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Canadian Arctic Policy, Capability, and Procurement

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CANADIAN ARCTIC POLICY, CAPABILITY, AND PROCUREMENT

By Lieutenant-Commander Emil Schreiner

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ABSTRACT

The Canadian Arctic is one of the fastest changing regions in the country. Arctic policy has been updated to reflect current Canadian views on the changing climate, natural resource extraction, and military presence in the region. In order to effectively implement this new policy, new capability must be introduced government wide. The Canadian Armed Forces play an integral role in the implementation of Canadian Arctic policy, and as such, their contribution will be enabled by defence procurement in Canada.

The current form of defence procurement in Canada has not changed significantly since before the Cold War. The system has effectively delivered capability based on known threats and updated requirements, however, is less effective at delivering on entirely new capabilities. The evolution of the Arctic Offshore Patrol Vessel procurement demonstrates the challenge in developing requirements and translating them into capability. Although incremental changes to defence procurement in Canada in the form of the Defence Procurement Strategy have been implemented, and the creation of a single defence procurement agency is being investigated, the issue of culture is presented as being of primary importance.

Defence procurement involves gaining approval from multiple government departments, and is structured such that once approval has been obtained for a given set of requirements, they are difficult to change. Implementing a culture change that enables a flexible procurement system at the lowest possible level is presented as a key enabler to realising the capability needed to deliver on Canadian Arctic policy.

CANADIAN ARCTIC POLICY, CAPABILITY, AND PROCUREMENT

INTRODUCTION

Canadian Arctic policy has been continuously evolving in response to increasing domestic and international interest in this emerging region. In order for Canada to deliver on the policy statements and critical needs of the Arctic, Canadian defence procurement must become more agile and able to deliver on these new requirements. The current defence procurement system is not structured to deliver on these new requirements and will struggle to keep up with demands unless a culture change is realised.

The Arctic represents a rapidly changing region of the globe. Climate change, natural resources, and the strategic importance of the Arctic have increased the worldwide profile of a once remote region. Technology and the increasing accessibility of the region have brought northern issues to the forefront and how the world sees the region and the inevitable change have become major international relations topics. The Canadian Arctic represents the fastest changing region in the country and how this change is managed is of critical importance to the country. Internally, improving the long-standing relationships with Indigenous groups and developing the technology and infrastructure to ensure the security and prosperity of the region is a priority. Externally, managing the large area and providing both physical security and ensuring sovereignty in the changing environment is a national priority. The changes demanded of these priorities are a result of a whole-of-government approach to the region, in which the Canadian Armed Forces are required to deliver key capabilities in the Arctic. Many of these key capabilities are yet to be realised, and the importance of these capability developments to Canada's Arctic strategy cannot be understated. Canadian military procurements relating

to Arctic capability are a key enabler to the future of the region, and the challenges associated with these new procurements have the ability to either ensure success or impede progress. Ensuring the military procurement system is structured to respond to these needs is essential to the future of the region.

Canadian Arctic policy has evolved over the previous 20 years. The 2005 election campaign statements, painting the region as a place in desperate need of defending from armed incursions and needing a fleet of heavily armed icebreakers providing a year-round presence has evolved. The current, more nuanced approach, highlights the importance of protecting the region from the impacts of climate change and by developing and strengthening the Indigenous population. This approach does, however, still include the ability to understand activity in the region, maintain awareness of changes in the region, providing search and rescue and environmental disaster response capabilities, and perform constabulary duties, up to and including sovereignty patrols. This updated approach includes capabilities the Canadian Armed Forces will be expected to deliver in order to realise the federal aspirations in the region. The link between Arctic policy and delivering capability in the region is of critical importance and subject to the rapidly changing environment. This link between Arctic policy and capability is represented by the military procurement system, and the Canadian Armed Forces ability to adapt to the national Arctic policy evolution is dependent on the efficiency of the procurement system.

The structure of the military procurement system in Canada in unique amongst our allies as it involves multiple federal departments and has developed over the past century. The authorities in the procurement system have changed over time, and adapted

to respond in times of war, however, the current iteration of authorities and processes is acknowledged to be challenging and struggling to deliver replacements to existing capabilities. The suitability of the military procurement system to respond to the contemporary Arctic policy will be discussed and the linkage between policy, capability and procurement investigated. Enabling Canada to respond to a rapidly changing region is of critical importance to national interest and the international view of Canada.

The importance of climate change to Canada's Arctic will be discussed and the disproportionate impact it is having on the region highlighted. This change is not only resulting in physical impacts to the region, it is increasing the national and international significance of the region. Natural resources, in the form of oil and gas, minerals, and fisheries, represent an increasingly attractive prospect due to the more accommodating environment. Oil and gas represent a large financial resource to the region and some Arctic nations are using it to fund development in the region. Canadian rare earth metals, prolific in the Arctic, are of critical strategic interest to the United States and the subject of bilateral agreements to ensure continued future supply. Non-Arctic nations, such as China, are including fisheries in the region as national level strategies, all resulting in an increased importance of the region.

This paper argues that in order for Canada to deliver on contemporary Arctic policy, the defence procurement system requires a culture change. The paper begins with an outline of the changing nature and importance of the Arctic and continues to explore capability development and the defence procurement system. An overview of the Arctic Offshore Patrol Vessel project and its development from a 2005 election promise to recent realisation, combined with the creation of a national shipbuilding strategy provide

insight into the nature of converting policy to capability. The importance of the defence procurement system and consideration of options, including the creation of a single department responsible for defence procurement is explored. The inextricable link between the ability to deliver on defence procurement and Canada's Arctic policy is demonstrated and the importance of a culture change is highlighted.

This examination demonstrates that a culture change in Canada's defence procurement system, one to include trust and flexibility, is a key enabler in ensuring the Canadian Armed Forces' ability to deliver on the capabilities demanded of the rapidly changing Arctic. Canadian policy in the region exists, the defence policy outlines the capabilities required, now the procurement system must respond to the challenge.

SIGNIFICANCE OF CANADIAN ARCTIC POLICY

Change in the Canadian Arctic

Climate Change

Natural Resources Canada's 2019 document, *Canada's Changing Climate Report*, provides strong, irrefutable evidence of the changing climate and specifically highlights the significant impacts forecasted for the Arctic region. Although climate change is undoubtedly a global problem and the focus is often at a global level when temperature increase or sea level rise are discussed, the impacts to Canada's Arctic region will be more severe. As a northern nation, Canada is much more susceptible to the impacts of climate change than the average global nation. As the climate continues to warm due to human influence, Canada will face an ever increasing rate of change in the region, making it more challenging to manage as time progresses. Based on historical evidence

and climate models, Canada is warming at double, and the Arctic region at up to four times the global rate.[1]

Canada's increased exposure to climate change is discussed in detail in *Canada's Changing Climate Report*, and can be summarised as being attributable to how specific regions react differently to increasing greenhouse gasses.[2] Local environmental conditions are the primary impact of the climate processes in the region and as the loss of sea ice and surface snow cover increases, so does the surface absorption of solar radiation. As the solar radiation is absorbed at an increasing rate due to the receding snow and ice cover, the process rate is increased, greatly exacerbating the change. The problem is further compounded as black carbon from shipping and global industrial process have increased as well, and these deposits on the Arctic snow and ice directly increase the solar radiation absorption rate as well.[3] These examples represent a simplified discussion of a few of the climate processes at work, however, they highlight why Canada is warming at twice, and the Canadian Arctic region is warming at up to four times the global average.[4]

Another important factor to climate change is the increasing access provided to the Arctic region by the reduction of sea ice. At an increasing rate, regions traditionally covered in multi-year sea ice are being replaced with only seasonal ice cover. The exact

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[1] E Bush and D. S. Lemmen, "Canada's Changing Climate Report" (Ottawa, ON: Government of Canada, 2019), 5.

[2] E Bush and D. S. Lemmen, "Canada's Changing Climate Report" (Ottawa, ON: Government of Canada, 2019), 5.

[3] Christian M. Zdanowicz et al., "Historical Black Carbon Deposition in the Canadian High Arctic: A 250-Year Long Ice-Core Record from Devon Island," Atmospheric chemistry and physics 18, 18, no. 16 (2018): 12345–61.

[4] E Bush and D. S. Lemmen, "Canada's Changing Climate Report" (Ottawa, ON: Government of Canada, 2019), 84.

historical data is very region specific, however, the data in *Canada's Changing Climate Report* provides evidence that it has been reducing at a rate of between five and 20 percent per decade. This data is used in conjunction with climate models, and forecasts an entirely sea ice-free summer in the Canadian Arctic by summer of 2050.[5] These changing sea-ice conditions will both serve to increase the accessibility of the region and expose new hazards to navigation that were previously unknown. As the process of multi-year ice breakup continues, the Northwest Passage will become increasingly navigable for longer periods. This will expose shipping in the region to the dangers of increased sea ice drifts as the last of the multi-year ice breaks free – highlighting the need for appropriate equipment in a region of rapidly changing climate. The Northwest Passage will provide more access and undoubtedly support increased shipping, both commercial and private, as the value of the region is exposed.[6]

The impacts of climate change are apparent on land as well. The temperature of Canada's permafrost is increasing and the high Arctic permafrost is melting at the highest rate of all. The exact physical impacts of a warming, and at times melting permafrost are not well defined, however, it will undoubtedly have both positives and negatives in terms of infrastructure and commercial development in the region. At this time, the permafrost serves as the solid base on which most of the infrastructure is built. As this changes, the impacts to industry have been clear as technologies to actually keep the permafrost frozen

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[5] E Bush and D. S. Lemmen, "Canada's Changing Climate Report" (Ottawa, ON: Government of Canada, 2019), 84.

[6] E Bush and D. S. Lemmen, "Canada's Changing Climate Report" (Ottawa, ON: Government of Canada, 2019), 199.

in localised regions around oil and gas facilities have become commonplace.[7] Local regional infrastructure and housing cannot afford such technologies, therefor it is evident that the changes in permafrost will have significant impact to infrastructure on a larger scale.

The warming and at times melting permafrost will also have an impact on resource exploration and speculation in the region. As the once solid foundation changes, exploration beneath the surface will become possible with reduced effort. The attractiveness of this proposition will be counterbalanced by the increased effort required to travel and work on an unstable surface, as moving heavy equipment and machinery will require specialised methods and transportation equipment.[8] The exact impacts will only be clear as the events play out in the future, however, it is highly likely that the increasing rate of resource speculation and exploration in the region will continue to increase due to a general softening of the harsh environmental and physical conditions. This increased presence in the region, directly attributable to climate change, will require a concerted effort by Canada to manage and ensure that it balances with the regional objectives of strengthening Canada's relationships in the region and responsible extraction of natural resources.

Natural Resources

[7] "Big Oil's Answer to Melting Arctic: Cooling the Ground so It Can Keep Drilling," The Guardian, October 19, 2020, https://www.theguardian.com/environment/2020/oct/19/oil-alaska-arctic-global-heating-local-cooling.

[8] Jan Hjort et al., "Degrading Permafrost Puts Arctic Infrastructure at Risk by Mid-Century," Nature Communications, no. 1 (2018): 5147–49.

