to a new normal, one that is characterized by instability, regional conflict within the globally networked environment, domestic and international threats, and continued aggression rising from the rubble of the last war.[1] Such an environment presents challenges for the Canadian Armed Forces (CAF) in the conduct and support of future operations.

Each service must determine its role in providing a solution to advance joint operational efficiencies. The Royal Canadian Air Force (RCAF) has developed and employed the Air Task Force (ATF) concept in recent operations and stood up 2 Expeditionary Air Wing to promote operational effectiveness.[2] The Canadian Army (CA) is investigating the adoption of the Light Force concept in an attempt to promote agility, autonomy, and deployability.[3] The Royal Canadian Navy (RCN) is in the midst of Fleet renewal, providing the Government of Canada with more modern and better equipped multipurpose forces.[4]

Canada's allies have also moved to counter the challenge of the future operating environment. This paper will focus on the continued development and employment of the United States Navy (USN) and United States Marine Corps (USMC) concept of Sea Based Logistics as a tool to promote operational success abroad. Specifically it will focus on the related concepts of

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[1] David Kilcullen, "I see no alternative to a larger, more intense conventional war against Isis." *The Guardian*, 10 July 2015, Last accessed at http://www.theguardian.com/commentisfree/2015/jul/10/i-see-no-alternative-to-a-larger-more-intense-conventional-war-against-isis.

[2] David Pugliese, "RCAF has new Expeditionary Capability." *Ottawa Citizen*, 27 April 2014, Last accessed 20 April at http://ottawacitizen.com/news/national/defence-watch/rcaf-has-new-expeditionary-capability-says-commander.

[3] LGen J.M.M. Hainse, "Your Army in Evolution." Presented at Canadian Forces College 7 April 2016.

[4] Canada, Department of National Defence, "Royal Canadian Navy's Transition to the Future Fleet." Last accessed 20 April at http://news.gc.ca/web/article-en.do?nid=886119.

Operational Maneuver from the Sea (OMFTS), Ship to Objective Manuever (STOM), and Sea Basing. These concepts will then be contrasted with CAF joint and maritime support doctrine and with recent Canadian experience in international operations in order to facilitate a review of the operational applicability of the concept across the spectrum of conflict. Finally, an overview of current joint capabilities to employ these concepts will be presented. Through this analysis, this paper will demonstrate the validity and applicability of these concepts to future CAF operations and provide recommendations on how Sea Based Logistics can be further developed to improve joint operational support and sustainment within the dynamic and challenging modern environment.

THE CONCEPT

The complementary concepts of OMFTS, STOM, and Sea Basing have been developed over time, with OMFTS drawing its roots from classic amphibious doctrine as seen during the beach landings of World War II. STOM and Sea Basing are more recent and transformational, based on evolving concepts and technology advances beginning in the mid 1990s.[5] This shift was driven by the recognition that the USN and USMC were likely to be the first on scene in any future conflict and therefore responsible to project power ashore from the littoral to rapidly resolve or contain the situation until heavier forces arrived, minimizing casualties throughout.[6] This section will provide further detail on each concept and its applicability to modern operations.

OMTFS

[5] David Schrady, "Sea-based Logistics and Lessons from the Falklands." 2000, Monterey, CA: Naval Postgraduate School Institute for Joint Warfare Analysis: 2.
[6] National Research Council (U.S.), "Naval Expeditionary Logistics: Enabling Operational Maneuver From the Sea." 1999, Washington, DC: National Academy Press: Preface vii.

At its core, OMFTS represents an extension of the manoeuvre warfare envisioned by theorists such as Liddell Hart and practitioners such as Guderian to the maritime domain. As detailed within the USMC's initial STOM concept paper, OMFTS is simply summarized as "taking the operational maneuver space offered by the sea, U.S. forces turn the sea and the littorals into vulnerable flanks for potential enemies, assailable at the time and place of the naval commander's choosing."[7] This concept allows joint commanders to exploit the opportunities provided by the littoral battle space in advancing their campaign objectives through amphibious forces or other means such as air and sea strikes based within the force at sea.

Within the scope of OMFTS, it stands to reason that each campaign will place varied demands on the commander and require flexibility in its application to the operation at hand. Six core features have been identified which require resolution prior to implementation of OMFTS to a given operation: (1) the composition of combat and logistics forces ashore; (2) the role of naval fire support vis-à-vis ground artillery; (3) the availability of overseas ports and airfields; (4) sea base standoff distances and duration; (5) operating distances ashore; and (6) the transition to shore-based logistics."[8] These six features will determine the complexity of the logistics chain and strategic lines of communication required to sustain operations. The larger and heavier the forces ashore and at greater distances, the more complex the chain must be. The small and lighter the force is, the more likely it is to be successful utilizing OMFTS.

