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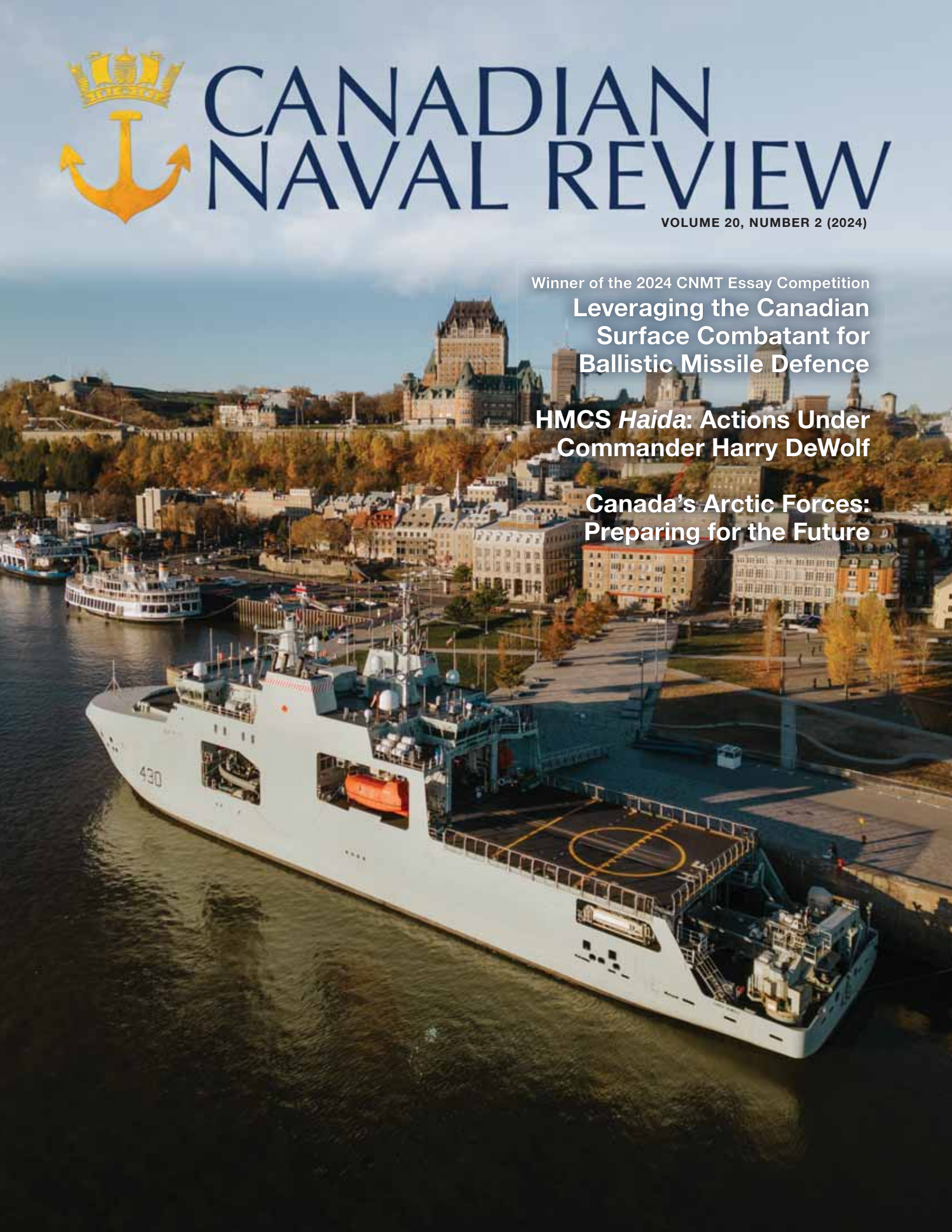

Winner of the 2024 CNMT Essay Competition

Leveraging the Canadian Surface Combatant for Ballistic Missile Defence

HMCS *Haida*: Actions Under Commander Harry DeWolf

Canada's Arctic Forces: Preparing for the Future

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CANADIAN NAVAL REVIEW

VOLUME 20, NO. 2 (2024)

BMIG StFX BRIAN MULRONEY INSTITUTE OF GOVERNMENT
Today's Policy Questions, Tomorrow's Policy Leaders

Correction: In the previous issue there was an error in the Editorial. It was not the *Iroquois*-class destroyers that were at the end of life, as stated – it was the *Mackenzie*-class destroyers.

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Canadian Naval Review has three primary objectives:

- provide a public forum for the discussion of the maritime dimension of Canada's national security;
- provide a public forum for the discussion of Canada's naval and maritime policies; and
- provide a source for the public examination of Canadian naval and maritime history and for the development of lessons learned.

The material included in *CNR* is presented for the professional and general education of the readers. Articles, commentaries and opinion pieces are invited from the widest possible spectrum for the purpose of informing, stimulating debate and generally challenging readers. **The opinions expressed by the authors do not necessarily reflect the opinions of the Editor, Editorial Board, Brian Mulroney Institute, the Department of National Defence, the Royal Canadian Navy or *CNR* sponsors.**

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Credit: Master Corporal Djalma Vuong-De Ramos, Canadian Armed Forces

*HMCS **Harry DeWolf** amidst fall colours in Quebec City during the 2023 Great Lakes Deployment, 6 November 2023.*

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Editorial

Collingwood's Acorns: Nurturing Hearts of Oak

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

I count myself as fortunate to have grown up in northeast England, a region for which the description 'rich in history' is an under-statement. Some years later I moved to New Brunswick and was surprised, and somewhat comforted, to find numerous place-name links – from the Northumberland Strait, to Benton, Blagdon and Tweedside.

These connections reflect a point of commonality in the heritage of these two regions, founded on the significance of the sea in shaping the economy, politics and identity of their people. Northeast England was once the pride of British shipbuilding and it is hard to over-state the importance of this industry to the region's economy and to Britain's foreign policy. Thousands of engineers and craftsmen worked on the Tyne and Wear Rivers, producing civilian and military vessels that were used across the globe. Indeed, in 1830 Sunderland was described by Lloyd's Register as "the most important shipbuilding centre in the country."[1] This importance only grew as wood gave way to iron, and by 1900 "four out of every five ships in the world were built in the United Kingdom, and two out of those five were built in the shipyards of the North East coast of England."[2] The Royal Navy benefitted greatly from this expertise – "between 1868 and 1927 [Newcastle-born engineer William] Armstrong's company was responsible for 42% of all British warship production."[3] On the civilian side, *Mauritania*, launched in 1906, was the largest and fastest liner in the world, holding the Blue Riband for the fastest Atlantic crossing between 1907 and 1929. The first dedicated heavy icebreaker, *Yermak*, was commissioned by the Imperial Russian Navy and built in Newcastle. It was launched in 1898 and ended its service in 1964, a monument to the vessel still stands in Murmansk.

Most of these shipyards have closed, but their legacy in Canada is worth remembering. The first ship commissioned into the Royal Canadian Navy (RCN), HMCS *Rainbow*, was built in Palmers Yard, Hebburn-on-Tyne, and the much-vaunted HMCS *Haida* (the subject of an excellent article in this issue), now a museum and the ceremonial flagship of the RCN, was launched into the Tyne from the Armstrong-Vickers yard in 1942.

In parallel, the northeast also built a reputation for crewing ships. The region has produced more than its share of remarkable people who have been instrumental in shaping our world.[4] Two, though, have been particularly honoured in their home region. A statue of Earl Grey, Prime Minister of Britain, who through the 1832 *Great Reform Act* radically expanded the franchise and laid a foundation stone for modern democracy, stands atop a 133-foot column in the centre of Newcastle-upon-Tyne.[5] The other is Vice-Admiral Cuthbert Collingwood, 1st Baron Collingwood, whose figure can be found upon a monument in Tynemouth, gazing to the point at which the rest of the world meets the Tyne.

Collingwood was buried near his close friend Admiral Horatio Nelson in St. Paul's Cathedral in London, a grand resting place for someone described at the unveiling of his monument in 1845 as "a typical north countryman – never duly elated with success or depressed by failure, caring little for public applause."[6] To those of us from northeast England, it is Collingwood, not Nelson, who was the true victor of the Battle of Trafalgar having commanded the British fleet following Nelson's death. Collingwood's ship, *Royal Sovereign*, was at the heart of the fighting, finishing the engagement barely recognisable due to the pounding it had sustained. Collingwood's temerity and decisiveness in turning toward the Franco-Spanish line, engaging the enemy an hour before any other British ship, was noted by Nelson, who urged his compatriots on board HMS *Victory* to "see how that noble fellow Collingwood takes his ship into action."[7] He inspired his sailors by showing, in the words of one, "a single-handed coolness … in the heart of a volcano … musing over the progress of the fight … munching on an apple … and [looking] himself along the

Credit: Q23c, Wikimedia Commons, CC BY-SA 4.0.

The monument to Vice-Admiral Lord Cuthbert Collingwood, Nelson's second in command at Trafalgar, in Tynemouth, England, seen in June 2016.

guns to see that they were properly pointed."[8] Little mention is made of the severity of the injuries that Collingwood suffered during the battle, further testament to his courage and modesty.

A consummate diplomat as well as an exceptional sailor and leader, Collingwood's talents resulted, much to his displeasure, in his appointment as Commander-in-Chief of Britain's Mediterranean Fleet. Despite his entreaties to return to his wife and daughters in his beloved Northumberland, Collingwood remained in the Mediterranean until finally being allowed to return to England in 1810. Sadly, his health broken, Collingwood died during the journey not having set foot in Britain since 1803.