Two factors are serving to increase interest in Arctic natural resources; increased global demand, and increased accessibility of the region due to the effects of climate change as previously discussed. The primary resource categories of interest in the Arctic regions are oil and gas, minerals, and fishing. Highlights of the opportunities and how they will drive increased demands include statements such as those by the U.S. Energy Information Administration, that the Arctic region contains 13% of the world's undiscovered oil reserves and 30% of the undiscovered natural gas reserves.[9] The discussion regarding the ethics and environmental risks associated with oil and gas extraction in the Arctic is a significant one, and is treated very differently amongst the major Arctic nations. In Canada, the pace of development and willingness to accept risk associated with these developments is much lower than in other nations, such as Russia. Russia has recently released $300 billion in funding incentives for oil and gas development in the Arctic region. The incentives are directly linked to increasing the development activities in the region and has the objective of increasing oil and gas extraction along Russia's northern coast. It is also forecasted to double the vessel traffic along the Northern Sea Route.[10] Canada is certainly taking a different approach towards this type of natural resource extraction in the region with a moratorium on offshore oil and gas exploration announced in December 2016.[11] Although this will slow the pace of development, it is next to impossible to prevent this type of resource extraction in the

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[9] "Arctic Oil and Natural Gas Resources," accessed November 15, 2020, https://www.eia.gov/todayinenergy/detail.php?id=4650.

[10] "What Russia's $300B Investment in Arctic Oil and Gas Means for Canada," 2020, https://www.cbc.ca/news/canada/north/russian-arctic-oil-and-gas-explained-1.5462754.

[11] Crown-Indigenous Relations and Northern Affairs Canada, "Arctic Offshore Oil and Gas," 2018, https://www.rcaanc-cirnac.gc.ca/eng/1535571547022/1538586415269.

region long-term. The strategic importance and financial value of such reserves will eventually result in the exploration and extraction of oil and gas in the Canadian Arctic.

The Arctic region is also extremely rich in minerals. Base metals (copper, nickel and iron), precious metals (gold, silver and platinum) and the strategically important rare-earth metals.[12] The significant strategic importance of the minerals in the region are highlighted by the *Joint Action Plan on Critical Minerals Collaboration* agreement signed with the United States.[13] The Joint Action Plan identifies Canada as an important strategic supplier of 13 of the 35 minerals that the United States have designated as being essential to national security and the economy.[14] The minerals include uranium for energy and defense applications, lithium for energy storage in portable devices and vehicles, and radioactive isotopes such as cesium needed for medical imaging. Natural Resources Canada states that the majority of currently active mining sites are spread throughout Canada, but that many of the future projects and pending approvals are planned for the northern regions, including the Arctic. Canada has the potential to meet 100% of the United States demands for critical minerals that are covered by the Joint Action Plan by 2030 if the pending projects are realised.[15] This is yet another example of the valuable resources which lay beneath the surface of the Arctic waiting for development to occur. The demand for these resources is being formalised in agreements

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[12] "Geology of Energy and Mines," 2019, https://www.nrcan.gc.ca/science-data/science-research/earth-sciences/geology-energy-and-mines/10717.

[13] Tijana Mitrovic, "Canada and U.S. Enter Collaboration on Critical Minerals," 2020, https://magazine.cim.org/en/news/2020/canada-and-us-enter-collaboration-on-critical-minerals-en/.

[14] "Canada and U.S. Finalize Joint Action Plan on Critical Minerals Collaboration," 2020, https://www.canada.ca/en/natural-resources-canada/news/2020/01/canada-and-us-finalize-joint-action-plan-on-critical-minerals-collaboration.html.

[15] Hilary Morgan, "Canada Joint Action Plan on Critical Collaboration" (54th Annual General Meeting: Saskatchewan Mining Association, Natural Resources Canada, 2020).

such as the Joint Action Plan, and the development which will follow is certain to bring increase importance and presence in the region. The critical importance of the Canadian Arctic rare earth element deposits is highlighted in a House of Commons report which states that 40 to 50% of the world's known rare earth elements are found in Canada.[16] The strategic value of these resources is reinforced by the fact that approximately 95% of the current global demand for these rare earth elements is satisfied by China. This highlights the reason behind the Joint Action Plan with the United States and the desire to develop a diversified supply of minerals that are critical to both the economy and defence.

The third, and a perhaps less well known natural resource in the Arctic region is fishing. Key marine fish species in the Arctic waters are polar cod, capelin and halibut. The Arctic region has not traditionally been considered a viable commercial fishing ground due to the harsh climate and extended sea-ice coverage, however, the changing climate, reduced sea-ice coverage and improved navigation technology are all increasing fishing activity in the region.[17] The future of Canadian Arctic fisheries is closely linked to the increased catch potential of the warming waters and will continue to drive increased interest in the region.[18] Modelling suggests that the Arctic waters which were traditionally limited to local sustenance fishing, will grow in importance on the global stage as the concept of international waters and fishing rights become interwoven. Non-

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[16] Standing Committee on Natural Resources, "The Rare Earth Elements Industry in Canada - Summary of Evidence," House of Commons Canada (Ottawa, ON, June 2014).

[17] E Bush and D. S. Lemmen, "Canada's Changing Climate Report" (Ottawa, ON: Government of Canada, 2019).

[18] Travis C Tai et al., "Evaluating Present and Future Potential of Arctic Fisheries in Canada," Marine Policy, (October 2019): vol. 108.

Arctic nations, such as China have explicitly included Arctic fisheries as reasons behind having active Arctic strategies, despite not actually having any territory in the region. China's 2018 Arctic policy lists future fishing in the Arctic region as a primary desired outcome, and when this is combined with estimates of China's global fishing fleet size, which ranges from 200,000 to 800,000 fishing boats and is thought to account for up to half of the world's fishing activity, the importance of the resource becomes clear.[19] The Chinese fishing fleet continues to explore new waters and travel further from home in order to support domestic demand. This information is not presented with alarmist intentions, rather it is presented to highlight the strong global inertia towards the exploration of newly opening regions and the commitment that some nations, including those without a geographic presence in the Arctic, place on the fisheries in the region.

The increasing importance of oil and gas, minerals, and fisheries is not something that Canada can control, nor is it something that can be ignored. There is a significant global movement toward leveraging the natural resources in the Arctic region, and when combined with the increasingly cooperative climate, will result in more presence and development in the region. How Canada chooses to position itself with respect to policy, action and military activity in the region, are of critical importance to how the Canadian Arctic will be seen in the future.

Military Activity

[19] Ian Urbina, "How China's Expanding Fishing Fleet Is Depleting the World's Oceans," Yale School of the Environment, accessed February 22, 2021, https://e360.yale.edu/features/how-chinas-expanding-fishing-fleet-is-depleting-worlds-oceans.

Canada, Denmark, Finland, Iceland, Norward, Russia, Sweden and the United States make up the eight Arctic nations. These nations form the Arctic states of the Arctic Council, and in conjunction with six indigenous groups form the permanent members of the council. Additionally, several other non-Arctic states such as China and the United Kingdom hold observer status at the council. Although the Arctic Council explicitly excludes military security, it is presented here as evidence of the global interest in the region. Non-Arctic states, intergovernmental and interparliamentary organisations, and non-governmental organisations form an additional 38 observer members.[20] The number of interested observers serves to highlight the global interest and level of importance the Arctic is anticipated to play in the future. The changing climate and abundance of critical natural resources will result in an ever increasing international presence in the region. Without even investigating the complex military and strategic security value of the region, it is evident that the increased presence in the region will be followed by an increased military presence as interest is increased.

Russia, the United States and Canada all have different strategic views of the Arctic. In simple terms, Russia is leveraging the strategic value of the resources in the region to increase its domestic position and strengthen relationships with China, the United States are primarily concerned about the region as a possible avenue of attack, and Canada is focused on the region itself. Whitney Lackenbauer put it much more eloquently by discussing threats in, to, and through the Canadian Arctic.[21] A discussion on the

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[20] "About the Arctic Council," https://Arctic-Council.Org/En/About/, 2021.

[21] Whitney Lackenbauer, "NAADSN Ideas Series with Dr. P. Whitney Lackenbauer: Threats In, To, and Through the Canadian Arctic: A Framework for Analysis," June 11, 2020, https://www.naadsn.ca/events/threats-in-to-and-through-the-canadian-arctic-a-framework-for-analysis/.

subject in the Canadian Army Journal expands on this by characterising the United States' focus as being on the *through* and *in,* in contrast to Canada's focus on the *to*.[22] That is, the United States are focused on the Arctic region as an avenue of approach and concerned about foreign ownership of mines and infrastructure in the region. This is contrasted with Canada's interest, which appears to be focused on the threats to the region itself: the impacts of climate change to the region and resulting relationships with Indigenous communities. Again, although this is a significant simplification of how three major Arctic nations see the region, it serves the purpose of highlighting the different perspectives and expanding on the environment in which Canada's Arctic policy has developed.

The United States has developed an Arctic strategy and military presence based on their position as a global superpower and concern for the region as an avenue of approach for threats to the continent. By contrast, Russia has by far the largest land mass in the region and is consolidating control of the region and investing heavily in military presence and infrastructure to secure the future economic value of the resources in the region. Partnering with China and leveraging the northern sea route, as well as maximising the economic value of the region appears to be the focus, as opposed to threatening the national sovereignty of the United States or Canada. Canada, reflects a third perspective, which is threats to the region, both in terms of threats to the physical climate and geography, and the local Indigenous population. This can be further extended to a commitment to develop sustainable infrastructure in the region and provide a

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[22] Andrea Charron, "Opportunities and Challenges for Canada in the North American Arctic," Canadian Army Journal, 2021.

credible presence to respond to the risks, such as environmental disaster or search and rescue requirements, which will increase due to the increased presence and traffic in the region.

Canadian Arctic Policy

Canada's Arctic and Northern Policy Framework

In September 2019, Crown-Indigenous Relations and Northern Affairs Canada released the *Arctic and Northern Policy Framework.* The framework builds eight interconnected, overarching goals for Canada and the Arctic. The goals provide a clear, shared vision for the federal government to follow in the region. The eight goals are: nurture healthy families and communities; invest in the energy, transportation and communications infrastructure that northern and Arctic governments, economies and communities need; create jobs, foster innovation and grow Arctic and northern economies; support science, knowledge and research that is meaningful for communities and for decision-making; face the effects of climate change and support healthy ecosystems in the Arctic and North; ensure that Canada and our northern and Arctic residents are safe, secure and well-defended; restore Canada's place as an international Arctic leader; advance reconciliation and improve relationships between Indigenous and non-Indigenous peoples.[23] These eights goals expand on the discussion in the previous section on how Canada sees the Arctic region. They formalise Canada's position and focus future efforts towards three themes. The first theme being strengthening the

[23] Crown-Indigenous Relations and Northern Affairs Canada, "Highlights of Canada's Arctic and Northern Policy Framework," 2019, https://www.rcaanc-cirnac.gc.ca/eng/1567697304035/1567697319793.

northern communities in terms of infrastructure and ability to become fully self sustaining through the creation of jobs and use of innovation to create a viable economy. The second major theme is to continue to develop on Canada's experience in the region and solidify Canada as an international leader in the Arctic. This includes defending Canada and ensuring that residents in the region and secure and well protected. The third theme is health and relationships, both with the environment and the Indigenous peoples. The stated goals include supporting the ecosystems in the face of climate change and improving relationships between Indigenous and non-Indigenous peoples. The three themes are important as they highlight how Canada sees the Arctic region in the future and where Canada needs to focus efforts to further develop in the region. The theme of developing policy to address threats *to* the Arctic is clearly communicated in this framework. The focus of all three themes is on enhancing the quality of life in the region and developing the necessary tools and expertise to ensure the security of the Arctic.

For the purposes of this paper, the focus will be on aspects which involve Canadian Armed Forces (CAF) capabilities. Several of the objectives listed in the *Arctic and Northern Policy Framework* are directly linked to Canadian Army (CA), Royal Canadian Air Force (RCAF) or Royal Canadian Navy (RCN) capabilities, while others are indirectly linked to capabilities that are expected of the CAF. These requirements are articulated in the S*afety, Security and Defence* chapter of the *Arctic and Northern Policy Framework.* This chapter discusses the important critical infrastructure requirements and emergency management considerations that will be required in the region and highlights the growing international interest in the Arctic. The lack of an immediate threat in the region is countered with the position that Canada remains focused on maintaining peace

and stability in the region and that with the increased international interest in the region, an effective safety and security framework, national defence, and deterrence posture are needed to protect the region.

