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CHINOOK: THE ARCTIC WAR HORSE

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CHINOOK: THE ARCTIC WAR HORSE

AIM

1. The aim of this paper is to address an existing capability gap currently impacting the Canadian Armed Forces (CAF) and whole of government (WoG) agencies in their ability to “Move and Act” in the Arctic. The CH-147 Chinook is a heavy-lift helicopter similar in speed and range to the currently employed CC-138 Twin Otter. However, the Chinook has a vastly superior payload which enables it to better exercise sovereignty and reinforce security in the Arctic. The CC-138 is suited and should be used to conduct light utility transport. Three additional CH-147s should be purchased and detached to Yellowknife in order to support WoG agencies and sustain the Canadian Army (CA) operating in the Arctic.

INTRODUCTION

2. This Service Paper will discuss the employment of the CH-147 heavy-lift helicopter as a supplement to the CC-138 light transport in support of operations within the Canadian Arctic to “Move and Act”. Canada’s Northern Strategy defines Arctic policy using four pillars: “exercising sovereignty in Canada’s Arctic, promoting social and economic development, protecting our environmental heritage, and improving and developing northern governance.”¹ Of interest, receding Arctic ice is making North West Passage (NWP) more accessible. Canadian sovereignty will be increasingly challenged without a means to monitor and regulate commercial shipping in association with other

¹ Canada., *Canada’s Northern Strategy: Our North, Our heritage, Our Future*, (Ottawa: Minister of Public Works and Government Services Canada, 2009), 9.

governmental agencies (OGA). The ability of the CH-147 to land anywhere means it is a better platform with which to provide assistance in an environmental disaster or emergency in the North.

3. The inhospitable nature of the Arctic challenges the CAF in its ability to reinforce its security. Receding ice is making the region more accessible while exposing valuable raw resources that could leave the Arctic vulnerable if not adequately secured. While the region should not be considered for contest in a prolonged campaign, it should be considered as “a theatre of operations and as a route of attack.”² The Canadian Army (CA) is limited in its capacity to operate in the Arctic because of its requirements to move, feed and fuel. Due to the austere environment and barren landscape, it can only deploy and sustain itself through airpower. Existing Forward Operating Bases (FOBs) provide a network of CAF hubs from which to operate while logistically supported by air and land transport routes of re-supply.

DISCUSSION

4. Sovereignty equates to control; it has been described as “a legal concept that entails ownership and a right to control over a specific area, regulated by a clearly defined set of international laws.”³ By prioritizing sovereignty as the first pillar, Canada empowers agencies of the state to exhibit control within the region and reinforce its legitimate claim among the Arctic States.⁴ Some debate exists regarding Canada’s claim to its territorial borders. Canada defines its border on a baseline drawn between

² Group Captain V.H. Patriarche, “The Strategy of the Arctic”, *The Roundel* 2, no 6 (April 1950): 38-42.

³ Canada. Standing Senate Committee on National Security. *Sovereignty and Security in Canada’s Arctic*. Interim Report. (March 2011), 1.

⁴ Canada, Norway, Finland, Denmark, Iceland, The Russian Federation, The United States, Sweden.

geographical points, which Canada argues encompasses the entirety of the archipelago. This baseline is defined as “...sovereign and jurisdictional rights over exploration and management, and economic exploitation of living and non-living resources”.⁵ The United Nations Convention on the Law of the Sea (UNCLOS), signed in 1982 and ratified in 2003, supports Canada’s claim in that the baseline method is the legally accepted means of determining international sovereign boundaries.⁶ This measure is accepted by the Arctic States with exception of the United States (US), which sees the NWP as an international strait rather than Canadian sovereign waters. The oil tanker *SS Manhattan* traversed the strait in 1969, followed by the *Polar Sea* in 1985, as a means to test viability of the NWP as a more economically viable commercial transit route to the Panama Canal. This created much consternation among the Canadian public. In 1988, respecting the benefit of economic ties and existing military bilateral relationship with the US, Canada negotiated the Arctic Cooperation Agreement seen as, “a practical solution that is consistent with the requirements of Canadian sovereignty in the Arctic”.⁷ With its recognition by UNCLOS and bilateral understanding with the US, Canada can insist on its sovereign territorial claim in order to “ensure that an appropriate level of control is exercised over navigation in the region”.⁸

5. With an expected increase to commercial shipping due to receding ice, there exists an increased risk of ecological disaster. In 1989, the *Exxon Valdez* ran aground in

⁵ Department of Fisheries and Oceans. “Canada’s Ocean Estate: A Description of Canada’s Maritime Zones,” accessed 29 Oct 2015, <http://www.dfo-mpo.gc.ca/oceans/canadasoceans-oceansducanada/marinezones-zonesmarines-eng.htm>

⁶ Francis Ngantcha. *Right of Innocent Passage and the Evolution of the International Law of the Sea* (London: Printer Publishers, 1990), 15.