While the official records of Collingwood's accomplishments understandably focus on the markers of his naval service, this does a disservice to a genuinely remarkable individual ahead of his time in refusing to flog his sailors and steadfast in ensuring that his daughters received a broad education. It is a smaller act, not reflected by his list of accolades, to which I draw your attention. One of Collingwood's joys was walking in the College Valley with his dog, Bounce. Collingwood always took with him a pocket full of acorns, planting them judiciously and encouraging his friends and acquaintances to do the same. This unusual behaviour was intended to ensure "that the Navy would never want for oaks to build the fighting ships upon which the country's safety depended."[9] Collingwood's wife Sarah continued this project following his death and, two centuries later, a grove of 200 'Collingwood Oaks' stands in the Cheviot Hills. This was augmented in 2005 with a further 2.5 acres of oaks planted opposite the original trees as one of 10 'Trafalgar Woods' created across the UK to commemorate the second centenary of the battle.

Planting acorns may well be beneficial from an environmental perspective, but rather less efficacious in enhancing naval capability in the coming years. Nevertheless, Collingwood and his acorns spring to mind whenever I read *Canadian Naval Review*. I often find it frustrating to see such brilliant work, produced by such a range of wonderful thinkers with an extraordinary breadth and depth of knowledge, not leading immediately to tangible policy outcomes. I am well aware that the wheels of government turn slowly, that academia is not intended to be some sort of policy think-tank, and that the creation of knowledge for its own sake has immense value. Similarly, this is not to say that all of the ideas contained in this journal (and other academic publications) are necessarily 'correct.' However, the content of this journal, as it celebrates 20 years of publication, provides a tremendous array of perspectives that offer an unparalleled opportunity not only to broaden our perspectives of naval affairs, but also to promote the integration of this new understanding into decision-making frameworks.

Hethpool, where Vice-Admiral Collingwood and his wife, Sarah, planted acorns for oak trees, as seen in 2012.

Each of these articles is one of Collingwood's acorns. We cannot predict who will see an article, whether a reader will have been eagerly awaiting a new edition or whether they stumble across the publication while researching a similar topic. It is the nature of things that not all of these ideas will take root – and we cannot know which of them will resonate, or the political and security contexts of the future in which an article becomes apposite. Similarly, the ideas may inspire later practise that reflects the original premise but not its absolute function – the Trafalgar Woods to the Collingwood Oaks, to take the metaphor further. But, ultimately, none of this matters. What matters is that those with real knowledge and expertise are provided with the opportunity to share their thoughts via an accessible and respected forum, and that those who take up decision-making positions at the political level have the opportunity to engage thoughtfully with them. That is why I am especially proud to join the Editorial Board of *Canadian Naval Review*. I have no doubt at all that the acorns of explanation and ideas contained here will become the keel and rudder of the next generation's *Victory*.

Thomas Hughes

Notes

1. Norman McCord and Richard Thompson, *The Northern Counties from AD 1000* (Oxford: Routledge, 2018), p. 216.
2. Dan Jackson, *The Northumbrians* (London: Hurst and Company, 2019), p. 81.
3. *Ibid*., p. 49.
4. Including George Stephenson, Josephine Butler, Susan Auld, William Armstrong, Mary Astell and Ann Swynford Lambton.
5. Earl Grey is often credited, probably incorrectly, with popularising the tea for which, somewhat depressingly, he is better remembered.
6. BBC Inside Out North East, "Collingwood: Forgotten Hero," BBC, 28 February 2005.
7. Jackson, *The Northumbrians*, pp. 45-46.
8. *Ibid*.
9. Dudley Pope, *Life in Nelson's Navy* (London: House of Stratus, 1981), p. 35.

Winner of the 2024 CNMT Essay Competition

Leveraging the Canadian Surface Combatant for Ballistic Missile Defence

Lieutenant-Commander Damien Ciotti*

Credit: Royal Canadian Navy

*A rendering of the Canadian Surface Combatant, now named **River**-class destroyer, as posted on LinkedIn by the RCN in summer 2024.*

While Canada contributes personnel to the Ballistic Missile Early Warning Mission as a part of the North American Aerospace Defence Command (NORAD), Canada currently lacks the ability to intercept ballistic missile threats. The Royal Canadian Navy (RCN) has, however, selected systems for the Canadian Surface Combatant (CSC)[1] which will enable Canada to conduct independent detection of ballistic missiles, and conduct intercept missions.[2] Through the CSC, the RCN can deliver on Canada's NORAD modernization goals by significantly increasing the Integrated Air and Missile Defence (IAMD) capability of assets declared to NORAD. The combination of a command and control (C2) system with a ballistic missile detection sensor in the CSC project creates the possibility of a seaborne platform with an intercept capability. Paired with the appropriate interceptor, this suite would build Canadian missile defence coverage over a significant portion of Canada which is currently vulnerable to ballistic missile attack.

In a world where threats of ballistic missile attack are rapidly expanding, there is both a national requirement for defence and a further requirement for seaborne ballistic missile defence (BMD). This article contends that leveraging the capabilities of the CSC is crucial for shaping a shift in Canadian policy towards conducting BMD operations. Focused development of BMD competencies in the CSC will strengthen Canada's security in North America through improved integrated air defence delivered via NORAD, and contribute to global peace and security by delivering a deterrent to hostile actors who threaten ballistic missile attacks.

The Canadian Armed Forces (CAF) have the institutional intention to capitalize on the enhanced capabilities of projects like the F-35 fighter jet, NORAD modernization and the CSC in the coming decade to bolster Canadian participation in missile defence operations. These operations will require improved air defence capabilities across the CAF. NORAD modernization prioritizes improving IAMD but focuses on air-centric aspects and delivery of the F-35.[3] However, there is an opportunity to incorporate a maritime element while adding defence capability, crucially expanding Canada's integrated air defence capability and facilitating response from varied and dispersed platforms.

This article examines both past and present Canadian BMD policies, providing an analysis through a comparative approach, evaluating the organization, equipment and deployment strategies of the US Navy's (USN) BMD capabilities. The article advocates for the RCN to utilize BMD capabilities obtained through the CSC project. Specifically, the RCN should employ these capabilities to detect and counter ballistic missiles in support of NORAD and other strategic missions. The comparison is centred on the equipment involved from the USN and in the CSC project which would enable this mission set.

What is BMD?

Ballistic missile defence can be described as "a system, weapon, or technology involved in the detection, tracking, interception and destruction of attacking missiles."[4] The concept emerged during the Cold War, focused on countering intercontinental ballistic missiles armed with nuclear warheads. It marked a strategic shift from the deterrence-by-punishment doctrine, exemplified by Mutually Assured Destruction. Instead, BMD exercised deterrence by denial, emphasizing the ability to intercept and neutralize hostile missiles before they reach allied territories.

BMD systems have evolved beyond the Cold War paradigm, adapting to emerging threats. This maturation enables engagement not only of long-range nuclear missiles but also shorter-range, non-nuclear missiles.[5] This adaptability is crucial in addressing a diverse range of post-Cold War missile threats, including from regional conflicts, and advanced technologies that have proliferated among state and non-state actors, such as the Houthis in Yemen who have used ballistic missiles to attack civilian merchant shipping in the Red Sea.[6]

Canadian Policy

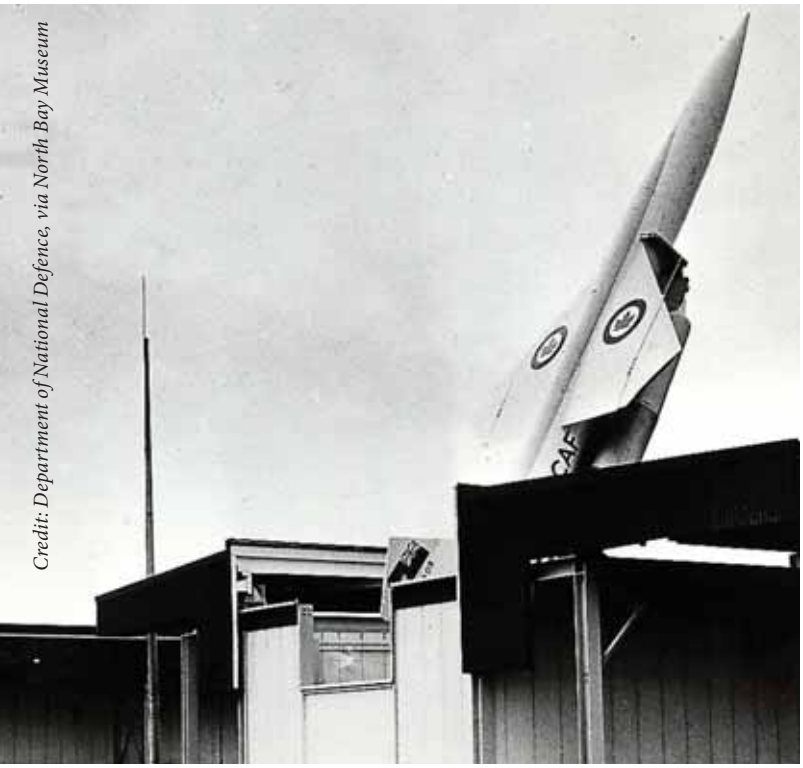
Historically, Canada has had a complex relationship with missile defence initiatives, particularly those advanced by the United States. In the late 1950s, Canada acquired two squadrons of the CIM-10 Bomarc surface-to-air missile for the newly integrated North American air defence system.[7] Designed to intercept and destroy incoming enemy aircraft, Bomarc became part of the joint defence arrangement symbolized by NORAD. Meant to be equipped with nuclear warheads, the presence of Bomarcs on Canadian soil triggered a public debate on the implications and potential consequences for Canadian security and sovereignty, contributing to the eventual downfall of the John Diefenbaker government.

