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DEFENDING CANADA'S ARCTIC: ENHANCING AIR POWER

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AIM

1. Canada's new defence policy, Strong, Secure, Engaged (SSE) stipulates the need for Canada to increase its presence and effectiveness in the Arctic in response to increased international interest.¹ With its core capabilities of reach and speed, the Royal Canadian Air Force (RCAF) is best suited to project Canada's presence in the Arctic and maintain our sovereignty. The aim of this service paper is to discuss and provide recommendations to Commander 1 Canadian Air Division on how the RCAF's search and rescue (SAR) and air-to-air refueling resources can best be utilized to support fighter operations in defending Canada's Arctic.

INTRODUCTION

2. The Global Arctic region is divided amongst Canada, the United States, Russia, Denmark (Greenland), Iceland, Norway, Sweden and Finland. Although these nations have formed the *Arctic Council* to address environmental and indigenous concerns, the political tensions remain. Evidence of these tensions include Russia's placement of a flag on a titanium post at the North Pole attempting to expand their claim on Arctic resources.² Additionally, non-Arctic states have begun strategic and economic planning in preparation for the opening of the Arctic region. In January, China released its white paper on the Arctic indicating their desire to see all resources and shipping routes shared equally amongst all states.³ Of most concern to the Canadian Government is the growing international interest in Canada's Arctic due to its 162 000 Kms of coastline, extensive resources and the highly valued Northwest Passage.⁴ The significant interest in Canada's Arctic makes it increasingly important to assure its defence. Recognizing the changing geopolitical landscape, the Government of Canada states in SSE "Acknowledging rising international interest in the Arctic, Canada must enhance its ability to operate in the North and work closely with allies and partners."⁵ The vast Landscape and isolated populations has historically made the RCAF a key player in the defence of Canada's Arctic

3. This paper will approach the question of how SAR and air-to-air refuelling resources can best be utilized to support fighter operations by first discussing the challenges to Arctic defense. It will then discuss the current state of SAR and air-to-air refueling resources identifying gaps/opportunities to meet the challenges of supporting Arctic fighter operations.

¹National Defence. "Strong, Secure, Engaged: Canada's Defence Policy." 2017, 57.

²Eric Roston and Blacki Migliozi. "How a Melting Arctic Changes everything." *Part II: The Political Arctic*, accessed 9 Oct 2018. <https://www.bloomberg.com/graphics/2017-arctic/the-political-arctic/>

³Marc Lanteigne and Mingming Shi. "China Stakes Its Claim to the Arctic." *The Diplomat*, 2018. Accessed 9 Oct 2018. <https://thediplomat.com/2018/01/china-stakes-its-claim-to-the-arctic/>

⁴Morrison, W.r. "Canadian Arctic Sovereignty". In *The Canadian Encyclopedia*. Historica Canada. Article published February 06, 2006; last modified July 16, 2018. <https://www.thecanadianencyclopedia.ca/en/article/arctic-sovereignty>

⁵National Defence. "Strong, Secure, Engaged...57.

DISCUSSION

4. The discussion will begin by exploring why climate change is creating increasing interest from the international entities in Canada's Arctic necessitating further investment and planning towards its defence. It will then assess the individual fighter-support capabilities, SAR and air-to-air refueling, and propose options to improve operations and effectiveness.

5. Climate Change. "Climate change is expected to transform the Arctic Ocean from a year round frozen sea with multiyear ice to a sea with open waters in summer and annual ice in the winter similar to the Antarctic Ocean"⁶. It is anticipated that this change will impact "socio-economic activities like transportation, marine sea food production and resource exploitation"⁷ The once impenetrable and formidable Arctic is quickly becoming accessible due to climate change. Canada's arctic is not immune to these effects and they are creating additional safety and security concerns, leading to greater burdens on domestic SAR and requirements for increased defence presence within the landscape.⁸ To truly understand the security threats the RCAF will be facing we need to understand the objectives of the international entities. The key aspects of the Arctic being opened as a result of climate change are the Northern shipping passages, the significant resources (primarily fishing and oil) and fresh water.