⁷ Canada and the United States, *Agreement Between the Government of Canada and the Government of the United States of America on Arctic Cooperation*, (No. 31529), 1988.

⁸ Ken S. Coates, Whitney P. Lackenbauer, William Morrison, Greg Poelzer. *Arctic Front: Defending Canada in the Far North* (Toronto: Thomas Allen Publishers, 2008), 203.

Prince George, Alaska, spilling eleven million barrels of oil and devastating the environment.⁹ Without joint operations in the North between CAF, the Canadian Coast Guard (CCG) and Environment Canada, the likelihood of similar disasters occurring in the future would only increase. The CCG have light helicopters but are of very limited range. The CH-147 is capable of carrying 21000lbs of people and equipment; it is a fast reaction platform able to land in the immediate vicinity to initiate cleanup operations.¹⁰ Should a ship sink in the Arctic, the CH-147 would already be forward deployed from Yellowknife or FOBs to provide Search and Rescue (SAR) until specialized crews flying the CH-149 helicopter and CC-130 transport could arrive to take over. With only four CC-138s in Yellowknife, three CH-147s would nearly double the capacity to monitor and regulate shipping as part of WoG operations and would provide an ideal platform to react to an environmental disaster or respond to an emergency. This supports the first two pillars of the Northern Strategy as well as the Air Mobility function of the Canadian Armed Forces Air Doctrine in terms of Personnel Recovery.¹¹

6. The Arctic contains resources such as gold, precious minerals, oil and natural gas; these resources remain untapped due to the isolation and inhospitality of the region. However, the overall volume of Arctic ice is retreating and exposing more open water, seasonally. Trending ice patterns indicate “an overall transition toward both less ice and less coverage”.¹² Canada’s Energy Board estimates that there exists nine trillion cubic

⁹ Peter Jaques and Zachary A. Smith. *Ocean Politics and Policy*. (Santa Barbara: ABC-CLIO Inc, 2003). 234

¹⁰ Government of Canada, news, “Canada’s new CH-147 Helicopter”, accessed 28 Jan 2016, <http://news.gc.ca/web/article-en.do?nid=865119>,

¹¹ Canada. *Canadian Armed Forces Air Doctrine, draft*. B-GA-400-000/FP-000. (Canadian Aerospace Warfare Center, 2015). 5-5.

¹² Marc C. Serreze, and Roger G. Barry. *The Arctic Climate System, 2nd Ed.* (New York: Cambridge University Press, 2014), 214.

feet of natural gas and five thousand million barrels of oil in the Beaufort Sea alone.¹³

Such rich natural resources will require protection. The CCG can provide a policing role; the CH-147 and RCN – by means of the upcoming Arctic Offshore Patrol Ship (AOPS) – could provide deterrence to those who may wish to exploit our resources. An increase to shipping will inevitably lead to an increase of illicit activities such as smuggling and possibly terrorism. The CH-147 could operate in activities supporting the Royal Canadian Mounted Police (RCMP) and Canada Border Service Agency (CBSA) who have limited inherent aviation capability. As RCAF “green tail” aircraft, these assets would deter illegal activities in the region.

7. Because the area is so vast, a constrained budget and limited material resources make it infeasible to permanently base CA forces in the Arctic. After Afghanistan, the CA evolved into an expeditionary force and could not be permanently based in the North without compromising foreign policy objectives or imposing risk to another capability. On account of distance and isolation, any deployment to the North might be considered as expeditionary. However, the CA cannot deploy, move, fight, or redeploy without support of airpower. It requires food, fuel, shelter, communication and supply lines in order to function effectively. This is logistically burdensome and without sustainment would quickly lead to mission failure. Ground transport is not a viable option in the Arctic due to speed and terrain. The CA recognizes this challenge and future CA doctrine regarding operations stipulates that, “as a force becomes more dispersed, it is assumed that a sustainment system will need to transition from a primary ground based system to