The US Strategic Defense Initiative (SDI), presented by President Ronald Reagan in 1983, proposed a missile defence system to safeguard the United States and its allies from potential Soviet nuclear missile attacks.[8] Referred to as 'Star Wars' in the media for its ambitious goals, SDI envisioned using ground- and space-based technologies to intercept and destroy incoming ballistic missiles. Prime Minister Brian Mulroney declined Canadian participation, citing sovereignty concerns and complaining that Canada "would not be able to call the shots."[9] The Canadian public strongly opposed both the Bomarc missile deployment and the SDI, with opposition raising concerns over national security, sovereignty and the potential escalation of the arms race. This widespread dissent reflected fears that Canada's involvement in these missile defence programs would entangle the country in US military strategies and increase its vulnerability in a nuclear conflict during the Cold War.

While the SDI never materialized, its elements laid the groundwork for subsequent US programs. In the early 2000s, the issue gained prominence in Canada as the United States proposed a much-reduced missile defence program to counter rogue states with intercontinental ballistic missiles (ICBMs). However, in 2005, Prime Minister Paul Martin decided against joining the US BMD program.[10] The decision was related to concerns about effectiveness, compatibility with Canada's defence priorities, and a desire to maintain diplomatic independence. While vocal public opposition remained, polls conducted at the time indicated that public opinion had shifted significantly, and that surveys revealed a nearly even split in opinion, with 52% of Canadians opposing participation in the US BMD system and 46% supporting it.[11] However, the opposition was notably more passionate, and drove a strong and vocal resistance against the initiative.

Credit: Petty Officer 2nd Class Aaron Lau

*A screenshot from a video posted by US Central Command shows the cargo vessel **Marlin Luanda** on fire in the Gulf of Aden after being struck by an anti-ship ballistic missile fired by Houthi rebels, 27 January 2024.*



Credit: Department of National Defence, via North Bay Museum

A Canadian Bomarc surface-to-air missile seen during an exercise at a Royal Canadian Air Force base (likely North Bay) between 1962 and 1972.

Canada's current policy regarding missile defence is nuanced but has failed to evolve and is ill-suited for the present security environment. Canada's policy toward the US BMD system has remained unchanged despite the escalating threats from hostile states and non-state actors, and a global security environment that has drastically deteriorated since the 2005 decision. However, Canada has quietly acknowledged the necessity of BMD, particularly within the NATO context. The 2010 signing of NATO's updated Strategic Concept emphasized the need for BMD as a core element of collective defence.[12] The 2012 NATO Deterrence and Defence Posture Review, signed by Canada, highlighted the growing concern and threat posed by the proliferation of ballistic missiles. In 2022 testimony before the House of Commons Standing Committee on National Defence, Director General Continental Defence Policy, Jonathan Quinn, affirmed Canada's significant role in North American aerospace threat detection, including detection of ballistic missiles, and acknowledged the diverse missile threats facing the North American homelands.[13] The policy contradiction between participating fully in missile detection, but only selectively in engagement – depending on missile type – suggests a lack of understanding among Canadians regarding the nuances of these threats.

The Canadian government acknowledges the importance of defending against ballistic missiles within a NATO context. However, when concerning North American defence, Canada adopts a bifurcated strategy, employing crewed aircraft to engage cruise missile threats while refusing to conduct BMD with the United States.[14] This approach is outdated and leaves Canada susceptible to various missile threats. Then-Chief of Defence Staff, General Wayne Eyre, highlighted in his 2022 Parliamentary appearance alongside Quinn that the distinctions between missile types are diminishing rapidly, and advocated for a Canadian IAMD system. He emphasized the challenge of targeting specific threats amid the range of potential dangers – i.e., separating cruise missiles from ballistic missiles – and asserted that IAMD is the future operating concept. Two years on from that testimony, IAMD is not just a future concept but a present necessity, requiring a mix of capabilities, including BMD, to counter current and future threats to Canadians.

While Canada's defence policy *Strong, Secure, Engaged,* released in 2017, makes no mention of BMD or IAMD, it repeatedly highlights the escalating risk to regional stability and international peace and security caused by the proliferation of ballistic missiles.[15] The defence policy update, *Our North, Strong and Free* released in April 2024, discusses the need for IAMD to defend against hypersonic and cruise missiles in an increasingly complex threat environment.[16] The policy and update both firmly commit to funding the modernization of NORAD as a key pillar of Canadian defence policy, including investing in IAMD capabilities. Canada's plan for funding NORAD modernization further discusses the increased need to collaborate with the United States in an IAMD system.[17] This is especially critical today, given the danger of evolving missile threats such as hypersonic weapons and improved cruise missile technology. In 2023, then-Defence Minister Anita Anand supported adopting an IAMD concept for Canada via NORAD modernization due to the complexity of contemporary missile threats.[18] While Canada's NATO allies have embraced IAMD, Canada's aged policy involves air platforms intercepting cruise missiles under NORAD, and US national assets engaging ballistic missiles after they are detected by NORAD, creating an artificial seam that an integrated air and missile defence system with a BMD capability would effectively address.

Comparative Analysis of USN BMD

The USN conducts BMD through a multi-layered and integrated approach, utilizing a combination of sensors, C2 systems and interceptor missiles. The primary goal of the system is to detect, track and, if necessary, intercept and destroy ballistic missiles that pose a threat. This is accomplished through the use of the Aegis C2 system deployed on *Arleigh Burke*-class destroyers and *Ticonderoga*-class cruisers.[19] Aegis-BMD is made up of three basic components: sensors, interceptors and command and control.

The primary sensors for Aegis-BMD are Active Electronically Scanned Array (AESA) radars, such as the AN/SPY-1D, or the newer SPY-6 or SPY-7 radars.[20] AESA radars are preferred for BMD systems due to several key advantages

that enhance their effectiveness in tracking and engaging ballistic missile threats.[21] AESA radars contribute to a comprehensive situational awareness by providing a continuous and adaptable view of the airspace. This is particularly crucial for detecting and tracking ballistic missiles in their various phases of flight.

The interceptors in use by Aegis-BMD are the Standard Missile-3 (SM-3) and the Standard Missile-6 (SM-6), both fired from the Mark 41 Vertical Launch System (Mk 41 VLS).[22] The SM-3 uses kinetic kill technology, essentially hitting the threat missile in flight with another missile outside of the atmosphere. The SM-6 engages in terminal BMD, which means engaging after the threat missile has re-entered the atmosphere. However, both missiles are effective in the BMD role.

Ballistic missile defence of the continental United States is currently provided by the Ground-based Midcourse Defense (GMD) system operated by US Northern Command, although Aegis-equipped BMD ships have been considered for this task. Primarily due to the number of hulls available, these ships are instead employed in theatres worldwide to safeguard against potential ballistic missile threats from rogue states like Iran and North Korea.[23] These BMD ships have also been operating in the Red Sea since late 2023, defending merchant shipping – and themselves – against Houthi missile attacks.[24] The proliferation of ballistic missiles to non-state actors like the Houthis, who are willing to use them against civilian targets, is extremely worrisome, and poses a significant challenge to global security that should gravely concern Canada.

Analysis of Potential CSC BMD Capability

Canada's strategic decision to adopt the Aegis C2 system for the CSC project marks a significant step.[25] This choice empowers Canadian vessels to execute BMD operations in a similar manner to the USN. The CSC will also be equipped with the SPY-7 radar and the Mk 41 VLS, providing the required technical components that the USN considers fundamental to conducting BMD.[26] With these systems in the CSC framework, the CAF has a path toward a robust IAMD system comprised of more than a single component, amplifying Canadian contribution to NORAD missions dedicated to safeguarding Canadians. These systems, integral to the CSC project, constitute the primary investment required to establish a fully equipped BMD-capable element. From a technical perspective, the only remaining gap is the acquisition of a suitable interceptor, given that the CSC will have the same VLS, sensors and C2 suite that is used by the USN for BMD.

The more challenging shift required is the change in policy to allow the CAF to conduct BMD. The urgency for this policy adjustment and the critical need for BMD capabilities at sea was underscored by Vice-Admiral Angus Topshee, Commander of the RCN, who stated in recent remarks that "BMD is self-defence for ships now."[27] The RCN needs the CSC to have BMD capabilities to be able to operate effectively at sea, and Canada needs BMD capabilities for a robust IAMD system under NORAD. CSCs delivering BMD capabilities in a period of increased threat from ballistic missiles are the vehicles the CAF should use to advocate for a policy change to permit the conduct of BMD. To navigate the proposed policy change effectively, CAF leadership must actively engage both the government and the public to explain the threat in modern terms.

Recognizing hesitancy rooted in historical sovereignty concerns and public opposition is crucial, but it underscores the need to educate the public on the current state of threats, which differ significantly from those envisioned last century, especially given the evolving complexities of today's international security environment. While the military is expected to act on government direction rather than shape policy, the CAF can still play a leadership role in educating the public by providing clear,

*A SM-6 Dual II missile is launched from USS **Preble**'s Mk 41 Vertical Launch System near Hawaii during a flight test on 28 March 2024. The test resulted in the successful interception of a medium-range ballistic missile.*

factual information about the threats posed by modern missile systems and the fundamentally defensive capabilities that come with BMD. Through educational outreach initiatives, including forums, media engagements and collaboration with academic institutions, the CAF can help demystify the technical aspects of BMD and highlight its importance for national security. Additionally, the CAF can emphasize Canada's existing support for BMD within the NATO framework, where it is recognized as a vital component of collective defence, and as a part of modern IAMD systems. By framing the discussion around the need for a robust, integrated defence strategy that includes BMD, the CAF can assist the government in making informed decisions that align with public interests, while respecting the democratic process and the established roles of military and civilian leadership.