Of the six objectives in this chapter, only the last, which deals with crime prevention and policing does not directly involve CAF capabilities. The first objective is to "Strengthen Canada's cooperation and collaboration with domestic and international partners on safety, security and defence issues" and highlights the role the Canadian Rangers fill in the region.[24] The Canadian Rangers are a part of the CAF Reserves and form the *eyes and ears* of the CAF in the Arctic. They are a significant part of the CAF presence in the region and their roles cannot be understated in terms of maintaining a connection to the CAF as a whole. Furthermore, domestic partnerships with Transport Canada, the Canadian Coast Guard, Environment and Climate Change Canada and the Canadian Hydrographic Service of the Department of Fisheries and Oceans are listed as required to maintain safety of maritime shipping in the regions. The importance of Operation NANOOK is highlighted as is its role in fostering a collaborative approach to security in the region. With respect to international partners, working with the United States and Denmark is specifically listed as a priority to increasing surveillance and monitoring in the region.

[24] Crown-Indigenous Relations and Northern Affairs Canada, "Arctic and Northern Policy Framework: Safety, Security, and Defence Chapter," 2019, https://www.rcaanc-cirnac.gc.ca/eng/1562939617400/1562939658000.

The second objective, to "enhance Canada's military presence as well as prevent and respond to safety and security incidents in the Arctic and the North,"[25] highlights the acquisition of six Arctic Offshore Patrol Vessels (AOPV) for the RCN and that Canada's defence policy specifically identifies the importance of the Arctic and increasing the Canadian Armed Forces' presence in the region. The requirement for the CAF to demonstrate a persistent presence in the region to support the whole-of-government approach to responding to major incidents is also provided. The function of search and rescue (SAR) in the Arctic is defined and the CAF's role in coordinating aeronautical and maritime SAR, and actually performing air search and rescue with the RCAF are further articulated.

Objective three is stated as: "Strengthen Canada's domain awareness, surveillance, and control capabilities in the Arctic and the North".[26] The large scale of the Arctic is highlighted, 162,000 km of coastline (75% of Canada's coastline) and 40% of Canada's landmass is presented as posing a challenge to maintaining situational awareness. The requirement to maintain the Canadian Air Defence Identification Zone (CADIZ) and modernise NORAD and the North Warning System is listed as essential to detecting and understanding threats to national security. The Maritime Security Operations Centre provides Canada the marine security capability by tracking maritime activities in the Arctic and identifying potential threats. The acquisition of advanced

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[25] Crown-Indigenous Relations and Northern Affairs Canada, "Arctic and Northern Policy Framework: Safety, Security, and Defence Chapter," 2019, https://www.rcaanc-cirnac.gc.ca/eng/1562939617400/1562939658000.

[26] Crown-Indigenous Relations and Northern Affairs Canada, "Arctic and Northern Policy Framework: Safety, Security, and Defence Chapter," 2019, https://www.rcaanc-cirnac.gc.ca/eng/1562939617400/1562939658000.

fighter aircraft by the RCAF and ships by the RCN are listed as enabling this objective, as is the need for leveraging advanced science and technology and the Innovation for Defence Excellence and Security (IDEaS) program.

Objective four is “enforce Canada's legislative and regulatory frameworks in the Arctic and North” and contains a more nuanced application to the CAF. The effective use of laws and regulations to ensuring that foreign investment in the Arctic benefits the region itself and does not pose a national security threat to Canada is listed. This also extends to ensuring that the protections are extended to the CAF in order to enable operations in the region.[27]

The final objective with applicability to the CAF is objective five. The “increase whole-of-society emergency management capabilities in Arctic and Northern communities” objective links tangentially to the CAF as they are routinely involved in Canada’s Emergency Management Strategy. Ensuring that the CAF has a presence both in the region and at the governance meetings, with the Indigenous representatives is essential. The CAF link via the Canadian Rangers provides that initial connection between remote communities and the Canadian government.

The objectives highlighted in the *Arctic and Northern Policy Framework* inextricably link CAF capabilities to the future national level objectives in the Arctic region. Ensuring that these CAF capabilities are developed and delivered on time, are what will enable the effective implementation of the framework. The question of whether or not this is occurring and what are the impacts will be discussed in the next chapters.

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[27] Crown-Indigenous Relations and Northern Affairs Canada, “Arctic and Northern Policy Framework: Safety, Security, and Defence Chapter,” 2019, https://www.rcaanc-cirnac.gc.ca/eng/1562939617400/1562939658000.

Department of National Defence Policy

Strong, Secure, Engaged: Canada's Defense Policy (SSE) released in 2017 is notable for the inclusion of the word *Arctic* 76 times. The Arctic region features heavily in the policy and the focus on being able to conduct operations in the region, to protect it and the local indigenous population from threats *to* the Arctic is continued throughout the document. The predominant themes are consistent with the objectives discussed in the *Arctic and Northern Policy Framework* with the inclusion of specific equipment focus for each of the CAF elements.

The overarching objectives for the CAF include being strong at home, secure in North America and engaged in the world. Of the ten items specifically listed, the inclusion of "increase presence in the Arctic over the long-term and work cooperatively with Arctic partners" is important as it sets clear focus for the future.[28] The changing climate is discussed as being a key contributor to this focus. The increased international presence in the region linked to a more hospitable environment due to climate change is considered to increase the safety and security demands in the region, and will result in increased demands related to SAR and natural or man-made disasters. Canada, and the CAF is tasked with establishing a persistent presence in the region in order to provide a credible capability in this regard. Canada's role in the North Atlantic Treaty Organisation (NATO) and the requirement to be able to project force in the region to defend and deter against adversaries, specifically Russia is discussed, however, the focus is more towards

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[28] "Strong, Secure, Engaged: Canada's Defence Policy," 2017, https://www.canada.ca/en/department-national-defence/corporate/reports-publications/canada-defence-policy.html.

the ability to monitor activity in the region and maintain a clear operating picture of all air and maritime traffic in the region.

The RCN capabilities specifically discussed in the defence policy are the acquisition of six Arctic Offshore Patrol Vessels (AOPVs) and the development of a refuelling station at Nanisivik, Nunavut. The AOPVs represent the first ice capable vessels in the RCN fleet and are designed for year-round operation in medium first-year ice. The Nanisivik refuelling facility is located 2800 nautical miles from Halifax, the nearest RCN base, or over a week away at transit speed. The importance of the Nanisivik facility at the entrance to the Northwest Passage cannot be overstated if the RCN is to maintain a persistent presence in the region.

The CA commitments are focussed on acquiring all terrain vehicles, snowmobiles and larger tracked, semi-amphibious utility vehicles optimised for use in the Arctic environment. The existing lack of these capabilities are notable in that they prevent the projection of force in the region by conventional forces and rely heavily on the Canadian Rangers to fill this role. The capital equipment requirements are raised in the 2013 CA document, *Northern Approaches: Army Arctic Concept 2021*.[29] The existence of a project in 2013 was not sufficient to translate into effective equipment delivery and these efforts are ongoing.

The RCAF requirements listed in *Strong, Secure, Engaged* are to establish functional satellite communications in the region, acquire fixed wing SAR aircraft and 88 advance fighters. Modernising the northern warning system (NWS) is also listed as key to enabling Canada's ability to monitor the region, however, the presence of over 800

[29] "Northern Approaches: The Army Arctic Concept 2021" (Canadian Army, 2013).

buildings across 60 sites represents a significant challenge in the region. The development of this capability will be essential to meeting the objective or prioritising Arctic joint intelligence, surveillance and reconnaissance and leveraging the defence research capabilities in this field.

The acknowledgement of the rising international interest in the region and that Canada must enhance its ability to operate in the region speaks to the importance of these commitments. The existence of these requirements in policy demonstrate a clear understanding of the path ahead, however, historically, Canada has been challenged in converting this policy commitment into tangible progress in terms of equipment and capability delivery.

Policy-Capability Translation Challenge

Policy Translation

A discussion on what exact capabilities Canada needs to fully realise the potential of the Arctic region would be an admirable undertaking. The work itself would be challenging, but perhaps the biggest challenge would be attempting to identify what the desired outcome in the region is. What exactly does a successful capability development and implementation program in the Arctic deliver? A large body of work, including as an example, a report entitled *Titanic Blunder: Arctic Offshore Patrol Ships on Course for Disaster* exists, providing alternatives to the approach being taken by Canada.[30] Rather than wade into the discussion on that specific topic and attempt to identify a solution that

[30] Michael Byers and Stewart Webb, *Titanic Blunder: Arctic/Offshore Patrol Ships on Course for Disaster* (Canadian Centre for Policy Alternatives, 2013).

satisfies all northern and Arctic interests; an investigation of the challenges in translating policy to capability is assessed as being more conducive to identifying the limitations of the current defence procurement system. The *Arctic and Northern Policy Framework* and *Strong, Secure, Engaged: Canada's Defence Policy* are policy documents which are evolutions of previous policy documents. The overarching goals of Canada and the Arctic have been relatively consistent over the past 20 years, however, the capabilities that have been realised in that time period are much less than what was forecasted or originally envisioned. Put another way, the policy and support in principle existed for these undertakings, but the translation from policy to capability has been lacking. Examples of the policy translation challenges exist within all elements of the CAF and are highlighted below.

Two of the primary RCN examples have figured heavily in Canadian media since their announcement in 2007. The Arctic Offshore Patrol Vessel (AOPV), sometimes known as the Arctic Offshore Patrol Ship (AOPS) and the refueling facility at Nanisivik. The AOPV has been argued to represent a diluted product from the armed icebreakers initially conceptualised in 2005.[31] Both these projects exhibit the effects of policy translation problems. The AOPV, initially envisioned as a class of armed icebreakers equipped to defend Canada's sovereignty in the Arctic and slated for operations in 2013 has recently entered service in the RCN with a different capability set.[32,33] The AOPV

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[31] Adam Lajeunesse, "Canada's Arctic Offshore and Patrol Ships (AOPS): Their History and Purpose," Marine Policy, (2021): vol. 124.

[32] Public Works and Government Services Canada, "National Shipbuilding Procurement Strategy Technical Briefing," January 16, 2015, https://www.tpsgc-pwgsc.gc.ca/app-acq/amd-dp/mer-sea/sncn-nss/nouvelles-news/2015-01-16-eng.html.

[33] Michael Byers and Stewart Webb, *Titanic Blunder: Arctic/Offshore Patrol Ships on Course for Disaster* (Canadian Centre for Policy Alternatives, 2013).

design did however, evolve in line with the evolution of the narrative surrounding Canada's Arctic. When initially announced, the conservative government was promising the AOPV as a change in Arctic policy, and the 2005 election campaign promises included statements that focused intently on sovereignty and defence threats to the Arctic, including tracking hostile submarines and intercepting hostile craft. The change was focussed on asserting Canada's presence in the region and providing an armed capability to defend the region.[34] Due to a variety of factors, the AOPV design evolved away from the idea of protecting the region from aggressors, to a vessel capable of exercising sovereignty through the concept of presence. This is highlighted in the selection of the AOPV armament. A 25 mm cannon is fitted to the AOPV and is stated to be suitable for constabulary missions and whole-of-government missions rather than high-intensity combat.[35] The evolution of the design and the AOPV requirements does appear to be inline with the development in contemporary Canadian Arctic policy, however, the delivery timeline and reduced capability are decidedly different than what was initially promised. The evolution of the requirement to maintain an armed sea-borne presence and provide surveillance in the Arctic with the AOPV is indicative of the policy translation challenges. An armed icebreaker, with the capabilities of a traditional warship was initially promised, however, something different was actually delivered. The specifics will be discussed in the following section and the reason for this challenge will be expanded.

