CANADIAN FORCES COLLEGE / COLLÈGE DES FORCES CANADIENNES
CSC 33 / CCEM 33

EXERCISE/EXERCICE New Horizons

Canada First Icebreakers and Deep Water Port – A Modest Design Change Proposal for Superior Protection of Canada's Arctic Sovereignty

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INTRODUCTION

Protecting Canada's Arctic sovereignty presents a difficult challenge for military planners and government officials. The premier novelist, essayist and historian, John Ralston Saul, captured Canadian's sense of identity with the north in his essay, "My Canada Includes the North":

> What was fascinating about the creation of Nunavut was the extent to which it captured attention around the country. Why were our imaginations so engaged? Because the formalization of a big slice of our North into a new, clearly Arctic body to be run by Northerners was a very positive expression of Canada as a whole. Of Canada as a northern nation.[1]

This spirit of national northern identity, along with general knowledge of the latent resource wealth, and national concern over periodic challenges to Canadian northern sovereignty[2], particularly those triggered by the United States[3], formed the recipe needed to create political pressure on the federal government to protect Canada's Arctic sovereignty. A relatively new ingredient, climate change, has progressively increased political pressure over the fifteen years since the 1992 Rio Summit. Advocates worry that increased global warming will lead to a retreat of the Arctic ice cover. In turn,

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[1] John Ralston Saul, Globe and Mail, "My Canada Includes the North,", 9 March 2001, 1. http://www.theglobeandmail.com/series/lafontaine/stories/COMYTHS5.html; Internet; accessed 22 April 2007.

[2] Neil Reynolds, "Arctic Sovereignty? Cue the Military," *Globe and Mail*, (9 February 2007); http://proquest.umi.com/pqdweb?index=25&did=1213203851&SrchMode=1&sid=1&Fmt=3&VInst=PROD&VType=PQD&RQT=309&VName=PQD&TS=1177099278&clientId=1711; Internet; accessed 22 April 2007.

[3] Capt(N) Ian Patterson, "Climate Change and the Impact on the Northwest Passage: A Challenge to Canadian (Arctic) Sovereignty,"(Toronto: Canadian Forces College National Security Studies Course Paper, 2006), 8. The United States has challenged Canadian sovereignty over the Northwest Passage on four occasions. The first event was in April 1957, when three American Ships transited east through Bellot Strait. The second and third were the oil tanker MV *Manhattan* voyages of 1969 and 1970, and the fourth was the transit of the American icebreaker Polar Sea in 1985.

those concerned about Canada's Arctic sovereignty worry that this signals the end of Canada enjoying the luxury of deferring action on persistent challenges to Arctic sovereignty[4]. Military planners have previously been able to rely on a lingering ambiguity in defence policy concerning the Arctic[5] because its hostile environment and strategic depth defied operations for defenders and challengers alike. What is new is the Conservative Party's "Canada First Defence Plan" which breaks with Canadian Arctic defence policy tradition by delivering a clear distillation of capabilities needed to protect arctic sovereignty.[6]

A key and contentious[7] feature of the plan is the proposal to build three heavy icebreakers for the navy and construct a deep-water port in Iqaluit. The Navy has not possessed icebreaking capability since 1957. [8]

This paper will analyze this controversial proposal and aim to convince the reader that, with slight modification, the proposal is sound and offers a prudent way to protect Canada's Arctic sovereignty. It will submit that the better approach is to acquire four

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[4] Canada's three principle sovereignty challenges are: defining the border over the Beaufort Sea with the United States (Alaska); the border with Denmark (Greenland); in the status of the Northwest Passage, which Canada claims as internal waters and others define as an international strait.

[5] Martin Shadwick, "Defence and the Conservatives," *Canadian Military Journal* (Spring 2006) www.journal.forces.gc.ca/engraph/vol7/no1/PDF/12-Commentary_e.pdf; Internet; accessed 22 April 2007

[6] *Ibid.,*

[7] CBC News, "Coastline Defence Inadequate, Senate Report Says", 28 March 2007; http://www.cbc.ca/canada/story/2007/03/28/senate-coast.html; Internet; accessed 22 April 2007.

[8] Department of National Defence, Canadian Military Heritage; http://www.cmhg.forces.gc.ca/cmh/en/image_657.asp?flash=1&page_id=729 ; Internet; Accessed 22 April 2007. The Navy turned the icebreaker HMCS Labrador over to the Canadian Coast Guard (CCG) in 1957 after three years of operations.

smaller icebreakers and build an austere Forward Operating Location (FOL) in the area of Lancaster Sound.

This paper will approach the topic by first examining Arctic sovereignty policies of the two major federal political parties and demonstrate there is considerable consistency between the two. Second, it will discuss naval strategy and show that the icebreaker purchase is compatible with this strategy. Third, it will present three principal counterpoints to the proposal, and proceed to refute the first two. Before moving to the third counterpoint, which deals with the proposal's cost, the paper will present a basic concept of operations and sustainment. This provides the basis for suggesting a superior approach that tweaks the Canada First plan and: clarifies the size of vessel needed; increases numbers needed to four; and moves the FOL further north. This then allows the third counterpoint to be refuted. Finally, the paper will look at two areas outside the area of defence to demonstrate the suitability of the proposal for protecting Canada's Arctic sovereignty from a diplomacy and development point of view.

POLICY

The Canada First Defence Policy states clearly the priority for the Department of National Defence (DND): "The roles and missions (of the Canadian Forces) supported by the Conservative Party are first, sovereignty protection…" The policy adds:

> national surveillance and control is a fundamental capability… National Defence must be effective as well as efficient…(with a)…Defence budget…sufficient to meet national interests…and …immediate moves to

> increase equipment and resources to exercise Canada's sovereignty in the Arctic (will be made).[9]

In a 22 December 2005 speech, Stephen Harper outlined the plan to procure three heavy icebreakers for the navy as well as establish a deep-water port in Iqaluit.[10] Intriguingly, the type of vessel needed is left undefined. Icebreakers range significantly in; size, capability and cost.[11] The Canada First plan unambiguously identifies the Conservative Party's policy for protecting Canada's Arctic sovereignty. At first glance, it appears to contrast appreciably with policies established by the previous Liberal government, which made no proposal to buy Navy icebreakers. However, a careful look at two of the Liberal generated policy documents, the 2005 International Policy Statement (IPS) and 2004 National Security Policy (NSP) reveals the difference between the two parties over how best to protect Canada's Arctic sovereignty is not so great as it first appears.