The comparative analysis of the USN's BMD capabilities yields crucial insights which support advocating for harnessing the capabilities of the CSC. The Aegis-equipped ships in the USN's arsenal showcase the manoeuvrability, practicality and effectiveness of an integrated approach to BMD. The use of advanced AESA radars and versatile interceptors like the SM-3 and SM-6 highlights the centrality of having a comprehensive and adaptable system to counter diverse ballistic missile threats.

This insight reinforces the argument for the CSC project's BMD capabilities, which includes the Aegis system and associated technologies. The CSC's integration of Aegis C2 systems, SPY-7 radar and the Mk 41 VLS aligns with the proven capabilities of the USN's BMD approach. By adopting a similar framework, Canada can use the CSC to establish a BMD capability, enhancing its contribution to NORAD missions and addressing evolving missile threats effectively. This comparative analysis supports the feasibility and strategic advantage in leveraging the CSC for bolstering Canada's air and missile defence capabilities.

Conclusion

This article has briefly traced past and present Canadian BMD policies, and proposed a strategic shift in defence posture through the CSC project. The primary objective of this shift is to strengthen Canada's security by significantly bolstering its role in North American defence, specifically addressing evolving missile threats. Additionally, possessing a credible BMD capability will serve as a valuable deterrent against hostile international actors posing a threat to global security. The analysis underscores the potential of the CSC project to facilitate this evolution; equipped with Aegis C2 systems, SPY-7 radar and the Mk 41 VLS, the CSCs would provide a credible BMD capability for Canada.

Keeping a CSC on a BMD patrol 24/7, 365 days a year would be both infeasible and impractical due to the significant strain it would place on limited naval resources, including personnel, maintenance and operational readiness. This class

Credit: Petty Officer 1st Class Cassondra Johnson, US Navy

US Navy students participate in the Aegis Tactical Action Officer training course in the Reconfigurable Combat Information Center Trainer at Naval Station Norfolk in summer 2024.

Credit: US Department of Defense

A CF-18 Hornet, F-35 Lightning II and F-16 Fighting Falcon intercept a Chinese H-6 in the Alaska Air Defense Identification Zone on 24 July 2024 during a NORAD mission. Canada's interception role in NORAD is limited to using air-to-air methods such as fighters.

of ships is designed to fulfill multiple roles and dedicating a single vessel on each coast exclusively to BMD would reduce the ship's availability for other critical missions, compromising overall fleet readiness, and thus the need for government flexibility. Moreover, such a continuous commitment would be unsustainable given the relatively small number of ships planned and the vast geographical area they would need to cover. However, BMD is not intended to be a standalone mission for the CSCs but rather a component of a comprehensive IAMD system. In this context, the ships can be leveraged to advance the policy discussion by presenting a complete technical solution for BMD, demonstrating that Canada has the capability to contribute meaningfully to BMD when required. This approach allows the CAF to participate in BMD operations as part of a broader, more adaptable defence strategy, rather than simply over-committing resources to an impractical, round-the-clock patrol model.

Recent shifts in Canadian policy towards BMD, evident in commitments to NATO's Strategic Concept and NORAD modernization, acknowledge the growing risk posed globally by ballistic missiles. However, a policy disconnect remains in Canada's differentiated approach to missile defence against cruise and ballistic missiles in North America.

Analyzing the USN's BMD capabilities provides a model for Canada to consider, emphasizing the effectiveness of Aegis-equipped ships in countering ballistic missile threats. The CSC project's selection of C2 architecture, sensors and BMD-compatible vertical launch systems presents the CAF with the opportunity to generate BMD capabilities and advocate for a policy shift towards the integration of BMD into the broader defence strategy.

In the current geopolitical landscape and with the stated need for an improved approach to integrated air and missile defence, Canada has a pivotal opportunity to strengthen its national defence and significantly contribute to collective security. As Canada invests in NORAD modernization, incorporating BMD capabilities such as through the CSC should be a critical component, aligning with a commitment to safeguard Canadian interests and those of Canada's allies.

Notes

* Opinions expressed or implied in this article are those of the author, and do not necessarily represent the views of the Department of National Defence or the Canadian Armed Forces.

1. Note that since this article was written, the RCN has decided on a name for the class – the *River*-class. For simplicity, the article will continue to refer to the CSC.
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13. Testimony before House of Commons Standing Committee on Defence, "Evidence, Tuesday, 18 October 2022," NDDN (44-1), No. 34, House of Commons of Canada.
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26. Dunlop, "A Potential Political Brawl over BMD Capabilities on Canada's CSC Type 26 Frigates?"
27. Vice-Admiral Angus Topshee, email "Ballistic Missile Defence," 4 February 2024.

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HMCS *Haida*: Actions under Commander Harry DeWolf

Commander James Brun

Credit: Timothy Choi

*HMCS **Haida** as seen March 2019 in Hamilton.*

HMCS *Haida* is Canada's most successful warship – Canada's Fightingest Ship. Between April and September 1944, *Haida* sank nine enemy warships, including three destroyers and a U-boat. As the last remaining *Tribal*-class destroyer, this ship is now a National Historic Site located in Hamilton, Ontario, and the ceremonial flagship of the Royal Canadian Navy (RCN). This article briefly examines *Haida*'s actions during this period, while under the command of Canada's most successful naval officer, Commander Henry George 'Hard Over Harry' DeWolf.

Haida was one of the most advanced ships of its kind when it was commissioned in August of 1943. The ship was laid down in 1941 by Vickers Armstrong in Newcastle, United Kingdom. *Haida* displaced nearly 2,000 tonnes, was 126 yards (115 metres) long, and could make an enviable 36 knots underway. Its complement of 260 men ably crewed an impressive array of weaponry, including three twin-mounted 4.7" guns, one twin-4" gun, one 2-pounder quad Pom-Pom, six 20mm twin Oerlikons machine guns, torpedoes and depth charge throwers.

In September of 1943, *Haida*, along with three other Canadian *Tribal*-class destroyers, joined the British Home Fleet at Scapa Flow, a sheltered body of water in the Orkney Islands. Their task was to protect Arctic convoys carrying urgently needed provisions to the Soviet Union. *Haida*'s first patrols on the Murmansk Run were uneventful yet challenging, often conducted in darkness and in an unforgiving environment. The transit was shorter than the North Atlantic run by several days, however, with the average passage from Loch Ewe to Murmansk requiring six to eight days.[1]

In late December 1943 *Haida* was serving as an escort for the 19 merchant ships of convoy JW-55B bound for Murmansk. *Haida*'s captain DeWolf was responsible for the rear of the convoy. On Christmas Eve, Admiral Bruce Fraser with his flag embarked in HMS *Duke of York* received a signal that the great German battlecruiser *Scharnhorst* was preparing to set sail from its base at Altenfjord, Norway, within 400 nautical miles of JW-55B.[2] Two days later, Fraser received a second signal from the Admiralty, confirming *Scharnhorst* was at sea. The resultant battle, known as the Battle of North Cape, resulted in the destruction of *Scharnhorst* in what was to be the final Royal Navy action between big gun ships. *Haida* remained to

the rear of the convoy throughout the main action, ensuring that the merchant ships were guarded.

