CANADIAN NAVAL REVIEW

VOLUME 18, NUMBER 3 (2023)

WINNER OF THE 2022 CNMT ESSAY COMPETITION

Making the Case for the *Sōryū*-class as a Canadian Procurement Option

NORPLOY '74: A Case Study in Northern Operations

Non-Commissioned Members and the RCN

INTERVIEW WITH CPO1 ALENA MONDELLI

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VOLUME 18, NO. 3 (2023)

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Today's Policy Questions, Tomorrow's Policy Leaders

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- provide a source for the public examination of Canadian naval and maritime history and for the development of lessons learned.

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Credit: Corporal Braden Trudeau, Canadian Armed Forces

*HMCS **Montreal** arrives in Souda Bay, Greece, during **Operation Reassurance** on 14 April 2022.*

Contents

Editorial

Preparing for the Future

(Note: Editorials represent the opinion of the author, not *CNR*, the Editorial Board or sponsors.)

We've discussed 'maritime blindness' in *Canadian Naval Review* on many occasions. It's a common ailment in Canada. A significant proportion of the population, and many elected representatives in Ottawa, are unaware of the importance of the oceans to the country, possibly because they live far away from the coasts. Whether it's obliviousness or willful ignorance is hard to say but the result is the same – Canadians tend to ignore what happens on the oceans. Unfortunately, what happens on the oceans will affect us whether we pay attention or not. Over the years governments have claimed that Canada is interested in what happens in the world. And yet how prepared is the Royal Canadian Navy (RCN) to address future threats at sea?

The maritime arena is becoming more unsettled. Bolivia is fighting Chile in the courts for maritime access. Australia and East Timor have disputed about maritime energy facilities for several years. Israel and Lebanon just settled a longstanding maritime border dispute. France and Britain have an unsettled dispute over fishing rights. In December 2022 Egypt unilaterally delineated its maritime border with Libya, to which Libya objects. China has maritime disputes in the South China Sea with Brunei, Indonesia, Malaysia, the Philippines, Taiwan and Vietnam, and in the East China Sea with Japan.

The Great Pacific Garbage Patch, a huge floating island of plastic in the Pacific Ocean, affects both marine life and navigation. Weather patterns are changing. There will be more frequent and more severe storms in the future. Climate change will affect economies and livelihoods and therefore crime, violence and migration. Canada has been a supportive actor in the aftermath of hurricanes and floods. Is the navy prepared to respond in the future? Canada is being pressured by the United States to lead a response to violence in Haiti. It's a dangerous place with a situation that may not be conducive to outside intervention, and Canada is understandably reluctant to commit forces. Perhaps a naval contingent is the answer. There is a precedent – this past fall, at the request of the government of Turks and Caicos, the United Kingdom sent a warship to assist local police in patrol and surveillance to address gang violence.[1] Would Canada be able (and willing?) to do this?

The global population reached eight billion in November 2022. As the population continues to grow, it needs to be fed and many people rely heavily on seafood in their diets. But global fish stocks are declining and illegal fishing continues to take a heavy toll. Hungry people don't pay attention to quotas. Aggressive fishing fleets – Chinese fishing boats are particularly aggressive – may lead to violent incidents at sea.[2]

Credit: Timothy Choi

*The container ship NYK **Remus** enters Halifax Harbour on 2 June 2022. Many of the items for sale in Canada arrive on container ships via the ocean.*

We have seen in Ukraine that weaponised uncrewed aerial vehicles (UAVs)/drones are now playing a significant role in conflict. Turkey, Iran and Israel are marketing their drones to willing customers. The UAVs work well on land and at sea, and are markedly cheaper than missiles (and fighter jets). The defence against them must develop in parallel.

The Russian Navy has seen firsthand the results of uncrewed surface vessel (USV) attacks. The USVs are fast, stealthy and effective, and their cost is reasonable compared to anti-ship missiles.[3] Indeed, even without a functioning navy, Ukraine has managed to hobble the Russian Black Sea surface fleet and sink its flagship. Ukraine has cobbled together effective USVs using imagination and easily available parts. Russian surface ships now stay close to port and even there they have been attacked. USVs have been less successful neutralizing Russian submarines, but nonetheless even they are at risk in port.

With the sabotage of the NordStream pipelines in September 2022 by as yet unknown perpetrators, the public has become aware of another form of warfare – seabed warfare. This is not new, but what *is* new is the importance of sub-sea infrastructure. This warfare purposely targets underwater infrastructure such as pipelines, communication cables and offshore platforms (eg., wind farms, oil drilling platforms). In addition to the Nordstream sabotage, in 2021 and 2022 sub-sea cables connecting the Svalbard Islands to Norway were cut, and in October 2022 a cable linking Scotland, the Orkney Isands and the Faroe Islands was cut (twice).[4] Navies and coast guards will be expected to defend this infrastructure. The United States, United Kingdom, Norway, France and Sweden, for example, are enhancing their ability to protect offshore infrastructure from sabotage. Sweden has developed a remotely-operated vehicle which can be launched and recovered from a submarine to inspect and investigate undersea infrastructure.[5] In October 2022 the French Navy conducted an operation with an autonomous underwater drone as part of exploratory seabed control capability,[6] and in December 2022, France announced that its navy will lease an Autonomous Underwater Vehicle (AUV) to undertake seabed warfare missions.[7] Is Canada prepared?

The point here is that maritime events which undermine national interests on land and orderly interactions at sea are multiplying. But Canada seems unconcerned. The National Shipbuilding Strategy (NSS) proceeds at a snail-like pace, building a navy that is designed for peacetime (the Arctic and Offshore Patrol Ships) or to fight the last war, not the wars to come. Will the next war at sea involve large warships firing at each other? Possibly. But it is likely that it will also involve the technology we have seen used so effectively in Ukraine. Canada has its Hammerhead target system so it can practice defending against small, fast, possibly explosive-laden surface vessels. But is Canada prepared for warfare that utilizes autonomous UAVs, USVs and uncrewed underwater vessels (UUVs)?

A fleet of Ukrainian 'kamikaze' uncrewed surface vehicles of the type recently employed against Russian naval forces are shown in an undated video filmed at an unknown location.

Like Canada, the US Navy is building ships to fight the last war, but the USN is also building and experimenting with uncrewed vessels. The USN 5th Fleet established an unmanned systems and artificial intelligence (AI) task force – Task Force 59 – in September 2021 to integrate uncrewed systems and AI into maritime operations in the Middle East. To speed up the process, the task force was given a mandate to try different systems and quickly bring them into use in the 5th Fleet. The USN has also been catching up to China and Russia in hypersonic weapon technology. Yes, the RCN has people working on uncrewed systems and AI but is it ready to adopt the systems? Is it preparing to fill looming capability gaps with them?

With the occasional assistance of the *Victoria*-class submarines, the *Halifax*-class frigates are the RCN's workhorses, and the only surface warships Canada currently has. But they were commissioned in the 1990s and are showing their age – and were briefly in an operational pause. The frigates can perhaps be maintained for another 20 years while the Canadian Surface Combatants (CSCs) are built, but it will be a struggle. And even if they can be kept moving and floating, they are near their capacity in terms of weapon upgrades and electrical generation (which limits the upgrades to communications, AI and new technology). The CSCs will be impressive ships when they are incorporated into the RCN in the 2040s, but will they be able to counter the maritime threats that exist then?

What role could the new Arctic and Offshore Patrol Ships (AOPS) play in a more conflictual world? They certainly

Credit: US Navy

A Devil Ray T-38 and Saildrone Explorer, both uncrewed surface vessels being exercised by the US Navy, sail in the Gulf of Aqaba on 10 September 2022 during Exercise Eager Lion 2022.

increase the RCN's ability to operate in the Arctic, although there are still difficulties accessing fuel because Nanisivik is not yet functional. But with their limited weapons could they even counter a fishing vessel that does not want to be boarded?

Bottom line. Maritime challenges are multiplying – boundary disputes, over-fishing/illegal fishing, piracy, human trafficking and massive population movements at sea, climate change leading to severe storms, disruption/destruction of sea-bed infrastructure, aggressive state actors, new technology. Warfare is increasingly hybrid, asymmetrical and technology driven. The RCN needs to have capabilities to address today's challenges, and fight the wars of today and tomorrow. Hopefully the upcoming defence policy review will think beyond what has been done in the past. Is Canada looking into the future and planning for how technology will affect naval warfare? Is there a plan to incorporate autonomous uncrewed systems and AI? Could the RCN fill looming capability gaps with innovative technological solutions? The RCN should not focus all of its energy and budget on duct-taping the frigates while it waits for the CSCs. Other navies are striding ahead to develop capabilities to address new challenges.

Canada has smart people, good educational institutions and excellent technology infrastructure. With this foundation, Canadians should be able to come up with ideas about how to address challenges in the maritime arena. The RCN cannot sit and wait for the CSCs to be built.

The Department of National Defence set up the RCN Innovation Team, and we will await the outcome of that endeavour. But tentative forays into innovation are not enough. The RCN needs to unleash creative minds to prepare for 21st century warfare at sea, whatever it might entail. However, and this is crucial, this would mean acceptance of *real* outside-the-box thinking, not just the appearance of it. And while they are at it, perhaps those creative minds could come up with a more efficient procurement process so that the capabilities for 21st century warfare don't arrive in the 22nd century!

Dr. Ann Griffiths

Notes

1. The Royal Navy was in the Caribbean to assist during hurricane season, and ended up providing assistance to the government of Turks and Caicos. Lisa West, "British Ship Suppresses Gang Violence in Overseas Territory," *UK Defence Journal*, 10 November 2022.
2. For example, in November 2022, off the coast of Ecuador, a Chinese fishing boat tried to ram a US Coast Guard patrol vessel to avoid inspection of its catch. The USCG vessel was forced to take evasive action, and abandon its plan to board the ship.
3. At approximately (US) $275,000 each for the models used to attack the Russian surface fleet, the USVs are reasonable in price. And Ukraine is finding novel ways to pay for the USVs by setting up a Crowdfunding campaign. Nicholas Slayton, "Ukraine is Crowdfunding a Naval Drone Fleet to Repeat its Black Sea Success," *Task and Purpose*, 12 November 2022.
4. Russian 'fishing' vessels were in the area of these latter incidents. Lisbeth Kirk, "Mysterious Atlantic Cable Cuts Linked to Russian Fishing Vessels," *EU Observer*, 26 October 2022.
5. H.I. Sutton, "Sweden's A-26 Submarine Creates New Possibilities for Seabed Warfare," *Naval News*, 16 November 2022.
6. "Mission Calliope: First Seabed Control Operation," *SeaWaves Press*, 21 October 2022.
7. Xavier Vavasseur, "Seabed Warfare: French Navy to Lease Deep Diving AUV from Exail," *Naval News*, 16 December 2022.

Winner of the 2022 CNMT Essay Competition

Making the Case for the *Sōryū*-Class as a Canadian Procurement Option

Jacob Benjamin

Credit: Mass Communications Specialist 2nd Class Chase Stephens, US Navy

*JS **Ōryū**, the eleventh **Sōryū**-class submarine and the first to be equipped with lithium ion batteries, moors alongside the submarine tender USS **Frank Cable** in Guam on 7 September 2021.*

All three of Canada's maritime theatres have security issues that either already exist, like extreme weather events, or are emerging, such as the intensification of state-to-state competition. Russia's aggressive war on Ukraine has kickstarted Canada's North Atlantic allies to increase their respective military contributions. Canada continues to come under scrutiny for falling short of the North Atlantic Treaty Organization's (NATO) stated goal of 2% defence spending as a proportion of Gross Domestic Product (GDP).

This article will argue that the Royal Canadian Navy (RCN) needs new submarines. New submarines could be an upgrade that reassures allies about Canadian commitment to upholding the international security architecture. Canada's current submarines are ageing and lacking in capability compared to those possessed by some NATO counterparts with comparable GDPs. This article will make the case that *Sōryū*-class submarines are the best fit for Canada's needs because of their cost, ability to travel long distances and potential for operations in icy environments due to their air-independent propulsion (AIP) systems, or lithium-ion batteries in the case of the last two-issued *Sōryū*-class submarines.[1]

The Situation

The Arctic will likely become rife with geopolitical competition as the climate crisis intensifies, and jurisdictional uncertainties on maritime claims and boundaries are exacerbated. Russian nuclear-powered ballistic missile submarines, the *Borei*-class, are increasingly active in the Arctic, and US officials seem confident that the People's Liberation Army Navy (PLAN) intends to patrol the Arctic with its respective nuclear submarines.[2] These developments make a strong Canadian naval presence necessary. Problematically, however, a November 2022 report from the Auditor-General's Office titled "Arctic Waters Surveillance" stated that Canadian agencies are not logistically up to the task of adequately monitoring the Arctic.[3] New RCN submarines should be able to enhance Canadian deterrence and surveillance capabilities in Canada's North.

As well, there is the Indo-Pacific theatre, which is vast and maritime-centric, and it is undoubtedly where the most consequential issues of global security will exist in the future. These issues include threats to freedom of navigation, regional naval arms races, maritime disputes in the East and South China Seas, contestation over Taiwanese

sovereignty, and PLAN and Chinese Coast Guard aggression against Southeast Asian vessels.

Canada is increasingly acknowledging the strategic importance of the Indo-Pacific region, and the RCN will play an important role in enhancing Canadian engagement there. The RCN's submarine HMCS *Chicoutimi* spent six months in the region in 2017-2018 to carry out duties as part of *Operation Neon*, Canada's initiative to surveil and enforce UN-mandated sanctions on North Korea. This operation was a successful one for *Chicoutimi*, but all four *Victoria*-class submarines are getting old – they were built in the 1980s. Canadian operations in the Indo-Pacific will likely continue to be maritime-centric, thus conditioning the need for new submarines to cooperate with friends and compete with adversaries. The Indo-Pacific region is far from Canada's shores and would therefore require a large submarine suitable for extra long-range operations.

Ottawa has recognized that Canada is due for naval modernization across the board. The National Shipbuilding Strategy (NSS) released in 2010 was a first step toward this goal. The NSS sets out a plan for the construction of ships for the RCN (and Canadian Coast Guard). The RCN commissioned the first of six *Harry DeWolf*-class Arctic and Offshore Patrol Ships in June 2021. The second ship was commissioned in October 2022, and a third ship is undergoing trials with the RCN. Two Joint Support Ships will be built by Seaspan in British Columbia, and the Canadian Surface Combatant project will produce up to 15 new frigates in contract with Irving Shipbuilding and Lockheed Martin.[4]

While the NSS is a welcome program to recapitalize the RCN fleet, it does not include the construction of new submarines. In 2017, Canada announced a plan for refurbishing and modernizing the *Victoria*-class submarines, with estimates ranging from $1 billion to $5 billion for carrying out this plan.[5] Each *Victoria*-class submarine will receive a life-extension which is designed to allow the boats to last until roughly the early to mid-2030s. By this time, the need for new submarines will be urgent. It is also important to take into consideration that, as we have seen with the ongoing NSS projects, most defence procurement projects are not delivered in the estimated time.[6] Therefore, the time for making decisions on the future of Canada's submarine fleet is now.

Credit: Sailor 1st Class Mike Goluboff, MARPAC Imaging Services

*The **Victoria**-class submarine HMCS **Corner Brook** begins the undocking process following its Extended Docking Work Period at Esquimalt, BC, in June 2021.*

Buying, Not Building

At the time of the First World War, Canadian Vickers Co., in consortium with a US counterpart, built submarines for the UK, Italy and imperial Russia. However, Canadian Vickers stopped building submarines, and hasn't built any since 1918.[7] Thus, Canada has not had the domestic shipbuilding capacity for submarine construction for a long time.

In 1957, under Chief of the Naval Staff Harry DeWolf, Canadian naval officials became supportive of an indigenously-built nuclear-attack submarine. However,

> support began to wane as the huge cost of a nuclear programme became apparent. In February 1959, the first interim report identified massive infrastructure requirements including the provision of shore facilities for refit and refuelling as well as large shore-based Very Low Frequency (VLF) facilities necessary to communicate with a submerged submarine. In March 1959, the Ottawa Journal reported comments by Defence Minister George Pearkes stating that the huge cost was the biggest obstacle to building nuclear submarines for the Royal Canadian Navy.[8]

Canada still does not have the wherewithal domestically to develop and build a submarine whether it is nuclear-powered or diesel-electric. (This is not unique to Canada since most non-great powers lack this capability.) Domestic shipyards like Irving in Halifax could provide lucrative in-service support for modernizing the existing submarines, but Canadian shipyards cannot build new submarines from scratch. Collaborative builds are increasingly the favoured approach, as we can see in the Australia-UK-US (AUKUS) agreement to build nuclear-powered submarines for the Royal Australian Navy – and even this program will be tremendously complicated.

For these reasons, military-off-the-shelf (MOTS) procurement may be the route the Department of National Defence (DND) will take in acquiring new submarines for the RCN. If MOTS is indeed the route for procurement,


Credit: Mass Communication Specialist 1st Class Brian G. Reynolds, US Navy

HMCS ***Chicoutimi*** *prepares to moor at Yokosuka, Japan, on 27 November 2017.*

the question of *how* becomes a question of *what*. What submarine would be a viable option for procurement? In the Arctic Ocean's icy waters, nuclear-propulsion submarines may be technologically advantageous to procure. However, this is unlikely to gain acceptance in Canada because of a lack of experience in this field (Australia's experience will be educational in this), and the reluctance of the Canadian public to adopt nuclear technology despite the critical distinction between nuclear-*powered* and nuclear-*armed* vessels. So, if we set aside nuclear-propelled submarines, what are the options? This article examines the option of procuring the *Sōryū*-class submarine, sometimes referred to as the 16SS, from Canada's Indo-Pacific partner, Japan.

The article will not be so ambitious as to propose that the *Sōryū*-class is necessarily the best procurement option. A final decision would take years and require committees of technocrats, engineers and military officials for proper evaluation. Moreover, rigorous technical verification is required in terms of assessing the compatibility of the *Sōryū*-class with the RCN. The goal of this article is preliminary – it argues that the cost-effective and technologically advanced *Sōryū*-class should receive serious deliberation by those experts tasked with naval procurement.

Built by Kobe's Kawasaki Shipbuilding Corporation and Mitsubishi Heavy Industries, *Sōryū*-class submarines are diesel-electric attack submarines, much like the *Victoria*-class submarines Canada already has. The two classes have roughly the same speed submerged (20 knots), but a *Sōryū*-class submarine's systems are superior in many areas. This is to be expected given that the submarines are much newer than the *Victoria*-class.[9] The first *Sōryū*-class submarine entered into service for the Japan Maritime Self-Defense Force (JMSDF) in 2009, and the last was procured in 2021. There are 12 in the JMSDF fleet. Submerged, a *Sōryū*-class submarine is 4,200 tons, making it around 42 per cent heavier than Canada's *Victoria*-class submarines. They are 84 metres (m) long with a beam of 9.1m. Their estimated range is 6,100 nautical miles at 6.5 knots.[10] Their maximum depth of diving is 650m. The boats operate with a crew of 65, including nine officers.