Based on this understanding of OMFTS, it is of little surprise that the USMC specifies "Enhancing Littoral Maneuver Capability" as key to its future success.[9] This directly aligns with the analysis conducted by the U.S. National Research Council who found "the mission calls for

[7] United States Marine Corps, "Ship to Objective Maneuver." 1997. Washington, DC: Marine Corps: II-3.
[8] David Schrady, "Sea-based Logistics…", 4.
[9] United States Marine Corps, "Expeditionary Force 21." 2014, Washington, DC: Marine Corps: 21.

those units making the transition from sea to land to be lighter, more maneuverable, and more widely dispersed, and that, in addition to fire support, the sea-based forces be prepared to provide logistical support rapidly moving inland forces on an efficient 'on call' basis."[10] In order to facilitate this requirement, the USN and USMC developed the complimentary concept of STOM.

STOM

Ship to Objective Maneuver is characterized as "…rapid maneuver by landing forces from their ships directly to objectives ashore…" and represents a transition away from traditional amphibious approaches in which "…operational phases, pauses, and reorganizations imposed delays and inefficiencies upon the momentum of the operation."[11] The vision of STOM is to "…exploit the sea as maneuver space…" in the projection of maritime expeditionary power "…directly from the sea onto operational objectives well inland, obviating the traditional need to first seize and secure a beachhead and build up a support base ashore before pushing out to accomplish inland operational objectives."[12] In developing the concept, the USMC understood the unique position of the USN to utilize the sea and waterways as manoeuvre space, thereby and in combination with the USMC providing the U.S. government with "…persistent, self-sustaining, sea-based forces to meet the full spectrum of requirements."[13] With the development of technologies like the MV-22 Osprey, Expeditionary Fighting Vehicles (the newest versions of the amphibious assault vehicle), the improved Landing Craft Air Cushion, and the modern

[10] National Research Council (U.S.), "Naval Expeditionary Logistics…", Preface viii.
[11] United States Marine Corps, "Ship to Objective Maneuver…", II-4.
[12] National Research Council (U.S.), "Naval Expeditionary Logistics…", 1.
[13] United States Marine Corps, "Expeditionary Force 21…", 18.

version of the heavy-lift helicopter CH-53E,[14] the USN and USMC possess the capabilities required to achieve STOM as envisioned through the insertion of forces by air and sea.

While OMFTS seeks to utilize the sea as manoeuvre space, STOM seeks to exploit those opportunities via rapid deployment from the Sea Base. Such deployment requires an agile and flexible logistics chain, for "…while warfighting needs set logistics requirements, the logistics capabilities available will in the end limit warfighting potential and the courses of action available to field commanders."[15] In order to support STOM, the concept of the Sea Base was developed.

Sea Basing

In their paper detailing the Sea Based Logistics Enabling Concept, the USN formally describes Sea Basing as "...the rapid deployment, assembly command, projection, reconstitution, and re-employment on Joint combat power from the sea, while providing continuous support, sustainment, and force projection to select expeditionary Joint forces without reliance on land bases within the Joint Operating Area (JOA)."[16] More simply put, "forces ashore are sustained from the seabase which, in turn, is sustained from extended air and sea lines of communications reaching back to intermediate support bases connected to the United States."[17]

The advantage of Sea Basing is that it provides governments and military planners with force projection options within a future global environment in which consent by foreign states for the use of their territory to conduct operations may not be certain. The U.S. National

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[14] LCol Stuart L. Dickey, "Seabasing and Ship-to-Objective-Maneuver: An Analysis of These Concepts and Their Implications for the Joint Force Commander." 2004, Carlisle, PA: U.S. Army War College: iii.
[15] National Research Council (U.S.), "Naval Expeditionary Logistics…", 2.
[16] United States Navy, "Seabasing Logistics Enabling Concept." 2006. Washington, DC: Office of the Chief of Naval Operations: 3.
[17] LCol Stuart L. Dickey, "Seabasing and Ship-to-Objective-Maneuver…", iii.