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[34] Adam Lajeunesse, "Canada's Arctic Offshore and Patrol Ships (AOPS): Their History and Purpose," Marine Policy, (2021): vol. 124.

[35] Adam Lajeunesse, "Canada's Arctic Offshore and Patrol Ships (AOPS): Their History and Purpose," Marine Policy, (2021): vol. 124.

The Nanisivik fuel facility was initially envisioned as a year round, full service support facility, including re-fueling capability that was to be in service by 2012 and fully operational by 2015.[36] Similarly to the AOPV, the Nanisivik facility was initially envisioned as a year round base in the Arctic, providing a presence in the region along with a *jet-capable* runway and crewed fueling facility.[37] These plans were scaled back and as the design matured, and the facility today looks much different than planned. The facility construction has yet to be completed and includes a smaller fuel facility, no runway, and is only capable of operating during the summer months.[38] It can be argued that this capability does in fact achieve the minimum needed to support operations in the region, but the fact that the capabilities have been reduced, the timelines delayed and the permanent presence in the region abandoned speaks to the challenge in converting policy to reality for the cornerstone projects of naval operations in the Arctic.

The CA equipment upgrades listed in the defence policy are captured under the *Domestic Arctic Mobility Enhancement* project with the expectation of providing all terrain vehicles, snowmobiles and tracked, articulated, amphibious all terrain carriers.[39] This requirement is specifically listed in SSE and supported by the CA *Northern Approaches: Army Arctic Concept 2021*, a concept document that was released in 2013 and provided guidance for capability development in the North. This 2013 document specifically lists the *Domestic Arctic Mobility Enhancement* project as advancing the

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[36] Michael Byers and Stewart Webb, *Titanic Blunder: Arctic/Offshore Patrol Ships on Course for Disaster* (Canadian Centre for Policy Alternatives, 2013).

[37] Michael Byers and Stewart Webb, *Titanic Blunder: Arctic/Offshore Patrol Ships on Course for Disaster* (Canadian Centre for Policy Alternatives, 2013).

[38] Lee Berthiaume, "COVID-19 Blamed for Delay on Arctic Military Port First Promised in 2007," August 2, 2020, https://www.cbc.ca/news/politics/arctic-military-refuelling-station-delay-1.5672360.

[39] "Domestic Arctic Mobility Enhancement," January 9, 2020, http://dgpaapp.forces.gc.ca/en/defence-capabilities-blueprint/project-details.asp?id=938.

requirement to address what is called a *broad range of Arctic requirements*.[40] Similarly to the RCN example above, although the policy and project has been in place for an extended period of time, the implementation period is less than ideal. The project is currently in the options analysis phase and does not expect initial delivery until the 2028 or 2029 timeframe.

The RCAF example provided differs slightly from the RN and RCAF examples in that they were specifically listed and funded in SSE. The North Warning System (NWS) was built in the 1980's and early 90's using 1970's technology and is of vital importance to both Canada and the United States' ability to detect, deter and defend the air space in North America.[41] As expected of a system that has been in service for over 40 years, it is not as capable at detecting contemporary threats as it once was. This, despite Canadian Arctic policy being clear on the requirement to be able to detect and monitor the airspace in order to maintain awareness in the region. Both the *Canada First Defence Strategy* of 2008 and SSE make the commitments to NORAD and importance of maintaining awareness in the region a priority, however, it is only now that the modernisation of the NWS is being discussed. The implementation timeline is unknown, but the conclusion that it is later than needed is a reasonable one.

Although the natural focus for a naval officer is the maritime capabilities, the examples demonstrate that the challenges in translating policy to capability are not unique to the senior service. Canadian Arctic policy over the previous 20 years has

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[40] "Northern Approaches: The Army Arctic Concept 2021" (Canadian Army, 2013).

[41] Brett Byers, "Why Canada's North Warning System Needs An Overhaul: New Commentary," January 14, 2020, https://www.macdonaldlaurier.ca/canadas-north-warning-system-needs-overhaul-new-mli-commentary/.

evolved from a view of the region as something to defend against aggressors to something that must be protected from the many different faces of change – the increased presence due to climate change and long standing cultural issues with relationships between the federal government and local Indigenous populations pose an equally credible, or perhaps more urgent threat to the region than the fear of invasion. Despite the evolving policy narrative, the nature of the required capabilities remains relatively consistent. Canada and the CAF are required to maintain a persistent presence in the Arctic. In order to achieve this objective, capability must follow policy or the gap will continue to grow.

Impacts of Policy Translation Challenges

The impacts of the policy translation challenges discussed are far reaching. The challenge is that instead of addressing the policy-capability link when initially defined, the issue is identified and not addressed until some distant time in the future. This both has the negative effect of waiting "*until it's too late to do nothing (something?) about it"* and increasing the burden on some future entity. As the cycle continues, the scale of the problem and the required solution increases such that the solution invariably increases in complexity. These increasingly complex procurements are routinely termed *"no fail"* and make frequent appearances in the media due to reduced capability, schedule delays or cost over-runs.[42]

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[42] Matt Gurney, "Just Build the Damn Ships. And Buy the Damn Planes. The Huge Cost Overruns Are the Price to Pay for Our Incompetence," February 25, 2021, https://nationalpost.com/opinion/matt-gurney-just-build-the-damn-ships-and-buy-the-damn-planes-the-huge-cost-overruns-are-the-price-to-pay-for-our-incompetence.

Simply put, the impact of the policy translation challenge is that the capabilities are not delivered when needed, rather, they are delivered in some reduced form, after they were forecasted to be needed due to a complex system that causes challenging procurements to be delayed until absolutely the last minute. Fortunately for Canada, there have not been any recent examples of this leading to catastrophic events. Likely due to the slow pace and rate of change in the Arctic, time has been less of a constraint than in other domains. As evidenced by the rapidly increasing rate of change in the Arctic climate, the increase in presence due to the extraction of critical natural resources, and increased international interest in the region, this is changing rapidly. The slow pace of change in the region is rapidly accelerating, and so must Canada's ability to deliver capabilities. Maintaining relevance in the Arctic, becoming a leader in the region, and increasing the quality of life for local residents demands immediate action, and a change of pace. Why do these policy translation challenges exist, and what can be done about them? An examination of the AOPV procurement history will be used to demonstrate why the policy translation challenge exists.

ARCTIC OFFSHORE PATROL VESSEL CASE STUDY

Requirements

The RCN took delivery of the first-of-class AOPV, HMCS *Harry DeWolf* on 31 July, 2020, and it is scheduled to be commissioned in mid-2021. This provides an opportunity to examine the evolution of the AOPV requirements as they developed from the concept initially pledged by Stephen Harper in 2005. Although not specific design requirements, the current AOPV represents an evolution from the 2005 election campaign

promise of armed icebreakers in the Arctic all year long.[43] At the time, Harper was accusing then Prime Minister Paul Martin of speaking of the importance of defending national security and sovereignty in the Arctic, while not actually doing anything about it. Harper promised to invest heavily in the Arctic and its defence, including building three armed icebreakers for the RCN. It is worth noting at the time, that similarly to the evolution in Canadian Arctic policy noted in the previous chapter, the focus was squarely on defending Arctic sovereignty rather than the current focus on developing Arctic security from within. When Harper took office in 2006, it was made clear that a lengthy procurement process for the promised icebreakers was unacceptable and that DND was going to lead the project.[44]

These initial aspirations were analysed by the Assistant Deputy Minister (Materiel) (ADM(Mat)) and the conclusion was that a heavy icebreaker, in line with the largest and most powerful icebreakers in the United States and Canadian Coast Guard fleets was required. Although these initial scoping activities were ongoing, there was no Statement of Operational Requirement (SOR) that provided the formal guidance. Within the department, capability gaps are normally documented in the form a Statement of Operational Capability (SOCD), which then can be formulated into a SOR. SORs are also the result of top down policy planning, whereby high-level government policy is generated and translated, in the RCN case, by the Director Naval Requirements (DNR) and transferred to ADM(Mat) for implementation in form of an SOR. The process of

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[43] Adam Lajeunesse, "Canada's Arctic Offshore and Patrol Ships (AOPS): Their History and Purpose," Marine Policy, (2021): vol. 124.

[44] Adam Lajeunesse, "Canada's Arctic Offshore and Patrol Ships (AOPS): Their History and Purpose," Marine Policy, (2021): vol. 124.

defining the high level policy objectives is performed at the highest levels of government and then translated by the RCN into operational requirements that can be used to develop a project. Interestingly, in this case, the SOR was tasked to Maritime Requirements (Sea), the name of the organisation at the time, without the top down guidance on what was to be achieved. Rather than being provided a problem and asked to develop the solution, the SOR itself became an exercise in both problem and requirements definition. This lack of higher level policy can be attributed to two things: the results driven focus based on an election promise and the ongoing work by the conservative government to draft a new defence policy. During this time period, when the RCN and ADM(Mat) were being asked to focus on the requirements for an Arctic icebreaker, several other high profile and critical projects were underway. The organisations were already stressed and over tasked dealing with other priorities in response to long-standing issues. Projects were already underway for new support ships, the next Canadian Surface Combatant (CSC), mid-life refits on the Halifax Class frigates and efforts to Canadianize and bring the Victoria Class submarines into operation after the purchase from the United Kingdom. These ongoing projects all represented overdue tasks and were taxing the support organisations to critical points. The time was not ideal for the introduction of a new, not-so-well defined requirement that was important to the Prime Minister.[45] The initial options and concept of employment had the ship capable of year-round operations in second year ice, able to operate in every part of the Canadian Arctic, breaking up to three meter ice and ramming up to ten meters of ice. This included a range in excess of 20,000 nm and the ability to be

[45] Adam Lajeunesse, "Canada's Arctic Offshore and Patrol Ships (AOPS): Their History and Purpose," Marine Policy, (2021): vol. 124.

self-sufficient for 200 days. This concept design by ADM(Mat) included the same 57 mm main gun fitted to the Halifax Class frigates and was thought to fully capture the intent of Prime Minister Harper.[46]

This preliminary design performed by ADM(Mat) rapidly evolved in 2006. Although the preliminary design fully reflected the election promise, as the RCN continued to investigate ice operations and engage with experts in the field, it became clear that the combination of requirements was not ideal. The Canadian Coast Guard already had a mandate to perform icebreaking in the Arctic and the concept of arming a heavy icebreaker to perform defence or constabulary duties was conflicting, as observed by Commodore (retired) Eric Lehre, it was said to be "awfully close to trying to improve highway safety by having the police drive the snowploughs."[47] The efforts to develop a concept that satisfied both the election promise and reflected the feedback from organisations that operated in the region highlighted the challenges. The government had provided the RCN with the *how*, rather than developing the concept of exactly what had to be done to meet the objective of defending the Arctic.

The concept continued to evolve in the summer of 2006 and the focus rapidly shifted from armed icebreakers to four to six Arctic capable patrol ships.[48] The exact origins of this distinct change of course are not clear, but the ongoing engagement between high levels of DND and CAF leadership with Privy Council are likely to have

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[46] Adam Lajeunesse, "Canada's Arctic Offshore and Patrol Ships (AOPS): Their History and Purpose," Marine Policy, (2021): vol. 124.