The *Sōryū*-class submarines are widely recognized as being among the stealthiest in the world, owing in part to their anechoic exterior (i.e., they feature material that deadens sound emissions) and hydrodynamic design which allows for evasion of sonars. Contributing to their undetectability, the submarines are equipped with two Kawasaki 12V 25/25 SB-type diesel engines, and most have four V4-275R Stirling engines that are Air Independent Propulsion (AIP) systems produced by Malmö Sweden's Saab Kockums shipyard.[11] The newest two variants of the *Sōryū*-class – JS *Ōryū* commissioned in March 2020 and JS *Tōryū* commissioned in March 2021 – are equipped with lithium-ion batteries. They are not installed with AIP. While AIP systems are impressive in their own right, lithium-ion batteries are a global first for submarines and enhance an already stealthy submarine through improved durability when submerged.

The main weapons of the *Sōryū*-class are UGM-84 Harpoon anti-ship missiles and the Mitsubishi-produced Type 89 torpedoes. Fixed on the bow and flank, all *Sōryū*-class boats feature Hughes/Oki ZQQ-7 Sonar suite and ZPS-6F surface/low-level air search radars for the detection of adversarial vessels and equipment.

Depending on what weapons and technology are fitted to a particular submarine, the cost of the *Sōryū*-class for Japan ranged from around (USD) $540 million to (USD) $635 million for the final and most advanced edition of the


Credit: Mass Communications Specialist 2nd Class Michael Lee, US Navy

The ***Sōryū****-class submarine JS* ***Hakuryū*** *arrives at Joint Base Pearl Harbor-Hickam on 6 February 2018.*

Credit: Cpl Carbe Orellana, MARPAC Imaging Services

*HMCS **Chicoutimi** escorts a People's Liberation Army (Navy) Type 054A frigate during a Chinese naval visit to Victoria, BC, on 13 December 2016.*

class, *Tōryū*.[12] In comparison, the Australian *Collins*-class diesel-electric submarines cost around $850 million in 1999, which in 2022 real dollars comes to (AUS) $1.5 billion. The US Navy *Virginia*-class submarines, the base model of the AUKUS pact, costs around (USD) $3.6 billion per unit when equipped with the Virginia Payload Module.[13]

Several countries have shown interest in procuring *Sōryū*-class submarines and this should encourage Canadian policy-makers likewise to make inquiries. In 2014 Tokyo ended its export-ban on weapons. A year later, Australia and Japan were deep in talks about Australia procuring submarines. Japan, however, lost this bid to France. Naval Group, then called Direction des Constructions Navales Services (DCNS), received a contract to construct 12 *Shortfin Barracuda* submarines, beating out Japan's bid to produce the *Sōryū*-class. The dramatic ending to that story is well-known – Australia later cancelled the deal with the French in favour of the trilateral AUKUS deal announced in September 2021. While Japan's export endeavour ultimately failed with Australia, the *Sōryū*-class nonetheless received very serious interest in Canberra.

The class has also received interest from Taiwan, Norway, Morocco, the Netherlands and India. India was once in serious consultations with Japan, issuing a Request for Information (RFI) for the *Sōryū*-class.[14] The deal with India did not, however, come to fruition for several reasons. There were incompatibilities on weapons systems and complications relating to President Narendra Modi's 'Make in India' initiative. Some of these obstacles are India-specific rather than issues with the *Sōryū*-class itself. Moreover, when India initially tendered a proposal to Japan in 2015, the institution of Japanese defence exports was still young, meaning that many of the legal intricacies and procedural rules for defence exports had not been hashed out in Japan, and Japanese negotiators were not experienced in military export deals.[15] Finally, it is important to emphasize that it was ultimately the Japanese who lacked interest in selling to India. Mitsubishi Heavy Industries did not meet the deadline to respond to the Indian RFI, and Tokyo was uneasy about the transfer of Japanese technology to domestic Indian shipyards as a byproduct of Modi government policies. In sum, Canada will likely not encounter the same obstacles as New Delhi did in its preliminary consultations with Tokyo and Japanese firms over the *Sōryū*-class.

Japan's defence industry has real potential and is located in a region where Canada needs to step up its presence.[16] In the past, Canadian naval procurement has been oriented on UK and US industries and, while these American and British industries should remain central partners, Canada should seek diversification with Japan's growing defence industry. Establishing deeper ties with Japanese firms such as Mitsubishi and Kawasaki (the manufacturers of the *Sōryū*-class) is an excellent step in that direction. It could be a mutually beneficial relationship as the JSDF could benefit from procuring the Canadian LAV III, a light-armoured vehicle with several customers worldwide.[17] Overall, Canada-Japan defence industry engagement has the potential to grow and benefit both countries.

There is a tertiary benefit to Canada initiating serious consultations with Japan over the *Sōryū*-class submarines. On a political level, Canada has sustained criticism for perceived inactivity in the Indo-Pacific security architecture, while allies and partners are steaming ahead on strategies, deployments and concerted diplomatic initiatives in the region. By consulting Japan on the *Sōryū*-class, Canada would be double-tasking – exploring procurement options while simultaneously making political inroads with a key Indo-Pacific power, like-minded liberal democracy, and capable defence industry that is due to make a splash on international markets.

Moreover, procuring a military-off-the-shelf submarine is not a one-time purchase but requires consistent engagement regarding maintenance, technology and diagnostics for

Credit: Mass Communications Specialist 3rd Class Henry X. Liu, US Navy

*JS **Ōryū** moors alongside the submarine tender USS **Frank Cable** in Guam on 7 September 2021.*


Credit: Timothy Choi

*A pair of **Victoria**-class submarines sit in the water at Esquimalt on 15 November 2022.*

in-service support. This is because submarines have different specifications that are particular to the manufacturer. So, if Canada were to procure the *Sōryū*-class, such a decision would effectively be a business commitment to the Pacific companies Mitsubishi and Kawasaki for decades to come. This business relationship would promote professional development on project management skills, technical knowledge and generally cultivate much-needed know-how on the submarine industry, that would in turn benefit Canadian shipyards. Procuring the *Sōryū*-class would also promote Canadian and Japanese interoperability and joint training. Canada and Japan are already undertaking more joint drills including: the anti-submarine warfare Exercise SeaDragon that takes place off Guam; the JMSDF-hosted ANNUALEX that takes place either in the Philippine Sea or the Sea of Japan; and Indo-Pacific Deployment 2022 which is a cooperative trilateral exercise involving the JMSDF, the RCN and the Royal New Zealand Navy (RNZN).

Conclusion

In conclusion, the *Sōryū*-class has the following redeeming qualities. First, it is cost-effective compared to continuing refurbishment of the *Victoria*-class and other off-the-shelf options, particularly if those options are nuclear. Second, since the Japanese have already constructed the submarines, there will be no need to wait for plans and processes to be developed. This means that Canada could get submarines in a time-frame to avoid a gap between the ageing *Victoria*-class and a new class of submarines. Third, naval experts widely recognize the *Sōryū*-class to be exceptional diesel-electric submarines, with systems that can offset the shortcomings of being non-nuclear. Fourth, the *Sōryū*-class would be suitable for Canadian operations in the Indo-Pacific since it is designed for long-range operations. Canadian naval operations in the Indo-Pacific are likely to increase due to the uncertain state of international security and the acknowledged desire for consistent Canadian presence in the region, which should be made clear in the government's Indo-Pacific Strategy. Fifth, AIP technology and lithium-ion batteries should be workable alternatives to nuclear-propulsion in terms of operability in the Arctic (more experimentation and research is required to gauge viability). Sixth, even though the Japanese defence export sector is young, the *Sōryū*-class has received interest from a variety of countries. There is a good case for RCN procurement of *Sōryū*-class submarines.

Notes

1. More research is needed to conclude that AIP systems are Arctic-compatible, although the impressive durability of the systems indicate good promise for under-ice operations. See Timothy Choi and Adam Lajeunesse, "Some Design Considerations for Arctic-Capable Submarines," North American and Arctic Defence and Security Network, 16 November 2020, p. 2; Lieutenant-Commander Iain Meredith, "Canada's Under-Ice Options: Submarine Air-Independent Propulsion," Canadian Forces College, JCSP 44, pp. 9-10.
2. Adam Lajeunesse and Timothy Choi, "Are Chinese Submarines Coming to the Arctic?" North American and Arctic Defence and Security Network, 19 July 2020.
3. Office of the Auditor General of Canada, *Arctic Waters Surveillance*, Ottawa, 2022.
4. The Standing Committee on Government Operations and Estimates put the project cost at $56 to $60 billion, and the Office of the Parliamentary Budget Officer estimates it will cost over $77 billion. "The Cost of Canada's Surface Combatants: 2021 Update and Options Analysis," Office of the Parliamentary Budget Officer, 24 February 2021, p. 6; Public Services and Procurement Canada, "Defence and Marine Procurement: Standing Committee on Government Operations and Estimates," 24 March 2021.
5. Jeffrey F. Collins, "Deadline 2036," Macdonald-Laurier Institute, September 2021, p. 11.
6. See Jeffrey Collins, "Defence Procurement Canada: Opportunities and Constraints," Canadian Global Affairs Institute, December 2019, p. 1.
7. See "Canadian Vickers," 14 July 2021, available at http://shipbuildinghistory.com/canadayards/vickers.htm.
8. Jason Delaney, "The One Class of Vessel that is Impossible to Build in ~~Australia~~ [sic] Canada," *Canadian Military History*, Vol. 23, Nos. 3 and 4 (2014), p. 262.
9. Note that official sources only provide limited information on the *Sōryū*-class. See Meredith, "Canada's Under-Ice Options," p. 9.
10. *Ibid*.
11. See "Submarine Toryu Launched," Kawasaki, 6 November 2019; "Commission of JS *Oryu* and DDG *Maya*," Ministry of Defense and Self-Defense Forces, May 2020; Franz-Stefan Gady, "Japan Launches 10th Advanced High-Tech Attack Sub," *The Diplomat*, 9 November 2017.
12. Kosuke Takahashi, "Japan Commissions 12th and Final Soryu-class Diesel-Electric Attack Submarine," *Janes*, 24 March 2021.
13. US Congressional Research Service, "Navy Virginia (SSN-774) Class Attack Submarine Procurement: Background and Issues for Congress," 28 April 2022, p. 6.
14. Ankit Panda, "Will Japan's Mitsubishi and Kawasaki Build India's Next Project 75(I) AIP Submarine?" *The Diplomat*, 24 July 2017.
15. Paul Kallender-Umezu and Vivek Raghuvanshi, "Japan Unlikely to Join Indian Sub Tender," *Defense News*, 11 April 2015.
16. Japan has increasingly been focusing on defence because of concerns about China, Russia and North Korea. The defence spending of the country increased by about 1.2% to reach USD $49.1 billion in 2020. See "Japan Defense Market: Growth, Trends, Covid-19 Impact, and Forecasts (2022-2027)," Mordor Intelligence, 2022.
17. David Welch, "It's Time to Think Boldly about Canada-Japan Security Cooperation," *International Journal*, Vol. 74, No. 3 (2019), p. 451.

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NORPLOY ’74: A Case Study in Northern Operations

Cate Belbin and Adam Lajeunesse

Credit: Corporal Simon Arcand, Canadian Armed Forces

*HMCS **Harry DeWolf** makes its way towards Pond Inlet during **Operation Nanook-Nunakput**, on the Davis Strait, 18 August 2021.*

In the summer of 2021 HMCS *Harry DeWolf* made an historic transit through the Northwest Passage. The first Canadian naval vessel to make the trip since HMCS *Labrador* in 1954, the new Arctic and Offshore Patrol Ship’s (AOPS) voyage represented the navy’s long-term ambition to project a purpose-built and sustainable presence in the North. In many respects, the voyage represented the culmination of decades of northern experience and ambition, a long and often circuitous route developing a true Arctic capability. In an attempt to capture how far the Royal Canadian Navy (RCN) has come since its large-scale, multi-ship northern deployments began in earnest decades ago, this article offers a snapshot of one of the largest Northern Deployments (NORPLOYS) from the early 1970s.[1]

Deployed in the aftermath of the US supertanker *Manhattan*’s 1969/70 voyages, NORPLOY ’74 was intended to be a visible demonstration of Canadian sovereignty, while engaging many of the eastern Arctic communities that rarely saw the RCN ensign. Despite the nearly 50-year difference, it is telling that many of the operational and logistical problems encountered in 1974 remain relevant today. Yet, there has also been significant improvement in planning processes, community relations and technology that have made RCN operations more effective and meaningful.

Undertaken between 6 and 29 August 1974, NORPLOY ’74 involved the deployment of HMCS *Preserver* (AOR 510), *Assiniboine* (DDH 234) and *Saguenay* (DDH 206) to the eastern Arctic. The mission objectives were somewhat vague and owed more to the government’s perceived need to respond to growing ‘sovereignty’ challenges than from a major operational requirement. The ships involved were tasked with conducting surveillance in the North and meeting local communities through a series of port visits, all while learning how to operate better in the North.[2] All of these distinct operational tasks fell, in one way or another, under the broader heading of sovereignty. Precisely how NORPLOYs were meant to strengthen sovereignty was never really clear and some in the Department of External Affairs chafed at this imprecise goal. In 1971, Legal Advisor Leonard Legault questioned why Arctic surveillance seemed to have been transformed into some sort of “mystic rite rather than a functional requirement to meet well defined needs.”[3] External lawyer Erik Wang noted wryly that “it would not be long before somebody noticed that one visit of the Governor General, accompanied by an enthusiastic press corps, can provide a sovereign presence … much more effectively” than could any military deployment.[4] However, in the long wake of *Manhattan*’s controversial voyage – which was interpreted as a challenge to Canada’s sovereignty over the Northwest Passage – the image of Canadian warships cruising ‘disputed’ waters provided Ottawa with a valuable political shield with which to defend itself against accusations of inaction or timidity.[5] As such, the NORPLOY mission of “sovereignty through presence” remained an important component of the operation.[6]

That concept of sovereignty was manifested principally through community visits, which offered the RCN an

opportunity both to demonstrate presence and to connect with northern peoples. While it was not spelled out in specific terms, the NORPLOYs certainly demonstrated an implicit recognition that a partnership with the Inuit was important both operationally and politically. Yet, how the navy should connect to northerners remained uncertain.

Planning for these visits began several months in advance and the governments of the Northwest Territories and the Keewatin Region Settlement were given a lengthy opportunity to consider what they might do with the navy. In June 1974, an RCN staff officer conducted a follow-up liaison in a Twin Otter to make community arrangements and to "offer assistance within ships' resources and capabilities."[7] In advance of the mission, the RCN considered this consultation a success, however the degree of engagement remained minimal by modern standards and, as the RCN would discover, it had no real relationships in the region.

The result was a mixed northern reception, defined by curiosity and apathy – hardly a ringing endorsement of Canadian sovereignty. When HMCS *Assiniboine* arrived at Arviat (then called Eskimo Point), the ship's report noted that "no one met the Commanding Officer on arrival, and it was apparent that no one was concerned about the ship."[8] A separate report noted that "it was painfully obvious from the start that no plans whatsoever for the ship's visit had been made by the [Eskimo] Point residents."[9] Part of this was simply poor planning. The residents had other responsibilities; many were managing the community resupply while others were away fishing. There was simply "no understanding of why a ship should visit them for a social visit" or what it might mean.[10] In an overly simple solution that seems to have missed the point, after-action reports recommended that Arviat should simply not be visited again.[11]

Further south at Churchill, the three ships found similar apathy. The report of the squadron commander, Nigel D. Brodeur, noted with "surprise" the low turn-outs and "lack of interest displayed by the local inhabitants," despite "considerable advance publicity."[12] This was not simply an issue with the Inuit population. "A noticeable lack of enthusiasm" was detected across the population and amongst Churchill's authorities. Curiously, this report was in direct contrast to HMCS *Assiniboine*'s report of the same event, which thought that the display was "well received by the community."[13] In fact, the interpretation was a matter of subjectivity as both made assumptions about what the community thought or believed without ever considering meaningful engagement after the fact that might have teased out genuine lessons for the future.

One of the principal lessons taken away from the visit was that far more consultation and planning had to be built into the process. That kind of engagement might have identified certain issues early on. One of the reasons for the local apathy was that the RCN was competing with far more important local activities. At Arviat few residents could spare the time from ongoing resupply efforts, while at Churchill, the three RCN ships occupied important pier space, effectively shutting down port operations and delaying commercial ships, which were forced to sit offshore. In small retribution, a waiting Soviet grain carrier blew grain dust all over the destroyers, to the great annoyance of their commanders.[14] The planning that the navy congratulated itself on was grossly insufficient.