¹³ Briefing Note, “Assessment of Discovered Conventional Petroleum Resources in the Northwest Territories and Beaufort Sea”. *National Energy Board*. (November 2014).

one that contains more air-based support.”¹⁴ Here, it may be useful to point to a related example of an existing force requiring air-based support for sustainment. The Canadian Rangers are a force multiplier to the CA that acts as the eyes and ears of the North in “operational, sociopolitical and representative functions”.¹⁵ Indigenous to the region, they function in a capacity in which the CA is incapable – permanence. Generally self-reliant, they nonetheless require transportation for sustainment while operating with the CA.

8. The CC-138 has a range of 750 nautical miles at just under 180 knots and can land in short distances on rough unprepared terrain.¹⁶ The CH-147 has a range of 700 nautical miles at a speed of 170 knots but can land anywhere and also hover.¹⁷ Range and speed being comparable, the CH-147 becomes a force enabler and force multiplier with its cargo capacity. The CC-138 can carry just under 6000lbs or nineteen passengers without equipment while the CH-147 can carry 21000lbs or thirty-three combat equipped troops internally plus a load slung underneath. The CC-138 is limited in the size of cargo it can carry by the small dimensions of the cargo door. The CH-147 has a ramp allowing drive-on, drive off capability of wheeled and treaded vehicles such as snowmobiles. Two CH-147s could deploy a combat capable platoon with vehicles, rations and equipment. Additionally, using the Forward Area Refueling Point concept (FARP), the CH-147 has the capability of offloading fuel from internal tanks to external bladders for use by the CA as cooking and heating fuel or as a staging point for smaller CH-146 Griffon

¹⁴ Major Andrew B. Godefroy, Peter Gizewski. B-978-1-100-11775-1. *Toward land Horizons 2021: Studies in Support of the Army of Tomorrow, Force Employment Concept* (Kingston: Directorate of Land Concepts and Design), 2009. 9-2.

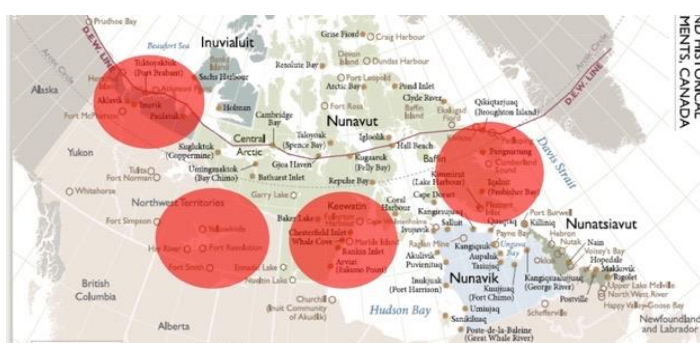
¹⁵ Whitney P. Lackenbauer. *The Canadian Ranger: A Living History* (Vancouver: UBC Press, 2013), 454.

¹⁶ Royal Canadian Air Force. “Aircraft: CC-138 Twin Otter,” accessed 28 Jan 2016, <http://www.rcaf-arc.forces.gc.ca/en/aircraft-current/cc-138.page>

¹⁷ Royal Canadian Air Force. “Helicopters: CH-147 Chinook,” accessed 28 Jan 2016, <http://www.rcaf-arc.forces.gc.ca/en/aircraft-current/ch-147f.page>

helicopters.¹⁸ The CH-147 could deploy combat ready troops as a quick reaction force to secure an area until supplies could be flown in by transport aircraft and other CA elements arrived to reinforce. Once established, the CH-147 could resupply and transport heavy weapons and equipment while acting as a fuel bowser for lighter helicopters when they arrive. This directly supports the Air Mobility function of the Canadian Armed Forces Air Doctrine to Move, as well as the primary and secondary tasks of the Canada First Defence Strategy; Defence of Canada and Defence of North America.¹⁹

9. In Yellowknife, CC-138 aircraft are situated within existing infrastructure designed to support their operation of light utility transport and secondary SAR response. Minimal investment to expand the existing infrastructure would easily accommodate three CH-147s. Alternatively, the existing FOB in Yellowknife could also be improved to support permanent basing. From here, the CH-147 could operate between the other three FOBs located at Inuvik, Rankin Inlet and Iqaluit as staging points for expeditionary operations as demonstrated below.²⁰



Map 1 - Northern Forward Operating Bases and Ch-147 Range Estimate

¹⁸ Boeing. “Soldiers Conduct Fat Cow Operations”, accessed 28 Jan 2016, http://www.boeing.com/chinooknews/2009/issue_01/field_s5_p3.html.