[47] Adam Lajeunesse, "Canada's Arctic Offshore and Patrol Ships (AOPS): Their History and Purpose," Marine Policy, (2021): vol. 124.

[48] Adam Lajeunesse, "Canada's Arctic Offshore and Patrol Ships (AOPS): Their History and Purpose," Marine Policy, (2021): vol. 124.

shaped the direction. The concept of being able to defend against armed aggression in the Arctic in the winter quickly gave way to the argument that other options existed, and that if regional sovereignty was being violated in the winter months, the RCAF was better positioned to do something about it anyhow.[49] The subsequent work, which took place while a new defence strategy was being developed, was completed by a small team within DND and is said to have benefited from this focussed effort and discussion with other agencies operating in the Arctic; resulted in a SOR for what was called the Naval Ice Capable Offshore Patrol Vessel (NICOPV).[50]

This period was marked with sound engineering analysis and arguably efficient design work. The flight deck was expanded to accommodate the RCN's new maritime helicopter, requirements were refined and justified in light of budget constraints and the number of hulls were discussed. The minimum number of ships to perform the anticipated roles was established at five, assuming no failures, therefore the target for the acquisition was set at six to eight ships in Spring of 2007 and the program was renamed to Arctic/Offshore Patrol Ship (AOPS) to reflect the addition of the offshore role. This offshore patrol role emerged as it became clear that the ship was neither a warfighting ship, nor an icebreaker. With a mandate to patrol the Canadian 5.6 million square kilometre exclusive economic zone, the RCN was challenged to do so with the existing fleet of 12 Halifax Class frigates and 12 coastal defence vessels. The addition of this constabulary role provided a much needed direction for the project. As the project

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[49] Adam Lajeunesse, "Canada's Arctic Offshore and Patrol Ships (AOPS): Their History and Purpose," Marine Policy, (2021): vol. 124.

[50] Adam Lajeunesse, "Canada's Arctic Offshore and Patrol Ships (AOPS): Their History and Purpose," Marine Policy, (2021): vol. 124.

progressed, the experience of several Arctic allies were engaged and design work progressed, the initially estimated speed of the vessel decreased. As the size and weight of the vessel was refined and the design work advanced the initially estimated 24 knot top speed was reduced to 20, before finally settling at 17 knots. The ice capability of the ship followed a similar path, although ending at a higher capability Polar Class (PC) five, as compared to the initially forecasted PC seven. This was to accommodate for the particularities of the multi-year ice inclusions and characteristics in the Northwest Passage.

After consultation with Norway and Denmark who had similar requirements (although different solutions due to geography and the local nature of the ice), Public Works and Government Service Canada started industry engagement in May 2009, based on a design that ADM(Mat) had developed from the Norwegian Svalbard Class which closely resembled Canada's needs (after additional ice-strengthening due to the particularities of operating in the Northwest Passage). The design was refined and was set to be awarded as an independent procurement, however, was delayed by two years due to the initiation of the National Shipbuilding Strategy (NSS), or as it was then known, the National Shipbuilding Procurement Strategy (NSPS). In July 2012 the contract to Irving Shipbuilding in Halifax was let and the detailed design commenced. Construction of the first ship began in September 2015, which was delivered to the RCN this past summer as the HMCS *Harry DeWolf*.

National Shipbuilding Strategy

The impact of the NSS to the delivery timeline of the AOPV was discussed above, however, the strategy is envisioned as a long-term commitment to shipbuilding in Canada, intended to drive down the barriers to projects such as these by ensuring an experienced and capable domestic industry. An extension of the policy to build large federally owned ships in Canada, the NSS launched in 2010 with the stated goal of developing a long-term, sustainable shipbuilding plan that benefits both Canadians and the Canadian Marine Industry.[51,52] On the heels of the termination of unaffordable ship procurement processes in 2008 for both the Canadian Cost Guard (CCG) and DND, the decision was made to start the NSS. The decision developed from an understanding that individual shipbuilding projects were being provided conflicting requirements – being both required to build the ships using Canadian shipyards and to a limited budget. This limited budget was not enough to realistically fund the recapitalisation of the Canadian shipbuilding industry, which had gradually disappeared following the last major round of shipbuilding in the 1980's and early 90's. The realisation that the failed DND and CCG projects would likely fail again if restarted without a way to address the state of shipbuilding in Canada, was what led to the relatively rapid, in terms of federal government programs, deployment of the NSS.[53] The Irving shipyard in Saint John had constructed the majority of the Halifax Class frigates, however, with the large gap in shipbuilding for vessels over 1,000 tonnes, the capability no longer existed. This is what

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[51] Ian Mack, "Emerging Lessons from the National Shipbuilding Procurement Strategy," Canadian Global Affairs Institute, March 2019.

[52] PSPC, "About the National Shipbuilding Strategy," accessed March 5, 2021, https://www.tpsgc-pwgsc.gc.ca/app-acq/amd-dp/mer-sea/sncn-nss/apropos-about-eng.html.

[53] Ian Mack, "Emerging Lessons from the National Shipbuilding Procurement Strategy," Canadian Global Affairs Institute, March 2019.

is commonly referred to as the boom-bust cycle of shipbuilding. With the majority of the RCN and CCG fleet requiring renewal and six ongoing procurements, destined to face the same challenges, the NSS was launched with some urgency.

Although the complex process of establishing support for the program was constrained by the short timeline and urgency of several shipbuilding projects ready to start, it was Fall of 2011 before the winning shipyards were announced and February 2012 before Irving Shipbuilding was under contract to build the major surface combatant package of ships, and Vancouver Shipyard was awarded the contract for the majority of the non-combat vessels. As recently as 2020, a shipyard in Quebec, Chantier Davie, has been added as a third strategic partner to the NSS, highlighting the quantity of work that is required to both recapitalize the CCG and RCN fleets, while at the same time maintaining the existing fleet of ever aging ships.[54]

The unfortunate reality of the NSS implementation was the delays caused to three RCN and CCG projects underway. The delays resulted from the inclusion of the shipyards that would have likely been competing to build the ships for these three programs. By precluding the shipyards from bidding on both the NSS and the discrete projects, the work on the smaller programs (only smaller in contrast to the 30 years of shipbuilding work promised by the NSS) was effectively shelved until the award of the

[54] PSPC, "Canada Announces next Step toward Adding Third Strategic Partner under National Shipbuilding Strategy," December 19, 2019, https://www.canada.ca/en/public-services-procurement/news/2019/12/canada-announces-next-step-toward-adding-third-strategic-partner-under-national-shipbuilding-strategy.html.

NSS contracts. According to Rear-Admiral (retired) Ian Mack, who was responsible for the NSS at the time, this injected delays of three to four years into the projects.[55]

Admiral Mack's concluding thoughts on the subject of lessons from the NSS are telling for their attribution of partial responsibility for the delays attributed to shipbuilding in Canada, the Canadian public, and political lack of priority.[56] His thoughts on the future success of the NSS are linked to the fact that there is no Plan B and that there is still time for the NSS to demonstrate its value to Canada. Although there are many negative lessons from the rapid deployment of the program, the fact that the project was launched without the benefit of a preceding program and has now delivered ships from both the combatant and non-combatant portfolio speaks to some measure of success. The very nature of complex project delivery is essential to the growth of the Canadian shipbuilding capacity and Admiral Mack argues that it was always going to have a bumpy start due to the complexity of the initiative.

The insight into the NSS provides both a reason for the delays faced in the delivery of the AOPV and insight into to complexities of translating policy into capability. Despite the three ongoing procurements for CCG and RCN ship, the delays associated with starting the NSS were deemed as warranted. The similarity to how the AOPV requirements were developed provides a perspective of the development of key enabling capabilities in Canada. The AOPV was initiated and initial requirements were not derived from a detailed analysis of the capability deficiency nor was the SOR a

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[55] Ian Mack, "Emerging Lessons from the National Shipbuilding Procurement Strategy," Canadian Global Affairs Institute, March 2019.

[56] Ian Mack, "Emerging Lessons from the National Shipbuilding Procurement Strategy," Canadian Global Affairs Institute, March 2019.

product of a problem set provided by overarching policy.[57] Both the initial AOPV requirements and the NSS were borne out of necessity – the realisation that something had been missed in the previous years and that the resulting gap, which should have been addressed gradually needed urgent action. In the case of the AOPV, the inability to operate in the Canadian Arctic was well known, the last ice capable vessel in the RCN having been transferred to the CCG in 1958. The return to the Arctic of two Kingston Class vessels in summer of 2002 highlighted the deficiency in CAF capability and it was articulated in the *Arctic Capabilities Study (ACS)* in the same year. It was not until 2020 that the RCN took possession of the first ice capable vessel since 1958. Similarly, the challenges facing the shipbuilding industry in Canada were well know prior to 2008, so why was nothing done about it, despite the number of ongoing and upcoming ship procurements? The NSS was initiated more out of necessity, rather than forethought. The realisation that the ongoing and upcoming procurements were destined to failure is what spurred Canada to action, and translated into starting a 30 year shipbuilding program by transferring up to four years of delays to the first projects.

POLICY, PROCUREMENT AND CAPABILITY

Defence Procurement

Defence procurement in Canada involves multiple federal government departments and the complexity and interrelationships are often cited as challenges to

[57] Adam Lajeunesse, "Canada's Arctic Offshore and Patrol Ships (AOPS): Their History and Purpose," Marine Policy, (2021): vol. 124.

procuring what is needed, or prescribed by policy.[58] DND, Public Services and Procurement Canada (PSPC), previously known as PWGSC, Innovation, Science and Economic Development Canada (ISEDC) and the Treasury Board of Canada Secretariat (TBS) are all responsible for military procurement.[59] Each of the departments are responsible for different aspects of the process and overlap in terms of timeframe. This approach is unique to Canada and many of our allies either manage procurement entirely within the armed services, their respective defence departments or some form of centralised defence organisation or corporation.[60] Due to the evolution of this complex procurement process, it is suggested that it adds to the challenges of converting policy to capability, particularly in areas such as the Arctic, where it is not simply a case of replacing or updating an existing capability, and sometimes entails developing entirely new relationships with industry.

The Evolution of Defence Procurement in Canada divides the development of the procurement process in Canada up historically and describes the current process as an evolution based on events during the First World War, the interwar years, the Second World War, the immediate post-war years, the Korean War and the Cold War and the current phase as post-Cold War.[61] The current structure of defence procurement really took shape in the years between 1969 and 1991 where the themes of unification and consolidation were espoused to increase the efficiency of the process. The Materiel

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[58] Matt Gurney, "Just Build the Damn Ships. And Buy the Damn Planes. The Huge Cost Overruns Are the Price to Pay for Our Incompetence," February 25, 2021, https://nationalpost.com/opinion/matt-gurney-just-build-the-damn-ships-and-buy-the-damn-planes-the-huge-cost-overruns-are-the-price-to-pay-for-our-incompetence.

[59] Martin Auger, "The Evolution of Defence Procurement in Canada" (Library of Parliament, 2016).

[60] Martin Auger, "Defence Procurement Organizations Worldwide: A Comparison" (Library of Parliament, April 28, 2020).

[61] Martin Auger, "The Evolution of Defence Procurement in Canada" (Library of Parliament, 2016).

Group was formed to prevent duplication of resources by the distinct CAF elements and provide more direct accountability to the Minister. This separation between the CAF chain of commands being the Chief of the Defence Staff (CDS), ADM(Mat) and at the time, the Department of Supply Services (DSS), the predecessor to PSPC, formed the structure of the current procurement system. In 1986, Industry Canada was added to the defence procurement process with the introduction of the Industrial and Regional Benefits (IRB) policy, with the intent of ensuring reinvestment of funds associated with Canadian defence procurement back into Canada.