Research Council review of the concept acknowledged this issue as they found "many military leaders are concerned about the growing reluctance of foreign nations to allow U.S. forces to use their territory for military operations and believe that the future availability of overseas facilities is uncertain."[18] Within their Naval Transformation Roadmap, the USN further touts the strategic value of this approach stating that "seabasing is the overarching expression of our shared vision, incorporating the initiatives that will allow the joint force to fully exploit one of this nation's asymmetric advantages – command of the sea."[19]

This concept is not without its challenges, in his paper analyzing the impact on the joint force commander, LCol Stuart Dickey specified that the approach required "fundamental change in logistics support and organization…" and further detailed the USMC approach to this problem was from two directions "…increased efficiency and effectiveness through internal restructuring (consolidated maintenance and logistics functions) …and…the actual reduction of requirements ashore."[20] From a more tactical perspective, the USN notes the challenges associated with operations at sea including adverse weather conditions and sea state, capability to interface with other sealift ships, the number and speed of shuttle of connector ships required based on stand-off distance, the need for a secure advance base with adequate infrastructure, the need for a robust joint C2 system, and efficiency in resupply operations.[21] From a force protection stand point, the USN further identifies the risk that operations in anti-access environments have the

[18] National Research Council (U.S.), "Naval Expeditionary Logistics…", 6.
[19] United States Navy, "Naval Transformation Roadmap." Last accessed 8 March 2016. http://www.navy.mil/navydata/transformation/trans-toc.html: 2.
[20] LCol Stuart L. Dickey, "Seabasing and Ship-to-Objective-Maneuver…", 8.
[21] United States Navy, "Seabasing Logistics Enabling Concept…", 11-12.

potential to significantly delay movements and stretch the limits of force protection for the sea connectors.[22]

Despite these challenges, the USN and USMC have pushed forward with the concept of Sea Basing, specifying the following tenets in order to focus future development: Primacy of the sea base, Reduced demand, In-stride sustainment, Adaptive response and joint operations, and Force closure and reconstitution at sea.[23] The USN concept paper further specifies the distinction between the various levels of the logistics chain whereby Strategic is considered Inter-Theatre distribution, Operational equals Intra-Theatre distribution, and Tactical is labeled as Ship to Shore distribution.[24] As such, commanders at the various levels have clear delineation of which assets are within their lines of responsibility.

The Sea Basing concept is integrated within the larger "Sea Shield, Sea Strike, and Sea Base" concepts of the USN designed to "…help Joint Force Commanders product and exploit a discontinuous battle space within which distributed and sustainable surface, sub-surface, air, ground and space elements form a unified force that assures and project both offensive power and defensive capability."[25] It is designed to be applicable across the full spectrum of operations as the USN's "contribution to joint operational concepts in: Major Combat Operations, Stability Operations, and Strategic Deterrence."[26]

CAF SUPPORT DOCTRINE

[22] *Ibid*, 12.
[23] LCol Stuart L. Dickey, "Seabasing and Ship-to-Objective-Maneuver…", 2.
[24] United States Navy, "Seabasing Logistics Enabling Concept…", 26.
[25] United States Navy, "Naval Transformation Roadmap…", 3.
[26] *Ibid*, 5.

In order to determine the potential value of applying the Sea Basing concept to the CAF, it is important to understand how the CAF currently supports operations. There are two key aspects that must be discussed, first how the CAF supports joint operations, and secondly how the RCN supports maritime operations. From a joint perspective, Canadian doctrine provides direction and guidance throughout the operational sustain function with delivery of support structured through a Joint Task Force Support Component (JTFSC).[27] This approach is fully interoperable within the North Atlantic Treaty Organization's (NATO) Joint Logistic Support Group (JLSG) concept for multinational or coalition operations.[28] From a RCN perspective, the need to coordinate with allied nations on a frequent basis for routine operations and exercises creates a requirement to utilize NATO maritime support standards as detailed within the Allied Logistics Publication (ALP) 4.1 as the basis for the RCN support concept.[29] While RCN specific standard operating procedures do exist, the support concept can be most accurately and simply described using the doctrine within the ALP 4.1. This section will detail both concepts as they are currently employed within the CAF and provide a comparison with the concept of Sea Based Logistics.