¹⁹ Canada. Prime Ministers Office. *Canada First Defence Strategy*. 2008: 10.

²⁰ PowerPoint. Generated 29 Jan 2016. “Northern Forward Operating Bases and Ch-147 Range Estimate”.

Map 1 indicates the approximate range of the CH-147 if it were to fly from a FOB and return without refueling. The FOBs are located near a Northern community with runways capable of supporting CC-130 and CC-177 transport aircraft for replenishment as well as an established highway system for road transport. Existing FOB infrastructures include hangars of sufficient size to house the CH-147, barracks to support limited troop capacity complete with kitchens and ablution facilities, and established lines of communication to ensure secure command and control.

10. Problematically, the fifteen CH-147s currently in use by the RCAF are at maximum capacity in training, operational use or refit. The RCAF cannot afford to detach three of their CH-147s to send to the Arctic on a permanent basis. The initial acquisition of the CH-147 project cost approximately 2 billion dollars for the 15 airframes plus 2.8 billion dollars for twenty years of long time in-service support,²¹ a figure supported by the Office of the Auditor General of Canada.²² At 2 billion dollars for the airframes, it cost approximately 13 million dollars for each helicopter. Three more CH-147s would therefore cost just under 40 million dollars. Initially, this may seem like a steep investment. However, the CC-138 is incapable of meeting all of the light utility transport requirements in the Arctic. Notwithstanding its limited capability to conduct operations beyond light utility transport, with only four airframes the demand far exceeds the requirement. As a result, the CAF contracts commercial operators to provide airlift to

²¹Defence Industry Daily. "On the Verge:4.8B+ for Canada's New Helicopter", accessed 29 Jan 2016, <http://www.defenseindustrydaily.com/on-the-verge-canadas-47b-program-for-mediumheavy-transport-helicopters-02390/>

²² Office of the Auditor General Canada, "Reports to Parliament, Acquisition of Military Helicopters", accessed 29 Jan 2016. http://www.oagbvg.gc.ca/internet/English/parl_oag_201010_06_e_34289.html#hd4b

meet excess capacity at approximately 5 million dollars per year.²³ With CH-147s based in Yellowknife and tasked to provide support to the CA and WoG agencies, the CC-138 could be used in a more focused way, to aid in meeting the light utility transport requirements of the government of Canada. Over a twenty-year lifespan of the CH-147, the cost of three additional airframes would be mitigated by having far less reliance on contract airlift in the Arctic. Heavy maintenance requirements would necessitate that the helicopter be flown from Yellowknife; this is no different from the CC-130 and CH-124 flown to British Columbia, the CC-150 flown to Germany.

CONCLUSION

11. Canada will continue to have its sovereignty challenged and this will be especially true once the Arctic becomes more accessible as the ice melts. Commercial shipping will increase as will Northern tourism. This means that controlling access to the North is key to exercising sovereignty in accordance with the first pillar of Canada's Northern Strategy. The ability to respond to environmental disasters and emergencies will speak to Canada's patronage in the region in support of the CAF doctrine on Air Mobility. Militarization of the North is a growing concern as the Arctic becomes less inhospitable. Raw resources will need to be protected and our ability to regulate, police and deter illegal activities as well as hostile acts will be a priority of the Canadian government. Canada will need to provide a greater presence in the North as well as having the agility to respond with speed and project with range. Three CH-147s based in Yellowknife – in

²³ Phone interview with former 1CAD Staff Officer Transport Readiness and verified by phone interview with Plans Officer, ACE North. Conducted 04 Feb 2015.

addition to existing CC-138s – would provide exceptional means to exercise sovereignty and provide security in the Arctic.