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[9] Conservative Party of Canada "Canada First Defence Policy"; http://www.conservative.ca/EN/2692/41691; Internet; accessed 22 April 2007.

[10] Stephen Harper, "Harper Stands Up for Arctic Sovereignty" http://www.conservative.ca/media/20051222-Speech-Harper-Winnipeg.pdf; Internet; accessed 22 April 2007.

[11] International Association of Classification Societies (IACS), "Requirements Concerning POLAR CLASS," (2007). http://www.iacs.org.uk/document/public/publications/unified_requirements/pdf/ur_i_pdf410.pdf; Internet; accessed 22 April 2007.
Numerous societies, such as the Norwegian Det Norske Veritas (DNV), American Bureau of Shipping (ABS), and British Lloyd's Registry (LR), provide classifications for icebreakers. Generally speaking, ships can be classified in one of three large categories: vessels not intended for operation in ice; vessels that can work in minor ice conditions and are typically referred to as ice strengthened ships; and vessels designed to operate in heavy ice conditions and typically referred to as icebreakers. The "Polar Class" system will be used throughout this paper. It is based on the International Association of Classification Societies (IACS) rules. These rules cover a number of technical details, such as hull strength, but generally the different classes are separated by the ice thickness that the vessels can operate in. For ships considered icebreakers, Polar Class 7 (PC7) is the lowest standard with ships expected to operate in ice up to 1.0-metre thick. Polar Class 1 (PC1) is the highest standard, allowing operations in ice up to 2.4-meters thick.

Looking first at the IPS, inference is made to what the military should expect for future Arctic sovereignty protection:

> These developments (climate change and the possibility of increased shipping) reinforce the need for Canada to monitor and control events in its sovereign territory, through new funding and new tools.[12]

The IPS identifies that sovereignty protection means more than monitoring activity; the military must have the means to control it. This distinction is important as further on in this paper, the issue of how best to exercise sea control will be discussed under Naval Strategy. With its emphasis on both monitoring and control, the IPS' Arctic approach is distinguishable from Canada First only in the absence of specifying icebreakers.

The NSP is a robust document that underscores from the beginning the level of will a government is expected to exert to defend Canadian sovereignty:

> The Government is determined to pursue our national security interests and to be relentless in the protection of our sovereignty and our society in the face of these new (asymmetric, terrorism) threats.[13]

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[12] Foreign Affairs and International Trade, "Canada's International Policy Statement: A Role of Pride and Influence in the World – Overview), http://geo.international.gc.ca/cip-pic/ips/ips-overview4-en.asp PDF version available at http://dsp-psd.pwgsc.gc.ca/Collection/FR4-3-2005E.pdf; Internet; accessed 22 April 2007.

[13] Privy Council Office, "Canada's National Security Policy: Securing an Open Society," http://www.pco-bcp.gc.ca/docs/Publications/NatSecurnat/natsecurnat_e.pdf; Internet; accessed 22 April 2007.

A key NSP contribution to the discussion of sovereignty protection is the use it makes of assigning lead agencies for specific initiatives. A six-point marine security plan for instance, places lead responsibility on DND for:

> …the co-ordination of on-water response to a marine threat or a developing crisis in our Exclusive Economic Zone and along our coasts.[14]

The marine security plan further assigns the Navy leadership for establishing Marine Security Operations Centers (MSOCs).[15] The rational for assigning the Navy this role, and not DFO or the Coast Guard, will be revisited later in arguments as to why the Navy must operate its own, small icebreaker fleet. The MSOCs role is more than passive Intelligence, Surveillance and Reconnaissance (ISR) collection:

> MSOCs will have the authority…and capacity…to bring to bear all resources necessary to detect, assess, and respond to a marine security threat[16].

The emphasis is on an active role. MSOCs are expected to order responses. The need for on water patrol and interdiction is also identified.[17] Such direction hints at a unique role for the Navy icebreaker.

The NSP points to an inescapable observation. Governments are dealing with an "…increasingly complex and dangerous threat environment."[18] The NSP dedicates a

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[14] *Ibid.,* 38.

[15] *Ibid.,*38-39.

[16] *Ibid.,*38.

[17] *Ibid.,*39.

[18] *Ibid.,*iii.

chapter to the difficulty of coordinating different departments on a single security task and notes this will always remain the fundamental challenge because in an open society. Checks and balances are deliberately set to restrict government operation: "The lack of integration in our current system is a key gap that has been recognized by the Auditor General of Canada."[19]

An additional challenge is acquisition of sound threat intelligence:

> Intelligence is the foundation of our ability to take effective measures to provide for the security of Canada and Canadians… the nature of intelligence is that we rarely, if ever, have complete information.[20]

Threat assessment therefore will never be perfect due to insufficient intelligence. The nature of this seemingly unsolvable problem appears to be the genesis of a Conservative plan to overcome department integration issues and ensure the Navy has the means at its disposal to exercise control and effectively protect Canada's Arctic sovereignty.

NAVAL STRATEGY

The role of maritime power is related to the previous discussion on monitoring and exercising control. The sea is where Canada's three main arctic sovereignty challenges lie. Ken Booth is a leading naval strategist and he captured the essence of maritime power and its contribution to protection of sovereignty. It is the flexibility of naval forces to move seamlessly up and down the spectrum of conflict that led him to

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[19] *Ibid.,*9.