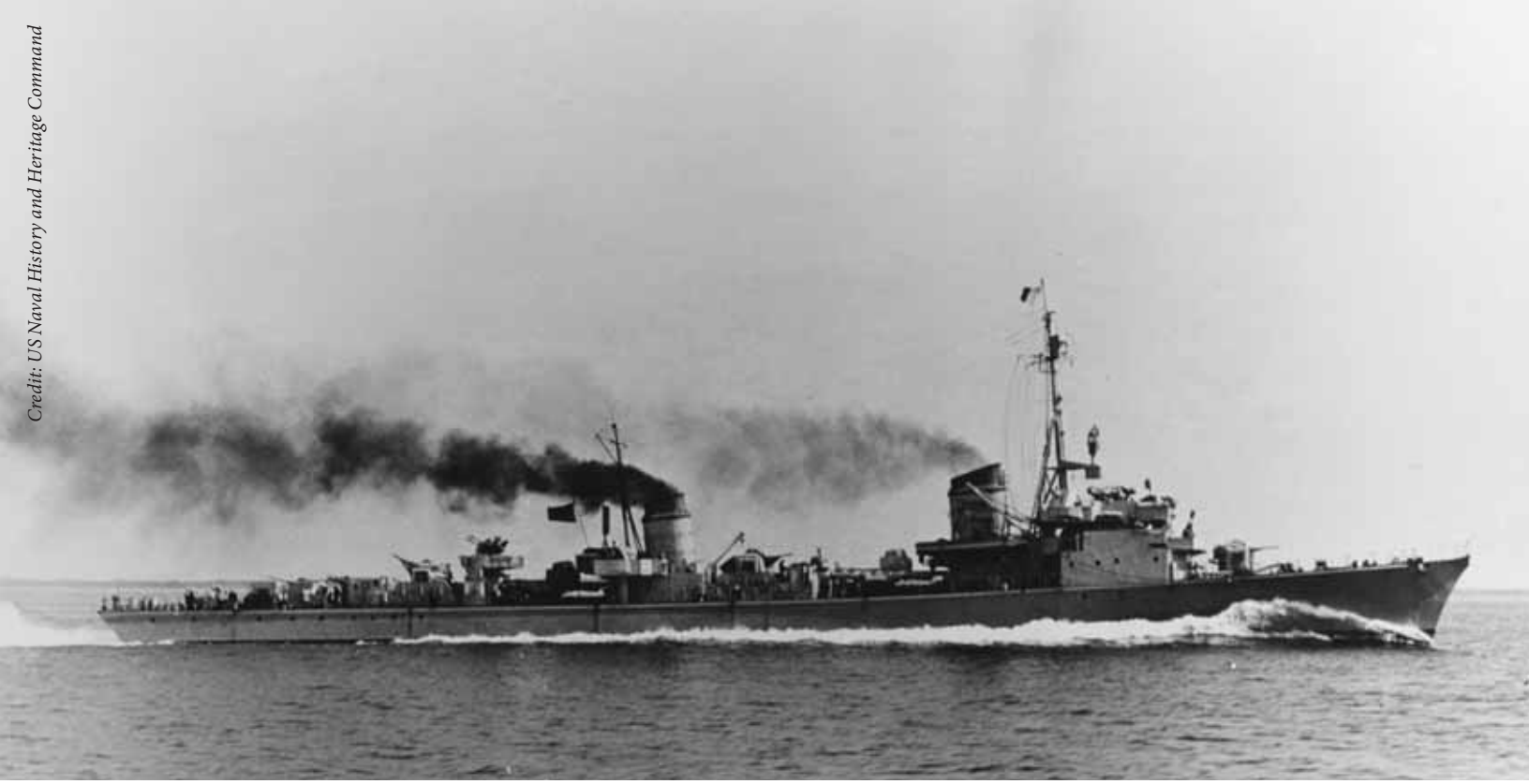
With the destruction of *Scharnhorst*, *Haida* and the other Canadian *Tribals* were transferred to Plymouth as part of the 10th Destroyer Flotilla. Their task was to guard the western approaches to the English Channel in the prelude to the invasion of Europe. Over the first months of 1944, Allied naval strategy in the English Channel became more offensive. Two concurrent operations were undertaken: *Operation Tunnel* and *Operation Hostile*. *Tunnel* operations were designed to intercept and destroy enemy shipping in the English Channel, while *Hostile* operations involved mine-laying along the French coast. During the lead up to the Normandy invasion, *Haida* participated in 10 *Tunnel* and nine *Hostile* operations, hunting German surface ships and providing cover to Allied mine-laying vessels off the coast of Brittany.

For three months *Haida* hunted the English Channel but found no prey. That would change in late April, when Force 26 sailed from Plymouth Harbour. Led by the cruiser HMS *Black Prince* and supported by other *Tribals*, HMC Ships *Athabaskan* and *Huron* and HMS *Ashanti*, *Haida*'s crew would finally see action up close. In the early morning of 26 April, the Allied force encountered three German *Elbing*-class destroyers: T24, T27 and T29. *Black Prince* illuminated the enemy ships with a star shell at 13,000 yards (about 11,900 metres), and the Allied destroyers opened fire.[3] T27 fired its torpedoes and *Black Prince* took evading action, effectively removing it from the remainder of the engagement. The *Tribals* pursued the German ships in a stern chase for an hour before *Haida* sighted T29, doubling back through smoke at a range of two nautical miles after receiving a shot through its rudder. The ship was immediately engaged by *Haida* and hit on the first salvo. *Athabaskan* joined the fight, and the two Canadian destroyers pummelled T29 until it was fully engulfed in flames. Harry DeWolf recalled the Canadian ships "went back a second time and perhaps a third, it was murder really."[4] T29 was the largest enemy warship yet sunk by the RCN during the war.

Three nights later, *Haida* and *Athabaskan* were back at sea in support of *Hostile* operations off the Brittany coast. It was a night of uncharacteristic atmospheric conditions, perfect for long-range radar detection, which enabled radar stations in Plymouth to track two *Elbing*-class

Credit: Timothy Choi

After the Second World War, HMCS ***Haida*** *received twin 4" dual-purpose guns in place of its original twin 4.7" meant for surface warfare.*



Credit: US Naval History and Heritage Command

The former T35, under US Navy control after the war, runs trials off Boston on 14 September 1945. T35 was a sister ship to the other ***Elbing****-class destroyers that* ***Haida*** *engaged during the war.*

destroyers, T24 and T27, the surviving enemy ships from *Haida*'s previous engagement, all the way across the English Channel.[5] The Canadian ships received a signal from Commander-in-Chief (C-in-C) Plymouth and were vectored to intercept the *Elbings* east of l'île Vierge, a small island off the northwest coast of Brittany. *Athabaskan* was first to pick up the enemy on radar, followed within two minutes by *Haida*. The RCN *Tribals* engaged at a range of 7,300 yards (6,675 metres), before the two German destroyers were within visual range.[6] Surprised, the two *Elbings* turned away and fired a pattern of torpedoes towards the Canadian ships. *Athabaskan* was hit by a torpedo port side aft and began to burn. *Haida* pursued the enemy, engaging T27 with devastatingly accurate gunnery. Out of options, the German captain drove his ship onto the rocks. *Haida* continued to engage the stranded ship for five minutes.

With the second *Elbing* now out of radar range, DeWolf returned to *Athabaskan*'s last known location. The fire in *Athabaskan* had spread, and a large explosion rocked the ship. Lieutenant Commander John Stubbs, *Athabaskan*'s captain, ordered the crew to survival stations to prepare to abandon ship. A second huge explosion, moments later, caused by the 4" magazine exploding, killed many of the sailors on the upper decks instantly, and threw many more into the sea.[7] At 0457 *Haida* stopped amongst a group of around 100 of *Athabaskan*'s survivors in the water. Near to the French coast with daylight approaching, DeWolf resolved to recover as many survivors as possible within 15 minutes before making way back to England at speed. DeWolf believed remaining longer was too great a risk to his own crew.[8] Before leaving, *Haida* dropped one motorboat, one whaler and eight carley floats into the water, for the remaining survivors to embark. At 0515, concerned that an enemy air patrol could spot them or the remaining *Elbing* could return, DeWolf went slowly ahead. Survivors from *Athabaskan* who were climbing up *Haida*'s scramble netting were dragged in the water and then left behind.[9] Of the men who were not rescued, 85 were eventually taken prisoner by the Germans. 128 men were lost, including the great naval captain, John Stubbs.

On 9 June, three days after D-Day, *Haida* and the 10th Destroyer Flotilla were at sea in support of *Operation Neptune*, the naval element of the Allied invasion of Europe. The 19th Division was leading the force, consisting of HM Ships *Tartar* and *Ashanti* along with the Canadian destroyers *Haida* and *Huron*. At 0121, *Haida*'s radar operator reported four echoes which looked like destroyers.[10] Moments later, *Haida* illuminated the sky with a star shell, revealing two destroyers, the closest of which was 4,000 yards (3,658 metres) away.[11] The enemy force consisted of four German destroyers, Z24 Z32, ZH1 and T24, the *Elbing* which had escaped two previous engagements with *Haida*. *Tartar* was hit by the enemy early and put out of action.[12] At 0237 *Ashanti* sunk ZH1 after pounding it with guns and finally smashing its bows off with a torpedo.[13] The action ultimately lasted four hours, during which *Haida* engaged the enemy on three separate and sustained occasions. First, from 0127 until 0150, *Haida* engaged Z24 and T24, scoring hits on both units until the enemy was out of range by escaping through an Allied minefield.[14] An hour later, *Haida* engaged Z32, pressing

the attack until the engagement was checked when that ship also escaped into an Allied minefield. Finally, Z32 was reacquired on the other side of the minefield and pummelled for over 40 minutes by *Haida* and *Huron* until the enemy captain, his powerful *Zerstörer* 1936A class destroyer engulfed in flames, drove his warship hard up on the rocks.[15] The two remaining enemy destroyers were extensively damaged but escaped, later to be sunk in an Allied airstrike.[16] *Haida* had destroyed three enemy destroyers in six weeks.

Two weeks later, *Haida* and HMS *Eskimo* met U-971 on what would become its first and only operational patrol. Built in Hamburg, the VII-C class U-boat was reliable and seaworthy, but at this point of the war, the crew was young and inexperienced.[17] The German U-boat set sail from Norway on 10 June on a mission to inflict Allied losses in the English Channel. By early morning on 24 June, the U-boat had already sustained several machine gun and depth charge attacks by various Allied aircraft over the course of its transit. Upon sighting two Allied destroyers, U-971's captain, *Oberleutnant zur See* Walter Zeplien manoeuvred to fire his torpedoes. The first torpedo's propeller started turning, but the weapon would not fire.[18] A second attempt to fire another torpedo also resulted in a misfire. Upon inspection, it was determined that all available torpedo tubes in the boat had either misfired or were previously damaged by air attacks.[19] Zeplien determined that his boat required repairs, and once clear of Allied warships, the submarine surfaced to make best speed to Brest, a port city in France, for repairs.