JTFSC

Support for CAF joint operations at the Strategic level, both expeditionary and domestic, is directed and coordinated by the Canadian Joint Operations Command (CJOC). Support for a given joint operation at the Operational level, is directed and coordinated by the in-theatre joint force commander. In order to assist and advise the commander in the coordination of this

[27] Col C.A. Mathé, "Operational Level Sustain: Presentation to the Joint Command and Staff Course 42." Presented at Canadian Forces College 28 January 2016.
[28] North Atlantic Treaty Organization, "AJP-4(A), Allied Joint Logistics Doctrine." 2003, Belgium: NATO Standardization Agency.
[29] North Atlantic Treaty Organization, "ALP-4.1, Multinational Maritime Force Logistics." 2001, Belgium: NATO Standardization Agency.

support, the JTFSC is established. From a command and control perspective, it is important to note that the joint force commander is responsible to CJOC; therefore CJOC is intimately involved with the coordination of support at both the Strategic and Operational levels. The RCN, RCAF,[30] CA,[31] and Canadian Special Operations Forces (CANSOF) will rely on their own doctrine to provide support to unit commanders at the Tactical level through the JTFSC.

In order to facilitate this support, the CAF has structurally established organizations such as the Canadian Forces Joint Operational Support Group (CFJOSG) in Kingston and the Canadian Forces Operational Support Hubs in Germany, Kuwait, and Jamaica to act as strategic enablers. The CFJOSG in particular is designed to deploy on short notice to stand up a new operation, activate the theatre and fill the role of JTFSC until further rotations arrive as necessary. The Operational Support Hubs act as strategic connectors and provide a standing line of communication to advance CAF force projection to a given region when required.

Sustainment at the Operational level within the JTFSC is composed of the following elements: Logistics, Support Engineering, Information Systems, Health Service Support, Military Police, and Personnel Services. These elements are coordinated within the larger coalition / multinational approach for a given operation under the direction of a lead nation where applicable. The JTFSC will seek to maximize the use of host nation support, mutual support agreements, and third party contracted logistics support in order to minimize the footprint in theatre both in terms of CAF personnel and the physical requirement for supplies, parts, and personnel to transition to theatre. Where transport is required, the JTFSC will coordinate strategic lift requirements amongst all components (RCN, RCAF, CA, and CANSOF)

[30] Canada, Department of National Defence, "B-GA-406-000/FP-001, Canadian Forces Aerospace Sustain Doctrine." 2011, Trenton, ON: Canadian Forces Aerospace Warfare Centre.
[31] Canada, Department of National Defence, "B-GL-300-004/FP-001, Sustainment of Land Operations." 2010, Kingston, ON: Chief of the Land Staff.

in order to promote efficiencies wherever possible. All receipt, staging, onward movement, and integration (RSOMI) is the responsibility of the JTFSC.

The JTFSC concept is not without its challenges. While it is designed to be scalable, it is best suited to support large, joint, multinational exercises and sustained operations. Smaller operations that are of shorter duration and do not include the full range of components may be better served to forego the JTFSC in order to minimize the footprint on the ground and maximize responsiveness and flexibility. This is particularly true in operations in which CANSOF or RCN has the lead, given the nature of those forces to be largely self-sustaining through well established procedures. This is also the case in domestic operations, where the local Regional Joint Task Force (RJTF) will have established procedures and sources of supply which are more likely to be readily available when required.

ALP 4.1

The size of naval vessels and the scope of their operations provide both advantages and challenges in terms of sustainment. As an advantage, ships are largely self-sustaining, often sailing with four months of supply for parts and equipment and up to ninety days of rations.[32] The ability to replenish at sea provides the opportunity to restore food, ammunition, and supplies while refueling operations are underway, providing the maritime commander with flexibility and maximizing time "on station" throughout the operation or exercise. This flexibility comes with the challenge of force protection for the replenishment vessel, and necessitates a reliance on airlift via shipborne helicopter for urgent movements of personnel and cargo. Ultimately

[32] Canada, Department of National Defence, "A-LM-007-100/AG-001, Supply Administration Manual." Ottawa, ON: Assistant Deputy Minister Materiel.

however, ships will outlast their organic support and eventually require re-provisioning from ashore.[33]

Governing this sustainment throughout the multinational maritime force is the ALP 4.1. In terms of application, it is nested within the larger NATO support doctrine for joint operations under the JLSG support concept and is focused at the Operational level. The doctrine specifies the requirement for two key structures ashore to enable theatre level maritime support, the Advance Logistics Support Site (ALSS) and the Forward Logistics Site (FLS).[34]

The ALSS is a larger in theatre hub that controls and directs support provided by the FLS to the maritime Task Forces at sea. Falling under the Multinational Maritime Force Commander, the ALSS will establish connection with the JLSG to link the maritime component with joint strategic reach back through the established lines of communication. It acts similarly to the JTFSC in terms of conduct of RSOMI for maritime elements prior to forwarding personnel and cargo to the Task Forces at sea through the FLS.