6. In August 2016, Cruise ship Crystal Serenity completed a 32 day trip through the Northwest Passage with over 1000 tourists on board to enjoy the sights of the Canadian Arctic. This marked the first time a cruise ship had completed the passage, however it had already been completed by Bulk ships and cargo carriers.⁹ Whilst the passage creates significant interest for tourists it is even more appealing to industry and militaries. The voyage via sea from Tokyo to London traditional involve sailing around the horn of Africa and totals over 23 000 kms while the same voyage utilizing the Northwest Passage would total less than 13 000 kms.¹⁰ The opening of the Northwest Passage to the extent it can be used as a regular economic shipping lane is presumably fast approaching. NASA tracks the Arctic Ice extent and reports that the coverage is decreasing by 12.8% per decade with a low being observed in 2012.¹¹ This will give the global market unprecedented access to Canadian waters and will possibly require a more significant military presence in the form of SAR and possibly fighters to show a willingness to

⁶Anne-Sophie Crépin, Michael Karcher, and Jean-Claude Gascard. "Arctic Climate Change, Economy and Society (ACCESS): Integrated Perspectives." *Ambio* 46.Suppl 3, 2017, 341.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5673869/pdf/13280_2017_Article_953.pdf.

⁷*Ibid.*

⁸National Defence. "Strong, Secure, Engaged...52.

⁹Arctic Energy Center. "What's the big deal with the Northwest Passage?" accessed 9 Oct 2018.

<http://arcticenergycenter.com/whats-the-deal-with-the-northwest-passage/>

¹⁰The Editors of Encyclopaedia Britannica. "Northwest Passage." Encyclopaedia Britannica, 2016.

Accessed 9 Oct 2018. <https://www.britannica.com/place/Northwest-Passage-trade-route>

¹¹NASA. "Global Climate Change: Vital Signs of the Planet". Last updated 3 Oct 2018.

<https://climate.nasa.gov/vital-signs/arctic-sea-ice/>

defend Canada's recently expanded ADIZ. The increased accessibility of Canada's Arctic will also generate more interest in its abundant resources.

7. The opening of the Northwest Passage and recession of the Arctic ice the North will become more attractive to foreign entities as the bountiful resources become increasingly accessible.¹² The growing interest in the north and budding natural resource industry are generating significant increases in the Arctic population. Between 2011 and 2016 the population of Nunavut grew by 12.7%, the highest in Canada with resource rich Alberta being the only Province coming close.¹³ The greater number of inhabitants living in very austere locations will continue to put a heavy demand on Canada's SAR squadrons.

8. An emerging threat to global stability is the global access to freshwater. The Global community is facing an ever growing demand for fresh water and the supplies are quickly dwindling. Former Prime Minister and Co-chair of the InterAction Council Jean Chretien stated "The future political impact of water scarcity may be devastating. Using water the way we have in the past simply will not sustain humanity in future."¹⁴ Major international population centers are quickly exhausting their water sources. As the scarcity of fresh water increases the international community will lean toward military action to assist in acquiring their objectives.¹⁵ These credible military threats would increase the demand for the RCAF's ability to rapidly respond to National Sovereignty Operations in Canada's Arctic regions.

9. Climate change and its impacts are still being heavily researched but are not completely understood. They have the potential to significantly impact the CAF in our mandate to protect Canada's Arctic. As the RCAF provides essential capabilities utilized in the defence of Canada's arctic it is recommended that RCAF conduct increased research into the effects of climate change on the arctic to ensure we are prepared for the future geopolitical landscape and defence objectives.

10. Search and Rescue. The RCAF is positioned to explore new options in employing its SAR assets. The impending Fixed Wing SAR (FWSAR) transition will allow the SAR Advisory Group (SARCAG) to look at the current Canadian Landscape and employ the new FWSAR aircraft to its greatest effect. The SAR community can situate itself to both

¹²Frank Jordans. "Battle for arctic resources heats up as ice recedes." The Associated Press, 2017, 3.