The 1993 merging of DSS with the Department of Public Works to create Public Works and Government Services Canada (PWGSC, renamed to PSPC in 2015) which maintained control of the *Defence Production Act* and exclusive authority to purchase defence products required by DND was another consolidation. This relationship can be summarised by DND setting procurement defence operational and technical requirements, preparing the procurement instrument and conducting the required trials and tests for acceptance; while PSPC is responsible for developing the procurement plan, including soliciting and evaluating bids and administering the contracts. This interwoven relationship is also complicated by the additional responsibilities held by ISEDC and TBS.

ISEDC policy includes Industrial and Technological Benefits (ITB) and a Value Proposition (VP). These policies are intended to allow the federal government to increase industrial and economic benefits to Canada during defence procurements. They include plans for bidders to describe how 100% of contract value will be re-invested into the

Canadian economy and a mechanism for it to feature into the bid evaluation process.[62] The ITB/VP process is another aspect of the procurement development process and figures heavily into the Defence Procurement Strategy (DPS) of 2014.

TBS is yet another government department involved in defence procurements and is responsible for approving the funding for all major capital projects and provides additional oversight. After requiring DND, PSPC and ISEDC cooperation and agreement on developing a procurement package, TBS approves the release of the procurement instrument and the subsequent contract award.

The recent and significant updates to defence procurement in Canada include the previously discussed NSS in 2010 and the DPS launched in 2014. The objectives of the DPS being to "streamline and enhance the efficiency of the defence procurement system, increase accountability and leverage greater industrial and economic benefits from defence contracts".[63] This comes in the form of an acknowledgment by the federal government that the defence procurement process is not ideal. Over the 20 year period discussed in this report, there has been discussion on whether or not Canada should centralise defence procurement under one, single agency or federal department. The DPS is the result of these discussions, and although it is an effort to improve procurement, it does not represent an overarching change to the procurement system. Something which has not occurred since before the Cold War era. The small incremental changes implemented in the DPS are an acknowledgment of the impacts the complex network of responsibilities between different departments involved in defence procurements have on

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[62] Martin Auger, "The Evolution of Defence Procurement in Canada" (Library of Parliament, 2016).

[63] PSPC, "Defence Procurement Strategy," February 27, 2020, https://www.tpsgc-pwgsc.gc.ca/app-acq/amd-dp/samd-dps/index-eng.html.

delivery timelines and overall efficiency, or lack of efficiency, of the process. The three stated objectives of the DPS are to "deliver the right equipment to the CAF in a timely manner, leverage purchases of defence equipment to create jobs and economic growth in Canada, and streamline the defence procurement processes".[64] Conceptually, the ideas of the DPS are commendable, however, personal experience and some documented feedback, highlight that the same barriers or stumbling blocks, involving multiple agencies in the decision making process and unclear authorities remain.[65] Whether the changes implemented in 2014 have had enough time to fully impact the defence procurement process remains to be seen, but anecdotal evidence, supported by statements by the federal government indicate that no significant improvement has been noted.[66]

An understanding of the development of the defence procurement process in Canada is essential as it demonstrates how the process has evolved. The evolution includes added complexity, the addition of more distinct federal departments and additional reporting requirements. Over this time period, defence procurements have been characterised by cost overruns and delays, yet the base multi-department procurement model has remained unchanged. This provides insight into the procurement environment over the past 20 years and supports the understanding that the complexity of the defence procurement system represents an additional barrier to the conversion of policy into capability. The existing procurement system was stressed and struggled to deliver replacement to existing capabilities over this time period. In addition to responding to the

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[64] Martin Auger, "The Evolution of Defence Procurement in Canada" (Library of Parliament, 2016).

[65] J. Craig Stone, "Implementing the Defence Procurement Strategy: Is it Working? (Canadian Global Affairs Institute, 2016).

[66] Martin Auger, "The Evolution of Defence Procurement in Canada" (Library of Parliament, 2016).

increased procurement support required of the Canadian participation in the global campaign against terror (2001), Afghanistan (2001 to 2014), Libya (2011) and Syria, the recapitalisation of the RCN and RCAF fleet, the focus was squarely on maintaining capability and no action was taken on combining the defence procurement process into a single agency. It is however, proposed that the impact of this evolution was an environment that was not friendly to the introduction of new capabilities, or capabilities not seen to be in response to urgent requirements, supporting these campaigns. Although the need for additional capability in the Arctic was known, the required procurement system capacity did not exist, as it was focussed on supporting the global campaign against terror. The RCN had been without ice capable ships since 1958, the CA was working towards implementing *Northern Approaches: Army Arctic Concept 2021*, and the RCAF was working towards the future fighter project; it is likely that the need to add additional capability in the Arctic when there were already more ongoing procurements than resources, resulted in this impediment to the implementation of Arctic capability. The argument presented here is that an over-taxed procurement system, focused on the immediate delivery of replacement capability does not have the required long-term planning capacity and represents an impediment to new capability introduction. Despite federal government and DND policy that clearly articulate the capabilities required to respond to changes in Canada's Arctic region, it is doubtful that any meaningful progress will be achieved in the current procurement environment. As evidenced by the example of the AOPV, if not for an election promise and political pressure to deliver (before the requirements were even defined), it is likely that the project would have been behind both the Joint Support Ship (JSS) and Canadian Surface Combatant (CSC) which started

beforehand. Would the creation of a single defence procurement department create an environment that is more accommodating of emerging requirements, such as those in the Arctic?

Single Defence Procurement Agency

Defence procurement and the topic of significant reform to the defence procurement process, including the creation of a single, separate defence procurement agency was a national level political campaign issue in the 2019 federal election. The Conservatives proposed the creation of a defence procurement secretariat in the Privy Council Office and the Liberal Party went as far as naming a proposed, separate defence procurement agency, Defence Procurement Canada (DPC). As of today, the creation of DPC is still being discussed and has not been realised. In fact, other than the creation of the mainly administrative additions of the DPS discussed in the previous section, no significant change had occurred to defence procurement since 1969.[67] The history of defence procurement in Canada includes a series of reforms that tended to be consolidation of authorities in response to urgent requirements such as the World Wars, the Korean War and the Cold War, followed by the return to administrative complexity and multi-department authorisations once the urgency had abated. The historical evidence suggests that the creation of a single defence procurement entity is in fact not a new construct in Canada, rather a return to what has worked in the past, and in the face of adversity.

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[67] "Defence Procurement Canada: Opportunities and Constraints" (Canadian Global Affairs Institute, December 2019).

The challenges of attempting to reach consensus in the current multi-departmental structure are highlighted in the following quote: "different policy and legislative mandates, organizational cultures, and at times, personality differences between senior officials can make this a challenging and time-consuming feat, something that is apparent when policy direction is ambiguous"[68] Although as previously discussed, policy direction at the highest level regarding the Arctic has been steadily increasing in clarity and the message has been refined over the past 20 years; the quantity of capability expected continues to grow and outweigh Canada's capacity to actually deliver. As discussed in the AOPV example, the addition of the AOPV requirement to the RCN and ADM(Mat) was not opposed on principle, rather it was challenging due to the overloaded organisations already trying to manage the sustainment of an ageing Fleet and initiate recapitalisation programs to replace existing capabilities. The clear policy direction with regards to the Arctic will not likely be enough to ensure the capabilities are realised. Additional direction and assistance in the form or prioritisation and increased defence procurement capacity is needed. This will help in determining where the new arising requirements fit in relation the overload of existing requirements and furthermore provide the justification to increase the capacity of the procurement organisations. Increasing the capacity of the procurement organisations consists of two parts, the first, being the reduction of the overhead and administrative requirements to move projects forward and the human resources component of increasing the size of the defence team.

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[68] "Defence Procurement Canada: Opportunities and Constraints" (Canadian Global Affairs Institute, December 2019).

This increase in capacity, or put another way, reduction in duplication of administrative effort of the defence procurement team across multiple agencies, is used to support the creation of the single procurement entity, DPC. The current procurement structure has been described as containing too many different entities with veto authority and different teams working in individual silos and characterised by the duplication of functions between PSPC and DND.[69] This difficulty in working together is highlighted in the development of the DPS itself in 2014, when the release of the strategy was delayed due to disagreements between PSPC and DND.[70] These types of disagreements are known to be commonplace, and the delays resulting from personality peculiarities from authorities in different ministries range from the author's own experience sustaining the RCN propulsion systems, all the way up Admiral Mack in the creation of the NSS.[71] These *personality mismatches* as Admiral Mack refers to them, are not only detrimental to the people directly involved, they rapidly translate to the subordinate staff involved and result in significant shortcomings. The importance of the balance of power between stakeholders and relating this to the specific personalities involved is much more complex when multiple agencies are involved. In the case of a single department, the management of personalities and team dynamics are manageable, however, when the requirement to work interdepartmentally is added in, the managerial requirement increases exponentially.

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[69] Chris Maclean, "Rona Ambrose on Procurement," 2017, https://defence.frontline.online/article/2017/1/6676-Rona-Ambrose-on-Procurement-.

[70] James Cudmore, "Military Defeated in War over Procurement Reform," February 6, 2014, https://www.cbc.ca/news/politics/military-defeated-in-war-over-procurement-reform-1.2524296.

[71] Ian Mack, "Emerging Lessons from the National Shipbuilding Procurement Strategy," Canadian Global Affairs Institute, March 2019.

The human resources improvements possible by the creation of DPC are another often cited reason for significant reform. The current multi-departmental structure has the expertise necessary for defence procurement spread out across all the stakeholders. In 2008, the House of Commons recommended the creation of cross departmental integrated project teams, and a 2017 Senate report goes further and recommends a group of skilled public servants in a distinct procurement group.[72,73] The benefits were seen as concentrating expertise and improving retention. The creation of a single entity would maximise the number of personnel who deal with defence procurement without being subject to the non-procurement related human resources demands of other departments, tasked with a more diverse mandate. Building institutional knowledge, prioritising recruiting on defence procurement and additional hiring is needed to ease the strain on the procurement system. The project management capacity of DND reduced from 2,500 personnel in the 1980s to only 600 in 2006.[74] These numbers are perhaps even lower today due to the reduced defence budgets from 2012 to 2016 and the layoff off 400 DND procurement personnel in 2012.[75] However, they highlight that the creation of DPC would not be enough to address the human resources issues, additional hiring of project management and procurement personnel is required to meet the demands. This requirement is articulated in SSE, however, the competing demands of the different

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[72] "Government Response to the Second Report of the Standing Committee on National Defence" (House of Commons Canada), accessed March 2, 2021, https://www.ourcommons.ca/DocumentViewer/en/39-2/NDDN/report-2/response-8512-392-50.

[73] "Military Underfunded: The Walk Must Match the Talk" (Standing Senate Committee on National Security and Defence, April 2017).

[74] Dave Perry, "Putting the 'Armed' Back into the Canadian Armed Forces: Improving Defence Procurement in Canada" (Conference of Defence Associations Institute, 2015).

[75] Jeffrey Collins, "Defence Procurement Won't Be so Easy to Cut in a Time of COVID-19" (Policy Options, 2020).

agencies involved in defense procurement are seen as competing against each other. In the author's own experiences, it is common to see personnel moving from DND to PSPC and vice versa, without the vacated positions being filled.