At the Tactical level, each Task Force commander will direct and control a FLS through the Force Logistics Coordinator (FLC). Where the ALSS may be physically located inland and close to the JLSG depending on availability of air and sea ports, the FLS is typically located within close proximity to the sea port in order to maximize responsiveness to the sustainment needs of the commander. Movements from shore to sea are coordinated by the FLC via airlift or transfer between ships replenished in port. Requests for sustainment are pushed through allied, coalition, or national lines depending on the specific requirement.

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[33]Cdr Mark B. Watson, "Assistance from Ashore: The Evolution of Naval Logistics Sites from the Korean War to Operation 'Apollo'." *Canadian Military Journal*, Summer 2004, 47.
[34] North Atlantic Treaty Organization, "ALP-4.1, Multinational Maritime Force Logistics."

The support structure of ALP 4.1 has its challenges as well. The specific nature and complexity of warships often precludes ships from differing nations within as Task Force from exchanging parts due to compatibility issues. As a result, demands from specific ships are often along national, rather than allied or coalition lines and require extensive coordination and communication on behalf of the FLC and ALSS / FLS support structures in order to provide support. This also promotes a tendency to utilize national support structures thereby minimizing the potential efficiencies gained within the multinational support construct. This is further evident as ships of the Task Force are largely dependent on contracted third party support within a given port or ports in theatre based on pre-facilitated national contracts, creating a potential conflict within smaller ports should the need of the Task Force outstrip the supply of service providers available. Reliance on national lines of communication may prevent the Multinational Maritime Force Commander in this instance from coordinating support for the maritime component based on operational priorities.

Comparison

The principle difference between the CAF support doctrine and the USN / USMC Sea Basing concept is the location of the logistics base ashore vice at sea. While this seems obvious, this distinction carries with it a number of factors that have the potential to impact operations.

Fundamentally, Sea Basing requires a capability to resupply the Sea Base at sea using strategic air or sea lift. This is facilitated through intermediate support bases that are similar in nature to the CAF's Operational Support Hubs. The challenge of extending the lines of communication to the Sea Base and forward to the objective through STOM requires specific capabilities. In their joint concept paper on the topic, LGen J.E. Rhodes and RAdm G.S. Holder

summarize these within five categories: Ship to objective logistics: the need for a robust and reliable system for end-user delivery, Selective offload: the capability for selective retrieval and distribution from sea based storage, Strategic logistics interface: the requirement for commercially compatible sea based replenishment, Sea based intermediate maintenance: the capacity for prolonged sustainment and reconstitution and Joint interoperability: as delivered through a network-based, joint logistics information system.[35]

In contrast, the JTFSC can be scaled to the size of the operation and is limited only by footprint available on the ground and the expertise and services available either through host nation, multinational, third party contracted, or integral CAF support. This is a potential advantage over Sea Basing, where the physical attributes and capabilities of the support ship(s) will limit the sustainment options available. The downside of this is the size of footprint, required force protection, and reduced flexibility of the static land based JTFSC support structure.

This specifically is the advantage of Sea Based logistics, an effects based operational enabler that delivers "…flexible, highly responsive support to better enable naval and joint operations...vice a massive logistic force centered on pre-planned resupply."[36] The at sea transportation and distribution system delivers support through a "…logistics 'pull' from ashore, as opposed to 'push' characterized by the land-based stockpile approach…" and therefore possesses the ability to respond to and support a rapid and changing operational tempo.[37] A small footprint ashore may still be required however, dependent on the size of the operation. The USMC envisions a "…small combat service support area…" that would be limited to one or two

[35] LGen J.E. Rhodes and RAdm G.S. Holder, *Sea Based Logistics: A 21st Century Warfighting Concept*, Last accessed 19 April 2016 at http://fas.org/man/dod-101/sys/ship/docs.sbl.htm.
[36] United States Marine Corps, "Expeditionary Force 21…", 38-39.
[37] *Ibid*, 40.

days of supply to act as an immediate reserve capability and reservoir should the pace of operations or temporary disruptions to provision of service from the Sea Base occur.[38]

OPERATIONAL APPLICATION

Given an understanding of the complimentary OMFTS, STOM and Sea Basing concepts and the contrast with CAF and NATO maritime support doctrine, it is possible to review the potential application to CAF operations. It is important to begin with an understanding of which operations Sea Basing is not suited for. Given the core nature of Sea Basing within the maritime domain, this concept will obviously not apply to operations that take place beyond the reaches of the littoral environment. Therefore, operations such as those conducted in Afghanistan are not supportable.