[20] *Ibid.,*15-16.

develop his conceptual trinity of naval roles; military, diplomatic and constabulary. His model is now commonly referred to as Booth's triangle[21] and it demonstrates well the ease with which a Navy can move between the three roles. Take for instance a principle military function, sea control. Mentioning sea control during discussion on protecting Canada's Arctic Sovereignty might seem curious because Canada's key differences are with allies; the United States and Denmark. Yet sea control is linked to the influence of the navy in the diplomatic leg of Booth's triangle, under the role of naval diplomacy. Sea control and naval diplomacy may seem mutually exclusive but they are interlinked. Peter Haydon explains:

> From a Canadian point of view…naval diplomacy has greater potential value in protecting national interests than sea control initially. From yet another perspective, a diplomatic task can quite easily convert to a sea control requirement or to a power projection operation within a deteriorating situation.[22]

The point being that flexibility is an inherent strength for a Navy and Booth's triangle conceptually displays how a Navy can effortlessly step up from naval diplomacy to a military role, sea control, and move back quickly.

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[21] Department of National Defence, "Leadmark, the Navy's Strategy for 2020," (Ottawa: Canada Communications Group, 2001) 31 – 34. Ken Booth presented his work in his book Navies and Foreign Policy (London: Croom Helm, 1977) Interestingly, it describes the same sort of environment that the much publicized concept, "the Three Block War" would bring forward 22-years later in the 1999 article by USMC General Charles Krulak. General Krulak's article "The Strategic Corporal: Leadership in the Three Block War" was published by Marines Magazine (January, 1999) and is available via the internet at: http://www.au.af.mil/au/awc/awcgate/usmc/strategic_corporal.htm.

[22] Peter Haydon, Dalhousie Centre for Foreign Policy Studies, "Sea Power and Maritime Strategy in the 21st Century: A "Medium" Power Perspective" (Halifax: Dalhousie University Press), 60.

The paper will leave further discussion on particular diplomatic and constabulary roles of Booth's triangle to the subsequent sections covering Diplomacy and Development.

Looking in further detail at the Navy's military role, Leadmark identifies it as exercising: sea control, sea denial, fleet-in-being and maritime power projection.[23] Sea control is where navy icebreakers would contribute most uniquely to the protection of Canada's Arctic sovereignty. The IPS extolled the need for monitoring and control in the Arctic but remarkably did not identify assets able to exercise sea control despite the sea being where the three principle sovereignty concerns rest. In contrast, Canada First makes clear it intends to exercise Arctic sea control. Consider the comment on Northwest Passage transit and the current voluntary practice of the Canadian Coast Guard's (CCG's) NORDREG traffic management and reporting system[24]:

> …(the Prime Minister) will make it plain to foreign governments – including the United States – that naval vessels travelling in Canadian waters will require the consent of the government of Canada.[25]

Stephen Harper went further to point out the need for "..forces on the ground, ships in the sea, and proper surveillance."[26] There is no doubt that the sea control is his intent.

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[23] DND, Leadmark…, 96.

[24] Department of Fisheries and Oceans Canada, "Vessel Traffic Reporting Arctic Canada Reporting Zone (NORDREG)"; http://www.ccg-gcc.gc.ca/cen-arc/mcts-sctm/mcts-services/vtrarctic_e.htm; Internet; accessed 22 April 2007.

[25] Stephen Harper, Harper Stands Up for…

[26] *Ibid.,*.

Peter Haydon outlines three criteria for exercising sea control; surveillance as an enabler; unequivocal maintenance of government authority in the waters in question; and a capacity to quickly and effectively respond to violations of the law and threats to national security. Haydon saw sea control as a principle mission for navies in peace and at war:

> To be able to control one's own waterspace effectively is the fundamental statement of sovereignty by a state to the rest of the world. For that reason, sea control is also the foundation upon which the maritime dimension of national security is maintained.[27]

The IPS and Canada First Plan are similar in many ways. The difference is that Canada First is better aligned with Naval strategy by backing up its intent to exercise sea control with the assets, Navy icebreakers, needed to "quickly and effectively respond to violations of the law and threats to national security."

COUNTERARGUMENTS

Having demonstrated that the acquisition of Navy icebreakers to protect Canada's Arctic Sovereignty is consistent with criteria set out by both major political parties as well as the Naval Strategy of Leadmark, the paper now turns to consider three counter-arguments. The first is that other assets meet the requirement rendering Navy icebreakers redundant. The second is that icebreakers may be needed but the Coast Guard should control them. Finally, the third argument is that the idea has merit, but it is unaffordable.

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[27] Peter Haydon, "What Naval Capabilities Does Canada Need?", *Canadian Military Journal* (Spring 2001) 21, http://www.journal.forces.gc.ca/engraph/Vol2/no1/home_e.asp; Internet; accessed 18 June 2007.

SPACE AND AIR ASSETS

Turning first to the issue of which mix of platforms best meets the need, the range of platforms to consider is broad. This paper does not have the scope to cover them all and list in detail their advantages and disadvantages. Rather, it will consider four that are representative of the various assets that exist in; space, land, uninhabited and traditional aircraft platforms. The reader will be able to appreciate the unique contribution each asset makes and further, understand their limits in matching the sea control capability Navy icebreakers provide. This contribution is acknowledged in Leadmark:

> Navies cannot hold ground to the extent that an army can. Nor can they reach as swiftly to the far corners of the globe as an air force. But the ability of a navy to stand off…shore for an indefinite period with substantial combat capability cannot be matched.[28]

First, RADARSAT 2 represents a space asset which by 2009, will provide DND with earth and ocean observation imaging under the guise of the $59-million Polar Epsilon project[29]. Space platforms show promise as a "first warning" indication systems in assembling a picture of domain awareness, otherwise known as the Recognized Maritime Picture (RMP). They can survey wide areas and their Synthetic Aperture Radar (SAR) provides all weather/day-night imaging. However, while RADARSAT 2's images can locate a contact, it cannot be identified by name. Arctic surveillance presents a unique problem because a polar elliptical orbit is needed which limits the period a satellite can "hover" over one area thus making continuous area coverage impossible

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[28] DND, Leadmark…, 31.

[29] Department of National Defence News Release, "Project Polar Epsilon Will Enhance Canada's Surveillance and Security Capability"; 2 June, 2005; http://www.forces.gc.ca/site/newsroom/view_news_e.asp?id=1674; Internet; accessed 22 April 2007.

without a constellation of satellites.[30] Maintenance is prohibitive should something go wrong. Sea control cannot be exercised from a satellite.