Generating community interest also meant determining why the navy was there and what it had to offer. *Assiniboine*'s mission report noted astutely that "the quick visit with no stated aim other than being visible while satisfying settlement visit requirements is not fully productive." Rather than simply showing up and expecting a warm reception, the navy had to "examine ways of doing meaningful things in the settlements which are of value to us and to the settlements."[15]

Operationally, the voyage was also intended to build RCN capability in the North. That the NORPLOY vessels were thin-skinned and never intended for operations in ice-infested waters was a serious limitation. The weather was extremely unpredictable and the need to avoid ice meant that the accuracy of times of arrival and times of departure were always in question; a lesson learned was simply to avoid those designations. Moving through the ice and around features required the support of a helicopter spotter and *Saguenay*'s skilled reconnaissance was held up as a model example of heli-directed navigation.[16]

Credit: Department of National Defence

*HMCS **Assiniboine** prepares to receive a Sea King helicopter in the North Atlantic, 27 November 1963. **Assiniboine** participated in the NORPLOY '74 operation.*

Credit: Department of National Defence

HMCS ***Preserver****, a participant in NORPLOY '74, sails off Halifax in this undated photo.*

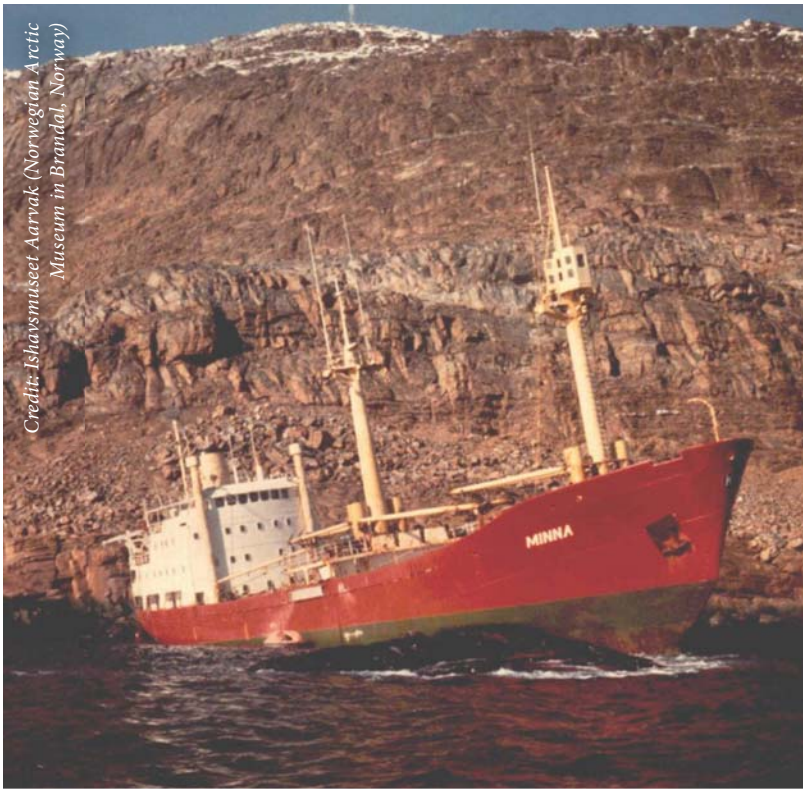
Even more serious than the summer ice was the paucity of reliable charts. At Arviat there were no marked landings or jetties and going ashore was deemed "an awkward undertaking." The charting of the channel leading to the community was, likewise, non-existent and described by *Assiniboine* as "very treacherous to boats without exercising extreme caution."[17] HMCS *Preserver* noted these same "usual" navigational difficulties: poorly charted coastlines; a lack of relief features; few soundings; and "white charts." The approaches to Chesterfield Inlet and Perry Bay, for instance, were white (or blank) charts, described after the fact as "virtually useless."[18]

Even during the operation, this lack of hydrographic information had real consequences. On 23 August, the civilian ship MV *Minna* hit an uncharted feature in Hudson's Bay, lifted and slewed 60 degrees. The crew abandoned ship until it settled. Lightening the ship was not possible since its hold was filled with 400 tons of steel-reinforced concrete blocks. The NORPLOY ships moved to support the vessel but that, in itself, was a danger. HMCS *Saguenay*'s after-action report noted with some concern, "if we'd gone any further west in Hudson's Bay we'd have ended up like the MV *Minna*."[19]

The NORPLOYs were also a process of learning to work around the extreme isolation of the Canadian North. Thousands of miles from Halifax, ships had no protected anchorages and there was a lack of fuel, repair facilities, fresh water and food.[20] Over the course of the operations, the ships gradually worked out which spares and supplies were most vital. Lessons from 1974 included equipping ships with extra gasoline and spare parts (for the ships' boats), as well as outfitting the small boats with more standardized, interchangeable, equipment.[21] Ships had to assume that they would lose small boats. At Chesterfield, for instance, a landing craft was wrecked, and its repair proved vexing without spares.[22] More Arctic clothing, tents, sleeping bags and camping equipment were, likewise, demanded for subsequent years.[23] Even summer in the Arctic can be a hostile environment.

The simple act of communication in the Arctic was also a serious challenge. High Frequency (HF) communications were unreliable with *Preserver* suffering a complete HF breakdown for three days. Satellite coverage was, likewise, missing for large periods of time. And, when American-controlled satellites were available they often were not needed.[24] Ship-to-shore communications also suffered blackouts, a problem that had, historically, put shore parties at great risk. Despite all this, clear progress was being made. Communications with the helicopters was good and the overall system was described as one of the "best ever" for a northern deployment.[25]

In many ways, the early NORPLOYs were an exercise in not only working in the North, but in planning, communicating and supplying a force in a region that was alien to the RCN. The learning process was a long and inconsistent one. Many of the operational lessons observed by the NORPLOY '74 ships dated back to Canadian and American voyages of the 1950s and, following 20 years of



Credit: Ishavsmuseet Aarvak (Norwegian Arctic Museum in Brandal, Norway)

MV ***Minna*** *as seen grounded in Hudson's Bay in 1974, when NORPLOY '74 ships moved to support the vessel.*

NORPLOY operations – which ended in 1989 – much of that corporate knowledge was lost once again.

In the 21st century, the RCN – equipped with far more modern technology – continues to struggle with many of these same operational issues. HF and VHF communications, satellite black-outs and cellular service remained persistent challenges as the RCN re-engaged with these technical issues in the 2000s.[26] Slowly, however, these issues have been resolved – if imperfectly. Cracks remain of course: in 2021 for instance, *Harry DeWolf* discovered that Canadian Ranger communications channels often did not match the ship's VHF. RCMP laptops were also unable to function online while aboard. Still, these were relatively minor irritants. During its 2021 voyage, *Harry DeWolf* found Military Satellite Constellation coverage as far North as 76°N and easy communications to the South and with local assets.[27] Later that same year, HMCS *Margaret Brooke* had surprisingly reliable broadband access.[28]

Slow progress is evident across the board. Arctic landings are still difficult, particularly in uncharted areas. As *Saguenay* found as it damaged an accompanying landing craft on rough beaches in 1974, practice and local knowledge are key to safe operations. In 2021, *Harry DeWolf* found its boat trapped ashore by low tide after the team waited too long to withdraw. The commander noted bruised egos but also lessons learned. Indeed, *Harry DeWolf*'s boats are a radical improvement, purpose-built for Arctic operations and fitted with a full communications, radar and navigation suite that includes an Automatic Identification System (AIS), which reduces the risks inherent in operating in restricted visibility.[29]

Operationally, fuel remains one of the great unsolved issues. Despite the Canadian government's long attempt to bring the Nanisivik refueling station online, the RCN still has no refueling capacity in the Canadian Arctic. This was always one of the greatest challenges to the NORPLOY vessels and remains vexing today. During HMCS *Harry DeWolf*'s 2021 voyage, for instance, it had planned to refuel from a contracted tanker, but that ship failed to arrive on several occasions. The result was the ship sailing on to Alaska without taking fuel. Still, here too are clear signs of true Arctic capability developing. Purpose-built for Arctic operations, the AOPS possess the range to overcome fuel limitations that had limited the RCN's options in the region. *Harry DeWolf* made the transit and arrived at Dutch Harbour, Alaska, with more than a quarter of its fuel remaining – a healthy margin.

The significant improvements made in the AOPS and modern equipment have made northern operations far safer. However, the RCN's most important shift has been in its adjusted attitude to the North itself. In 1974 M.H.D.

Credit: Walter E. Frost via City of Vancouver Archives

*HMCS **Saguenay**, a participant in NORPLOY '74, as photographed in Vancouver harbour, 19 August 1960.*

Taylor, Commanding Officer of the Fifth Destroyer Squadron, identified the need to go beyond "the quick visits with no stated aim other than being visits." These were the community stops which looked good to the politicians and seemed to satisfy a sovereignty requirement but were never really "productive."[30]

As the AOPS enter service, the philosophy behind community engagement has changed dramatically. Rather than a perfunctory call or coordinating visit, the RCN has attempted to build deep and sustainable relationships with local communities to highlight what the RCN is and what it offers the region. Representing this shift, each AOPS is affiliated with a region in the North, with *Harry DeWolf*, the first to deploy, representing the Qikiqtaaluk region. Much deeper collaboration has led to a far better reception to the navy's arrival than in earlier times. Following a great deal of in-depth preparation, *Harry DeWolf*'s visits to northern hamlets were both well received and well attended (in spite of covid precautions). The ship conducted programs to highlight its regional affiliation, while carrying out community engagements at cultural centres and community halls and hosting leadership discussions with Mayors, senior Hamlet Administration Officers and Elders. The ship also offered tours that resonated with residents, with the ship's report specifically noting the positive reaction to the presence of the RCN/Canadian Armed Forces (CAF) and its new partnerships in the North. The measure of success might even have been the noticeable interest amongst community youth in joining the navy.[31]

The relationships that the crew of HMCS *Harry DeWolf* struck in the communities must continue. Engagements must go beyond social engagements and move into actual work onboard ships and on land. Future plans for AOPS in the North should continue to seek opportunities to engage with remote communities as well as seek additional

Credit: Corporal Simon Arcand, Canadian Armed Forces

Defense Research Development Canada (DRDC) members walk on the shore of Devon Island, Nunavut, while making their way to the DRDC camp during ***Operation Nanook-Nunakput****, 27 August 2021. HMCS* ***Harry DeWolf****'s landing craft is seen in the water.*

community/capacity-building opportunities. Meanwhile, a genuine effort to listen to northern communities and accommodate their needs has meant better results than the short briefings given to sailors in 1974, as a means of giving those crews "social credibility with the Inuit."[32]

As William H. Whyte, an American sociologist and analyst, once said, "the great enemy of communication, we find, is the illusion of it. We have talked enough; but we have not listened."[33] Much of the confusion over sovereignty and the RCN's presence and role from this case study in 1974 can be chalked up to communication. There were letters and meetings to outline schedules but no relationship building or efforts to understand local conditions or needs. The RCN's ability to extend its fuel, build stronger ships and improve communications will facilitate a great deal of Arctic activity, but learning to engage in the North will have a far greater long-term return. And, in this, there has been real progress.

Notes

1. A list of these deployments can be found in Michael Whitby, "Deployments by Ships of the Royal Canadian Navy into Canadian Northern Waters, 1949-2014," *Canadian Naval Review, Broadsides forum* (November 2014).
2. "Report of Northern Deployment, 1974," LAC, RG 24, file 3250-NORPLOY 2 (75).
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4. E.B. Wang, "The Role of Canadian Armed Forces in Defending Sovereignty," 30 April 1969, introduced/edited by P. Whitney Lackenbauer, *Journal of Military and Strategic Studies*, Vol. 11, No. 3 (2009), pp. 22-23.
5. For more on the voyage of *Manhattan*, see John Kirton and Don Munton, "The Manhattan Voyages and their Aftermath," in Franklyn Griffiths (ed.), *Politics of the Northwest Passage* (Kingston: McGill-Queen's University Press, 1987).
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7. *Ibid*.
8. Commander 5th Cdn Destroyer Squadron, "Post Deployment Report – NORPLOY '74 Phase I, Annex C" (21 August 1974), LAC, RG 24, file 3250-NORPLOY 2 (75).
9. *Ibid*.
10. *Ibid*.
11. M.H.D. Taylor, "Post Deployment Report – NORPLOY 74 Phase I" (21 August 1974), LAC, RG 24, file 3250-NORPLOY vol. 3.
12. "Report of Northern Deployment 1974" (23 December 1974), LAC, RG 24, file 3250-NORPLOY vol. 3.
13. These two reports are held as separate appendices in "Report of Northern Deployment 1974" (23 December 1974), LAC, RG 24, file 3250-NORPLOY vol. 3.
14. "Report of Northern Deployment 1974" (23 December 1974).
15. Taylor, "Post Deployment Report – NORPLOY 74 Phase I."
16. *Ibid*.
17. *Ibid*.
18. *Ibid*.
19. "Post Deployment Report, HMCS *Saguenay*" (21 August 1974), LAC, RG 24, file 3250-NORPLOY vol. 3.
20. Commander 5th CDN Destroyer Squadron, "Post Deployment Report – NORPLOY '74 Phase I, Annex D."
21. "Report of Northern Deployment 1974" (23 December 1974).
22. Taylor, "Post Deployment Report – NORPLOY 74 Phase I, Annex H" (22 August 1974), LAC, RG 24, file 3250-NORPLOY vol. 3.
23. Taylor, "Post Deployment Report – NORPLOY 74 Phase I, Annex G" (22 August 1974), LAC, RG 24, file 3250-NORPLOY vol. 3.
24. Taylor, "Post Deployment Report – NORPLOY 74 Phase I, Annex H."
25. "Report of Northern Deployment 1974" (23 December 1974).
26. Adam Lajeunesse, "The CAF Returns to the Arctic, 2000-2006," in Adam Lajeunesse and P. Whitney Lackenbauer (eds), *Canadian Armed Forces Arctic Operations, 1941-2015: Lessons Learned, Lost, and Re-Learned* (Fredericton: Gregg Centre, University of New Brunswick, 2017).
27. "After-Action Repot, HMCS *Harry DeWolf* deployment on Operation *Nanook* 2021."
28. Presentation from HMCS *Margaret Brooke* to the Students at Sea Program (2021).
29. Corey Gleason, "HMCS Harry DeWolf Transits the Arctic," *Canadian Naval Review*, Vol. 18, No. 1 (2022), p. 6.
30. Taylor, "Post Deployment Report – NORPLOY 74 Phase I" (21 August 1974).
31. Operation Nanook 2021, draft operational report.
32. "Report of Northern Deployment 1974" (23 December 1974).
33. William Hollingsworth Whyte, "Is Anybody Listening?" *Fortune*, September 1950.

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Non-Commissioned Members and the RCN

Interview with CPO1 Alena Mondelli

On 23 November 2022, *Canadian Naval Review* sat down with Chief Petty Officer 1st Class (CPO1) Alena Mondelli to talk about the Royal Canadian Navy (RCN) and its Non-Commissioned Members (NCMs). CPO1 Mondelli is currently Maritime Forces Atlantic Formation Chief Petty Officer. This interview has been edited for length and clarity.

CNR. Thank you for meeting with me. Let's start with a question about your experience. Why did you join the Canadian Armed Forces as an NCM?

CPO1 Mondelli
At the time I joined up (in 1991), I had no concept of military rank structure and that there even was one, let alone know the difference between an officer and an NCM. I only wanted to join. I was 18 and had just graduated from high school with a grade 12 general diploma. If I had graduated with an advanced diploma, I would have had the courses necessary for college or university. When I began my recruiting process in August 1991, one of the elements of the recruitment process I had to complete was the Canadian Forces Aptitude Test (CFAT). Based on my CFAT scores, I was offered about seven or eight different occupations. It was explained to me that they were the only ones I had an aptitude for, and I had to choose my top three. Naval Radio Operator was my #1 choice and was the occupation I was selected for when I enrolled on 1 November 1991.

CNR. Have there been officers who have tried to influence you to make the change to become an officer?

CPO1 Mondelli
The first time I was asked if I would consider becoming an officer was when I was a Leading Seaman (now called Sailor 1st Class) onboard HMCS *Thunder*. I was the Leading Seaman of Telecommunications (LSTEL) for the small vessel. The small crew meant my primary role was to be a leader and sailor with communications sometimes being my tertiary role. My Commanding Officer at the time convinced me that I needed to be an officer. When I agreed, he contacted the Base Personnel Selection Officer (BPSO) on my behalf, and we were very quickly told 'no' as I didn't have an undergraduate degree. My only option was to pursue education on my own time and try again later.

Between the rank of Petty Officer 2nd Class (PO2) and up to my first posting as a Chief Petty Officer 1st Class (CPO1), several of my Commanding Officers and senior officers around me did their best to try and convince me to commission. In 2008, after receiving my MA in Leadership through Royal Roads University, I began looking at two specific officer occupations: Personnel Selection Officer; and Training and Development Officer. I took time to really reflect on my decision and I ultimately chose to stay an NCM. At that time I had completed almost 17 years of service and I looked at my remaining time left to serve and compared that to how I would be able to contribute to the Canadian Armed Forces (CAF). Ultimately, I decided that as an officer I could have possibly made it to the rank of Lieutenant-Commander – maybe. As an NCM, I knew I wanted to be a CPO1. I also knew, through experience

Official portrait of CPO1 Alena Mondelli, taken 2 July 2021.

watching the CPO1/Chief Warrant Officers (CWOs) around me, that the sphere of influence of a CPO1 to initiate change within the RCN and CAF is far greater than that of a Lieutenant (N) or Lieutenant-Commander. I made my choice and decided to remain an NCM.

CNR. You've been in the RCN for a while now, have the thought processes and the institutional processes to become an NCM changed since you joined?

CPO1 Mondelli

I would say that, although the process to recruit an NCM is the same as when I first joined, the role – especially of the senior NCMs – and definition of what an NCM is have evolved. In today's CAF, NCMs share leadership responsibilities and are required to master skills and gain knowledge of the theory of conflict along with the technical knowledge of their occupation. NCMs are now considered professionals within the Profession of Arms. In previous decades, the role of decision-maker was held by the professionals, or officers, and the applied technical role was held by the NCMs.

Today, the requirements to become an NCM are pretty much the same as 30 years ago. Most NCM occupations require applicants to have a grade 12 diploma and there are still several that only require grade 10. The difference between when I joined and now is that when I joined only officers were considered professionals because of their education and experience. The situation resembled what Samuel P. Huntington described in his book *The Soldier and the State* published in 1957.[1] In 2003, with the publication of *Leadership in the CF: Duty with Honour*, that view evolved as NCMs were officially defined as also being professionals.[2]

I remember attending a financial lecture during my first few months in Esquimalt as a young sailor, and the CPO1 who gave the lecture told us all how he only had a grade 7 education and was given the option of either joining the military or going to jail. I remember wondering to myself at the time: 'how could this person function in life with only grade 7? And, he's a senior rank.' I didn't realize it until later, but that Chief was a lesson about personal and professional development.

CNR. I know it'll be different for differing divisions within the NCM ranks, but in general terms what kind of education and training do NCMs receive?

CPO1 Mondelli

All NCMs start their career with their initial socialization of becoming a military member with Basic Recruit Training (BRT). Upon successful completion of basic training, they're then sent to their various elements and bases to conduct their initial occupational training. As

*HMCS **Thunder**, a **Bay**-class minesweeper, sails off the British Columbia coast in this undated photo. CPO1 Mondelli served as the ship's Leading Seaman of Telecommunications.*

they progress through their occupations, they are then provided more training in order to become functional at each level. Technical occupations will mostly likely have several years of formal post-secondary education and training at the front end of the technical/mechanical career path, while operator occupations will only have several months of training within their respective occupation schoolhouse.

As NCMs progress throughout their careers, they're also provided a Professional Military Education (PME) that is interwoven throughout the leadership courses offered between developmental periods (DP) 2 through 5. These include the Primary Leadership Qualification (PLQ), the Intermediate Leadership Programme (ILP), Advanced Leadership Programme (ALP), Senior Leadership Programme (SLP), and Senior Appointment Programme (SAP). There are several other education programmes offered by the CAF for succession managed NCMs[3] including the Osside Institute Professional Education Program (OIPEP) at CMR Saint Jean, and the Non-Commissioned Member Executive Professional Development Programme (NEPDP) at RMC Kingston. At the end, the OIPEP provides PO1/WOs with a certificate in International Studies, and NEPDP provides CPO1/CWOs with a certificate in either General Military Studies or Advanced Military Studies depending on the level of PME they've completed prior to the programme.

CNR. Has this education and training evolved over the years? How?

CPO1 Mondelli

Training has evolved to meet up with the complexities of the systems and overall battlespace NCMs must be

Credit: Royal Roads University

An undated photo of Hatley Castle at Royal Roads University, from which CPO1 Mondelli received an MA in Leadership.

effective with and within. The same can be said for education. In order for NCMs to be institutionally proficient, relevant and effective within the scope of their influence at their leadership level, their intellectual, analytical and reasoning skills must also be further developed. This is why CAF-provided OIPEP and NEPDP opportunities exist. Should an NCM want to take advantage of self-development opportunities on their own, there exists an educational expense reimbursement programme providing funding to CAF members upon successful completion of their course or programme.