Haida and *Eskimo* were patrolling the western approaches to the British Isles in support of the 2nd Escort Group, Captain F.J. Walker's famous U-boat killers. Five miles astern of the *Tribals*, a Liberator aircraft sighted U-971 and engaged with depth charges. The two destroyers turned and proceeded to the last known position of the submarine, which the Liberator had marked with a smoke float.[20] *Eskimo* gained contact first, followed moments later by *Haida*. The two destroyers carried out nine deliberate attacks with depth charges over the next two hours.[21] The attacks had taken their toll on the submarine. The boat was filling with water, the starboard diesel was out of action, and there was only enough air left to surface. Zeplien ordered the destruction of all secret material, then issued

Credit: US Naval History and Heritage Command

*The former Z39, seen here off Boston on 12 September 1945 under US Navy command as DD-939, was a sister to the large '**Narvik**'-class destroyers Z24 and Z32 that **Haida** and HMCS **Huron** engaged during the war.*

Credit: PO Guy J.A. Goulet, Department of National Defence

Commander Harry G. DeWolf on the bridge of HMCS ***Haida****, 5 May 1944.*

each man a bottle of beer, which they drank in the control room, knee deep in water.[22]

Haida was preparing to make its next attack when U-971 surfaced 800 yards (732 metres) ahead. DeWolf immediately opened fire with his main armament and machine guns. The high explosive shells penetrated the U-boat's conning tower and fire could be seen through the holes which had been smashed through the German boat.[23] *Haida* ceased firing as it became apparent the Germans were abandoning their boat and did not intend to fight. Fifty-two prisoners were recovered, including the captain, before the submarine slipped back beneath the waves forever. Upon its return to Plymouth following the action, *Black Prince* signalled to *Haida*: "Elbings, Narviks, and submarines all seem to come alike to you."[24]

In July of 1944 Plymouth Command extended its anti-shipping patrols into the Bay of Biscay. On 14 July, *Haida*, in consort with *Tartar* and the Polish destroyer ORP *Blyskawica*, intercepted three submarine chasers putting to sea. Two of the small vessels were sunk, with the third escaping back into port having sustained damage.[25] The destroyer force was unscathed in the engagement.

Several more patrols over the next few weeks provided *Haida* with little enemy action, until the night of 5-6 August when Force 26 intercepted an enemy convoy of eight ships moving 900 soldiers from their base in Saint-Nazaire, France. *Haida*, along with *Iroquois*, *Bellona*, *Tartar* and *Ashanti*, engaged the enemy for over two hours. During the action the Allied force moved deliberately through the convoy, wreaking havoc. A high explosive round exploded in the breach of one of *Haida*'s after guns, resulting in the immediate deaths of two sailors, and several other injuries.[26] Ultimately, the German convoy was destroyed, and six enemy ships, including two minesweepers and one patrol ship, were destroyed.[27] One hour later the Allied force intercepted a second German convoy, and succeeded in sinking two more escort ships. During both engagements, *Haida* fired "1,061 rounds of 4.7-inch and 425 rounds of two-pounder Pom-Pom at seven different targets."[28]

Haida was out of action for several weeks of repairs following the action of 6 August. In mid-September *Haida* departed the European theatre for Halifax. Back home in Canada, Harry DeWolf relinquished command of *Haida*, concluding his appointment as Canada's most successful destroyer captain, in Canada's fightingest ship.

Notes

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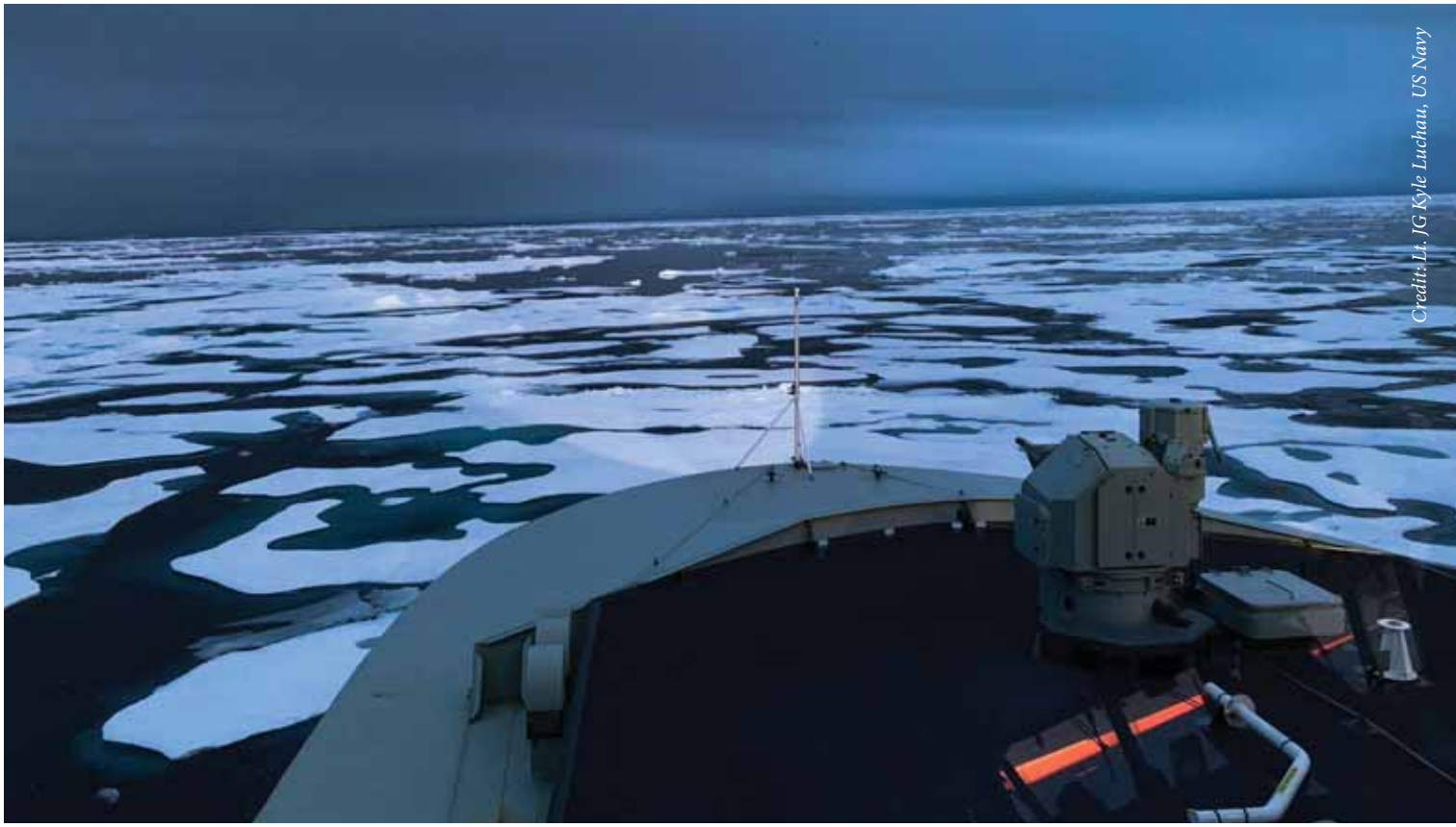
Canada's Arctic Forces: Preparing for the Future

Major (Ret'd) Les Mader[1]



Credit: Lt. JG Kyle Luchau, US Navy

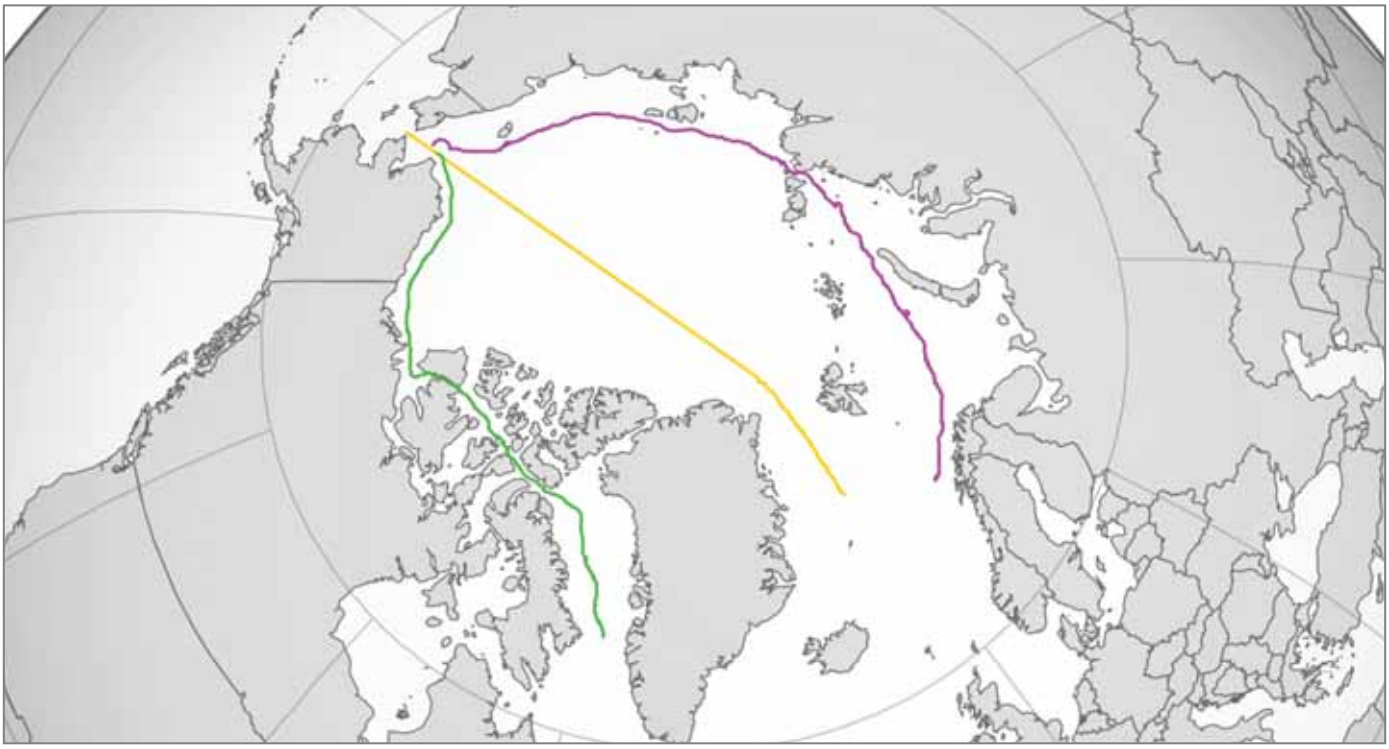
*HMCS **Harry DeWolf** transits through the Northwest Passage during the ship's maiden deployment, 28 August 2021.*

The uncertainty caused by the massive and difficult-to-predict effects of climate change is creating the need for a range of capabilities that Canada can use to protect its Arctic sovereignty, territory and people. Therefore, the Canadian Armed Forces (CAF) must urgently acquire the climate knowledge that will allow them to identify which operational capabilities are required to be able to address whatever happens in the decades to come. This article will explore this idea and make suggestions.