A further limitation of Sea Basing is that it is limited in supporting operations of a prolonged duration. This is primarily based on the fact that Sea Basing is fully reliant on the endurance and serviceability of ships and air craft throughout the operation. While the Sea Base will possess an organic ability to maintain air craft and ships for issues that are more routine in nature, both are likely to require more demanding maintenance and repair alongside port over extended periods of sustained operations. While an exact specification of the ability of the Sea Base to maintain operations for a set period of time is difficult and subject to a number of variables, it is believed that the benchmark duration of one year or less is realistic based on the length of current naval deployments.

The following section will discuss the potential applicability of Sea Basing to CAF operations by utilizing a recent experience to serve as an illustrative example.

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[38] *Ibid*, 40.

Operation HESTIA

Operation HESTIA was the CAF participation in humanitarian operations in response to the earthquake that struck Haiti on 12 January 2010. In response, Canada deployed over 2,000 personnel located in Port-au-Prince, Léogâne, and Jacmel under Brigadier-General Guy Laroche as the commander of Joint Task Force Haiti. The Task Force consisted of maritime, air, and land components and provided emergency medical services, engineering expertise, mobility, and defence and security support. [39]

From a maritime perspective, the component consisted of a destroyer, Her Majesty's Canadian Ship (HMCS) *Athabaskan*, in the waters off Léogâne and a frigate, HMCS *Halifax*, in the waters off Jacmel. Notably, *Athabaskan* carried a CH-124 Sea King helicopter detachment, however *Halifax* did not. The availability of air lift was identified as a key lesson for future operations following HESTIA.[40] The RCN was specifically noted for its ability to land general labour and security teams to assist on a daily basis in addition to its ability to transport large quantities of humanitarian assistance to theatre.[41]

At first glance, a humanitarian operation such as HESTIA seems ideally suited for the employment of the Sea Basing concept. The physical geography of Haiti as an island nation that is fully accessible by the sea makes this approach viable. Given the state of existing infrastructure immediately following the earthquake, a Sea Based approach would not constrict freedom of manoeuvre through reliance on sea or air ports, or the use of internal roadways. The

[39] Canada, Department of National Defence, "Operation HESTIA." Last accessed 19 April 2016 at http://www.forces.gc.ca/en/operations-abroad-past/op-hestia.page.
[40] Maj Dave McQueen, "The DART and Op HESTIA, Canadian Forces: Helping in Haiti." 15 October 2010. Last accessed 19 April 2016 at http://www.epicc.org/uploadfiles/documents/Presentation2010/Haiti_DART_Presentation_for_Earthquake_Preparedness.pdf
[41] Rick Leswick, "Operation Hestia: Haiti Five Years Later." *Esprit de Corps*, 26 January 2015, Last accessed 19 April 2016 at http://espiritdecorps.ca/edecfeatures/2015/1/26/operation-hestia-haiti-five-years-later

maritime component could simply rely on organic sea lift in order to conduct STOM in accessing areas in need of humanitarian assistance until follow on support was available. Such an approach has the spin off benefit of reducing an already strained demand for those key infrastructures by other contributing nations and relief agencies that may not possess the capability to provide assistance from the sea. A final and important benefit of the Sea Based approach in this case is that the CAF would possess the ability to reach the most remote areas by air and provide greatly needed assistance until reconstruction and engineering teams could restore accessibility via roadway.

The key difference between humanitarian and other expeditionary operations is that humanitarian operations take place within a largely permissive environment. The same would hold true in a domestic environment, where the absence of a security threat is highly likely. Looking back to the concept, the Sea Base is generally to be located over the horizon and under the security umbrella of protection from the remainder of the Fleet.[42] The limiting factor in determining applicability of this concept to a specific CAF operation is therefore the range of the air craft providing support to operations ashore, and the ability of the Fleet to protect the Sea Base. Based on the current collaborative operating environment, that protection is likely to come in the form of allied or coalition capabilities operating within a combined Task Force.

It is also important to define the Sea Base from a CAF perspective. In the HESTIA example, the Sea Base is the *Athabaskan* and the *Halifax*. In a 'standard' operation, it stands to reason that the Sea Base would be considered the Joint Support Ship (JSS) or replenishment ship, given its size, role, and function. For northern operations, the Sea Base could be the Arctic

[42] National Research Council (U.S.), "Naval Expeditionary Logistics…", 1.