CNR. Why do you think it's important for NCMs to pursue their education during their careers?

CPO1 Mondelli

Education provides an added layer of knowledge, reasoning and critical thinking that can further enhance the 'leadership toolbox' of NCMs, especially as they progress to the higher ranks and become leadership team partners. In those leadership relationships, NCMs are an essential element in providing advice to their leadership partners, as well as influencing those higher and lower in rank than them within their spheres of influence. At the end of the day, professional development and academic advancement of NCMs provide important value to the CAF, as those elements bring the fresh ideas, critical thinking and deeper outlooks required by modern and effective professional armed forces.

CNR. Are there barriers for sailors to pursue education/training while they are in the service? What are they?

CPO1 Mondelli

There is the barrier of time. The Distance Learning (DL) portions of the ILP/ALP/SLP/SAP series is time consuming, despite the mandated one day a week they're required to work from home over the duration of the DL. Other than PME, OIPEP and NEPDP, all other self-pursued education is done outside of working hours – in other words, on their own time. This will also have an impact on work-life balance.

There is also the barrier of resources. The Defence Learning Network, although evolving, hasn't always been user friendly and sometimes is very difficult for personnel to navigate through. Connectivity while deployed, even when home, can also be a barrier as not everyone will have access to DWAN resources, etc.

CNR. Tell me about deployments. How often would NCMs be deployed? And how would this affect their lives?

CPO1 Mondelli

This is a subjective question, and a sailor will give you a different answer than a soldier or aviator. For the RCN, whenever a ship is at sea, it is technically conducting naval operations even if it isn't a named operation or deployment. This affects the lives of crew members as it then has an impact on work-life balance. When sailors are home, they want to spend time with their families or recharging. They don't necessarily want to spend their time on the external pursuit of education outside of provided PME.

CNR. Obviously recruitment and retention are key issues being faced right now in the Canadian Armed Forces as a

whole and the RCN specifically. How will issues of recruitment and retention affect training and education of NCMs?

CPO1 Mondelli

I personally can't say much on this question other than provide my opinion. Currently the various Commands, and specifically Chief Military Personnel, are looking at ways of removing barriers for both recruitment and retention, including the RCN. How this will affect both training and education is yet to be seen. I am looking forward, though, to discussions on both topics, especially on retention as for many years the focus has only been on recruitment.

CNR. Technology has certainly changed significantly over the past 20 years. I would imagine that some of the changes to NCM education and training would relate to evolving technology. I'm thinking specifically about unmanned/uncrewed systems and Artificial Intelligence. Will this affect NCM training and education?

CPO1 Mondelli

This will absolutely affect NCM training and specifically what NCMs will be trained in. I know this has already started with uncrewed systems we currently use. I feel the larger piece at play here is how technological changes have forced us to look at our current occupations themselves to determine if the tasks and jobs that define the occupation are still relevant. For the RCN, this can be seen with the recent decision to eliminate the Steward occupation. As well, there is an occupational analysis being conducted in which naval managed combat-focused occupations are being reviewed and potentially restructured to meet the forces' future needs. If a new occupation is created, training and education for that new occupation will also need to be created.

CNR. The rank titles were changed a few years ago to make them more gender neutral. How did this come about, and how has the transition gone?

Credit: Cpl Hugo Montpetit, Canadian Forces Combat Camera

*Members from Fleet Diving Unit (Pacific) and HMCS **Brandon** deploy REMUS 100 uncrewed underwater vehicle as part of Exercise Arctic Edge 22 in Juneau, Alaska, on 4 March 2022. NCM training on these and other new technologies is becoming more important.*

Credit: Royal Canadian Navy

A pair of Sailors 1st Class inspect diving equipment during Exercise Cougar Gauntlet, May 2022, somewhere along the Canadian Pacific coast.

CPO1 Mondelli

Approximately 18,000 personnel responded to an RCN survey asking to chose new English rank designations for its junior ranks. The Commander RCN and the RCN Command Chief Petty Officer at the time listened to the voices of the Master Seaman and Below ranks. This resulted in the more gender-neutral terms currently used – i.e., from Ordinary Seaman, Able Seaman, Leading Seaman and Master Seaman to Sailor 3rd Class, Sailor 2nd Class, Sailor 1st Class and Master Sailor. To determine how the transition has gone, it's best to ask those affected. I do know that there are those not within the junior ranks who have different opinions on the subject. Regardless, a decision was made, and we follow our orders. For my part, I welcome the change. The old rank titles represent a time that no longer reflects our current RCN demographic. For me, it was the reason why I could never really identify with them. The change of titles is a perfect example of policy evolution we need to see in the RCN and CAF.

CNR. As the RCN tries to adapt to demographic changes in society and to technology, will this have an impact on the identity and cohesion of the navy?

CPO1 Mondelli

This is a deep question and could be the subject of an entire research thesis. These changes will have an impact if those currently within the RCN do not embrace the change happening around them. If current RCN members can't let go of the past, the old ways of doing things that are no longer relevant, safe, or culturally acceptable, then they become part of the problem. When those who want the change are met with these resisters, there will be a clash. This can have an impact on productivity, innovation and overall morale.

CNR. Anything else?

CPO1 Mondelli

One thing I would like to see is combined officer and NCM Professional Military Education starting at the DP 3 level with a focus on transformational, values-based leadership. So much of what we do and learn is done in rank silos. We don't fully understand how to be effective leadership team partners because we don't learn key leadership pieces together.

CNR. Thank you very much for taking the time to sit down with me and share your expertise. I really appreciate it.[4]

Notes

1. Samuel P. Huntington, *The Soldier and the State: The Theory and Politics of Civil-Military Relations* (Cambridge, MA: Harvard University Press, 1957).
2. Department of National Defence, Canadian Forces Leadership Institute, *Duty with Honour: The Profession of Arms in Canada*, Government of Canada, Ottawa, 2003/2009.
3. For clarification, CPO1 Mondelli later provided the following explanation: "Starting at the beginning of DP3, most elements have some form of succession planning programme where succession planning is a subset of career management that is intended to establish a talent pool of future leaders with the potential to succeed to higher, institutional, leadership roles."
4. If you want to learn more, see CPO1 Mondelli, "Non-Commissioned Members as Transformational Leaders: Socialization of a Corps," *Canadian Military Journal*, Vol. 18, No. 4 (Autumn 2018), pp. 26-32.

Making Waves

(Note: These commentaries represent the opinion of the authors, not of *CNR*, the Editorial Board or sponsors.)

Addressing the Naval Procurement Problem

Hugh Segal

The challenges that seem to bedevil naval procurement in Canada – the slow decisions, the endless process that produces those decisions and the seemingly too relaxed process of delivering on those decisions – are not sufficiently discussed as core failures of federal government operations.

This is not about any one series of surface or undersea platforms, or any single procurement that seems abnormally delayed. This is about why Canada does this so badly and so much more slowly than its significant NATO partners such as Germany, France, the UK, the United States, the Netherlands, and non-NATO friendly countries like Japan, Israel, South Korea and Australia. And Canada has done so on a consistent basis since 1993. When you take a three-decade period in recent history, during which naval procurement has been unduly delayed, you build a serious and dynamic challenge to the deployable effectiveness of the Canadian Armed Forces overall, and the Royal Canadian Navy (RCN) specifically.

One can understand why elected politicians who were part of that delay, and the various interest groups who sincerely prefer social spending to defence investment, are not eager to have any retrospective analysis of procurement delays. But that does not exclude the rest of Canadian society and media from pursuing the 'whys and wherefores' of how the endless delays took place and continue still.

Our national challenge is to try and understand the particular mix of politics, public administration, naval specification and private sector capacity that makes our process so tardy. The notion that it takes a full decade or more for a supply ship – essential to fleet operations on all three Canadian coasts – to be at the point of cutting steel is simply outrageous. That it took Canada over a decade to decide which fighter aircraft to purchase to replace the CF-18 fleet that itself has served for decades – at least one decade longer than normal steel fatigue issues would have emerged – is also a travesty. The endless and politically influenced and deferred decision on the Sea King helicopter replacement is another compelling example of institutional dither.

Partisans may wish to blame these endless delays and snafus and the concurrent gaps in Canada's deployable armed capacity on one political party or another which has formed a government. That sort of blame game would

Credit: Timothy Choi

A CH-148 Cyclone performs a demonstration near HMCS ***Edmonton*** *on 15 November 2022. The Cyclone replaced the Sea King helicopter after a procurement effort spanning several decades.*

Credit: Corporal Eric Chaput, Canadian Armed Forces

CF-18 Hornets take off from Mihail Kogalniceanu (MK) Air Base in Romania to return to Canada during ***Operation Reassurance****, 1 December 2022.*

be shallow, unfair and counterproductive. The challenge of failed or delayed procurement is more the result of a confluence of politics, public service culture and regional economic competition within Canada than the fault of a particular political party. It is also the result of no real sense of urgency since the federal election of 1993, among politicians and bureaucrats.

This was not the case for some earlier governments. For example, Canadian Prime Ministers Louis St. Laurent (Liberal) and Brian Mulroney (Progressive Conservative) and their governments made efficient and timely procurement decisions with respect to naval and armed forces requirements. And they did so consistently while in office. Pierre Trudeau's government (1968-1979; 1980-1984) was responsible for the CF-18 procurement itself. Between the decision that a new aircraft was required and the arrival on Canadian soil of the new CF-18s, five years passed. We would be lucky to get to stage 1 of a military procurement process in five years (and much longer for the navy) these days.

Louis St. Laurent, instrumental in the shaping and launch of NATO, ensured Canadian fighter aircraft, with nuclear-tipped rockets, were in Europe to support NATO. Brian Mulroney agreed to continue with the second batch of frigates in the Canadian Patrol Frigate Project initiated by the preceding government, doubling Canada's naval capacity efficiently. And to be fair, Prime Minister Stephen Harper moved swiftly to purchase five Globemaster C17 jet transports, essential to moving Canadian forces quickly around the world with necessary equipment.

But on the issue of naval procurement, there is no adverb beyond *lethargic* to describe how protracted and delayed Canada's procurement decisions and execution have been. If DND is not to stand for Department of National Dithering rather than the Department of National Defence, it is time we had a strong and frank national discussion on the defence procurement decision process. In that discussion we need to determine why the process is so long and protracted and, most importantly, how it can be made more efficient. As it follows that the decision to procure new ships results from the ageing beyond refit of key parts of the existing fleet, delay is both an expensive and dangerous option. Fortunately, the newest Minister of Defence, Anita Anand, seems disposed to take this challenge on.

At a recent version (25 October 2022) of the annual Defence Procurement Conference sponsored by the Canadian Global Affairs Institute there was an exchange between participants on a particular panel, including present Canadian government procurement officials, that was truly sobering. The discussion, reflecting two emergency periods in the last 36 months – first, the acquisition of personal protective equipment (PPE) at the outset of the pandemic, and second since the Russian invasion of Ukraine, on supplying and procuring military and other needs for Ukraine's defence – was both measured and reasonable. Where the gauze begins to cloud the clarity of mission is around the panoply of priorities such as sustainability and generating economic and social benefits to Canada from military procurement. The process truly begins to clog up when discussing the many stages of careful analysis and cross-sectoral implications of design and precise system requirement activities that precede actual contract award and, by many years, cutting steel for actual platform delivery. The many different variables, nuances and capacity analysis pieces could and perhaps should form the basis for a doctoral thesis. A scholar, however, might seek to avoid the level of complexity described by the senior public servants actually charged with working with the private sector to provide the required naval platforms. If they did so, it is likely that their doctoral dissertation would be submitted long before any ship is actually delivered.

The loyalty, professionalism, sense of public service and commitment of the Assistant Deputy Minister (ADM)

level panelists is not in doubt, nor is their expertise or experience. Their professionalism, devotion or expertise are not at issue. What is compellingly missing is any sense of urgency. In fact, a specific question from the floor about gearing up to a 'war footing' was not embraced in any meaningful way by the expert panelists. As several of the panelists had their own experience in the military, their determination to serve the women and men in uniform with the right kit in a reasonable timeframe is a given.

At this time we are seeing an expansive and modernized Chinese naval presence in the Pacific and an enhanced Russian offensive capacity in its own Arctic territory, not many miles from Canadian Arctic waters and landmass. With this, plus the heightened tensions over Ukraine and China's professed interest in building an icebreaker fleet capacity aimed at the Arctic, there has been no period when international tensions have been more fraught since the fall of the Berlin Wall in 1989. There are very few Canadians who would knowingly approve sending our sailors out, not only in ships that are out of date, but to face, for example, newly constructed high-tech naval platforms of the Chinese People's Liberation Army Navy (PLAN) with their superior capacity in terms of speed, manouevrability and firepower.

While history is not predictive, it can be informative. In the early days of World War II, after Winston Churchill had become Prime Minister in 1940, the UK was facing a heightened and deployed German war capacity on the land and in the air in Europe and over Britain. It was also dealing with a failure to expand its own defensive and deterrent capacity under the previous 'peace in our time' government of Neville Chamberlain. A radical departure in the ways things were done was clearly required. Churchill worried that the Whitehall approach to urgent military needs was simply too relaxed.

He put his 'Action this Day' exhortation into immediate effect with respect to the defence of British skies from the deadly onslaught of the Luftwaffe by radically changing the approach to aircraft production. Churchill appointed Lord Beaverbrook, a Canadian newspaper mogul resident in the UK, to take over as Minister of Aircraft Production. Lord Beaverbrook radically redesigned the production process and measurably expanded aircraft production. It was a process that would continue throughout the war, generating the fighter aircraft that UK, Commonwealth and Polish pilots used to win the Battle of Britain.

The similarities between our strategic context today and that faced by Britain after Germany's invasion of Poland and France can be over-stated. But what the UK faced in a dictatorial European power which was laser focused on territorial expansion is not completely disconnected from the kind of threat the West is facing from Russia and could face from China.

Moving through our naval procurement cycle without urgency, and leaving the process-obsessed stately advance uninterrupted by a genuine war footing, continues the historical premise of 'steady as she goes.' But that lack of urgency, despite the courage, training and determination of Canada's sailors, can never produce a Royal Canadian Navy that can deliver on its motto of Ready, Aye, Ready.

Credit: Canadian Global Affairs Institute

Retired Canadian Lieutenant-General Michael Day speaks with General Wayne Eyre, Chief of the Defence Staff, during the 25 October 2022 Canadian Global Affairs Institute Defence Procurement Conference.

Achieving a More Balanced and Affordable Fleet

Roger Cyr

At the start of World War II in 1939, the Royal Canadian Navy (RCN) consisted of 13 combat ships. Six years later in 1945, when the war ended, it comprised over 450 ships.[1] Of course, the ships of those days did not reflect the superior technology of today's ships. But, then again, the shipyards that built them did not have the industrial capabilities of today's yards. During the war Canada truly achieved what seems to be the impossible. Yet today it appears to take six years to build four ships.[2]

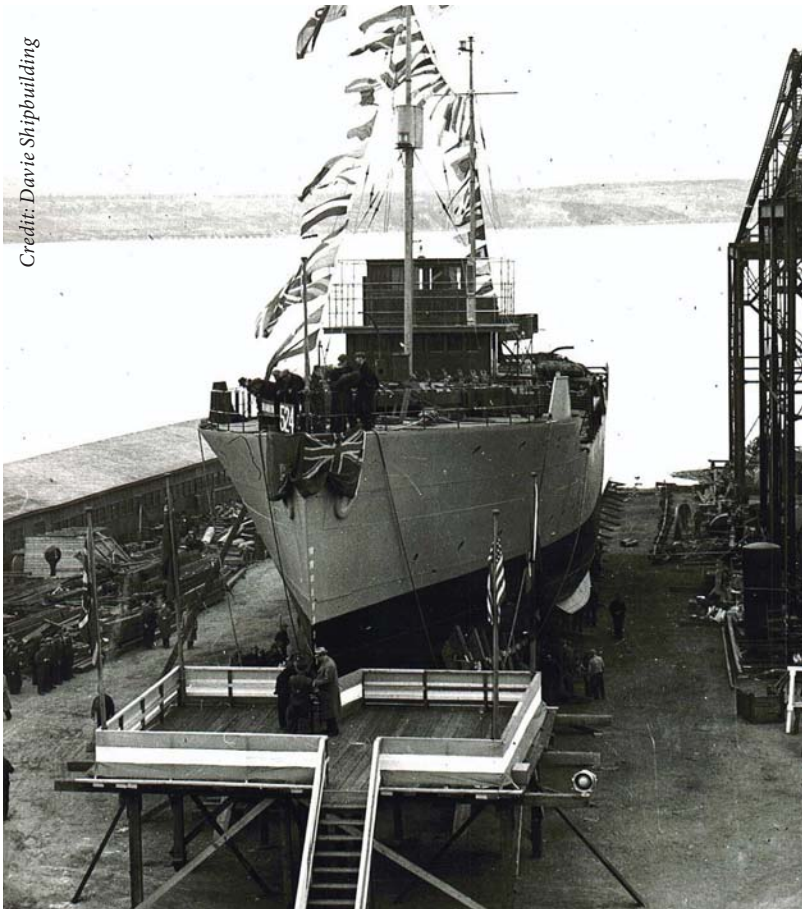
In the war years, there were stressful, challenging situations and limited resources – and there was an urgent need for patrol and escort ships. Canada is not at war today, but the world is nonetheless in confusion. According to UN Secretary-General António Guterres, "[w]e are gridlocked in colossal global dysfunction," adding that "our world is in peril – and paralyzed."[3]

Canada is a maritime state bordering on three oceans and it must have maritime forces at its disposal that are ready and able to deliver in the event of hostilities across the spectrum of naval operations. The navy's mission is to generate combat-capable, multi-purpose maritime forces that support Canada's participation in security operations anywhere in the world. Yet it is doubtful the navy is capable of conducting its mission today given how it is equipped.

In the near future, the RCN will operate 30 surface ships. They are: 12 *Halifax*-class frigates; 12 Maritime Coastal Defence Vessels (MCDV); and six Arctic and Offshore Patrol Ships (AOPS) (of which three are now built and three more are to come). Of the 30 surface combatants, 18 are not fitted with naval weapons and are certainly not combat capable. The navy also operates four used *Victoria*-class submarines, and it will acquire two Joint Support Ships by 2027. So Canada now has 12 combat-capable frigates to meet its combat mission requirements. As a comparison, the Chinese navy has some 500 combat-capable warships, and the US Navy assessed the number of ships needed to meet its mission requirements to be 373.[4]

The 12 frigates are not enough to carry out the RCN's mission. The navy needs more and more capable ships, fitted with up-to-date combat systems. It must have the multi-function ships that the navy had in WWII. A balanced and cost-effective fleet needs to be created.