Second, Automatic Identification Systems (AIS) overcome the issue of identification and therefore greatly assist in building the RMP by reducing the unidentified "clutter" in the picture. The system is small and can be fitted on a variety of platforms such as the Hibernia oil rig and RADARSAT 2. Their signal transmission is line-of-site which limits monitoring to 40 nautical miles from a dedicated shore receiver station[31]. The CCG is spending $32-million to build the National AIS project, which will provide continuous coverage of the approach to the West and East Coast by 2008, but not the Arctic. Vessels under 300-tons do not require the system.[32] AIS cannot exercise sea control.

Air assets can be divided in to Uninhabited Air Vehicles (UAVs), as represented by the Predator MALE (Medium Altitude Long Endurance) UAV[33], and conventional aircraft such as the CP-140 Aurora.

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[30] MacDonell et al., "Satellite…" Missions – RADARSAT Constellation Mission" http://sm.mdacorporation.com/what_we_do/radarsat_con.html; Internet; accessed 22 April 2007.

[31] Canadian Coast Guard, "National AIS Monitoring System", http://www.ccg-gcc.gc.ca/mcts-sctm/docs/misc/projects_e.htm#4; Internet; accessed 22 April 2007.

[32] *Ibid.,*.

[33] Department of National Defence News Release, "ALIX - Atlantic Littoral ISR Experiment Surveillance and Security Capability"; 18 August, 2004; http://www.forces.gc.ca/site/newsroom/view_news_e.asp?id=1432); Internet; accessed 22 April 2007. The General Atomics Aeronautical Systems Predator is used as a sample MALE UAV because it was the Predator UAV operated out of 5 Wing, Goose Bay and flew three 23-hour missions. Details on the Predator are available from the USAF web site http://www.af.mil/factsheets/factsheet.asp?fsID=122.

The Predator's key benefit is that it can carry out long endurance missions without risking human life. Despite media press, UAVs have a number of disadvantages for Arctic operations including: poor weather functionality; requirement for long paved airstrips which are not common in the Arctic; slow speed (70-knots), and large ground crew requirement (a 55-person ground crew in the case of a 4-aircraft Predator squadron.) They are costly, with Canada reported ready to pay $500-million for a package of 10 Predator UAVs.[34] Like space and land assets, UAVs cannot exercise sea control.

Finally, Manned aircraft provide speed, reach, and flexibility for ISR tasks as well as defined period sea interdiction capability. The CP-140 Aurora can fly significantly faster than a UAV with a cruise speed of 350-knots. Equipped with advanced underwater sensors and torpedoes it is a formidable sea interdiction weapon against submarines. The range of a MPA also far exceeds MALE UAVs at 5000 nautical miles.[35] Where aircraft fall short in the exercise of sea power is in their lack of persistence, based on their need to return to base after a few hours. Further, aircraft cannot provide the same degree of graduated interdiction response, such as insertion of boarding teams, that a ship can and thus are not as valuable for naval diplomacy roles.

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[34] Canada.Com, "Tories Kill Sole Source DND Contract: $500-million deal for aerial drones from US Firm cancelled over optics"http://www.canada.com/components/print.aspx?id=dea75e57-fe60-42d9-9c02-725e7e1cdd9e; Internet; accessed 22 April 2007.

[35] Canada, Department of National Defence, "CP-140A Aurora" http://www.airforce.forces.gc.ca/equip/cp-140/intro_e.asp; Internet; accessed 22 April 2007.

Space, air and land-based assets all have a role in the protection of Canada's Arctic sovereignty. However none can provide superior sea control capabilities to a ship. As the NSP identifies:

> The (security) system we build needs to be capable of responding proportionately to existing threats while adapting quickly to meet new threats that may emerge.[36]

Ships can provide the broad, graduated range of armed response in the Arctic to maritime threats. This is the role of Navy icebreakers in protecting Canada's Arctic sovereignty.

ARMED ICEBREAKING A COAST GUARD ROLE

Turning to the second counterpoint to the Navy acquiring icebreakers is the view that advocates that the Coast Guard retain full responsibility for their operation. The argument is that the icebreakers could be temporarily armed as warranted by the situation by placing Navy personnel aboard. Alternately, the Coast Guard could fully take on a constabulary role[37]. The argument is seductive but seeks efficiency at too high a price to effectiveness.

Problems emerge with both suggested options. In terms of adding a navy crew to a Coast Guard icebreaker, potential problems were alluded to earlier in the National Security Policy (NSP) section. The NSP raised concern over the implicit challenges

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[36] PCO, National Security..., 8.

[37] Canada, Standing Senate Committee on National Security and Defence; Internet http://www.parl.gc.ca/39/1/parlbus/commbus/senate/com-e/defe-e/rep-e/rep10mar07-4-e.pdf; Internet; accessed 22 April 2007. This suggestion was made in a recent report from the Standing Senate Committee on National Security and Defence.

involved with integrating different government departments together on a complex national security task. The assignment to the Navy and not the Coast Guard, of lead roles for the on-water response to a security incident and establishment of the MSOCs is important. This is not a slight against the Coast Guard but rather an acknowledgement that the Navy is better suited to make decisions involving risk in a complex security environment in the absence of perfect intelligence.

Peter Haydon drew attention to the foreseeable, inevitable problems of mixing navy and coast guard crews in his observation that government and its naval and coast guard staff must strike a balance between the three mission categories of Booth's triangle. He observed "the whole thing is absolutely meaningless unless it is acknowledged that the model must sit on a firm military foundation."[38] CCG icebreakers are principally regulatory and safety vessels[39]. It is not difficult to envision a scenario that leads to conflict of opinion over how to deal with a tense situation. Should the CCG Commanding Officer and the Boarding Party Officer disagree, finely drafted Concepts of Operation will matter little, as the mission will not be met.

Turning to the idea of training the Coast Guard to take on armed roles as advocated by the Senate committee[40], the complexity of changing the institution's culture should not be underestimated. Commenting on the 1995 Turbot war with Spain, the

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[38] P. Haydon…"Sea Power…", 45.