Offshore Patrol Ship (AOPS). More discussion on the capabilities of the CAF to utilize a Sea Based logistics concept is provided in the following section.

CAPABILITIES

In order to implement a Sea Based logistics concept, the CAF requires capabilities to first, provide logistic support at sea and secondly, to deliver it via the air or sea to the desired location. This section will discuss current and expected near term future (within five years) capabilities to do so and identify gaps which must be addressed should the OMFTS, STOM and Sea Based logistics concepts be pursued.

Supply Ship

Despite the current supply ship capability gap within the RCN due to budget constraints and project delays[43], two projects are well underway to provide the Navy with replenishment at sea capability in support of Task Groups on both coasts. Each of these will be discussed in order to provide background on the short and long term capability being pursued by the RCN.

The first of these is Project Resolve, the RCN's pursuit of a leased capability provided by a civilian contractor, Chantier Davie shipyards of Lévis, Quebec. For a five year period, beginning with the expected delivery in 2017, the civilian crewed Motor Vessel (MV) *Asterix* will provide the RCN with a stop gap capability until the JSS project delivers two *Queenston* class vessels expected in 2020 and 2021.[44] Based on the specifications available, MV *Asterix* will possess the capability to act as a Sea Base. Key highlights include a flight deck capable of

[43] *Ottawa Citizen*, "Plan for Supply Ships comes up Short." 19 May 2008, Last accessed 19 April 2016 at http://www.canada.com/ottawacitizen/news/story.html?id=6af0d1a9-1aad-448e-ab21-a5eded6d2be3
[44] Jon Rosamand, "Canada turns to Asterix for stop gap at-sea Support." IHS Jane's Navy International 5 October 2015, Last accessed 20 April 2016 at http://www.janes.com/article/55006/canada-turns-to-asterix-for-stop-gap-at-sea-support

handling a Chinook helicopter, a large hospital capability, additional dormitories for use by troops or evacuees as required, protected cargo bay for transport of commercial sea containers, and an air detachment maintenance facility.[45]

The second is the JSS project is the RCN's ongoing effort to replace the now decommissioned *Protecteur* class Auxiliary Oil Replenishment (AOR) ships HMCS *Protecteur* and HMCS *Preserver*. The project has continued to evolve over time from its original announcement in June of 2006. The JSS envisioned by the Chief of Defence Staff (CDS), General Rick Hillier, was to provide "…the vital lifeline of supply and support to other Canadian navy ships as well as to army and air force assets in certain deployed operations. A key component of Canadian Forces Transformation, the ships will help build a truly 'joint' navy, army, and air force capability."[46] The ships were to support force projection ashore through capabilities such as roll-on roll-off (RO-RO) of cargo, lift-on lift-off (LOLO) of cargo, operation of three to four maritime helicopters, covered space for the transport of vehicles and containers, and the ability to function as a joint task force headquarters as "it may be impossible to establish a JTF HQ ashore in areas of conflict."[47]

While the original iteration of the JSS sounds exactly like the type of ship required to act as a Sea Base, budget and other issues plagued the project leading to a redesign commencing in 2008.[48] The selected design for the JSS is based on Germany's *Berlin* class vessels and will possess some additional capabilities beyond traditional AORs including an air detachment

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[45] Project Resolve. "MV Asterix Specifications." Last accessed 20 April 2016 at http://projectresolve.ca/website/?page_id=3299

[46] Canada, Department of National Defence, "'Canada First' Defence Procurement – Joint Support Ship." Press release June 26, 2006, Last accessed 19 April 2016 at http://www.marketwired.com/press-release/canada-first-defence-procurement-joint-support-ship-601360.htm

[47] *Ibid*.

[48] *Ottawa Citizen*, "Plan for Supply Ships comes up Short."

maintenance facility, medical and dental facilities, limited sealift from ship to shore, and limited support to operations ashore.[49] Given the refined scope of the JSS project, these vessels will be somewhat limited in their ability to act as a Sea Base in support of operations ashore.

AOPS

The AOPS represents a unique capability and provides the CAF with options for a range of operations within the North. It is designed to accommodate additional personnel beyond the core crew, is Ch-148 maritime helicopter capable, shipping container capable, and will possess a vehicle bay to promote rapid mobility over land and ice via pickup truck, all-terrain vehicle, and snowmobile or others.[50] These capabilities are in step with the Sea Basing concept and provide sufficient capability to provide support to limited operations in the North or where ever the CAF may choose to deploy the AOPS.