On the horizon there is the replacement of the existing 12 *Halifax*-class frigates with the construction of 15



Credit: Davie Shipbuilding

*A **Flower**-class corvette about to be launched at Davie Shipbuilding during the Second World War.*

Canadian Surface Combatants (CSCs) based on the design of the UK's Type 26 frigates. However, the project is behind schedule and its cost keeps growing. The ships were originally expected to cost (CDN) $14 billion (B). Currently, the government estimates the cost of the CSC project could be up to $60B. However, the Parliamentary Budget Office estimates the fleet of new frigates will cost $77.3B to build – which will reach $84B due to ongoing delays.[5] This amount is for the design and build of the frigates, it does not include life-cycle costs.[6] This works out to over $5B for a single frigate with a displacement of 8,000 tonnes. The Royal Navy's latest aircraft carrier, HMS *Prince of Wales*, cost (GBP) 3.1B ($4.7B Canadian), and it is a ship with a displacement of 65,000 tonnes.[7]

So far, the Canadian government has issued a contract to Irving Shipyard to build only the first three frigates.[8] The 15 CSC project is ambitious and expensive, and given the cost and delays, the government is likely settle for a lesser number of new frigates.

Should there be a reduced number of new frigates, then the surface units would be composed of several frigates,

An April 2020 rendering of the Type 31 ***Inspiration****-class frigate being built for the Royal Navy.*

the six AOPS that are Arctic capable but not fitted with naval combat systems, and the 12 MCDVs that are commercial-standard ships and not fitted with weapon systems. To compensate for a lower number of CSC frigates, it would become imperative that the MCDVs be replaced with smaller and less expensive warships that would be able to carry out all naval missions. These ships should be of moderate size and be armed with guns, surface-to-surface missiles, surface-to-air missiles and anti-submarine weapons.

A prime candidate for Canada should be the Type 31 frigate or *Inspiration*-class frigate (formerly known as the General Purpose Frigate (GPF)). It is a planned class of frigate intended to enter service with the Royal Navy alongside the Type 26 or *City*-class frigate. The Type 31 is a light, flexible and affordable frigate. The crew size is estimated at around 100, with space for 40 more personnel. The export version is being bought by Indonesia and Poland.[9]

To compare, the CSC frigate will have a displacement of 8,000 tonnes, a complement of 210 personnel, and an estimated cost of (CDN) $5B each. The Type 31 will have displacement of 5,700 tonnes, and a complement of 100 personnel. With design and program costs added, it is expected that the Canadian cost would be $1B each.

Three CSC frigates would cost $15B. Adding 12 Type 31 frigates would cost $12B, which would bring the total for new frigates to (CDN) $27B, as compared with the acquisition of 15 CSC frigates at (CDN) $84B. With the mix of Type 26 and 31 frigates, all the missions assigned to the navy would be achievable. Also, the Type 31 will require less than half of the personnel needed to sail the CSC. This should ease the navy personnel shortages, because the change from the full 15 CSCs to 12 Type 31s would mean a personnel requirement reduction of about 1,000 people. Since they are technologically advanced, the Type 31 frigates would facilitate the introduction of reserve sailors to state-of-the-art combat systems. Hence, with the mix of CSCs and Type 31 frigates, the cost would go from (CDN) $84 to $27B, thus a possible saving of $57B.

There would then be ample funds available to replace the four existing *Victoria*-class submarines that were built in the 1980s. Assuming a decision is made to replace the submarines and given likely objections to a nuclear-powered option, there are some good non-nuclear options available such as the German Type 212. This type of submarine features diesel propulsion and an additional air-independent propulsion (AIP) system of compressed hydrogen fuel cells. The submarines can operate at high speed on diesel power or switch to the AIP system for silent slow cruising, staying submerged for up to three weeks with little exhaust heat. The system is also said to be vibration-free, extremely quiet and virtually undetectable. It is estimated that the cost for four submarines would be about $5B for an offshore design and build.[10]

*The first Type 26 frigate, HMS **Glasgow**, is seen here after its launch in Scotland in December 2022.*

If this plan were to be adopted, the RCN fleet composition would be:

- 2 Joint Support Ships;
- 3 Canadian Surface Combatants;
- 12 Type 31 General Purpose Frigates;
- 6 Arctic and Offshore Patrol Ships; and
- 4 Submarines.

Unpredictable conditions are widespread around the world today, and with the growing unrest and conflicts, Canada's peace and security cannot be guaranteed. The Canadian government has promised a robust package of military resource investments to bolster Canada's defence. Canada must always be ready to protect itself, and if necessary, aid its allies should they come under attack. As a trading country that has always had an outward focus and interest in the world, Canada must be prepared to act internationally when required. Canada must be strong, secure and engaged. Hence, the navy must be always ready and able to face any hostilities and must have the resources to carry out all its missions.

Notes

1. "Canada in the Second World War," The Juno Beach Centre, 2022.
2. "Vice-Admiral Defends Need for 15 New Naval Warships," *Times Colonist*, 29 September 2022.
3. Quoted in "'Our World is in Peril,' UN Secretary-General Warns General Assembly," CBC News, 20 September 2022.
4. See Sam LaGrone, "New Navy Fleet Study Calls for 373 Ship Battle Force, Details are Classified," *USNI News*, 19 July 2022; and Kris Osborn, "Chinese Navy is on Track to Reach 500-Ships in Less Than 10-years," Warrior Maven, Center for Military Modernization, 16 June 2021.
5. Carleigh Busby, Albert Kho and Christopher Penney, Office of the Parliamentary Budget Officer, "The Life Cycle Cost of the Canadian Surface Combatants A Fiscal Analysis," 27 October 2022.
6. *Ibid*.
7. See "UK's Biggest Warship HMS Prince of Wales Breaks Down en route to US, See What Caused It," *The Economic Times*, 29 August 2022.
8. David Pugliese, "Government to Commit to Building First Three Warships Despite Budget Concerns," *Ottawa Citizen*, 8 June 2021.
9. Wikipedia, "Type 31 Frigate."
10. Wikipedia, "Type 212 Submarine."

Moving Canadian Defence Procurement to a 'Wartime Footing'?

Dan Middlemiss

The Challenge

The Russian 'special military operation' in Ukraine has prompted warnings from senior Canadian political and military leaders that the global security environment has taken an ominous turn for the worse.

Addressing a conference in Ottawa, Minister of National Defence Anita Anand warned that "[o]ur world has changed immeasurably on February 24th." She went on to add that we "live in a world at the present time that appears to be growing darker." Now, she said, "Canada's geographic position no longer provides the same protection that it once did. And in this new world, the security environment facing Canada is less secure, less predictable and more chaotic."[1]

Minister of Defence Anita Anand speaks with David Perry about Canadian defence priorities during the Canadian Global Affairs Institute's "After the War" conference on 10 May 2022 in Ottawa.

Credit: Corporal Eric Greico, Canadian Armed Forces Photo

Soldiers from 3rd Battalion, Princess Patricia's Canadian Light Infantry deployed on ***Operation Unifier-UK****, instruct and mentor Ukrainian recruits during live fire ranges in the United Kingdom, 13 November 2022.*

Echoing these remarks, Canada's top soldier, General Wayne Eyre, Chief of the Defence Staff, stated in May 2022:

> Given the deteriorating world situation, we need the defence industry to go onto a wartime footing and increase their production lines to be able to support the requirements that are out there, whether it's ammunition, artillery, rockets, you name it.… [W]hile Canada is currently able to meet its NATO commitments, the Canadian Forces need to be fully prepared for future demands while still supplying weapons to Ukraine.[2]

Eyre noted that "[t]he world, as of the Russian invasion, became much more dangerous." According to him, Canada is not as secure as it was in earlier years. The solution? As he said, "[w]e need to rapidly invest in our Canadian Forces because the demand is going to increase and our nation is going to need us more than ever."[3]

Other defence analysts have also added to these calls for a more urgent, crisis-oriented approach to the way Canada procures its major military equipment. In an article published in June 2022, Ian Mack, a former Director-General who held tenure in the Department of National Defence (DND) in the period 2007-2017, for example, criticized Canada's risk-averse, process-dominated system. He has concluded that "we see a culture for many procurement and National Defence officials which generally acts to survive by going along to get along with the status quo."[4] Mack argued that the old, peacetime procurement culture is far from satisfactory in today's changing times. According to him, "[t]he need for change has been obvious for decades." We know that the procurement system can be flexible, and has been during crises in the past. Mack argues that "[i]t is time to move to that footing as the default approach." This change is possible, says Mack, but it might require abandoning some of the status quo policies and practices of the past. Some of the changes might require:

- resorting more frequently to military-off-the-shelf products;
- ramping up oversight panels to speed up the process;
- abandoning competitive bids for contracts, and instead empowering the Treasury Board Secretariat to recommend alternate policies to meet urgent military requirements;
- embracing more sole-source contracts when necessary;
- adopting a more Industrial and Technology Benefits-lite approach; and
- considering offshore ship design and construction to speed up the delivery of government vessels under the National Shipbuilding Strategy (NSS) when our shipyards lack capacity or cannot improve on (or even *meet*!) delivery schedules for contracted vessels. This might mean abandoning Ottawa's insistence on a strict 'build-in-Canada' policy in cases where speed is critical.[5]

The Response

Given these clarion calls for procurement reform, one might expect at least some token measures to inject a greater sense of urgency into the procurement of a few of today's more prominent defence equipment programs. But almost immediately, any hope for long-awaited changes was quashed. As one senior official of DND's Materiel group explained, "[w]e're not going to move the entire defence procurement (process), I don't think, to a 'war footing.' If we attempt that, we'll overwhelm ourselves and we'll overwhelm you [industry]."[6]

I have little doubt that this apparent resistance to change is merited in present circumstances. Indeed, there is ample evidence that the current procurement apparatus is *already* seriously overwhelmed. Personnel shortages, the constraints imposed by the covid pandemic, and serious supply chain shortages have all taken their toll. Shipbuilders struggle to modify a decades-old design for the Joint Supply Ships, and the snail-like progress on the design for future Canadian Surface Combatants can be traced back to at least 1994 – 28 years and counting, yet still no contract.[7]

How did we arrive at this sorry state of affairs? Without intending to impugn the integrity and dedication of the vast majority of people involved in Canadian defence procurement, there is still plenty of blame to spread around.

The military itself can be indicted for trying to 'gold-plate' its requirements on the understanding that this or that project may well be its last major equipment acquisition for the next five decades. So 'scope creep' takes over, and 'desirements' morph into 'requirements.'[8] In the case of the Royal Canadian Navy, this proclivity emanates from the RCN's longstanding fascination with large, general-purpose warships in an effort to recapture its blue-water 'golden years.' As a result, oftentimes the search for the best becomes the enemy of good enough. A relatively modest frigate design then becomes more complex and much larger and heavier, with the accompanying increase in projected costs and delivery delays.

For the bureaucracy, in the absence of project and funding approvals, it is compelled by its overseers to ape the appearance of progress in most major capital projects. Subject to ever more stringent accountability hierarchies and procedures, bureaucrats resort to generating vast piles of reports – and reports about reports – all accompanied by myriads of powerpoint presentations and bedecked in colour-coded risk assessment matrixes. There is an element of 'cover your ass' and 'pass-the-buck' behaviour in all this, and stalling becomes a workplace norm.[9]

Credit: Sergeant Vincent Carbonneau, Canadian Forces Combat Camera

A Royal Canadian Air Force CC-177 Globemaster is loaded as part of ***Operation Renaissance*** *20-01 at Nellis Air Force Base, Nevada, in January 2020. CC-177s were purchased in a relatively expedient manner during the war in Afghanistan in a process that may be suitable for a 'wartime footing.'*

Surprisingly, the defence industry is perhaps the least culpable of these actors. Yes, it lobbies ceaselessly for a greater share of Canadian content in any major defence procurement, and plays the regional/local job creation game that politicians so long to hear. But shipbuilders and the like are not charitable organizations. They are in it for the money and see any major program as a steady profit stream for the long term. Moreover, they cannot act without a contract, and this brings us to the heart of the problem – political dithering and procrastination.[10]

Defence procurement does not take place in a political vacuum. But too often the role that politicians in general, and Cabinet in particular, are drawn to is that of advocating for job creation via greater Canadian content, promoting regional economic development, and stimulating technology transfer. Lost in the shuffle is what should be the number one priority, namely getting equipment delivered within a clear schedule to the Canadian Armed Forces. For this to occur, our political masters need to 'bell the cat' on the procurement file and provide clear defence policies and priorities, appropriate funding, and above all, timely contract decisions.

Defenders of the current defence procurement system often point to the fact that Canada is no worse than most

other Western countries regarding procurement. But this is a woefully low aspirational bar for a well-off, G7 country, one that has sent astronauts to space and has produced vital aerospace components like the Canadarm.

We can – and must – do better. DND possesses the legal and policy tools to act more expeditiously, and, in fact, Canada has acted with a greater sense of urgency and purpose in acquiring badly needed equipment for its military forces in the not-so-distant past. A 'wartime footing' should not be an alien or unattainable concept to those charged with providing for Canada's defence.

Notes

1. "Defence Minister Anita Anand Addresses Canadian Global Affairs Institute Conference," 10 May 2022. See also, Amanda Connolly, "Canada's Defence Minister Says the World is 'Growing Darker' and 'More Chaotic,'" Global News, 10 May 2022.
2. General Wayne Eyre in an interview with Vassy Kapelos, *Power & Politics*, CBC, May 2022. See also General Eyre quoted in Peter Zimonjic, "Canada's Top Soldier Says Defence Industry Needs to Ramp up Production to 'Wartime Footing,'" CBC News, 4 May 2022.
3. Eyre quoted in Zimonjic, "Canada's Top Soldier Says Defence Industry Needs to Ramp up Production to 'Wartime Footing.'"
4. Ian Mack, "Military Procurement Innovation Now," Canadian Global Affairs Institute, Calgary, June 2022, p. 3. Ian Mack is now a retired Rear-Admiral who as a Director-General held tenure in DND in the period 2007-2017 with portfolio responsibility for NSPS/NSS and over seven major capability projects destined for the RCN and Canadian Army.
5. *Ibid*., p. 4.
6. Assistant Deputy Minister Materiel Troy Crosby quoted in James Careless, "CGAI Conference Puts Procurement Debate on War Footing," *Canadian Defence Review*, canadiandefencereview.com, 26 October 2022.
7. Andrea Migone, Alexander Howlett and Michael Howlett, "(Mis)aligning Politicians and Admirals: The Problems of Long-term Procurement in the Canadian Surface Combatant Project 1994-2021," *Canadian Public Administration*, Vol. 65, No. 1 (March 2022), pp. 28-51.
8. Marcus Hellyer, *Special Report: Understanding the Price of Military Equipment* (Canberra, Australia: Australian Strategic Policy Institute, May 2022), p. 10.
9. For a colourful account, see General Rick Hillier, *A Soldier First: Bullets, Bureaucrats and the Politics of War* (Toronto, ON: HarperCollins Publishers, 2009), especially pp. 414-420.
10. See Alan Williams on this key point in David Pugliese, "Canadian Generals Push for Industry to Go to 'War Footing,' but Hurdles Remain," *Ottawa Citizen*, 17 October 2022.

Arctic Waters Surveillance: Auditor General Report 2022

Bill E. Featherstone

The Office of the Auditor General (OAG) Report "Arctic Waters Surveillance" was released in October 2022.[1] It is not directly about the Department of National Defence (DND) requirements in the North, nor the renewed focus on the Arctic of the North American Aerospace Defence (NORAD) Command and North Atlantic Treaty Organization (NATO), although there are certainly potential implications. What the report is primarily about is Arctic maritime domain awareness, and specifically maritime traffic surveillance, as accessibility and traffic through Arctic waters have more than tripled since 1990, and this trend is likely to continue as the effects of climate change also increase.[2]

The purpose of this commentary is not to repeat everything from the OAG report but introduce the Canadian players responsible for maritime domain awareness, summarize the findings and recommendations, and indicate the gaps between initial assessment of requirements and implementation of these requirements. The report discusses the gaps in detail, the problems causing them and possible solutions. They do not require repeating in this summary.

To begin this summary, a quotation is in order. According to the report, "[t]he objective of this audit was to determine whether key federal organizations built the maritime domain awareness required to respond to safety and security risks and incidents associated with increased vessel traffic in Arctic waters."[3] The scope of the audit was

Credit: House of Commons Standing Committee on Foreign Affairs and International Development

Transport Canada's Dash 7 aircraft is seen here in Fall 2018. The aircraft is part of the National Aerial Surveillance Program.

A graphic from 2020 shows the Radarsat Constellation Mission orbiting the Earth.

restricted to the current efficacy of domain awareness for surveillance in Canadian Arctic waters. The responsibility for that surveillance is part of a whole-of-government approach.

The following federal organizations were involved in the audit. The federal departments and their contribution to maritime domain awareness are briefly described as follows:

- *Transport Canada*
  Responsible for developing, administering and enforcing regulations to ensure marine and safety and security and to protect the marine environment.
- *Fisheries and Oceans Canada, and Canadian Coast Guard*
  Responsible for policies and programs related to oceans, including hydrographic services, navigational charts, limits and boundaries, regulation of fisheries within Canadian waters. *Canadian Coast Guard*: This special agency reports to the Minister of Fisheries and Oceans. It is responsible for the safe and efficient movement of vessels in Canadian waters, provision of aids to navigation (such as beacons and shore lights), marine communications, traffic-management services, ice management, icebreaking services, the marine component of federal search and rescue, and response to marine pollution from ships.
- *National Defence and the Canadian Armed Forces*
  Responsible for detecting, deterring and defending against threats to Canada and North America, specifically in this case, those coming from Arctic waters. It also coordinates aeronautical and maritime search-and-rescue operations, providing assistance to civil authorities as required in national security, disasters and emergencies.
- *Environment and Climate Change Canada*
  Responsible for weather forecasts and information regarding water and climate conditions.
- *Public Services and Procurement Canada*
  Responsible as the central purchasing and contracting agent for equipment, platforms (ships and aircraft) and infrastructure for all the listed organizations.[4]

The collaborative mechanism for these organizations falls basically into two areas. The first one is the Interdepartmental Marine Security Working Group created in 2001. This group is responsible for awareness of evolving threats to the maritime domain. It conducts analysis and provides recommendations to mitigate those potential and real threats to maritime security.

The second area of collaboration is the Marine Security Operations Centres. There are three of these centres, located on the East Coast, West Coast and the Great Lakes. They were created in 2005, covering all of Canada's maritime domain. The centres support a whole-of-government response to collecting, analyzing and disseminating timely situational awareness of the maritime domain. The East Coast and the Arctic are covered by the centre based in Halifax, Nova Scotia, and the Department of National Defence is the lead agency.