[39] Canada, Canadian Coast Guard, http://www.ccg-gcc.gc.ca/overview-apercu/context_e.htm; Internet; accessed 22 April 2007.

[40] CBC, "Coastline Defence…"

Commissionaire of the Canadian Coast Guard, Mr. John Adams, told the Committee that it would take a generation or two to change the coast guard's culture to accept a new constabulary role:

> You must also remember that our vessels are truly ships intended to do those types of tasks (traffic management, channel marking, safety). If you ask them to take any form of aggressive action, you would have to arm both the crewmen and the ship in one way or another, which would mean a fairly significant cultural change. As one of your witnesses said some time ago, it would take one or two generations for that change to occur, because that is not the inclination of Coast Guard personnel.[41]

In response to a question on what the result was of putting two 50-caliber guns on board a coast guard vessel:

> It scared the living daylights out of the Coast Guard. I think they fired them once over the bow, but I am not sure. They could not get the guns off the boats fast enough.[42]

In turning the argument on its end, the difficulty in the Navy taking on the icebreaking role appears exaggerated. The main icebreaking requirement is for the ship to have an ice navigator as required by the Arctic Shipping Pollution Prevention Regulations (ASPPR)[43]. Cdr Paul Dempsey, Commanding Officer of HMCS Montreal, noted in a paper he co-authored following his experience on Operation Lancaster that

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[41] Canada, Proceedings of the Standing Committee on National Security and Defence "Issue 16 - Evidence"http://www.parl.gc.ca/37/2/parlbus/commbus/senate/Com-e/defe-e/16evb-e.htm?Language=E&Parl=37&Ses=2&comm_id=76; 5 May 2003; Intenet; accessed 22 April 2007.

[42] Senate, Proceedings…

[43] Canada, Transport Canada, "Arctic Shipping Pollution Prevention Regulations" http://www.tc.gc.ca/acts-regulations/GENERAL/a/awppa/regulations/001/awppa001/awppa001.html#0.2.VF5B4I.Z2BFBE.PTL75D.F; Internet; accessed 22 April 2007.

there "...were challenges unique to the Arctic (but), they were not uniquely challenging to a warship."[44] Cdr Dempsey went on to observe:

> Although navigating near ice in the Arctic required special attention and care, it took no more attention and care than to safely navigate around fishing fleets with extended nets in the shallows around St. Margaret's Bay.[45]

This is not to make light out of the advanced training required to specialize as an ice navigator. However it seems apparent that since the Navy possesses the fundamental building blocks in its highly trained personnel, acquiring Arctic and icebreaking skills should not be considered unreasonable. In the view of the author, the difficulties with the Navy acquiring icebreaking skills are not as significant as the culture change that the coast guard, with its risk-averse safety culture, would have to undergo to take on an armed enforcement culture.

In concluding the rebuttal to the counterargument that the armed icebreaker role is best left to the Coast Guard, the Coast Guard has no experience in interdiction nor does it actively seek it. The Coast Guard in not philosophically opposed to the Navy acquiring icebreaking capacity and therefore, this would seem the logical route to go.

CONCEPT OF OPERATIONS

The final counterpoint deals with the issue of cost and the supposition that navy icebreakers would cost too much. In considering costs, one must first depart for a

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[44] Canadian Naval Review, Centre for Foreign Policy Studies, Dalhousie University "Dodging Icebergs and Talking Policy: HMCS Montreal's 2006 Northern Deployment" (Winter 2007,) http://naval.review.cfps.dal.ca/pdf/winter2007excerpt.pdf; Internet; accessed 22 April 2007.

[45] *Ibid.,*.

moment and consider the operational domain in order to assess the type of vessel needed to exercise sea control and protect Canada's Arctic sovereignty.

OPERATIONAL DOMAIN

Operational demand during icebreaker sovereignty patrols will be moderate due to the limited merchant vessel traffic forecast for the Arctic, even with the influence of climate change. While it seems reasonable to expect increased shipping in the Arctic if the retreat of ice opens the shorter route through the Northwest Passage between Europe and North America's Pacific Northwest and Asia's Pacific Northeast, an argument has been put forward that the retreat of sea ice will not automatically correspond to increased shipping opportunities. Studies by the Canadian Ice Service reveal significant year-to-year variability in the extent of sea ice in Canada's eastern Arctic, sometimes with double the extent of sea ice observed.[46] The inability to reliably forecast ice conditions will hamper business planning as will the ice that remains inside the passage:

> Despite widespread retreat of sea ice around the Arctic Basin, it is clear that the unusual geography of the Canadian Arctic Archipelago creates exceptionally complex sea ice conditions and a high degree of variability for the decades ahead.[47]

Ships will need to reduce speed to maintain safe navigation thereby tempering the benefit of time saved from shorter routes. There are a number of additional factors, the scope of which this paper does not provide room to address, which counter a possible significant increase in shipping through the Northwest Passage. These factors include the

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[46] Union of Concerned Scientists, "Arctic Climate Impact Assessment" http://www.ucsusa.org/global_warming/science/arctic-climate-impact-assessment.html; Internet; accessed 22 April 2007.

[47] *Ibid.,*.

recent vote by the citizens of Panama to support a $5-billion project to expand the canal to accommodate the largest post-Panamax vessels[48] and the early opening of the competing Russian Northern Sea Route. All point to a tempering effect on the rate of increase in shipping traffic in the Arctic, even with global warming.

With this type of patrol environment in mind, a concept of operations (CONOPS) requires a few assumptions about the type of patrol required by Navy icebreakers. The assumptions can be tweaked but they will serve the main purpose of demonstrating the significant influence that construction of an austere FOL in the area of Lancaster Sound will have on overall cost. It is assumed as a starting point that the icebreakers will deploy for 30-day sovereignty patrols which calls for a range of 7500-nautical miles without refuelling.[49]

FOUR SMALL ICEBREAKERS

Maintaining a presence in the north in order to counter sovereignty challenges from the United States and Denmark requires that Canada match their capability which translates into a Polar Class 3 vessel.[50]

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[48] The Economist, "Maxing out; Container Ships" London, Mar, 3, 2007, p.74. Until 1988, the biggest container ships carried 5,000 TEU (Twenty-foot Equivalent Unit or TEU is a shipping parameter used to describe a standard 20-foot long shipping container) and could fit through the maximum handling dimensions of the Panama Canal locks, 294.1-meters in length, 32-meters wide and a draught (depth of the ship's hull under the waterline) no greater than 12-meters. The world's largest containership, the *Emma Maersk*, sent into operation in late 2006 and can carry 11,000 TEUs.