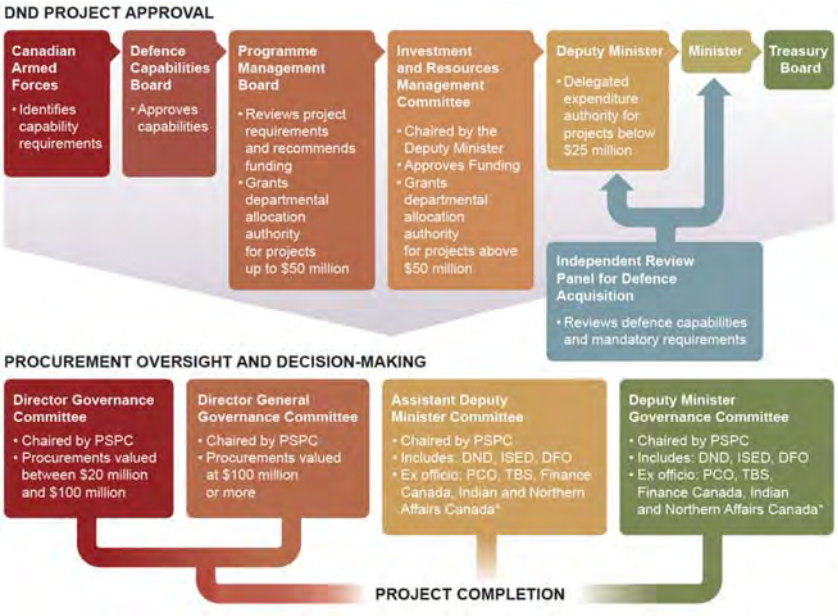

Figure 1 - Defence Procurement in Canada

Source: *Canada, First Interim Report on Defence Procurement*, 14

Accountability and responsibility for defence procurements currently rests with multiple ministers across all departments involved as demonstrated in Figure 1. The consolidation of defence procurement into a single entity is argued to address this deficiency. A single minister and deputy minister for defence procurement would improve accountability to Parliament and overcome the interdepartmental issues identified. The current process is described in Canada's defence policy as being cumbersome and unclear, and is perhaps the single most potent argument in support of the creation of DPC.[76] The creation of an independent defence procurement agency may

[76] "Strong, Secure, Engaged: Canada's Defence Policy," 2017, https://www.canada.ca/en/department-national-defence/corporate/reports-publications/canada-defence-policy.html, 74.

be able to address the technical challenges listed above, however, the high level challenges of a lack of trust between ministers and procurement teams would remain. DPC should not be considered alone, the creation of a new agency or department would only add to the administrative burden in the near term and add further risk to the several large ongoing procurements. The mechanics of the creation of DPC are undeniable, but it would not address the long-standing trust issues that have developed between departments. Efforts to address the reasons for the creation of departmental silos and the inter-ministerial personality differences that occur are perhaps a better use of time. PSPC and DND are all motivated to deliver the best service possible to Canada, however, the lack of clear accountabilities and inability to delegate trust to the lowest levels are perhaps what underpins the challenges. Efforts to breakdown the silos and formalise approval authorities as stated in the DPS mandate are likely to result in many of the same improvements as a new department.

The efforts to identify the benefits of a single defence procurement authority will undoubtedly result in positive change. The duplication of effort, human resource challenges and departmental silos are issues that need to be addressed. Even the clarification of ministerial reporting and accountability can be addressed without the added burden of a new entity. The realisation of all the ongoing military procurements and the addition of capacity to cope with the increase due to the progressively clear direction in Canada's Arctic policy is a priority. The existing shortage of procurement capacity is a major cause of the slower than anticipated Arctic capability development. Ensuring that a favourable solution develops is not only in the interest of DND, it has far reaching impacts on Canada's future in the Arctic.

Culture Change

The creation of a single defence procurement agency is still being investigated according to the Minister of National Defence (MND) and it is perhaps for the best.[77] Many experts involved in defence procurement in Canada believe that the creation of DPC risks shifting the focus away from a needed change in culture and focus, a focus on allowing the federal procurement policy to adapt to the rapidly changing pace of technology and the impacts to the defence sector. A culture change to include more trust and accountability, allowing for innovative procurement approaches that reflect the changes in the defence industry will likely result in more meaningful change in capability delivery in Canada, than the creation of a single defence procurement entity.[78]

The shift away from the traditional defence industrial base of the previous century, where the national industrial capability supports the production and technological development of equipment needed for the military is significant. Instead of the technological developments coming from within government and the traditional defence contractors, they are primarily coming from innovative commercial companies.[79] Commonly discussed are the innovations stemming from the commercial high-technology sector, but innovations in the energy sector that support oil and gas exploration, wind and solar energy and power electronics are increasingly being applied

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[77] Charlie Pinkerton, "No Timeline Set for Development of Promised Defence Procurement Agency," January 2, 2020, https://ipolitics.ca/2020/01/02/no-timeline-set-for-development-of-promised-defence-procurement-agency/.

[78] William Richardson, "Toward Agile Procurement for National Defence" (Canadian Global Affairs Institute, 2020).

[79] William Richardson, "Toward Agile Procurement for National Defence" (Canadian Global Affairs Institute, 2020).

to military hardware. The mechanics of building a ship or a vehicle may be much the same as they have been over the past century, but the high level of equipment integration, careful selection of electronics packages and sensors, and innovative, energy efficient propulsion systems reflect the pace of change in the commercial high-technology industry. For this reason, the lessons learned being discussed amongst our allies regarding military technology procurement and the adaptability required to keep pace with the rapidly evolving industry are directly related to Canada's ability to convert policy to capability in the Arctic.[80]

The challenge facing Canada's defence procurement system is a lack of flexibility in the procurement process. An example cited in *Toward Agile Procurement for National Defence: Matching the Pace of Technological Change* uses the analogy of purchasing a smartphone in 2007.[81] If DND where to use the current procurement process to define the requirements based on the *minimum viable product* at the time, the requirements would look like a legacy Blackberry or original iPhone. By the time the contracting process had progressed sufficiently to the point of posting a Request for Proposal (RFP) the requirements may have been updated to reflect the iPhone 2 or 3 equivalent of that time period, but once the contract was awarded, testing completed and initial delivery complete, the program would be delivering an iPhone 2 equivalent ten years later, when iPhone X represented the current technology level. Although this example is perhaps overly simple, it highlights how the relationship between the pace of technological

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[80] William Richardson, "Toward Agile Procurement for National Defence" (Canadian Global Affairs Institute, 2020).

[81] William Richardson, "Toward Agile Procurement for National Defence" (Canadian Global Affairs Institute, 2020).

change and the lack of change in the defence procurement process impacts Canada. The iPhone 2 delivered in the era of iPhone X may actually be perfectly acceptable to perform the function envisioned 12 years prior, but it does not represent best value at the time of delivery and in fact increases the burden on the support system as it attempts to manage obsolete equipment.[82] The iPhone example represents a consumable item and is perhaps not the most direct analogue to typical defence procurements. Another more relevant example is the improvement in electric car range over the previous decade. An average mid-size electric car in 2013 had a range of 133 km, while in 2019, the average range of the same vehicle class was 393 km.[83] This dramatic increase demonstrates that flexibility must apply not only to consumables, but capital procurements as well. The culture change discussed must work in conjunction with a more flexible procurement system that allows for the evolution of the requirements as a project progresses and to work with a contractor to deliver best value.

The culture change needed in the example above comes as the result of a process that is inherently time consuming and inflexible due to how it evolved. Referred to as a *mechanical process in a digital age,* the difficulties are apparent from the start of the process.[84] The length of time needed for a major defence project in Canada is currently 10 to 15 years and the challenges start with the time needed to define the capability requirements. The process previously discussed in the AOPV example represents an imperfect and misrepresentation of the capability development process. While in the

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[82] William Richardson, "Toward Agile Procurement for National Defence" (Canadian Global Affairs Institute, 2020).

[83] Canada Energy Regulator, "Market Snapshot: Average Electric Vehicle Range" (2019).

[84] William Richardson, "Toward Agile Procurement for National Defence" (Canadian Global Affairs Institute, 2020).

AOPV example, the capability requirements were defined as the project progressed, and the initial, high level requirements represented a political promise rather than a high level capability gap. The actual execution of the parallel process of developing the AOPV requirements as the project progressed thanks to political pressure, actually did produce a ship that serves a useful role in the RCN, however, it does not reflect the initial capability gap described by government at the time.

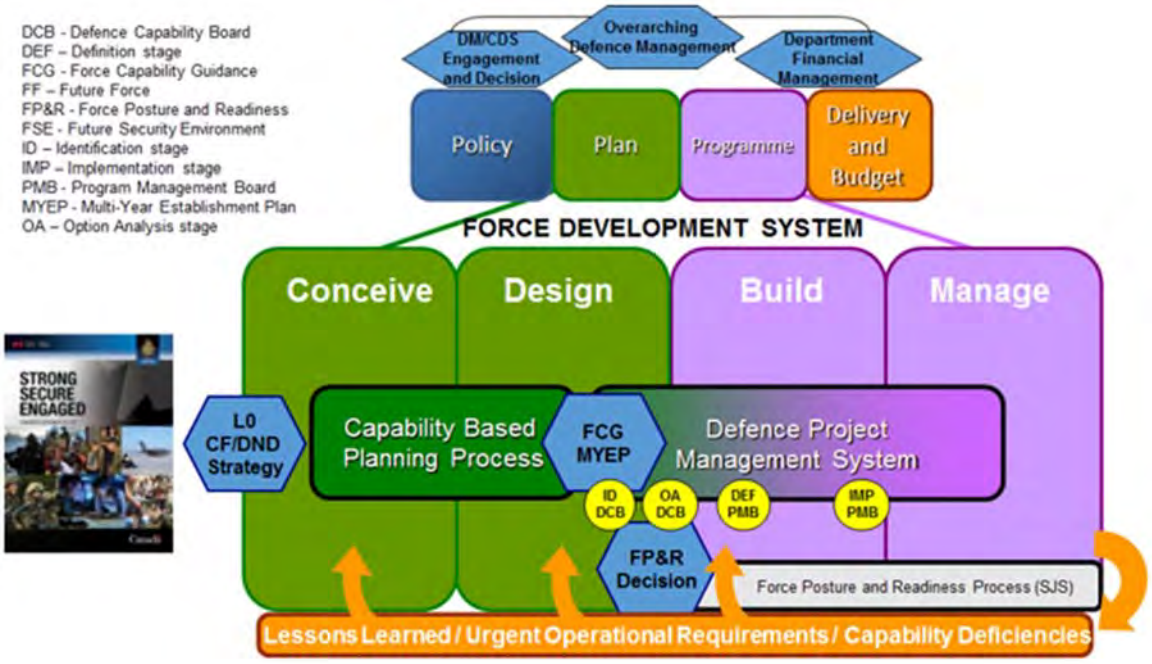

Figure 2 - Defence Capability Development Process

Source: Canada, *Evaluation of Defence Capability Development Program.*

The capability development process as defined (Figure 2) is a front loaded activity during the project identification and options analysis phase. During this time the capability gap, or desired capabilities are converted into requirements that can be used in the contracting process. Again, as demonstrated in the AOPV example, the process of developing these project requirements is intensive and takes a number of years. After this

time period when the project enters definition and implementation phases, the requirements are used by DND, PSPC and ISEDC to develop the contracting vehicle and bid evaluation criteria. Only after this is completed can the project be presented to TBS for expenditure authority. During this time, negotiations over requirements and the bid evaluation process are not taking place with industry, as they should be to determine best value, rather, they are taking place between DND, PSPC, ISEDC and TBS to clear up misunderstanding and address competing departmental priorities.[85] Once a winning bidder is selected, TBS must once again provide contracting approval based on the rigid requirements set out in the contract.[86] The rigidity of this process results in the fixing of requirements after the options analysis phase and the inflexible culture makes continuing engagement and refinement of the requirements with industry next to impossible, even if the process takes many years to complete.