The OAG report showed that both of these collaborative areas provide valuable service to overall maritime domain awareness, but that there is room for improvement. The report concludes that:

> Overall, the federal government has not taken the required action to address long-standing gaps affecting its surveillance of Canada's Arctic waters. As a result, the federal organizations that are responsible for safety and security in the Arctic region do not have a full awareness of maritime activities in Arctic waters and are not ready to respond to increased surveillance requirements.[5]

In addition to insufficient information about the vessels that are in Canadian waters in the North, the government

bodies have "poor means of sharing information on maritime traffic, and outdated equipment." The report also notes that "[t]he renewal of vessels, aircraft, satellites, and infrastructure that support monitoring maritime traffic and responding to safety and security incidents has fallen behind to the point where some will likely cease to operate before they can be replaced."[6]

It is important to note that the individual federal departments included in the audit were able to identify their own areas of deficiency in maritime domain awareness. To varying degrees, depending on the department and other factors,[7] they have taken measures to mitigate some of their shortcomings where they could, but these efforts have moved slowly.[8] The audit report showed that, overall, the departments have not taken the necessary steps to address the gaps between initial assessment of requirements and the implementation of solutions.[9] The assessment thus is that the federal organizations tasked with safety and security in the Arctic do not have the requisite domain awareness, and are not ready to respond to the increasing surveillance requirements of the Arctic.

The OAG presented its recommendation to address these delays. It lists two items. First, it says it is necessary to "[i]dentify options and take action to acquire equipment in timely manner." And second, it is necessary to "[d]evelop and approve contingency plans to address the risk of reduced surveillance capability, in the event that equipment ceases to operate before they are replaced."[10] All parties agreed. A complete surveillance picture of what is happening in the Arctic will only occur if action is taken to close the gaps of requirements and if essential equipment – vessels, aircraft, satellites and infrastructure – is put on a sustainable renewal path. As the report notes, "[d]elays in the renewal of satellites, ships, and aircraft risks compromising the presence of these organizations in Arctic waters."[11]

In summary, the report is comprehensive and covers the many complex areas of maritime domain awareness. It is well worth a thorough study particularly by those identified as responsible for the many sectors of Arctic defence and security. Throughout the report, it was noted that all the organizations covered were in full agreement of the findings and recommendations. One should assume that, based on this agreement, serious consideration will be given to the recommendations, and that this consideration will lead to action.

Notes

1. Report of the Auditor General of Canada to the Parliament of Canada, "Arctic Waters Surveillance," Report 6, 20 October 2022.
2. *Ibid.*, p. 1.
3. *Ibid.*, p. 24.
4. *Ibid.*, para. 6.6, pp. 4-5.
5. *Ibid.*, para. 6.12.
6. *Ibid.*, para. 6.13.
7. In the years 2020, 2021 and 2022, the Covid-19 pandemic affected supply chains and the labour force, contributing to delays in meeting the requirements for effective maritime domain awareness.
8. Auditor General report, "Arctic Waters Surveillance," p. 8.
9. *Ibid.*, p. 7.
10. *Ibid.*, para. 6.66, p. 23.
11. *Ibid.*, para. 6.67.

In Praise of the LSI(A)

Major (Ret'd) Les Mader[1]

Public discussion of the employment of a Canadian Arctic amphibious capability seems to have started in 2019 with a *Canadian Naval Review* article by Colonel (Ret'd) Brian Wentzell. In this article he suggested that Canada could use the Royal Canadian Navy (RCN) vessels (mainly Arctic and Offshore Patrol Ships (AOPS)) currently being built to transport and sustain 300-330 soldiers during an Arctic crisis.[2] Over the following several years, I sought to build on this idea in three articles that described two different, conceptual Arctic amphibious ships that the RCN should consider procuring.[3] These were:

- the Landing Platform Arctic (LPA), a well-deck-equipped ship optimized for Arctic operations; and
- the smaller, less expensive and less capable Landing Ship Infantry (Arctic) (LSI(A)).

Subsequent to my first two articles, Mr. José Cañadas Mendez expressed concerns about the LSI(A)'s limited capabilities.[4] He then described a *smaller* version of the LPA which was based on his analysis of how much – notably Cyclone helicopters – could be fit/operated inside a hull of the relevant dimensions (see Table 1 for some of its key characteristics).

Sailor 1st Class Jean-Daniel Baker-Lucas fires the C-8 weapon during a training drill onboard HMCS ***Margaret Brooke*** *during* ***Operation Nanook****, 14 September 2022.*

Table 1. Some Key Desired Characteristics: LPAs and LSI(A)

Criteria	LPA (Large)	LPA (Small)	LSI(A)
Displacement – Full Load (Tons)	16,680-20,000	12,000-16,000	>6,300
Length (metres) (m)	176.35	150	137
Marine Infantry	~350	250-300	~145
Aircraft	8-12 x Cyclones	Up to 4 x Cyclones + 2-3 x UAVs	3-4 x Cyclones
Landing Craft/Hovercraft	5-6 x light/medium/ heavy	3-4 x light/medium	2 x light
Well-Deck (m^2)	~525	~300	None
Vehicle Deck(s) (m^2)	~1,700	900-1,200	None
Endurance (days)	~120	60/120 – half/full complement	~120
Reference Vessel	HNLMS *Johan de Witt*	Several notional designs	HDMS *Absalon*

Mr. Mendez's article is a valuable contribution to the discussion of a Canadian Arctic amphibious capability. It makes a number of important points, including: how hard it is to extrapolate the capabilities of ice-capable vessels from those that are not; the unique imperatives that affect ships that have to operate in Canada's Arctic, including waste management and pollution reduction; and the trade-off required between the number of personnel carried and days of endurance. It is obvious from his article that only detailed engineering work can truly confirm how many personnel, helicopters, landing craft, vehicles and stores can be carried and operated in an Arctic-capable ship of a given size.

I find myself in general agreement with Mr. Mendez's key arguments. The one significant area where we seem to disagree is that I feel that the relative simplicity of the LSI(A) – due to the absence of a well-deck – makes it a valuable enabler/part of a Canadian Arctic amphibious capability. I will expand of this viewpoint in the rest of this article.

The creation of an amphibious force from scratch is a major, multi-faceted and long-term endeavour for any country. Developing one that must operate in the Arctic is even more demanding. Thus, I assess that the program and technical risks for the design and construction of the required amphibious ships for Canada are high. Since no country – to my knowledge – has ever built such vessels, there will likely be great hesitancy on the part of the government and the leadership of the Canadian Armed Forces (CAF) and RCN for Canada to be the pioneer in such a domain. This sensible concern argues strongly for undertaking measures that reduce the risk and initial cost of starting on the Arctic amphibious road. I believe that building the simpler LSI(A) before trying either the large or small LPA described at Table 1 would be one way to reduce these risks and to assuage, somewhat, the concerns. Being smaller and simpler than the LPAs, the LSI(A) would be a useful way for Canada to 'dip its toe' into the Arctic amphibious waters. Government and military leaders would not find themselves being asked to go out

Credit: Vancouver Air Detachment, Canadian Armed Forces photo

*HMCS **Vancouver**'s CH-148 Cyclone lands on JS **Izumo**, a Japanese Maritime Self-Defense Force warship, in the Philippine Sea during **Operation Projection** on 31 August 2022. A large flight deck would be key to efficient Arctic naval infantry operations.*

on an expensive and risky limb. Instead, they would be asked to approve one or more LSI(A)s as a risk reduction measure on a long road to a full Arctic amphibious capability. Inherent in this approach is the obvious off-ramp of not doing more than deploying the LSI(A)s if the program's costs and risks turn out to be more than expected.

Another part of the risk reduction inherent in this approach is the fact that Canada's shipbuilding industry would be able to use the LSI(A) as a learning experience before undertaking the design and construction of the larger and more complex, well-deck-equipped LPAs. Analysts and shipbuilders would, thus, be able to work their way through the complexities touched on by Mr. Mendez. They could also look at other concerns that have not really been raised, such as the question of whether the current dictates of good Arctic environmental stewardship will become stringent legal requirements during the decades of the ships' service.[5] The simple requirement to store all of a ship's 'grey water' while sailing in polar waters could significantly affect its design and the number of personnel that can be carried. Such issues lead to a recommendation to assign construction of the LSI(A)s, and any subsequent LPAs, to a single shipyard in order to maximize the learning gained by all members of the construction team.

Additionally, the keel-laying of the first LSI(A) would be an unmistakable message to the CAF that a paradigm shift in Arctic operations was occurring. This message would concentrate the minds of all relevant parties and confirm how serious the government and military leaders were with respect to developing the amphibious capability. Thus, all would have the focus required to push forward with their responsibilities in preparing for the arrival of the first LSI(A). These doctrinal, command and control, force structure, training development and scheduling, supporting equipment and unit preparations would also be relevant to the subsequent arrival of the LPAs. Preparing for the entry of the LSI(A)s into service and the lessons learned from their initial employment would, in effect, be operational risk reduction for the full capability.

Credit: Royal Canadian Navy via Wikimedia Commons

*Four landing crafts assault (LCAs) go ashore from HMCS **Prince David** off the French coast on 6 June 1944. HMCS **Prince David** was serving as a Landing Ship Infantry (Medium) at this time.*

Even if all of these risk reduction measures function perfectly, I doubt whether Canada would be able to find enough funds and personnel to deploy an operationally relevant number of LPAs – which I estimate as at least four hulls to support the RCN's two fleets and cater for maintenance and refits. Given this concern, I consider the LSI(A) not only to be an enabler for the new capability but also a means by which Canada can put more useable hulls into the water. A task group comprised of an LSI(A) paired with either of the LPAs described in Table 1 would be able to deploy some 395-495 marine infantry, 7-16 Cyclone helicopters and 5-8 landing craft of various types to a crisis area. While this is not a major amphibious force compared to the landings at Normandy, Sicily and Iwo Jima, it would be very significant in the Arctic. It would also dwarf anything that Canada is currently able to deploy. Two such task groups, operating as part of an integrated strategy, would be a major force in Canada's Arctic archipelago. Additionally, a single LSI(A) may be more than sufficient to respond to many Arctic situations and crises. Certainly, it would be a valuable intermediate step in Canada's escalation of forces between the AOPS and the LPA during the evolution of a crisis.

The creation of a Canadian Arctic amphibious capability could be sidelined due to concerns about program risk and cost. The inclusion of LSI(A)s as part of such a capability provides a useful way to reduce both risks and costs while also providing a valuable asset, either operating on its own or with one or more LPAs. Any discussion of the creation of a Canadian Arctic amphibious capability should include a quantity of LSI(A)s as part of the proposed force structure.

Notes

1. The author wishes to thank Guy Lavoie for his editorial input.
2. Colonel (Ret'd) Brian K. Wentzell, "Arctic Amphibious Capabilities for Canada?" *Canadian Naval Review*, Vol. 15, No. 2 (2019), p. 37.
3. Major (Ret'd) Les Mader, "A Suggestion for an Intermediate Level of Arctic Amphibious Capability," *Canadian Naval Review*, Vol. 16, No. 1 (2020), pp. 33 and 34; Major (Ret'd) Les Mader, "The LSI(A): An Arctic Sovereignty Protection Option?" *Canadian Naval Review*, Vol. 17, No. 1 (2021), pp. 33-35; and Major (Ret'd) Les Mader, "The LPA: The RCN's Arctic Linchpin?" *Canadian Naval Review*, Vol. 18, No. 2 (2022), pp 23-27.
4. José Cañadas Mendez, "A Landing Platform Arctic Ship: Turning the LSI(A) back to the LPA," *Canadian Naval Review*, Vol. 18, No. 1 (2022), pp. 31-34.
5. "Stewardship and Due Diligence in Maritime Operations," Broadsides, *Canadian Naval Review* online discussion forum, 17 October 2007; and "Grey Water Dumped into Nunavut Waters is Set to Double by 2035, says WWF," *Nunatsiaq News*, ArcticToday, 21 August 2018.

Putin's War: Implications for Canadian Security

Peter T. Haydon

Vladimir Putin's war in Ukraine has changed global security; the effects will likely be felt for some time. Through its barbarous actions, Russia has become somewhat of an international pariah. In response, NATO, the European Union (EU), and several like-minded states have become a unified force in supporting Ukraine but without actual military intervention. Putin's stubborn determination to re-create the Russia of Peter the Great has tested Western diplomacy to the point where some are beginning to wonder if the Western allies will be driven to intervene to force a ceasefire in a Srebrenica-like response to the continuing Russian war crimes.[1] That said, the decision is complicated by Putin's threats to use nuclear weapons to defend the Russian homeland.

The future is potentially more dangerous than the 1962 Cuban Missile Crisis but perhaps not as bad as the darkest days of WWII. As Graham Allison explains, the situation is not unlike that facing President John F. Kennedy in October 1962 when he needed to offer Soviet leader Nikita Khrushchev a way out of a situation to avoid a possible nuclear exchange. Like Khrushchev, Putin is unlikely to accept a humiliating defeat – to the point of actually using nuclear weapons to prevent it.[2] Thus, any Western intervention should contain an option for avoiding a humiliating Russian defeat without sacrificing Ukrainian sovereignty. This may be impossible in the near future.

At this point, only a fool would attempt to predict the future; nevertheless, some facts stand out. Although Putin will doubtless have a bloody nose from a tactical defeat in the Ukraine, his grand Russian unification strategy may still be intact – at least in his mind. Only the replacement of Putin by a moderate leader could restore the *status quo ante*, if such a condition can ever exist. There is no way the internal affairs of Russia can be predicted and there is no guarantee that regime change would produce a result favourable to the West. Until there is a favourable regime change, by whatever means and at whatever time, states adjacent to Russia will have to be prepared to defend themselves. Canada is one of those states because Russia is one of its Arctic neighbours. The United States is similarly vulnerable in Alaska. Even in his wildest dreams Putin would be unlikely to see North America as part of Peter the Great's Russia, but based on the Western response to his invasion of the Ukraine, he could well consider a diversionary attack on the North American Arctic to deflect

An F-22 Raptor assigned to Joint Base Elmendorf-Richardson in Anchorage, Alaska, intercepts a Russian Tu-95 Bear on 9 June 2020.

the Americans from responding to a future invasion of the Baltic states or Finland.

That Russia has recently increased the level of military activity in the Arctic is cause for concern, as recent articles published by the Rand Corporation and Britain's Chatham House have argued.[3] These concerns have yet to be reflected, or even endorsed, in Canadian government policies. Yet the Canadian military has accepted that the Arctic is one of Canada's strategic vulnerabilities. As General Wayne Eyre, Chief of Defence Staff, stated to a Parliamentary Committee, "Canada's hold on the outer reaches of its Arctic territory is 'tenuous' and will face significant challenges from both Russia and China in the future." Despite the fact that the government has promised to spend $4.9 billion to overhaul NORAD, Eyre believes that more needs to be spent to upgrade all necessary capabilities not only to detect but interdict hostile intrusions into Canada's Arctic.[4]

For far too long successive Canadian governments have not taken national security seriously particularly with respect to the Arctic. As the Auditor General pointed out in a November 2022 report, Canada does not know who is using its Arctic waters and why.[5] The reasons for this political myopia are not important, the point is that Canada has allowed itself to become strategically vulnerable, and this situation must be fixed. The implications of not doing this, especially in light of Russian aggressiveness, are not pleasant.

Not only does Canada stand guilty of not meeting its share of NATO and allied commitments to collective security but a situation now exists in which Canada would have to rely on American capabilities to counter any

future Russian challenge in the Arctic. Fixing the problem – essentially a lack of effective military capabilities in the right places – will require money, time and political commitment. If the April 2022 Budget is anything to go by, the political commitment for the timely upgrading of Canada's military capabilities is missing. Token money and comfortable words won't fix the problem.

Canada has been down this road before. When the Cold War began in 1949, and with the start of the Korean War in 1950, Canadian politicians understood the country's vulnerability as well as the importance of collective security. Therefore they opened the public purse, with some reluctance, to develop the military Canada and its NATO allies needed. In 1951 the NATO "Imminence of War" document looked five years ahead, and the Canadian rearmament program was structured to meet that target. We did it then, we should be able to do it again if a sense of urgency exists.

In the 1950s a comprehensive plan for re-armament existed through NATO planning and, significantly, through bilateral planning for the defence of North America that started in earnest in 1947. In ways reminiscent of the two World Wars, plans called for North America to be the industrial base and breadbasket for Europe as well as a source of reinforcements. The related strategic tasks were straightforward: defence of North America and adjacent waters; maintenance of a credible deterrent; supply and reinforcement of Europe; and protection of associated sea lines of communication (SLOCs).

On the assumption that a new form of Cold War has descended on Europe and North America, but without the simplicity of an Iron Curtain, those four strategic tasks remain valid. Once again, Canada has one strategic requirement that is not a matter of choice – the defence of North America jointly with the United States. The need to resupply and reinforce Europe, and provide SLOC protection in concert with allies, continues to exist. Involvement in strategic deterrence has always been, and should remain, beyond Canadian capabilities other than stationing token or quick reaction forces in Europe; something likely best done these days on a rotational basis rather than by longer-term forward deployments.

Thinking about the practical aspects of national security, it is wise to remember that we have been down this road before. The bilateral defence agreements that grew out of the 1940 Ogdensburg Agreement, and were extended into the Cold War by mutual agreement in 1947 and evolved into plans like the North American Aerospace Defence Command (NORAD), stand today as testaments to the strength of the bilateral relationship especially at the working level. The parallel maritime plans were relatively simple and based on a series of ocean-specific emergency

A US Army Avenger surface-to-air missile system is being offloaded from a Royal Canadian Air Force CC-177 Globemaster in North Bay, Ontario, during NORAD Exercise Vigilant Shield on 13 August 2016.

defence plans and related operational plans. But the maritime plans were never subjected to the same political and public scrutiny as the NORAD agreement which means that they are not as widely understood.[6]

Continental defence has been a shared responsibility with the United States since 1940 and there is no good reason to change this, especially as the existing structure preserves Canadian sovereignty. Because of the bilateral defence plans, what the American military does on Canadian territory or in Canadian waters and airspace is always done with the full concurrence of the Canadian government. This is another poorly understood fact.

Within the new security environment created by Putin's War, the possibility of a Russian diversionary attack on the Arctic cannot be ignored. However, Alaska is the more likely venue because it is an easier assault route and there are strategic energy sites there whereas the Canadian Arctic has little strategic leverage potential to a would-be aggressor. However, in the event of hostilities or as a heavy-handed attempt to gain a diplomatic bargaining chip, the Canadian Arctic offers a location for a forward operating base that could become a major problem. Canadian northern waters could become locations for Russian submarines to launch cruise missiles at Canadian and American cities and military installations.

Are those threats credible? Russia certainly has the capability and has significant expertise in Arctic operations. It would be dangerous, therefore, to ignore the possibility of Russia carrying out military operations in the North American Arctic.

So, what is to be done? Obviously, there is far too much to cover in this short opinion piece so let me prompt the much-needed discussion with some simple questions.

- Does Canada need to revisit the family of bilateral defence plans to make sure that American forces will cover for Canadian shortcomings in the short term?
- Will the announced NORAD upgrade include expedited procurement of new fighter aircraft as well as rapid development of forward operating bases?
- Does Canada need rapid reaction ground forces able to operate in the Arctic at any time of year?
- Should the Royal Canadian Navy's capabilities be expanded quickly to provide for the interdiction/elimination of hostile forces in Canada's Arctic and northern waters?