12. The CA cannot deploy in the Arctic without airpower. Even then, it must pre-deploy to staging points due to the limited access to useable runways. Due to speed and range, airpower provides continued presence in the Arctic. CH-147s could operate out of any of the FOBs in the Arctic and be ready to move troops and equipment to forward areas as required. With a carrying capacity of 33 combat ready troops, three CH-147s could transport a fighting force 700 nautical miles; they would have support from fighter aircraft operating from the same FOBs and resupplied by transport aircraft. CH-147s can also move heavy equipment, supplies, vehicles and field artillery. The CH-147 provides combat versatility with speed and range regardless of terrain. Once an area of interest is secure, the CH-147 would then be able to act as a fuel tanker for equipment and aircraft. While concurrently providing combat presence in the North, the CH-147 would alleviate the demand of the CC-138 to conduct utility transport. At a cost of 40 million dollars, acquisition would be offset by the savings garnered from contracting airlift over the lifespan of the CH-147.

RECOMENDATION

13. It is recommended that the CAF purchase three CH-147s and detach them to Yellowknife where existing infrastructure can be expanded to support WoG requirements and provide tactical airlift to the CA.

BIBLIOGRAPHY

- Canada. Prime Ministers Office. Canada First Defence Strategy. 2008.
- Canada. Canadian Armed Forces Air Doctrine, draft. B-GA-400-000/FP-000. Canadian Aerospace Warfare Center. 2015.
- Patriarche, V.H., Group Captain. “The Strategy of the Arctic”, *The Roundel* 2, no 6 (April 1950).
- Canada. Sovereignty and Security in Canada’s Arctic. Standing Senate Committee on National Security, Interim Report. (March 2011).
- Canada. Godefroy, Andrew B., Gizewski, Peter, Major, ed. *Toward Land Horizons 2021: Studies in Support of the Army of Tomorrow, Force Employment Concept*. 978-1-100-11775-1. Kingston: Directorate of Land Concepts and Design. 2009.
- Canadian Armed Forces Air Doctrine, draft. B-GA-400-000/FP-000. Canadian Aerospace Warfare Center. 2015.
- Department of Fisheries and Oceans. “Canada’s Ocean Estate: A Description of Canada’s Maritime Zones,” accessed 29 Oct 2015, <http://www.dfo-mpo.gc.ca/oceans/canadasoceans-oceansducanda/marinezones-zonesmarines-eng.htm>
- Francis Ngantcha. *Right of Innocent Passage and the Evolution of the International Law of the Sea* (London: Printer Publishers, 1990), 15.
- Canada and the United States, Agreement Between the Government of Canada and the Government of the United States of America on Arctic Cooperation, No. 31529, 1988.
- Coates, Coats S, Lackenbauer, Whytney P, Morrison, William, Poelzer, Greg. *Arctic Front: Defending Canada in the Far North*. Toronto: Thomas Allen Publishers, 2008.
- Jaques, Peter, Smith, Zacharia. *Ocean Politics and Policy*. Santa Barbara: ABC-CLIO Inc, 2003.
- Government of Canada, news, “Canada’s new CH-147 Helicopter”, accessed 28 Jan 2016, <http://news.gc.ca/web/article-en.do?nid=865119>.
- National Energy Board. Briefing Note, “Assessment of Discovered Conventional Petroleum Resources in the Northwest Territories and Beaufort Sea”. November 2014.
- Lackenbauer, Whitney P. *The Canadian Ranger: A Living History*. Vancouver: UBC Press, 2013.

Royal Canadian Air Force. "Helicopters: CH-147 Chinook", accessed 28 Jan 2016, <http://www.rcaf-arc.forces.gc.ca/en/aircraft-current/ch-147f.page>

Royal Canadian Air Force. "Aircraft: CC-138 Twin Otter", accessed 28 Jan 2016, <http://www.rcaf-arc.forces.gc.ca/en/aircraft-current/cc-138.page>

Boeing. "Soldiers Conduct Fat Cow Operations", accessed 28 Jan 2016, http://www.boeing.com/chinooknews/2009/issue_01/field_s5_p3.html.

Defence Industry Daily. "On the Verge:4.8B+ for Canada's New Helicopter", accessed 29 Jan 2016, <http://www.defenseindustrydaily.com/on-the-verge-canadas-47b-program-for-mediumheavy-transport-helicopters-02390/>

Office of the Auditor General Canada, "Reports to Parliament, Acquisition of Military Helicopters", accessed 29 Jan 2016. http://www.oagbvg.gc.ca/internet/English/parl_oag_201010_06_e_34289.html#hd4b

Serreze, Marc C, Barry, Roger B. The Arctic Climate System, 2cd Ed. New York: Cambridge University Press, 2014.