The melting of the Arctic sea ice due to climate change has already led to a significant increase in human activity in Canada's North. For example, the gross domestic product (GDP) of Nunavut, which contains most of Canada's coastal Arctic territory, grew 2.86 times to CDN$3.87 billion between 2000 and 2023, with resource extraction accounting for 43.87% of the territory's 2022 GDP.[2] Additionally, of the 392 ship transits of Canada's Northwest Passage (shown in green at Figure 1) that occurred between 1903 and 2023, 85 occurred in the first 100 years, 96 more occurred in the next 10 years, and a further 211 (53.8%) happened in only the final 11 years.[3] Further, the continuing reduction in sea ice coverage has led to intense international interest in profiting from immense and increasingly accessible Arctic riches. These are believed to include large fish stocks and an estimated 13% of the world's undiscovered oil reserves and 30% of the undiscovered gas, as well as possibly US$1 trillion of undiscovered mineral deposits.[4]

Disappearance of the sea ice cover is also creating expectations about new and significantly shorter sea routes between East Asian and Western European ports that could cut 8,200-13,600 kilometres off a voyage, depending on the route employed.[5] It was estimated in 2020 that by 2030 the Northwest Passage (shown in green at Figure 1) would likely be open for travel by massive container ships for three months per year. It was also predicted that the Transpolar Sea Route (shown in yellow at Figure 1) might open briefly in September by the early 2040s, some 30 years earlier than had been previously predicted, and that the Arctic Ocean would be ice-free in September by 2050. The third Arctic sea route, the Northern Sea Route along Russia's Arctic coast (shown in purple at Figure 1), is already experiencing the disappearance and thinning of ice, leading to its increased use.[6]

Figure 1. Expected Future Arctic Shipping Routes



Credit: Chessrat, Wikimedia Commons. CC BY-SA 3.0

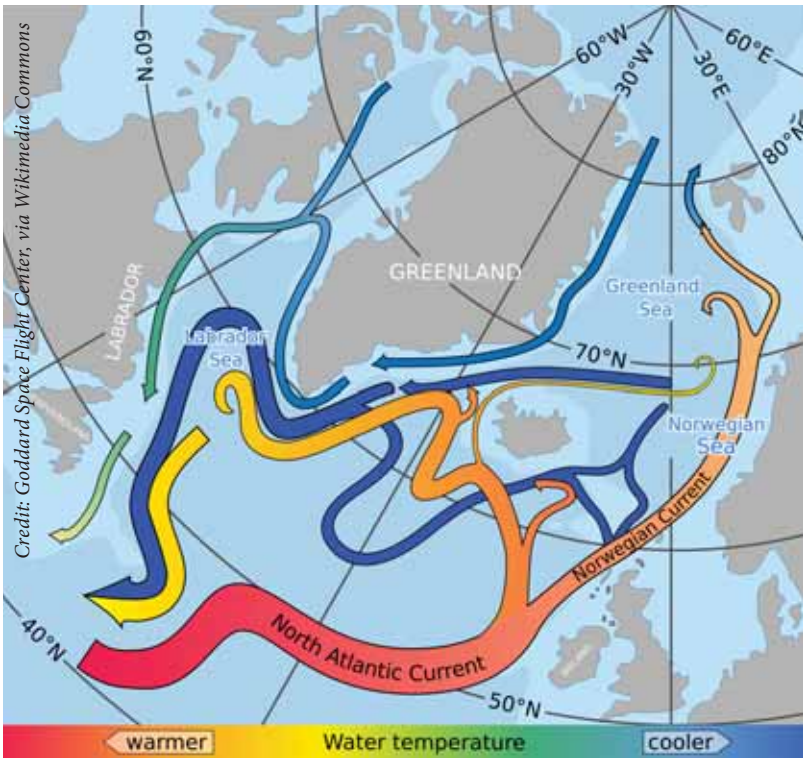
Map of current and potential Arctic shipping routes: the Northwest Passage is marked in green, Northern Sea Route in purple and Transpolar Sea Route in yellow.

One possible consequence of climate change has, however, the potential to become so overwhelmingly dominant that it would completely overturn these rosy expectations and totally change the geo-strategic situation in which Canada finds itself. This is the slowing down or possible abrupt collapse of the Atlantic Meridional Overturning Circulation (AMOC), perhaps as early as 2025, but perhaps as late as 2095, or even in the 2100s, with a 50+% chance that a collapse will occur by 2050.[7] The AMOC is a system of ocean currents. These currents move warm water north on the European side of the Atlantic and cool waters south on the North American side. These water movements affect temperature and rainfall patterns, and any changes in them will in turn be factors in droughts and floods for example. The AMOC is illustrated at Figure 2.

The AMOC forms part of a larger worldwide system of currents known as the Global Meridional Overturning Circulation (GMOC) (illustrated at Figure 3).[8] This system "is predominantly driven by deep convection in the high-latitude North Atlantic Ocean and around the Antarctica, [and] wind-driven upwelling in the Southern Ocean."[9] Thus far, according to modeling, there is "a near absence of the Pacific Meridional Overturning Circulation (PMOC)."[10] While it is clear that climate change has already caused significant changes to the GMOC, only those occurring in the AMOC portion are directly measurable.[11] Thus, this article will consider only the changing AMOC.

The possible effects of an AMOC collapse could be massive and widespread.[12] Because the temperature in Europe is warmed by the currents moving warm water from south to north, any change would lead to lower temperatures. Therefore, possibly the most serious effect would be that parts of Europe could experience temperature declines of 1^0C every decade (10^0C in a century) up to perhaps 30^0C in a century. This temperature decline would not be limited to Europe; there could be an abrupt cooling of wide reaches of the northern hemisphere. At the same

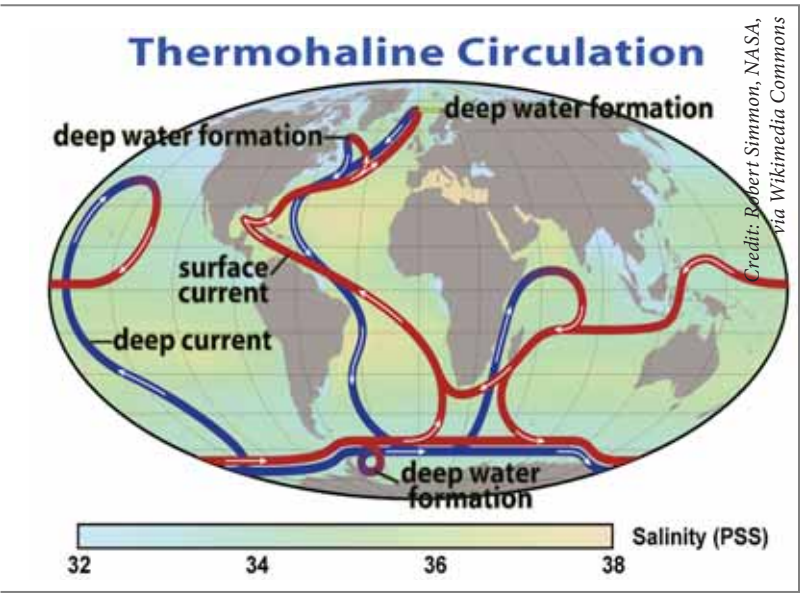
Figure 2. Representation of the AMOC



Credit: Goddard Space Flight Center, via Wikimedia Commons

A representation of the North Atlantic Current and the Atlantic Meridional Overturning Circulation.

Figure 3. Representation of the GMOC



A representation of the Global Meridional Overturning Circulation.

time, because the currents moving cool water south along the western side of the Atlantic would also be affected, the tropics and the southern hemisphere would experience increased warming and changes to rainfall patterns. These precipitation and temperature changes would seriously disrupt agriculture, likely causing widespread food shortages.

The uncertainty about the possibility, timing and effects of an AMOC collapse may cause some to doubt that it will happen at all. The lack of precision about the timing is due to a number of factors. These include the short period (since 2004) during which direct observation and monitoring of the AMOC have occurred, and the great difficulty in identifying and gathering the required data and then modeling it correctly to predict the likely changes and probable future impacts.[13]

Even though predictions about the AMOC's actions and future are currently imprecise, we can still ask how any changes/collapse could affect the CAF, and more specifically the Royal Canadian Navy (RCN), in the Arctic. How, for example, will the cooling of the northern hemisphere affect the Arctic's temperature? Will such cooling cause the sea ice to start re-forming? The answers to these questions are vital to determining the types of forces that the CAF and RCN will require. On the one hand, continued warming of the Arctic Ocean could make icebreakers and ice-capable ships less necessary, and perhaps irrelevant. The re-forming of the sea ice, on the other hand, would make them more relevant and might even end all efforts to access the Arctic's resources and make polar shipping harder, if not impossible.