Let the discussion begin.

Notes

1. In the summer of 1995, after refusing to take the lead in ending the slaughter of thousands of people by the Bosnian Serbs in the former Republic of Yugoslavia, the United States undertook the leadership role in ending the violence. The catalyst was the Bosnia Serb decision to consolidate gains by winter of 1995 which required the 'elimination' of four Muslim enclaves. The July 1995 summary execution of over 7,000 male Muslims in Srebrenica despite their being under nominal protection of a UN force of some 20,000 became the call to action. After two years of attempts to end the conflict, Washington and London agreed to mount an aggressive air campaign that quickly forced the belligerents to the negotiating table to sign a peace treaty – the Dayton Accords. See Ivo H. Daalder, "Decision to Intervene, How the War in Bosnia Ended," Brookings Press Occasional Papers, December 1998.
2. Graham Allison, "Putin's Doomsday Threat," *Foreign Affairs*, 5 April 2022.
3. See Benjamin J. Sacks and Kristin Van Abel, Rand Corporation, "How the Russian Invasion of the Ukraine May Impact the Arctic," *Los Angeles Times,* 22 August 2022; and "Myths and Misconceptions around Russian Military Intent, Myth 8: Russia's Military Build-up in the Arctic is Defensive," Chatham House, 14 July 2022.
4. General Wayne Eyre, quoted by Murray Brewster, "Canada's Tenuous Hold in Arctic Could be Challenged by Russia, China, Says Top Soldier," CBC, 18 October 2022. The 17 November 2022 Report of the Auditor General of Canada, *Arctic Waters Surveillance*, is highly critical of the present Arctic surveillance capability. The report focus is primarily on the Coast Guard and land-based surveillance capabilities and thus does not delve into the interdiction problem that is essentially a military one.
5. Office of the Auditor General of Canada, Report to Parliament, *Arctic Waters Surveillance*, November 2022.
6. See Joseph T. Jockel, *No Boundaries Upstairs* (Vancouver: University of British Columbia Press, 1987); and Peter T. Haydon, "Chapter 5, Continental Defence," in Peter T. Haydon, *The 1962 Cuban Missile Crisis: Canadian Involvement Reconsidered* (Toronto, Canadian Institute of Strategic Studies, 1993).

Response to "Reserve Military Forces Should be Under Provincial Jurisdiction"

Colonel (Ret'd) Brian K. Wentzell

This is a response to the commentary "Reserve Military Forces Should be Under Provincial Jurisdiction" by Roger Cyr published in Making Waves in *Canadian Naval Review*, Volume 17, Number 3 (2022).

The proposition by Roger Cyr to give provincial jurisdiction over the Canadian Military Reserve Forces is not well founded in concept. The Canadian Army Militia, as most recently reorganized, is not aligned with provincial boundaries. The reserve divisions and brigades, as currently structured, may cover more than one province. Not all military capabilities exist in a particular province. Thus, response to a particular event may require resources drawn from locations outside of the location that requires a military response. Assignment of command of the militia to provincial authorities will not guarantee an adequate response to a particular event or crisis. It would also demand a constitutional amendment.

The issue of raising military forces in Canada is well settled by the provisions of Section 91 of the *Constitution Act 1867* which states as follows:

> It shall be lawful for the Queen [now King], by and with the Advice and Consent of the Senate and House of Commons, to make Laws for the Peace, Order, and good Government of Canada, in relation to all Matters not coming within the Classes of Subjects by this Act assigned exclusively to the Legislatures of the Provinces, ... it is hereby declared that (notwithstanding anything in this Act) the exclusive Legislative Authority of the Parliament of Canada extends to all Matters coming within the Classes of Subjects next hereinafter enumerated; that is to say, …
>
> 7. Militia, Military and Naval Service, and Defence.
>
> …

The jurisdiction of the federal Parliament is clear, complete and unambiguous with respect to military, naval and defence matters. There is no provincial constitutional power in respect to such matters. Aside from Mr. Cyr's article, I am not aware of any political discussions that would support a sharing of military, naval, or defence responsibilities between the federal and provincial governments. Few, if any, provincial governments have the financial, technical, or leadership resources to undertake defence responsibilities. If Canada is to remain a state, it must have the national military capabilities to defend its borders and meet its international and national security and political obligations.

A View from the West: Canada's Future in the Indo-Pacific Region

Jocelyn Sandhu

Canada released its highly anticipated Indo-Pacific Strategy (IPS) on 27 November, finally joining its partners in crafting a policy on a region critical to its interests. The facts bear repeating: the Indo-Pacific is the fastest growing region in the world. It accounts for approximately 50% of global Gross Domestic Product (GDP) and six of Canada's largest trading partners are located there.[1] It is home to over 65% of the world's population and represents a region where Canada's social connections are deepening, as around 20% of new Canadians originate from Indo-Pacific countries.[2] The Indo-Pacific is also a region critical to global supply chains as goods shipped around the world, including to Canada, pass through it daily. At the same time, it is the site of a multitude of security challenges that threaten the international order on which Canada relies. As such, the creation of a policy that addresses the region was long overdue.

The IPS details Canada's strategic objectives under five broad priority areas – security, trade, social ties, sustainability and diplomacy. Although the IPS largely summarizes Canada's current policies and engagement in the region, it also includes new initiatives that are worth examining. This article will focus on three developments in particular: the plan to expand Canada's security presence in the region; the identification of India as an engagement priority; and Canada's relations with China.

Strategy Highlights

Security initiatives are the second largest item in the IPS, with CAD $720.6 million dedicated to bolstering Canada's security presence in the region.[3] Although more details – such as the extent of the involvement of the Canadian Armed Forces in the region – are to be confirmed with the forthcoming defence policy update, the policy reveals that the Royal Canadian Navy's (RCN) presence in the region will expand. An additional frigate from the Atlantic fleet will regularly deploy to the Indo-Pacific in addition to two ships from the Pacific coast.[4] The IPS also sets the objective of securing an information-sharing agreement with Japan, and later South Korea, which would improve interoperability between the RCN and its North Pacific counterparts and could lead to the RCN's involvement in more joint exercises and operations in the region, another goal of the strategy.[5]

The RCN has been Canada's most active form of security engagement in the Indo-Pacific – a region in which there are many maritime security challenges – so an expansion of its role was not unexpected.[6] Instead, a more notable change is the focus the IPS places on bolstering Canada's cyber-security capacities, as the strategy acknowledges that the Indo-Pacific has become an increasing source of risk to Canadian intellectual property and research, foreign influence and the spread of disinformation in Canada.[7] Countries in the region have been targeted by cyber-attacks and scams attributed to actors in North Korea and China, warranting increased cooperation on the issue. As such, commitments under this section of the IPS include increasing funding for Canada's national security entities and collaborative projects with countries in the region. Although experts have questioned whether

Credit: Master-Corporal Matthieu Racette, Canadian Forces Combat Camera

*Members of the Republic of Korea (ROK) Navy greet HMCS **Vancouver** at the Port of Busan during **Operation Neon**, 4 October 2022.*

Credit: Melanie Joly's Twitter account

Canadian Minister of Foreign Affairs Melanie Joly speaks with India's External Affairs Minister Dr. S Jaishankar on the sidelines of the East Asia Summit, 12 November 2022.

Canada's cyber-security doctrine is developed enough domestically to advance cyber-diplomacy initiatives abroad, its inclusion in the policy is welcome, as it signals an understanding about how vulnerable Canada could be to foreign interference.[8]

A second shift to Canada's approach is the IPS emphasis on building stronger relations with India. Canada has cultivated partnerships in North and Southeast Asia but has been accused of ignoring the 'Indo' in the Indo-Pacific region in the past. The inclusion of India as an engagement priority in the IPS points to both an acknowledgement by Canada of the increasingly strategic role India has come to play in the region, and New Delhi's willingness to diversify its partnerships in the wake of China's incursions on India's Himalayan territory and sphere of influence. The strategy focuses on furthering the economic and political aspects of Canada-India relations by sending enhanced trade missions to the country and improving visa processing times at offices in India. The omission of any security initiatives with India is unfortunate, although it is likely that sticking points between the two countries, including the presence of Khalistan separatist networks in Canada, continue to limit growth in this area.

Finally, the IPS section on China is the most high-profile element of the policy. The strategy does not present a major shift in how Canada handles its relations with China – it will continue to balance economic interests with security concerns. However, it uses the most forceful language to date when addressing China's ongoing human rights abuses, use of economic coercion, and actions contrary to international rules and norms in the region. The strategy's clear identification of China's destabilizing behaviour and the impact it is having on Canada's interests, while acknowledging the need to find productive ways to work with China, is one of the strongest points in the IPS. To have avoided any discussion of Canada's view of China and its actions would have undermined the strategy entirely. Pursuing a policy that seeks to avoid offending Beijing has not spared Canada from coercion in the past, and has only served to discredit Canada in the eyes of its partners and states in the region. To that end, the IPS pledges to support Indo-Pacific countries against coercion and continue to voice support for those facing human rights abuses at Beijing's hands.

The IPS also calls for Canada to continue to diversify its economic partnerships in the Indo-Pacific – its ratification of the Comprehensive and Progressive Trans-Pacific Partnership Agreement resulted in a significant expansion of its free trade agreements there. This will not only provide alternatives to China, but will also hedge against the impact of protectionist trade policies that Canada's largest trading partner, the United States, may put into place in the future.

Conclusion

The new Indo-Pacific Strategy is comprehensive as it ties together a wide range of priorities and interests that will shape Canada's future in the region. The success of the IPS will depend on whether the initiatives promised within it are implemented, as well as Canada's ability to balance its relations with its Western allies with the interests of Indo-Pacific countries with which it hopes to enhance its partnerships. The government's success in communicating the goals of the strategy and the region's connection to its domestic interests will also be key to achieving the whole-of-society response it calls for. In the meantime, the fact that Canada's activities, goals and interests in the Indo-Pacific have been articulated in one policy should not be undervalued. In fact, this is the most important thing the policy offers: direction. Not only will a written strategy guide the Canadian entities that carry it out, it will also provide prospective partners in the region with clarity about Canada's future intentions there.

Notes

1. Canada, Global Affairs Canada, *Canada's Indo-Pacific Strategy*, 27 November 2022, p. 1.
2. *Ibid*., p. 19.
3. Global Affairs Canada, Media Release, "Canada launches Indo-Pacific Strategy to Support Long-term Growth, Prosperity, and Security for Canadians," 27 November 2022.
4. Global Affairs Canada, *Canada's Indo-Pacific Strategy*, p. 15.
5. *Ibid*., pp. 10-11.
6. From territorial disputes to illegal fishing to China's use of maritime militia forces, the Indo-Pacific's maritime security challenges are complex points of risk. For more, see the Asia Maritime Transparency Initiative website.
7. Global Affairs Canada, *Canada's Indo-Pacific Strategy*, p. 14.
8. Josh Gold, Christopher Parsons and Irene Poetranto, "Canada's Scattered and Uncoordinated Cyber Foreign Policy: A Call for Clarity," *Just Security*, 4 August 2022.

Jocelyn Sandhu is a Geopolitical Analyst at Maritime Forces Pacific HQ. The views expressed within this article are those of the author, and do not reflect the policies of the Royal Canadian Navy or the Department of National Defence.

Dollars and Sense:

NORAD Modernization: Trudeau's Defence Policy, Part 2

Dave Perry

On June 2022 the Minister of National Defence presented the government of Canada's plan for NORAD modernization. This announcement came after a couple years of active efforts by the Department of National Defence (DND) and Canadian Armed Forces (CAF), especially senior officers assigned to NORAD, to push for continental defence modernization, and the imperative created by renewed great power competition to improve continental defences against a wide array of threats. These discussions had reached the point at which the issue featured in multiple engagements between two American Presidents and Prime Minister Justin Trudeau.

The NORAD modernization announcement pledged investment in five areas: surveillance systems; command and control; advanced air-to-air missiles; infrastructure and support capabilities; and science and technology.[1] In discussing these investments, Minister of National Defence Anita Anand highlighted $4.9 billion (B) in spending over six years, and indicated that the plan was funded for the long term, with a total value of approximately $40B over 20 years. When asked if the $4.9B was new funding, the Minister indicated that it was and that it was on top of funding provided in Budget 2022.[2]

An explanatory backgrounder quietly issued two days later clarified that the figure of $4.9B cited by the Minister referred to funds set aside on a cash basis (the amount over six years is $3B) and that funding had been allocated in Budget 2022.[3] This suggests that the Minister conflated accounting formats when describing the funding over various time-frames. A week after the announcement, when asked if the $4.9B the Minister had mentioned was new money, or was being reallocated from existing funds within the department, the Chief of Defence Staff (CDS) replied "I haven't completely figured out myself the sources of funds for this."[4]

The need for clarification, then the unusual comments about a lack of certainty from the CDS, on top of the initial announcement which was organized on short notice, without American involvement (strange for a major announcement about a binational Canada-US defence arrangement), created significant uncertainty about the funding for NORAD modernization. Several observers have questioned whether there is actually any new funding assigned to the initiatives at all, or whether it is in effect "pretend money" as one prominent Canadian defence academic called it.[5]

A month after the announcement DND published a Fact Sheet further clarifying the financial underpinnings of the NORAD modernization initiative. That document indicates that "[t]he incremental funding for the first six years of NORAD modernization comes from existing, previously announced funding. Planning for NORAD modernization has been underway for several years, and the Government of Canada previously announced funding for elements of continental defence and NORAD modernization in Budget 2022, as well as defence funding in Fall Economic Statement 2020." It also stated that

Credit: Master Sgt. Michael Jackson, US Air Force

A US Air Force F-35A fires an AIM-120 Advanced Medium-Range Air-to-Air Missile against a QF-16 aerial target during tests over the Gulf of Mexico on 20 June 2018. As part of its NORAD modernization, Canada will procure new air-to-air missiles.

"[t]he most recent NORAD modernization announcement provides new funding beginning after year six."[6]

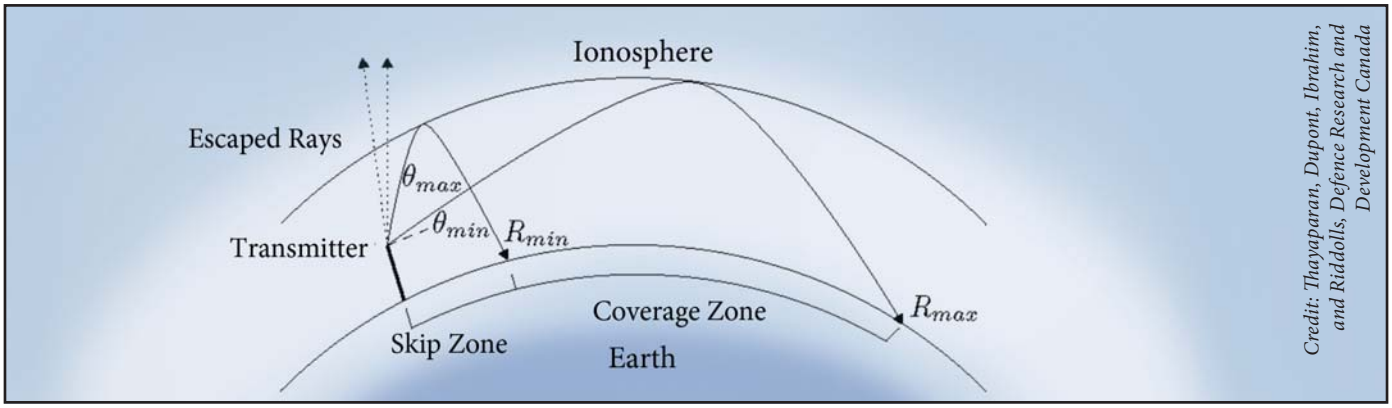
The announcement also itemized the funding across a number of capability investment areas, which is presented in Table 1. Notably, that itemization reflects funds provided on an accrual basis, and the backgrounder helpfully itemized the salient difference between the accrual and cash basis of accounting used by the government. According to the backgrounder, "[u]nder the accrual basis of accounting, the cost of acquiring an asset is recorded when the asset is put into service and spread over its useful life, rather than being recorded at the time the bills are paid. The portion of DND's accrual budget records the forecasted depreciation expense of capital assets, like equipment and infrastructure."[7] The Department of Finance works with accrual accounting which is why that accounting format is the focus of funding descriptions in Budgets and Fall Economic Statements, although in recent years those documents have sometimes described the cash value of funding. As the confusion created by the Minister's statement announcing the modernization plan highlighted, keeping the different accounting formats clear is problematic.

So too is finding information in Budgets or Fall Economic Statements to help reconcile the various statements attached to announcements like this. While recent major announcements related to DND's funding, dating back to the 2008 Canada First Defence Strategy, have been presented on 20-year time-frames, Budgets and Economic Statements generally only itemize funding over five-year time-frames, even if a funding announcement contained funds beyond the initial five-year window. This is unhelpful as, in trying to reconcile various budget commitments with long-term defence funding plans, it is impossible to

Table 1. Continental Defence Modernization Investments (Billions, accrual basis)

Funding	Area of Investment	Individual Investments
$6.96	Bolstering Canada's ability to detect threats earlier and more precisely by modernizing surveillance systems.	• Arctic Over-the-Horizon Radar • Polar Over-the-Horizon Radar • Classified Sensors
$4.13	Improving Canada's ability to understand and communicate threats to decision-makers in a timely manner through investments in modern technology.	• Modernize command, control and communications capabilities • Modernize the Canadian Combined Air Operations Center • Renew the CAF's high- and low-frequency radio capability • Enhance satellite communications in the Arctic • Procure new digital radios • Expand support for the Pathfinder program • New positioning, navigation and timing capability
$6.38	Strengthening Canada's ability to deter and defeat aerospace threats by modernizing air weapons systems.	• Short-range air-to-air missiles • Medium-range air-to-air missiles • Long-range air-to-air missiles
$15.68	Ensuring CAF can launch and sustain a strong military presence across the country, including in Canada's North, through investments in new infrastructure and support capabilities.	• Acquiring additional air-to-air refueling aircraft • Upgrading infrastructure at four locations in Canada's North • Upgrade fighter infrastructure across Canada • Modernize air operational training infrastructure
$4.23	Future-proofing Canadian capabilities to defend North America through investments in science and technology.	
$1.18	Internal services	
Total $38.56		

Credit: Provided by Author



An illustration of over-the-horizon radar propagation included in a 2019 DRDC article. These radars are a major component of NORAD modernization.

know the full value over 20 years of a budget's initiatives if only a five-year view is presented. As an example, Budget 2022 stated "Budget 2022 proposes to provide $6.1 billion over five years, starting in 2022-23, with $1.3 billion in remaining amortization, and $1.4 billion ongoing to the Department of National Defence in order to meet our defence priorities, including our continental defences, commitments to our allies, and for investments in equipment and technology to immediately increase the capabilities of the Canadian Armed Forces."[8] None of the words in that paragraph make clear how much money, on an accrual basis, might be available in total over a 20-year time-frame.