Air Lift

Primary air lift for RCN operations comes is delivered by the new CH-148 Cyclone maritime helicopter, designed to replace the aging CH-124 Sea King.[51] While capable of limited movement of troops and supplies, the Cyclone represents a light lift capability. The current CAF medium lift capability as represented by the Chinook has not been used in routine operations at sea.

Capability Gaps

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[49] Canada, Department of National Defence, "Joint Support Ship." Last accessed 19 April 2016 at http://www.forces.gc.ca/en/business-equipment/joint-support-ship.page
[50] Canada, Department of National Defence, "Arctic Offshore Patrol Ship." Last accessed 19 April 2016 at http://www.forces.gc.ca/en.fleet-units/aops-home.page
[51] Canada, Department of National Defence, "Maritime Helicopter Project." Last accessed 19 April 2016 at http://www.forces.gc.ca/en/business-equipment/maritime-helicopter.page

Current and near term future CAF capability is sufficient for providing limited Sea Based support to operations ashore. The limiting factors are assessed as the capacity of the Sea Based vessels to provide extended support, and the restricted ability to provide air lift of materiel and personnel ashore. Operation HESTIA provides a good example of an occasion where support from the sea added value to the joint approach in a humanitarian context. Though destroyers and frigates were utilized to provide support in this case, a review of their capabilities was not conducted as these vessels will normally form the security umbrella required to support JSS/AOPS Sea Based Logistics operations in a non-permissive operational environment. It is important to note however that by their nature, any ship of the RCN can provide support to operations ashore.

In order to expand the capability to project power ashore from the sea, the CAF must invest in a dedicated and modern amphibious platform and the associated air and sea lift required for such a vessel. This ship would fulfill the original vision of General Hillier and represent a true joint enabler in the projection of power and influence to areas of Canadian strategic interest.

There are indications that senior leadership of the CAF is already thinking of a move in this direction. A recent news release highlighted the position of current CDS, General Jonathan Vance, regarding the proposed purchase of two French *Mistral* class amphibious vessels in which he concluded that the flexibility and versatility of the ships could "directly contribute to the desire for rapid, deployable and far-reaching projection of state interests, which could result in positive influences both domestically and internationally."[52] Along a similar vein the Commander of the RCN, Vice-Admiral Mark Norman, recently stated in an interview that

[52] Kristen Eversen, "Top General and Defence Bureaucrat we at odds over whether to buy French Warships." *CBC News*, Last accessed 19 April 2016 at http://www.cbc.ca/news/politics/navy-defence-ships-purchase-fance-mistral-1.34325803

Canada could do more in the area of sea based humanitarian support, calling current capability "relatively modest" compared to a ship that could carry "…four to six helicopters and a bunch of vehicles and several hundred troops-or embark several hundred evacuees, if you wanted to use it for that purpose..." summarizing "that would be one area that we don't have capability that we probably should have."[53]

CONCLUSION

This paper has discussed the USN and USMC concept of Sea Based Logistics as a tool to promote operational success abroad. It has reviewed the related concepts of Operational Maneuver from the Sea (OMFTS), Ship to Objective Manuever (STOM), and Sea Basing and contrasted these with CAF joint and maritime support doctrine. The example of Operation HESTIA was discussed in order to provide an illustration of Sea Based support from a joint CAF perspective. Finally, a review of current joint capabilities and an analysis of perceived capability gaps restricting the ability of the CAF to employ these concepts were presented.

Through this analysis, this paper has demonstrated the validity and applicability of these concepts to current and future CAF operations. Though limited in their current application, support from the sea is an inherent function of sea power as provided by the RCN. As the type of operation increases in size and scope and shifts through the full spectrum of conflict, the CAF will require an increased capability in order to project power and influence in line with Canadian political-strategic level objectives. Given an increased capability, the CAF will require new doctrine in order to direct its use. The concepts of OMTFS, STOM and Sea Based Logistics provide the CAF with a proven and ever evolving basis from which to start. In the interim,

[53] Marie-Danielle Smith, "A Conversation with the Commander of the Navy." *Embassy News*, Last accessed 10 March 2016 at http://www.embassynews.ca/print_out_story/38347

elements of these concepts can be employed to current joint CAF operations, specifically use of the sea as manoeuvre space and utilization of ship-borne airlift to affect ship to objective manoeuvre in small scale humanitarian operations. The RCN can and must continue to fill these roles in augmenting the joint CAF effort in operations both domestically and internationally.

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