The secondary effect of this de-linkage of project requirements from Industry engagement as the project progresses is that it deters innovation and the engagement of smaller companies. Companies not used to the extended process and rigid requirements are often hesitant to participate in procurement processes in which so much of the schedule and technology risk is transferred to the contractor.[87] It is the author's own experience working in ADM(Mat) on a long-term support arrangement contract for a ship propulsion system that in fact, the sole Canadian company capable of supporting the

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[85] CADSI, "From Bullets to Bytes: Industry's Role in Preparing Canada for the Future of Cyber Defence" (Canadian Association of Defence and Security Industries, 2019).

[86] William Richardson, "Toward Agile Procurement for National Defence" (Canadian Global Affairs Institute, 2020).

[87] William Richardson, "Toward Agile Procurement for National Defence" (Canadian Global Affairs Institute, 2020).

particular system was initially unwilling to continue with the procurement due to the lack of flexibility from DND, PSPC and ISEDC. Only after significant industry engagement and changes to the procurement strategy to include flexibility in terms and conditions and support delivery, were they able to continue with the process.

The concept of increasing the agility of procurement in Canadian defence projects is not new. It is often discussed in terms of the existing projects and the negative impacts to efforts that are replacing existing systems. The benefits of an increasingly agile procurement system would in fact be multiplied when dealing with new requirements or capability requirements in areas or regions without recent significant procurements. The requirements for procurement management in these fields should be considered in light of the principles of government information technology projects which require an iterative approach to deliverables, outcome focused, cross function teams of procurement, technical and management exerts, and a collaborative approach with suppliers to enable adjusting the requirements based on the desired outcomes, as they are refined.[88]

The principle of accountability and responsibility should also be considered. For a procurement to be agile and able to adapt to rapidly evolving technology, trust and the delegation of authority to the project or procurement teams is needed. Although the DPS aimed to improve the decision making process by formalizing the PSPC, ISEDC and DND authorities needed in terms of Director General Governing Councils (DGGCs), in the author's opinion, it had the side effect of requiring all decisions to be approved by senior representatives of each department and actually introduced additional approval

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[88] Jerome Reine and Matt Hasik, "The Ten Rules for Agile in Aerospace and Defense," n.d., https://www.bcg.com/industries/engineered-products-infrastructure/Ten-Rules-Agile-Aerospace-Defense.aspx.

delays. Many of the items addressed at the DGGC level could have been expected to be approved at the project team level, and with clear accountabilities would have been. This then creates a project team that is hesitant to change or adapt to industry feedback or arising requirements due to the schedule impacts of seeking additional approvals. The cultural change discussed is arguably the most important update needed to defence procurement in Canada and is represented by current thinking in the aerospace industry. Agility in procurement requires focus on principles over process, selecting leaders based on mindset and leaving them in place for the duration of a project, and supporting an iterative process that is allowed to fail at times.[89]

Adapting the current Canadian defence procurement system to ensure the ability to deliver the existing requirements on time and on budget, while enabling the additional capacity needed to respond to the new capability requirements of the Arctic is likely more about improving trust and accountability and less about organisational changes or the creation of DPC. These changes will be more likely to be realised if the focus remains on changing the culture and less about the mechanics of the system. Yes, improvements to the processes which create a lack of trust between ministers and agencies and adds gates and approval processes in response to projects gone wrong are needed. The culture change that is required is one of loosened constraints and acceptance of risk where appropriate. Enabling trust in procurement such that smaller, individual failures are not automatically translated to project failure should be part of the learning process, and not a reason to *reset* a project. The changes recommended are put best as: “To be blunt,

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[89] Jerome Reine and Matt Hasik, “The Ten Rules for Agile in Aerospace and Defense,” n.d., https://www.bcg.com/industries/engineered-products-infrastructure/Ten-Rules-Agile-Aerospace-Defense.aspx.

considering the government's current priorities, trust in exchange for transparency will do far more to improve defence procurement than a single agency will".[90]

Impact to Arctic Capability Introduction

The capacity of the defence procurement system reflects a significant challenge to acquiring the capabilities required in the Canadian Arctic. The procurement system is both overloaded, working to replace existing capabilities and has become increasingly rigid, such that it is not flexible enough to deal with the arising requirements of the region.[91] The requirement to deliver capabilities in response to Canada's Arctic strategy is clear, however, the evolutionary nature of Canada's defence procurement system must be considered in conjunction with the capabilities to ensure they can be realised.

The first chapter of this report demonstrated the rapidly changing nature of the Arctic. Not only is the climate changing, but the resulting impacts to resource extraction, commercial exploration and tourism, and military presence in the region are rapidly changing as well. This rapidly changing environment by its very nature creates a rapidly evolving set of project requirements. Technologies for operating in the Arctic are responding not to the needs of national defence, instead they are driven by the commercial sector as they focus their efforts on the resource potential of the region. If defence procurement is to profit from these rapidly evolving technologies, the relationship between Arctic capabilities and defence procurement must be considered.

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[90] William Richardson, "Toward Agile Procurement for National Defence" (Canadian Global Affairs Institute, 2020).

[91] Canada, "First Interim Report on Defence Procurement", *26.*

These impacts include acknowledgment that the current procurement system has developed to procure known systems in response to well defined and slow moving requirement sets. Threat based planning is a system designed to develop capabilities in response to a known threat or enemy, whereas, capability based planning does not focus on a known adversary or threat, rather an estimation of what capabilities may be used by any adversary.[92] In the example of Arctic capabilities, it appears the defence procurement system is focused on responding to the threat based planning approach and would benefit from a better examination of what capabilities are needed to effectively implement Canada's Arctic policy. The requirements associated with Arctic capabilities as compared to traditional weapons systems should not be expected to use the same system. The lack of flexibility in the current system may not be ideal, but it has nonetheless delivered credible capability for Canada. Assuming that this will be the case for all future procurements is not advisable. As the requirements for delivering the Arctic capabilities required of both Canada's Arctic framework and defence policy are developed, they will be developing alongside a rapidly changing environment and technology set. In order for Canada to have the best chance of delivering the capabilities expected in the future, the same rigid procurement system should not be applied. Processes that account for the flexibility in the requirements and that acknowledge the benefit of risk sharing with innovative companies when operating in a new environment with rapidly evolving requirements should be investigated and will be required to deliver on the capabilities described in policy. The application of the same rigid processes to these new capabilities

[92] Tony Balasevicius, "Is It Time to Bring Back Threat-Based Planning?" (Mackenzie Institute, 2016).

would result in equipment procurements that do not meet the actual operational environment, or are delivered later than expected and with reduced value.

CONCLUSION

The Arctic is a rapidly changing environment and many efforts are underway in Canada to adapt. Government policy, CAF policy, and institutional commitments have all be updated to reflect this new environment, however, the challenge of transforming policy into capability remains significant. The military procurement system in Canada represents a challenge to fully realising the outputs envisioned in the updated Arctic policy. Flexibility and trust are needed to ensure the ability of the procurement system to keep pace with the rapidly changing nature of Arctic capability requirements.

Climate change has been widely accepted in Canada, however, the increased impacts on the Artic are less well known. Canada is warming at twice the global rate, and the Arctic at up to four times. These changes are due to many different factors, but they represent a cycle in which the increased warming and reduction of snow and ice cover serves to increase the rate of warming. The rate of change and outcome can hopefully be impacted by responsible stewardship, but the changing nature of the environment cannot be avoided. The changing climate has enabled an increased presence in the region as well. Natural resources such as oil and gas, minerals, and fisheries have been attracting increased attention and providing an incentive for exploration. The incentives are seen very differently amongst the different Arctic and non-Arctic states, but they all have the common resulting impact of increasing presence in the region. Oil and gas exploration in the Russian Arctic is supporting both an increased military presence in the region and

economic boost to the country. The United States have signed a bilateral agreement with Canada to ensure access to and a supply of rare-earth metals, critical to both industry and military capabilities. This strategic resource is currently provided to the United States by China, however, Canada has the ability to supply almost the entirety of their demands. Canada, on the other hand, is focused on protecting the Arctic and ensuring it develops in a way that is reflective of a desire to protect the region and the Indigenous people. In order to accomplish this, Canada has committed to increasing capabilities and presence in the region.

The *Arctic and Northern Policy Framework* is reflective of the evolution of Canada's policy in the region. Having grown from earlier policy focused on defending the region from outside threats, the focus is on protecting the region and ensuring a sustainable future, both in terms of the environment and economy. The CAF figures heavily into this framework and the participation of the military is essential to the aspirations in the region. Specific links are made to *Strong, Secure, Engaged: Canada's Defence Policy* and the development of capabilities to monitor activity in the Arctic region, provide security, and respond to search and rescue and environmental disaster events. The capabilities required touch all elements of the CAF; the RCN, CA, and RCAF all have essential roles to play in the future of the region. The roles have evolved from the concept of defending the region from outside aggression, to a focus on maintaining awareness of activity in the Arctic and the ability to respond to threats from within. This evolution is due to the rapidly changing nature of the environment and follows along with the changing climate and increased presence in the region. For the aspirations of the national level Arctic policy to be realised, the CAF will have to develop

and implement the capabilities needed to operate in this environment. A direct connection between the implementation of new capabilities in the CAF and the successful implementation of Canada's Arctic policy can be made.

The challenges of developing these new capabilities were demonstrated with examples including the development of the AOPV and NSS. The common thread being that they required outside influence or the added impetus of previous and repeated future failure to actually deliver what was intended, albeit later than anticipated and with a different requirement set. The AOPV was reliant on external political pressure to jump ahead of the requirements definition phases, and it can be argued that the only reason it is currently entering service is because the project did not follow the typical capability development cycle. Political pressure and the unique nature of the requirement enabled success, despite a procurement system that is not known to be agile or flexible. The NSS was only implemented in response to several failures in shipbuilding projects that had long been forecasted. The implementation of the strategy caused follow-on delays, however, represents a positive shift towards implementing capability in the future. The challenges addressed with the NSS focus on the replacement of existing capability, the recapitalisation of the CCG and RN fleet. The added challenges of developing capability to respond to the rapidly changing Arctic will continue to fall to DND and the defence procurement system.

The defence procurement system in Canada has evolved over the last century and is seen as cumbersome and focussed on replacing existing capabilities. A significant change has occurred in the defence industry, shifting from the traditional defence industrial base to the commercial sector. Innovations in defence are increasingly coming

from non-traditional sources and the defence procurement system is not structured for this. A complex multi-departmental system, involving at times duplicate authorities and unclear reporting has evolved to become functional at replacing existing capability, but is not up to the challenge of responding to the changing Arctic. The reorganisation of Canada's defence procurement system has become a recent political issue, with options up to and including the creation of a new department being proposed. While reorganisation and organisational change is undoubtedly needed, the creation of a single defence procurement agency is not seen as a solution. The need to include a culture of change in the procurement system, one that focuses on trust and flexibility was identified as a key enable to future success.

"No matter what agile initiatives are put in place, they will only succeed if a still larger change in culture is embraced, one that rethinks trust and accountability in defence procurement."[93] The previous quote highlights the change recommended, and the linkage to the Arctic is especially strong. With the rapid pace of change in the Arctic, both in terms of the environment and presence of a diverse array of nations, this flexibility is a critical item. The success of Canada's Arctic policy aspirations and the CAF's focus on operations in the North are all dependant on a culture of change in the defence procurement system. A simple refocus or restructuring is not the answer, rather, a culture change inline with what has occurred in the past, when at war is needed. The defence procurement system is built on a strong base of dedicated and committed personnel and is capable of accommodating the change needed to deliver the Arctic capabilities expected.

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[93] William Richardson, "Toward Agile Procurement for National Defence" (Canadian Global Affairs Institute, 2020).

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