Parsing the NORAD modernization Fact Sheet, with the aid of conversations with defence officials, the funding for NORAD modernization (on an accrual basis) appears to contain the following sources of funds. The first is Budget 2022 which, as discussed above, highlighted $6.1B over five years of accrual funding, but did not specify how much money was provided to DND over a 20-year time period. The Budget 2022 announcement provided $12.2B on an accrual basis towards NORAD modernization, and this funding had already been provided to DND prior to the announcement. A second source of funds was the 2020 Fall Economic Statement which had, amongst other things, itemized for defence "$8.9 billion for anticipated future requirements."[9] As readers might recall from a previous column, as a result of the reprofiling of the Capital Investment Fund due to shifting project schedules, $8.9B worth of funding for projects approved in *Strong, Secure, Engaged* was shifted out beyond the original 20-year timeframe to align with the requirements of those initiatives. In shifting this funding, the Department of Finance allowed DND to retain the $8.9B worth of fundings in its Capital Investment Fund within that same 20-year window for anticipated future investments. This gave DND a source of funds to use for future investments but required DND to present government with a plan to spend the money. DND therefore had a pre-existing source of funds, already in its fiscal framework from the Fall Economic Statement 2020, and NORAD modernization provided a funding decision about how that money will be used. Third, new funding of roughly $17.5B, not previously in the fiscal framework, was provided with the NORAD modernization announcement itself. Added all up, that amounts to the total of $38.6B, on an accrual basis, announced by the Minister. With that complicated combination of funding sources, it is easy to see how it may have been difficult to understand, or communicate.

Additionally, since the value of the announcement on an accrual basis represents, literally, how the government will account for NORAD modernization on its books, the more meaningful presentation of the funding for anyone not worried about how the government is going to account for it, is the value on a cash accounting basis. This is the money that will actually be given to DND and CAF through the Parliamentary Estimates process, appear in departmental planning documents, be reported to NATO, and actually be spent on personnel, operations and maintenance, equipment and infrastructure. While the various explanatory documents do not spell this out, DND's Chief Financial Officer stated at a Canadian Global Affairs Institute conference that the total cash value of NORAD modernization is $87B over 20 years. For the sake of comparison, *Strong, Secure, Engaged* contained $62.3B in new funding over 20 years on a cash basis. Thus, while the funding arrangements are convoluted, there is new money attached to modernization Canada's defence through NORAD, and a sizeable amount of it at that.

Notes

1. Department of National Defence (DND), "Minister Anand Announces Continental Defence Modernization to Protect Canadians," News Release, 20 June 2022.
2. Cable Public Affairs Channel (CPAC), "Canada Announces $4.9B Investment for NORAD Modernization," Headline Politics, 20 June 2022.
3. DND, "Minister Anand Announces Continental Defence Modernization to Protect Canadians."
4. General Wayne Eyre, *The West Block*, 26 June 2022.
5. Conference of Defence Associations Institute (CDAI) Force Development Series, "Canada's Future Submarine Capability: 2030 and Beyond," Ottawa, 30 November 2022. Conducted under Chatham House Rule.
6. DND, "Fact Sheet: Funding for Continental Defence and NORAD Modernization," 21 July 2022.
7. *Ibid*.
8. Canada Department of Finance, Budget 2022.
9. Department of Finance, Fall Economic Statement, 2022, p. 134.

Dave Perry is President of the Canadian Global Affairs Institute and host of the Defence Deconstructed Podcast.

Warship Developments: Aircraft Carrier News

Doug Thomas

I have written before about aircraft carriers (CVs). Some are quite small: for example Canada's short-lived flirtation (1946-1971) with carriers was with 20,000 ton ships, of which the modified *Majestic*-class HMCS *Bonaventure* was the most capable and longest in service at 13 years. Aircraft carriers are seen as instruments of national power and prestige – rather like battleships 100 years ago – especially those larger than 40,000 tons operating jet fighters that can be launched via catapults or off a 'ski jump' bow ramp. Such operations conducted without a catapult are known as Short Take-Off But Arrested Recovery (STOBAR). Catapult Take-Off But Arrested Recovery (CATOBAR) is used in the largest carriers where stored energy in the catapult system is used to accelerate the aircraft from stationary to flying speed without it having to expend huge quantities of jet fuel. This enables the operation of larger, faster aircraft which can be more heavily laden with fuel and weapons than with non-catapult CVs. Most new vessels equipped with a ski-jump ramp are fitted with arrestor wires for recovery, as are all catapult-equipped ships.

In addition to pure CVs are the large-deck amphibious ships in countries such as Australia, Japan and the United States. They are capable of operating the Vertical/Short Take-Off and Landing (V/STOL) variant of the F-35 Joint Strike Fighter (JSF) which, when so equipped, transforms them into aircraft carriers perhaps with a capability comparable to that possessed by a small CV years ago. Most are not fitted with a ramp or arrestor wires, which would limit aircraft operations.

USS *Gerald R. Ford* recently sailed into Halifax harbour to conduct its first foreign port visit. *Ford* is the biggest, most modern and powerful aircraft carrier in the world. Leading-edge technology such as its Electromagnetic Aircraft Launch System (EMALS) and Advanced Arresting Gear (AAG) will permit a higher intensity of flight operations and also cause less stress on the structure of aircraft it launches and recovers than is the case with steam catapults. *Ford* is the first of a projected 10 new nuclear-powered CVs (CVN) with many improvements over the *Nimitz*-class carriers which they will replace in the coming decades. One of the improvements is a reduction in crew by some 700 men and women through automation and smart design. Considering that the service life of these ships is planned to be 50 years, significant through-life funding will be saved by reducing manning costs. Three more *Ford*-class ships have been authorized and are in various stages of construction – USS *John F. Kennedy*, USS *Enterprise* and USS *Doris Miller*.

Other countries are building CVs. Two navies in the Far East are particularly interesting: the Chinese People's Liberation Army Navy (PLA Navy); and the Indian Navy.

PLA Navy

Type 001: The Chinese have been interested in aircraft carriers since the 1970s. In 1985 China bought the ex-Australian HMAS *Melbourne* for scrap in order to dissect the design and learn how to build carriers. Apparently the steam catapult system was removed to a shore facility to study its operation. China also bought two of the four *Kiev*-class carriers from Russia for scrap (they are still afloat!), and renovated the incomplete RFS *Varyag*, the second Russian *Kuznetsov*-class carrier that had been rusting in the Black Sea for some years. That ship, now named *Liaoning*, was completely rebuilt and is operational as China's first aircraft with a small air group of fighters

Credit: Mass Communication Specialist 1st Class Ryan Seelbach

*USS **Gerald R. Ford** (CVN 78) arrives in Halifax Harbour on 28 October 2022.*

Credit: Indian Ministry of Defence

India's first indigenously-built aircraft carrier INS ***Vikrant*** *sails next to the destroyer INS* ***Kolkata*** *during sea trials on 16 July 2022.*

and helicopters. *Liaoning* is being employed conducting trials and training, but is an impressive looking ship and, unlike the bases China builds on atolls and reefs in the South China Sea, it is very mobile.

Type 002: A modified and improved version of *Liaoning* is *Shandong*, referred to as a Modified *Kuznetsov*-class. Part of the contract to buy the ex-*Varyag* included some 40 tons of drawings and blueprints. This data was apparently used to build a new and improved carrier, deleting the spaces previously assigned to missile launchers in *Varyag* to provide additional hangar space for more aircraft. China is following the lead of the US Navy in building a fleet of aircraft carriers, not large aircraft-carrying cruisers which was the Soviet/Russian concept. The Russian concept held that the aircraft-carrying cruiser's main armament was its large anti-ship cruise missiles, and embarked aircraft were intended to defend the ship and accompanying escorts from attack aircraft and missiles. This is different from the NATO tactic of carrier-based aircraft acting proactively and aggressively against opposing naval forces and land targets.

Type 003: The third CV, *Fujian*, launched earlier in 2022, is about 10,000 tons heavier than the *Kuznetsov*-class, and will be fitted with a Chinese-developed EMALS catapult system. It will have a larger air group and will be able to operate more sophisticated aircraft than *Liaoning* or *Shandong*. It is conventionally powered with steam turbines and boilers, as are the *Kuznetsovs*.

Type 004: It is predicted that the PLA Navy will have five or six CVs in the 2030s. It is estimated that the fourth ship will be launched in three to five years and will be conventionally powered. My guess is that it will be a second *Fujian*-class (Type 003). There are many advantages in training, operations, maintenance, etc., when navies operate multiple ships of the same class. Subsequent carriers will likely be nuclear-powered, fitted with EMALS and may approach the size of the American *Nimitz*-class and *Ford*-class.

Indian Navy

The Indian Navy has been operating aircraft carriers since 1961 with the acquisition of INS *Vikrant*, a ship similar to HMCS *Bonaventure*. Since then, a secondhand carrier, INS *Viraat* (ex-HMS *Hermes*) was acquired as a replacement for *Vikrant* and in turn scrapped after India purchased *Vikramaditya* from Russia in 2012. This much-modified ex-*Kiev*-class carrier had its missile launchers removed, new propulsion machinery and electrical cabling fitted throughout, and is now capable of STOBAR operations with an air group.

It has been an ambition of the Indian Navy for some time to build its own aircraft carriers and to have a three-carrier navy, so that two carriers could be available at all times with the third in maintenance, refit or working up in preparation for operations. To that end India embarked on a program to build Indigenous Aircraft Carriers (IAC). The first IAC was commissioned 2 September 2022 as INS *Vikrant*, named for the first Indian CV. This modern ship with GE gas-turbine propulsion and a speed of about 30 knots, is reported to have had a very successful trial period. The ship's air group will include the MiG-29 K and helicopters including Sikorski's MH-60R Sea Hawks. It is understood that a second ship of this class will be built to achieve the aim of a third carrier. Beyond that, it is likely that a future replacement for *Vikramaditya* will be larger and fitted with EMALS.

Conclusions

Aircraft carriers continue to be built and operated. They, and their embarked air groups, are expensive but provide great flexibility by changing the mix of aircraft and a range of effective options for the exercise of national policy. Part of the motivation for India's willingness to build an effective Fleet Air Arm is likely that the Chinese Navy is flexing its muscles with new aircraft carriers which can operate in the Indian Ocean, as well as its more traditional operating areas in the South China Sea and western Pacific. However, India has built up a very credible navy in recent years, and operated aircraft carriers long before China considered doing so.

Book Reviews

The Boats of Cherbourg: The Navy that Stole Its Own Boats and Revolutionized Naval Warfare, by Abraham Rabinovich, Independent Publication, 1988/2013, 354 pages, $20.99 (Cdn), ISBN 978-1-71020-421-6.

Reviewed by Rob Dienesch

When it comes to history, it is sometimes easy to get lost in our areas of interest. Yet it is refreshing to step outside of our areas to explore the larger vistas of history. Sometimes it opens us up to studying new areas. The problem is that we tend to pigeon-hole history, sometimes subconsciously, into topic areas, like military history or Cold War history, which can narrow our perception of events. For example, when we think of the history of Israel in the 20th century, we tend to think of the struggle for the creation of Israel or the early wars for its survival, or within the context of Middle Eastern history and the Cold War. But rarely do we find references to the role of the Israeli navy in the 1960s and 1970s. So when a book appears that examines this area, it has the potential to expand our understanding. Abraham Rabinovich's book *The Boats of Cherbourg* is just such a book.

Originally published in 1988, and reprinted in 2013, Rabinovich's book examines a strange convergence of forces that reshaped Israeli naval development. Starting in 1967 and the loss of the destroyer *Eilat*, the book traces the development and procurement of Israeli missile patrol boats in the years leading up to the 1973 Yom Kippur War. Despite their small number, these boats represent a massive change in power projection for the Israeli navy and in the process produced major technological developments that have shaped naval warfare ever since. It is also the story of the development of an Israeli military-industrial complex, an important process that helps shape our understanding of Israel's technological revolution.

Over 27 chapters Rabinovich traces an incredible odyssey. Everything from internal political conflict through the challenges of ship acquisition in a Europe caught within the Cold War and the repercussions of World War Two is part of the story. Interwoven within the tale is discussion of the personality clashes between scientists and experts making this a very human story at many levels. But it is also a story about the challenges of technological innovation within Israel of both domestic missile development and the new science of electronic countermeasures which in many ways was created by Israeli scientists, engineers and inventors. And throughout the narrative is a good dose of straightforward shenanigans at many levels, from playing on European and especially German guilt after the Holocaust for funds and design plans for motor torpedo boats to clandestine meetings, fraudulent business arrangements and the outright cheeky theft of the future missile patrol boats from Cherbourg after they were embargoed by France.

Broken into three main areas – concept, the escape and war – Rabinovich's book lays out a clear chronology of events. In the process he gives the reader insight into the complicated politics both within Israel and in Europe at the time. He also provides an excellent sense of the heightened military necessity that drove Israel's decision-making and the high-stake risks it was willing to take. However, the complicated web of personalities and issues is daunting and difficult – a great many of the key players are not people with which we would be familiar.

This book is written in a dynamic and lively manner with humour and passion, and the author manages to explain scientific and technical issues clearly for the reader. This makes it into a potentially valuable resource for historians and those trying to understand this complicated history. Unfortunately, there is one glaring failure that limits the overall utility of the book. It does not provide any citations or documentation for the events. Yes there are some images of documents included as illustrations along with individuals and ships but the text lacks any reference to primary documents or citations. This limits the overall value of the text as it fails to provide proof for the reader to follow. The author explains in the Preface that the Israeli government wanted the tale to be told but was unwilling to give him access to the documents essential to explain the story. Rather, he was given a couple of phone numbers and left to his own devices. The numbers led to people willing to talk which led to others and so on. Thus the entire text is based on oral histories and interviews conducted by the author years after the events. While I do not doubt the honesty of those interviewed or the author's desire for accuracy, without the documents necessary to help trigger memory or round out the story, those interviews are always subjective and potentially limited in value.

This puts this reviewer in a difficult position. I enjoyed the book. The story told is fascinating and undoubtedly essential to our understanding of the development of missile patrol boats and missile technology in the 1960s. It is also key in understanding the development of missile defences that have become an essential part of any modern fighting ship. Without the documentary backup, however, it will always lack credibility. But perhaps that is the point of the text – it is a starting point. By establishing the waypoints for the story, the key moments, people and technological breakthroughs, Rabinovich has begun the process of shining the light on to this topic. Other authors can begin here and tease out the documents to support or disprove his tale. Thus, this book is an essential first step to understanding the topic of guided-missile boat development. Even with this limitation I still recommend the book as a window into an incredible set of events.

Till the Boys Come Home, by Curtis Mainville, Fredericton, NB: Goose Lane Editions, 2015, 174 pages, ISBN 978-0-864-92879-5

Reviewed by Katelyn O'Neill

In his book *Till the Boys Come Home*, Curtis Mainville offers a detailed historical depiction of the obstacles that the First World War presented for those in Queens County, New Brunswick. Captain Curtis Mainville is a veteran of the Canadian Armed Forces and has published several scholarly articles which focus on New Brunswick's military history. This book is part of a New Brunswick Military Heritage Series and acts as an important historical resource.

Till the Boys Come Home offers a unique perspective into how one rural Canadian community shouldered the responsibilities of the Great War. At the time of the war, 11,000 people inhabited Queens County. Like many rural communities in Canada at the time, there were different circumstances that affected support for conscription and the war effort in general. Mainville illustrates exactly how support for the war in Queens County evolved and how industry (mining, farming) had significant impact on the community's wartime response. As a result of these effects, this county's response to the war fell behind the rest of New Brunswick and Canada. By comparing Queens County with the rest of the country, Mainville demonstrates the importance of local context, while also emphasizing major themes in wartime Canada.

In addition to exploring the evolution of support for the war and conscription numbers in Queens County, Mainville also discusses post-war issues that the community faced. These issues include a drop in price of coal, labour strikes, a rise in unoccupied farms, an increase in the price of feed, an overall high rate of unemployment, and the devastation that the Spanish influenza brought to the community. Mainville personalizes these experiences by giving a detailed account of what workers in each industry faced and how these struggles related to their attitudes before, during and after the war.

Mainville also discusses how the war had an unprecedented effect of spreading news among local communities. Letters from the front were submitted to the local paper by family and friends for publication. Publishing these letters kept the community connected to the experiences of their fellow community members who were experiencing the war first-hand. This was a smart strategy to garner support for the war effort as it personalized these experiences.

As in many other communities in Canada and around the world, the end of the war brought a time of deep mourning to Queens County. As the community was being devastated by the influenza, services for the dead were simultaneous to celebratory church bells marking the return of surviving community members. The community continued to enthusiastically embrace those who returned from the front lines for the next year; there were individual celebrations to welcome back returnees from the front.

Till the Boys Come Home offers valuable insight into the struggles of everyday Canadians during the First World War from a community-centric lens. Like any historical account, the book is heavy on detail and not necessarily a quick read but it is certainly worth reading for a well-rounded account of the realities that Queens County faced during the war. Mainville also provides many visual components, historical pictures and documents, which help to personalize the experiences he details throughout the book.

2023 Canadian Naval Memorial Trust
Essay Competition

Canadian Naval Review will be hosting the CNMT's annual essay competition again in 2023. There will be a prize of $1,000 for the best essay, provided by the **Canadian Naval Memorial Trust**. The winning essay will be published in *CNR*. (Other non-winning essays will also be considered for publication, subject to editorial review.)

Essays submitted to the contest should relate to the following topics:

- Canadian maritime security;
- Canadian naval policy;
- Canadian naval issues;
- Canadian naval operations;
- History/historical operations of the Canadian Navy;
- Global maritime issues (such as piracy, smuggling, fishing, environment);
- Canadian oceans policy and issues;
- Arctic maritime issues;
- Maritime transport and shipping.

If you have any questions about a particular topic, contact **cnrcoord@icloud.com**.

Contest Guidelines and Judging

- Submissions for the 2023 *CNR* essay competition must be received at **cnrcoord@icloud.com** by Tuesday, **30 May 2023**.
- Submissions are not to exceed 3,000 words (excluding references). Longer submissions will be penalized in the adjudication process.
- Submissions cannot have been published elsewhere.
- All submissions must be in electronic format and any accompanying photographs, images, or other graphics and tables must also be included as a separate file.

The essays will be assessed by a panel of judges on the basis of a number of criteria including readability, breadth, importance, accessibility and relevance. The decision of the judges is final. All authors will be notified of the judges' decision within two months of the submission deadline.

The *Sōryū*-class submarine JS *Sekiryū* departs from alongside the submarine tender USS *Frank Cable* on 25 November 2021 at Kure Naval Base, Japan.

Credit: Mass Communication Specialist 2nd Class Chase Stephens, US Navy