[49] The length of a typical patrol will need to be the subject of operational research but 30-days is a reasonable assumption based on the typical length of Navy-supported Fisheries patrols. A further assumption is a patrol speed of 10-knots in ice-free waters which produces a range requirement for 7200-nautical miles, in this case rounded up to 7500-nautical miles. This range easily supports the ship transiting without fuelling from Halifax or Esquimalt to the Lancaster Sound FOL. The ship could actually make its way from Halifax to Esquimalt through the Northwest Passage without fuelling.

The final disposition of assets for sovereignty patrols requires a detailed operational analysis but a reasonable starting assumption is to mimic the current Navy East/West Coast disposition and plan to operate two vessels in the Arctic during the summer shipping season. This disposition allows the Navy to position a ship anywhere in the Northwest Passage in under 48-hours and have its organic maritime helicopter over any area in under 24-hours.[51] Taking into account maintenance, refit and training requirements as well as crew quality of life considerations[52], a four-vessel fleet operating on a four-year 6-3-3-0 operational cycle (deployed period north in months) would meet all force generation and employment requirements while maintaining a reasonable operational tempo for ship's companies.

Vessel size can vary significantly, even within a common Polar Class standard. USCG Healy and CCGS Terry Fox are both Polar Class 4 icebreakers for instance, yet the Healy is far larger, displacing 16,000-tons, with a range of 16,000-nautical miles and

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[50] This is the same capability provided by the UCCG icebreaker Polar Star. Additional assumptions are that Arctic operations will require the vessel to have year-round access to Iqaluit and a transit capability through the Northwest Passage at least equal to the principal challengers to our arctic sovereignty, the icebreaking fleets of the United States and Denmark. The largest icebreaker in this fleet is the USGS Polar Sea. This leads to acquisition of a minimum International Association of Classification Societies (IACS) Polar Class 3 standard vessel which can operate in ice up to 1.8-meters thick and provide year-round access to Iqaluit and through the Northwest Passage as far as Cambridge Bay.[50]

[51] A glance at the Arctic distances reveals a distance of approximately 1300-nautical miles (nm) between Iqaluit in the east and Resolute, and Tuktoyaktuk in the West and Resolute. During the ice-free summer season, and reasonably assuming the icebreakers will be able to transit at a minimum of 15-knots, the deduction is that the two-ship, east/west disposition would enable the Navy to position an icebreaker anywhere in the Northwest passage between the entrances to Amundson Gulf in the west and Davis Strait in the East in no more than 48-hours. Further, if the ship were to carry a CH-148 Cyclone (range approximately 500-nautical miles) it would also be possible to position the ship's helicopter anywhere in the Northwest Passage in under 24-hours.

[52] The four-year operating cycle is similar to the Canadian Patrol Frigates.

operated by a crew of 68[53] compared to the Terry Fox's 4,200-tons, range of 1920 nautical-miles and crew of 24[54]. In assessing different icebreaker designs it quickly becomes clear that that the support concept greatly influences the size of vessel needed. A self-sufficient icebreaker designed to embark sufficient fuel to meet its mission will require a range in the vicinity of 20,000 nautical miles[55]. This will require a significantly larger ship but no FOL is needed. This turns the paper to consideration of the FOL impact.

SUSTAINMENT CONCEPT

Introducing a Forward Operating Location serves as a force multiplier, allowing the same capability to be exercised in the Arctic while substantially reducing endurance requirements and hence onboard fuel requirements. The author submits that use of a Forward Operating Location will reduce range requirements from 20,000 nautical miles

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[53] United States Coast Guard, "United States Coast Guard Cutter Healy" http://www.uscg.mil/pacarea/healy/; internet; accessed 22 April 2007.

[54] Murmansk Shipping Company, "Vladimir Ignatujuk"; http://www.msco.ru/cgi-bin/common.cgi?lang=eng&skin=menu2&fn=cont2_1&back=1 Internet; accessed 22 April 2007 "This website is for CCGS Terry Fox's sister ship, Vladimir Ignatujuk. All dimensions are similar.A review by DND Naval Architects reveals that a ship similar in design to the CCGS Terry Fox, could be upgraded to Polar Class 3 standard. Ref: Canada, DND, "Preliminary Analysis of Canadian Forces Arctic Capability." Report Number DMSS 2-3-2006-003 March 2006. The report did not recommend the CCGS Terry Fox design due to its limited range. However, given its design as an offshore supply vessel, it is reaonsable to assume that the vessel incorporates large tanks for transport of fuel, fresh water and mud to oil rigs. Converting these tanks to ship's cargo fuel can reasonably be expected to increase the range to 7500-nautical miles. As well, the cargo deck is longer and wider than a Tribal Class Destroyer, therefore it would be possible to design a similarly sized vessel for carrying two helicopters. Finally the cargo space below where the flight deck would go could be made available for additional accommodations for a Land Force Landing Party, Naval Boarding Party, or aircrew.

[55] The proposed CONOPS suggests a minimum three-month operational summer deployment with 30-day missions requiring the ship to range 7500 nautical miles. Therefore a self-sufficient ship will require enough fuel for; three missions times 7500 nautical miles/mission for an overall sustained range of 22,500 nautical miles.

to 5000 – 10,000 nautical miles. The type of vessel needed to meet this requirement is significantly smaller, cheaper and requires a smaller crew as will be seen next.

COST COUNTERARGUMENT

Constructing a limited FOL to provide a place for the icebreaker to come alongside and receive fuel incurs a small cost however reducing the size of vessel offsets this. Simon Fraser University's Canadian American Strategic Review (CASR) looked at the cost of construction of the aforementioned USCGC Healy and estimated it to be $460-million.[56] Using similar cost estimate figures for the cost of CCGS Terry Fox yields an estimate of $125 to $150-million[57].