<https://globalnews.ca/news/3690400/arctic-resources-shipping-routes/>

¹³Statistics Canada. "Population and Dwelling Count Highlight Tables, 2016 Census." Government of Canada, 2016. Accessed 10 Oct 18. <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/hltfst/pd-pl/Table.cfm?Lang=Eng&T=101&S=50&O=A>

¹⁴Robin McKie. "Why fresh water shortages will cause the next great global crisis." The Guardian, 2015, 8. <https://www.theguardian.com/environment/2015/mar/08/how-water-shortages-lead-food-crises-conflicts>

¹⁵Peter H. Gleick. "Water and Conflict: Fresh Water Resources and International Security." *International Security* 18, no. 1, 1993, 79-112. <https://muse.jhu.edu/>

better support the fighters in their defense of the arctic and the growing population of inhabitants, workers and tourists who are now able to access the arctic like never before.

11. When the CC-295 was purchased utilizing the best value approach, capability was given the highest weight of 65%.¹⁶ The RCAF primarily valued how we could use technology to improve how we currently conduct SAR Operations. The end result was a vastly superior aircraft then the CC-130H with respect to sensors and avionics at the cost of reduced range, endurance and speed. At typical SAR loads the max range and speed of the C-295 are 2300 Nm and 260 Kts respectively.¹⁷ In comparison the CC-130H at typical SAR weights has a range and speed of 2800 Nm and 300Kts.¹⁸ The reduced capability adds additional pressure on the most significant challenges, both distance and time, SAR crews face when responding to a callout in the Arctic. The lack of a Primary SAR asset located in the North means that a person may have to survive in frigid Arctic waters for hours until an aircraft is able to arrive on scene.¹⁹ In the defence of the Arctic framework this translates to no SAR asset available north of Winnipeg to provide essential lifesaving support to CF-18 pilots operating at the extreme limits of Canadian Airspace.

12. The establishment of an airbase able to support SAR operations in the high arctic was not stated or resourced within SSE, but there are ways we can maintain a SAR presence. By exploiting our new fleet of FWSAR aircraft and the predicted serviceability spike compared to the legacy CC-130H fleet we need to establish an increased training footprint in the arctic. The four SAR Squadrons, which will be operating the CC-295, can create efficiencies while creating a shared yearly Arctic training plan. Each squadron would own a period of time to conduct SAR training missions throughout the peak activity periods (summer or day light months) in the Arctic.²⁰ Historically, SAR Squadrons have minimized the training in the arctic environments due to the lead time required to inform northern communities and provide environmental impacts. This hurdle could be minimized through establishing long term agreements with specific communities in the north expediting any future operations. This regular SAR footprint in the arctic would become a key enabler for expedited SAR crew deployments in support of fighter operations in the defence of Canada' arctic. It is recommended that a robust and shared

¹⁶David Pugliese. "Here's why the C-295 was picked as RCAF's new search and rescue aircraft." Ottawa Citizen, 2017, 2. Last updated 12 May 2017. <https://ottawacitizen.com/news/national/defence-watch/heres-why-the-c-295-was-picked-as-rcafs-new-search-and-rescue-aircraft>

¹⁷Airbus Military. "C295 Search and Rescue: the proven, reliable and low risk solution." Airbus Military, 3. Accessed 11 Oct 2018. <https://archive.is/20130115192346/http://www.c295.ca/c-295-canadian-sar/specifications/>

¹⁸U.S. Air Force. "C-130 Hercules." U.S. Air Force, 2011, 12. <https://web.archive.org/web/20130710110223/http://www.af.mil:80/information/factsheets/factsheet.asp?id=92>

¹⁹Pierre Leblanc. "Canada's Northern People Deserve Better Arctic SAR Capabilities." The Maritime Executive, last updated 03 Oct 2018, 2. <https://www.maritime-executive.com/editorials/canada-s-northern-people-deserve-better-arctic-sar-capabilities>

²⁰Andrew C. Revkin. "North Pole Busy Season Begins." The New York Times, 2008, 1. Accessed 11 Oct 2018. <https://dotearth.blogs.nytimes.com/2008/03/21/north-pole-busy-season-begins/>

arctic training program be considered in the development of the unit yearly training plans to attempt to find efficient ways to increase our SAR footprint in the Arctic.