The CASR study also estimated the cost of constructing a single berth deep-water port at $35.5-million.[58] This will permit operation of the smaller Polar Class 3 icebreakers at a cost of $600 to $700-million and a 96-person establishment as compared

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[56] Simon Fraser University, Canadian American Strategic Review "Armed Icebreakers and Arctic Ports for Canada's North? Costing Three New Canadian Heavy Armed Icebreakers" April 2006, http://www.sfu.ca/casr/id-iqaluitport3.htm; Internet; accessed 22 April 2007.

[57] J.D. Irving Limited "Contract for Two New Offshore Supply Vessels to Employ Over 400 Halifax Shipyard Workers", 25 April 2001; http://www.jdirving.com/Index.asp?Site_Id=1&Page_Id=356.) Internet; accessed 22 April 2007. A similar study is not available for the CCGS Terry Fox however similarly sized offshore supply vessels (the basis of the Terry Fox design) were recently constructed in Halifax for a cost of $75-million. A conservative estimate of cost of construction can be made by doubling this figure to $150-million to take account requirements to reinforce the hull for icebreaking plus other additional details as laid out in the Canada Shipping Act (CSA). This is consistent with the CASR study which identified cost estimates of $28,700/ton to construct a Polar Class 4 icebreaker which yields an estimated cost of construction of $ for a vessel the size of the Terry Fox.

[58] Simon Fraser University. Canadian American Strategic Review "Breaking the Ice: Planning a Deep Water Port at Iqaluit" February 2006, http://www.sfu.ca/casr/id-iqaluitport2.htm; Internet; accessed 22 April 2007 The study also underscores the complexity of Iqaluit as a location for a port with its strong tidal range and notes costs could run as low as $9-million for a better site, which reinforces the need to complete a detailed construction engineering investigation before making any final decision on future FOL sites.

to $1.84-billion and a 272-person establishment for the larger, USCGC Healy style, self-sufficient vessels. It is observed that this compares reasonably with the $500-million cost of 10 Predators previously noted. Given the range of capability the icebreaker provides, they clearly represent value for money.

DIPLOMACY

The second leg of Booth's triangle, Diplomacy will now be discussed as it reinforces the value of the Navy acquiring four small icebreakers. Diplomacy concerns the management of Canada's external relationships and the Arctic represents a key challenge due to pre-existing fault lines in our sovereignty claims to the north. As sea ice retreats due to climate change and the Arctic opens to increased merchant traffic, Canada will face new challenges to its outstanding sovereignty claims.[59] Looking to the future security environment, Canada must be ready to exercise preventive diplomacy in the event a foreign nation intrudes within Canada's arctic jurisdiction[60]. Such a response requires a sea-borne platform for persistence. The current fleet cannot provide this capability in ice-covered waters thus an icebreaker provides Canada with new capacity to exercise preventive diplomacy.

Three main diplomatic issues are at stake for Canada: the boundary with the United States in the Western Arctic remains unresolved; the boundary with Denmark in the Eastern Arctic has not been settled; and Canada's declaration that the Northwest Passage represents internal waters is not the subject of universal agreement, with the

[59] Union of concerned…84.

[60] DND, Leadmark…79.

United States in particular opposed and arguing that the passage is an international strait.[61] The resource potential of the Arctic is a final area of diplomatic concern because other nations could be drawn into conflict with Canada should disagreements over jurisdiction lead to conflict of whose sovereignty applies in the event of an incident such as an oil spill.

Ken Booth spoke of naval diplomacy and various roles for the navy in support of a country's foreign policy.[62] Given that our disputes rest principally with countries we hold alliances with, the United States and Denmark, the potential is minimal for use of force to resolve disagreements. However, the need to use armed force in support of naval diplomacy is real. The turbot war in 1995 demonstrated this point when Canada engaged in confrontation and used naval diplomacy despite the fact that our principal dispute was with Spain, a NATO ally[63]. Leadmark nicely captures this role in noting "Naval diplomacy…will be deployed to influence, not only potential adversaries, but also friends and partners."[64] The availability of Navy icebreakers will support diplomats in a similar fashion and ensure they are negotiating from positions of credible strength when it comes to resolving Canada's arctic sovereignty claims[65].

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[61] Matthew Carnaghan, Allison Goody, Canadian Arctic Sovereignty, 26 Jan 2006; http://www.parl.gc.ca/information/library/PRBpubs/prb0561-e.htm; Internet; accessed 16 April 2007.

[62] DND, Leadmark…30.

[63] *Ibid.,* 79.

[64] *Ibid.,* 96.

[65] *Ibid.,* 38-40.

Canada faces a future a requirement to resolve three significant sovereignty issues in the Arctic. The role of a Navy in support a country's Diplomatic effort is captured well by the concept of Naval Diplomacy and acquiring icebreakers for the Navy will assist diplomatic efforts to resolve outstanding sovereignty issues.

DEVELOPMENT

In turning to development, the acquisition of four small icebreakers along with a Lancaster Sound FOL would support the development of regional economic capacity in Nunavut and the federal government's capability to exercise its powers. Turning initially to regional development, the citing of the FOL in particular will need to be carefully considered. Nunavut has a high unemployment rate at 27%, limited infrastructure and a young, predominately aboriginal population[66]. The need for development is clearly identified in the 2003 Nunavut Economic Development Strategy (NEDS):

> An economic development strategy for Nunavut must recognize that in developmental terms the Nunavut economy is far behind other jurisdictions in Canada. Nunavut still has to put almost all the economic fundamentals in place before it can have a thriving, diverse, business – and community – driven economy.[67]

The NEDS identified three key areas for development: minerals, fishing and tourism.[68] Note that all three are associated with the sea; access to mines; source for

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[66] Nunavut, Nunavut Economic Development Strategy: Building a Foundation for the Future, Internet; http://www.edt.gov.nu.ca/docs/nes/NUNAVUTE.pdf p. vii and Canada, Department of Indian and Northern Affairs, Nunavut, September 2003; http://www.ainc-inac.gc.ca/pr/info/info100_e.html Internet; accessed 22 April 2007. Nunavut's population is 85% Inuit out of a total of 29,000.

[67] *Ibid.,* vii.

[68] *Ibid.* vii.

fishing; and one of the principle means, through cruise ships, for tourists to access the Arctic.

The NEDS seeks to work in partnership with the federal government and other partners to build the infrastructure needed to provide a public base for private sector investment, which is consistent with the Navy's need to build a FOL. Although directed at the mining industry, the strategy outlined in Nunavut's Mineral Exploration and Mining Strategy (MEMS) are germane to Navy considerations in building a FOL:

> Build partnerships with…(the) federal government…to build long term and sustainable, territorial, regional, and community infrastructures…Where possible…companies should base their activities from within a Nunavut community to help stimulate long-term economic development in that community. "Once a mine makes a decision to use a community as a base, and critical infrastructure is put in place, the community may then become a viable hub for other activities, including mining, exploration, transportation, tourism and other economic pursuits. [69]

The principle issue will be where to site the FOL near Lancaster Sound as three options are available; Resolute, Nanisivik/Arctic Bay and Pond Inlet. Nanisivik initially seems the obvious leader as it already has a deep-water port[70]. However the NEDS points out that investing in infrastructure that is not beneficial to the community does not represent the best choice for use of scarce resources. As the strategy notes:

> With the need for the development of community infrastructure it is difficult to consider the use of public funds to build and support infrastructure at a remote site.[71]

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[69] Nunavut, Parnautit: A Foundation for the Future – Mineral Exploration and Mining Strategy; http://www.edt.gov.nu.ca/parnautit/8790%20English_eng.pdf ; Internet; accessed 22 April 2007. 33

[70] Nunavut, Nunavut Economic… 61. Nanisivik is the only deep-water port in Nunavut and its nearby mine has closed.

The MEMS also provides some wise caution over the latent environmental liabilities that would be assumed by DND should it take over the port[72]. From a development perspective, siting the FOL in Pond Inlet or Resolute would be consistent with Nunavut's development goals and better meet the community development needs. Following effects from constructing and operating from the FOL will also be significant. The NEDS specifically seeks development of associated hydrographic data to support the needs of its mariners; information that would be developed by the Navy to support its own operations and which could be shared:

> A related issue is the substandard condition of hydrographic information for navigation of Arctic waters. It is essential for Nunavut to have up-to-date nautical charts, sailing directions, bathymetric maps, and tide and current tables[73].

The other aspect of development is improving the federal government's capacity to exercise its own power and jurisdiction in federal areas of responsibility. These areas form part of the Constabulary role of Booth's triangle. The north is not immune to violence as the murder of three men in Cambridge Bay on 6 January 2007 unfortunately demonstrates[74]. Leadmark outlines the following naval roles under the Constabulary leg:

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[71] Nunavut, Parnautit… 37.

[72] Ibid., 37.

[73] Nunavut, Nunavut Economic…61.

[74] Petti Fong The Globe and Mail, "Storm delays police probe of shootings in Nunavut", 8 January 2007. p.A7; http://proquest.umi.com/pqdweb?index=8&did=1190746461&SrchMode=1&sid=5&Fmt=3&VInst=PROD&VType=PQD&RQT=309&VName=PQD&TS=1177316245&clientId=1711; internet; accessed 22 April 2007

sovereignty patrols; aid of the civil power; assistance to OGDs; Search and Rescue (SAR) including response to a Major Air Disaster (MAJAID)[75]; Disaster Relief; and Oceans Management[76], all of which will support territorial and federal governments in the exercise of their authority.

CONCLUSION

This paper looked at the controversial Canada First proposal to acquire three heavy icebreakers for the Navy, a capability that has not been available since 1957, and construct a deep-water port in Iqaluit. The paper submitted that far from being radical, the plan was sound and with some modification: specifically smaller ships, increasing the number of platforms to four; and moving the FOL further north, it would be a prudent use of resources to protect Canada's Arctic sovereignty.

To back the thesis, the paper compared the Conservative and Liberal policies and found significant consistency in both, including the need to exercise sea control in the North. The Navy's strategy, Leadmark, also supported this proposal. Three counterarguments were considered and refuted. Space, land and air assets cannot replace a ship's ability to exercise sea control and carry out roles such as naval diplomacy. Assigning sea control responsibility for the icebreakers to the Coast Guard would be

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[75] Corinna Schuler and Jim Farrell, "The crash of Box Top 22; Life, death & heroism in the High Arctic" Edmonton Journal, Edmonton, Alta. November 9, 1991. pg. G.1 http://proquest.umi.com/pqdweb?index=31&did=193096821&SrchMode=1&sid=2&Fmt=3&VInst=PROD&VType=PQD&RQT=309&VName=PQD&TS=1177308999&clientId=1711; Internet; accessed 22 April 2007 The story describes a smaller incident where use was made of Thule, Greenland for Search and Rescue assets following the crash of Boxtop 22, a Hercules C-130 supply flight into Alert on 30 October 1991. Blackhawk helicopters were landed by C-5 in Thule from their airbases in Alaska, assembled and flown to Alert to aid in the SAR effort.

[76] DND, Leadmark…40-41.

more difficult than imagined, particularly in light of the relative ease of the Navy acquiring icebreaking skills. Costs were demonstrated to be reasonable given the proposed modification to the plan and were relatively similar to the cost of acquiring 10 Predator UAVs. The proposal was then assessed from the viewpoints of Diplomacy and Development. Canada's future diplomatic efforts in resolving the three big challenges to our Arctic sovereignty can only be aided by the Navy acquiring icebreakers. Finally, managed carefully and with the full engagement of regional leaders, the construction of a FOL in Resolute or Pond Inlet could provide significant benefits to the community as well as the fishing and tourist industries that are strategic development priorities for Nunavut. The purchase of four small, Polar Class 3 icebreakers and construction of an austere FOL in either Resolute or Pond Inlet represents an excellent choice for protecting Canada's Arctic sovereignty.

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