13. Air-to Air Refuelling. The opening of the Northwest Passage, increased industry and tourism in the north and expansion of the Canadian ADIZ will require an increased CF-18 presence across the breadth of the Canadian Arctic. This presence will require substantial AAR support to effectively expand the fighters reach and permanence. With the current CC-130HT fleet ceasing AAR operations in July 2020 the RCAF will be facing a significant capability gap in tactical AAR which is highly effective operating in the arctic region. The ability to take-off from short, ice covered runways is essential and most heavy refuelling platforms require long runways to operate.²¹ The longest runways available to RCAF assets in the north are located in Inuvik Yellowknife and Iqaluit. The longest being in Iqaluit at just over 8600 ft. Although this would be suitable for heavy aircraft under ideal conditions the frequent severe weather and significant ice in the winter months make them unusable most of the year. It is recommended that the RCAF seek a suitable interim tactical AAR asset to replace the CC-130HT while the procurement process unfolds for the strategic tanker project.

14. As highlighted in the SAR discussion there is no dedicated SAR platform to support our fighter aircraft while deployed defending Canada's arctic. Although we do not currently possess the resources to provide an entire SAR platform we could create a minimal SAR capability within our tactical air-to-air refuelling fleet. Equipping the tactical AAR platforms with Survival Kit Air Droppable (SKAD) bundles could provide essential time critical survival equipment to our ejected aircrew over either land or sea.²² This equipment is not new and is already being utilized by the CP-140 while escorting CF-18s crossing the Atlantic and extensively on Operation Mobile.²³ Due to the light weight of the various SKAD configurations (Maritime, Land, Arctic...ect) the CC-130HT and most other tactical AAR aircraft are capable of carrying multiple versions on each mission. It is recommended that RCAF tactical AAR crews receive training on the aerial deployment of SKADs and that they are incorporated as standard equipment carried on AAR missions.

²¹David A. Shlapak and John Stillion, Olga Olikier, and Tanya Charlick-Paley. "A Global Access Strategy for the U.S. Air Force". RAND Corporation, 2002, 49.

https://www.rand.org/pubs/monograph_reports/MR1216.html

²²IrvinGQ. "SKAD – Survival Kit Air Droppable." <https://www.irvingq.com/irvingq-products-services/aerial-delivery-search-and-rescue-products/aerial-delivery-equipment-sar-copy-2/skad-survival-kit-air-droppable/>

²³Daniel Arsenault and Josh Christianson. "Punching Above its Weight: The CP-140 Aurora Experience within Task Force Libeccio and Operation MOBILE." The Royal Canadian Air Force Journal, vol 1, No 3, 2012, 32. http://publications.gc.ca/collections/collection_2012/dn-nd/D12-16-1-3-eng.pdf

CONCLUSION

15. To align with Canada's Defence policy the RCAF must position itself to play a key role in the defence of Canada's Arctic. The effects of climate change are changing the accessibility of the Arctic for both business and tourism. In order to effectively prepare a sound Arctic defence strategy we need to understand the potential threats. Within the arctic environment it means anticipating what the opening of the arctic ice to shipping, both commercial and tourism, mining and industry will mean as foreign interest rises. With world freshwater reserves being depleted and conflicts being fought over access rights the abundance of fresh water in the arctic may become an additional point of interest.

16. The RCAF's SAR capability is facing an imminent transition and this poses an opportunity to exploit improved serviceability to augment historical training plans and incorporate a significant arctic presence which can respond quickly to support CF-18 operations or civilians in distress.

17. The loss of the CC-130HT tactical AAR capability in summer 2020 could significantly reduce the CF-18s ability to respond to threats in Canada's Arctic due to the requirement to operate from short and often ice covered runways. The CC-130HT AAR platform has potentially been underutilized as the inclusion of SKADs within its mission set would be relatively simple and provide essential time critical aid to ejected fighter aircraft pilots. Working within the direction and resources identified by there are viable options for improving the fighter-support in both the SAR and AAR capabilities.

RECOMMENDATION

18. Summary of all recommendations:

- a. Conduct further research on the effects of climate change in Canada's Arctic and the potential defence ramifications.
- b. Consideration for a robust arctic SAR training plan incorporating all Squadrons to place SAR assets in the Arctic during peak population periods.
- c. The RCAF seek an interim tactical AAR platform to bridge the gap between the CC-130HT and the new strategic AAR platform,
- d. Train CC-130HT and future tactical AAR crews on the dispatch of SKADs and make them part of the operational equipment carried during AAR missions.

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