Additionally, temperature declines of 10-30^{0}C in a century would stress any society severely or even cause it to shatter as it heads into a new Ice Age. Thus, a critical, but more general, question about the future geo-strategic environment is: even if the Arctic Ocean offers faster, cheaper transportation routes between Asia and Europe, will the commerce that requires these routes occur if European civilization is straining/collapsing? Finally, given the difficulty modeling climate change, it is important to ask oneself what other catastrophic effects could an AMOC collapse provoke?

The inability to model climate interactions accurately makes it challenging to predict future outcomes. An example is the problem of determining how melting sea ice will affect navigation in the Northwest Passage. As mentioned earlier, the expectations have been that such melting would increase the amount of time each year that ships could travel the length of the passage safely. However, new research indicates that this is not correct; in fact, the number of weeks of safe end-to-end navigation is decreasing.[14] This is due to the fact that the new sea ice found in and around the passage has been melting faster than the thicker, centuries-old ice located further north, allowing the old sea ice to move south and choke parts of the passage and make ship movements difficult.[15] This southerly movement of old sea ice may, however, accelerate the opening up of the Transpolar Sea Route across the North Pole to end-to-end navigation. Depending upon the specifics of ice melting, this route will probably be outside of Canadian jurisdiction, but possibly close enough at times to result in environmental/humanitarian disasters and hostile military forces located there affecting Canada. A similar process may also be affecting the Northern Sea Route along Russia's north coast.

Given the high levels of uncertainty, and in order to identify which new capabilities will be required and how soon, Canada must ensure that it acquires extensive, authoritative and timely climate knowledge on a continuing basis. This effort will give it as much warning as possible of when/if the collapse will occur in order to be able to take appropriate action quickly. Canada cannot afford to wait until the collapse happens to act. This is because the consequences of climate change will likely be paradigm-shattering, even without a complete AMOC collapse.

The possible range of additional, extraordinary and probably cataclysmic costs due to a full collapse of the AMOC means that Canada must eschew a 'business-as-usual' attitude and give itself the ability to react to a very wide range of possible outcomes. This new approach must be guided by the philosophy that the greater the level of uncertainty, the greater the need for flexibility – which is provided by the possession of a large and diverse range of operational capabilities and reserves. Thus, the greater the uncertainty about what will happen with the AMOC, the more Canada will require large reserves of a wide assortment of capabilities in order to be well placed for whatever actually occurs. This philosophy will require the adoption of a radically new approach to national defence.

Some might argue that the consequences of an AMOC collapse would be so apocalyptic that there will be few resources to spend on defence. This might turn out to be correct. However, given the lengthy time period during which this collapse might occur, and the existence of authoritarian world leaders who clearly care only for their own power and grievances and nothing about solving/mitigating climate change, Canada cannot afford to leave itself defenceless. Doing so would ensure that the authoritarians hold Canada's fate in their uncaring and unworthy hands.

In this context, we must ask whether countries will confront/fight each other to control the riches expected to be found in the Arctic and the shortened sea routes that may appear there. Some authors have argued that such confrontation/conflict is likely enough to merit preparations to defend Canada's Arctic sovereignty, territory and people.[16] Other authors have downplayed the possibility of conflict for Arctic resources.[17] Writing in *Canadian Naval Review*, Mihai Giboi, citing Rob Huebert and others, raises a third possibility – 'Arctic peripheralism' – in which China and Russia use confrontation/conflict in the Arctic to gain advantages elsewhere in the world.[18] Regardless of which perspective is correct, it behooves Canada to think about how it should protect its northern territory and people.

Several approaches have been suggested for the types of Arctic-oriented, military forces that Canada must possess to meet this requirement. The first of these, proposed by Jeff Gilmour, and which could be considered a 'whole-of-government' Arctic approach, is oriented towards dual-use (civil and military) activities, surveillance and limited combat forces. Gilmour's 14 steps include items as diverse as: enhancing Arctic navigation support and search and rescue; enhancing the Canadian Rangers and Canada's contribution to the North American Aerospace Defense (NORAD) Command; increasing northern operations by the RCN's Arctic and Offshore Patrol Ships (AOPS); and possibly creating an army airborne unit.[19] Some of the dual-use initiatives that he proposes would actually be the responsibility of government departments other than the Department of National Defence.

The second approach, first raised by Colonel (Ret'd) Brian Wentzell, involves the creation of an Arctic amphibious capability.[20] This would fit into a larger, dual-track strategy of being able to deploy expeditionary forces overseas for Canada's 'distant defence' and separate, specialist Arctic sovereignty forces.[21] The third approach is found in Canada's 2024 defence policy, *Our North, Strong and Free: A Renewed Vision for Canada's Defence*. Its wide range of initiatives includes several of Gilmour's steps in the Arctic portion of its *de facto* dual-track strategy.[22]

This author believes that these three approaches will not individually provide the broad and deep defence capabilities and reserves needed to face the immense uncertainty caused by climate change in general and a possible AMOC collapse in particular. Thus, Canada must find the will needed to implement a comprehensive, integrated Arctic strategy as part of a new, unprecedented and broad-reaching version of the existing dual-track national strategy. The Arctic portion should combine the relevant elements found in the 2024 defence policy with the additional ones contained in Gilmour's whole-of-government approach and the Arctic amphibious concept. This new strategy would be implemented in three stages.

Given the need for as much advance warning as possible of the actual effects of climate change on Canada's Arctic and the Earth in general, the first stage must be expanding our understanding of the pace and impacts of that change, and in particular those of the evolving AMOC. The CAF would not have the lead for the relevant research;

Credit: Master Corporal Alana Morin, JTF-North, Yellowknife

Members of Canadian Armed Forces and 1 Combat Engineer Regiment divers set off to undergo surface level training in Cambridge Bay as part of ***Operation Nanook-Nunakput*** *in Nunavut on 27 August 2024. The Canadian Coast Guard icebreaker* ***Louis St. Laurent*** *is in the background.*

this would be the priority responsibility of Canadian research agencies. The CAF's role would instead be that of an 'informed consumer' who is pushing for greater and more refined knowledge and understanding. Clearly, this research could take place over decades. Its results will inform the subsequent stages.

The second stage, which will evolve as the first stage proceeds, would be that of articulating and launching the integrated Arctic strategy with a coordinated set of activities from the three approaches mentioned earlier. This could be done by implementing the 2024 defence policy and all of Gilmour's 14 steps with three changes. The first of these is clearly and formally laying out the command and control (C^2) arrangements for Canada's Arctic forces. The CAF's Canadian Joint Operations Command (CJOC) is the obvious headquarters to command any joint military forces that Canada deploys into its Arctic territories and the waters around them.[23] Since the CJOC's air component commander is also the commander of the Canadian NORAD region,[24] there should be no difficulty coordinating the participation of CAF aircraft, normally assigned to NORAD, in Canadian Arctic sovereignty operations.

However, some may believe that the NORAD defence agreement requires that these joint forces must instead respond to the orders of the American general who commands NORAD, and who is also responsible within the American military for the defence of North America.[25] Such an approach could result in an American President commanding – through this general – the forces that Canada sends to defend its sovereignty, even when that President is the one threatening that sovereignty.[26] Given such a potentially confusing situation, it is essential that the NORAD agreement be modified, or supplemented, where necessary, to lay out in detail what the C^2 arrangements will be when Canadian-only forces are deployed to defend Canada's territory during a crisis and when American forces also respond to that crisis.

The second modification would be exploring the benefits of possessing an Arctic amphibious capability by conducting a multi-year experiment, based on the concept proposed by Wentzell, employing existing personnel, ships and equipment. This experimental force would replace Gilmour's step of possibly creating an army airborne unit. Since the Canadian Army already possesses airborne infantry company groups that could operate in conjunction with the amphibious force, this experiment would afford, at least temporarily, a certain on-the-ground presence capability that benefits from the strengths of both airborne and seaborne land forces.

The final change would be exploring the feasibility and utility of ice-capable surface combatants. These heavily-armed warships would be able to operate both within and outside of Arctic waters. This feasibility study could benefit from the interim employment of up-armed AOPS.

The key activity during the third stage of strategy implementation would be adapting the new defence policy and strategy as necessary, based on the latest climate knowledge and the practical experience gained to date. This adaptation could include exploring and possibly procuring new and/or additional capabilities. It would also permit decisions about whether to proceed with an Arctic amphibious capability and with ice-capable surface combatants.

Climate change is already massively affecting the world in which we live and access to the Canadian Arctic. The

Credit: Master Corporal Alana Morin, JTF-North, Yellowknife

Members of the Land Task Force of the Canadian Armed Forces establish communications as part of the observation point on Victoria Island, Nunavut, during ***Operation Nanook-Nunakput*** *on 24 August 2024.*

consequences of any collapse of the AMOC could well be catastrophic. In order to be prepared to deal with such an event, the Canadian government and the CAF must become far more knowledgeable about the current pace and likely consequences of climate change. This will require a significant and urgent Canadian involvement in climate research. The knowledge thus gained will determine which additional defence/dual-use capabilities Canada will require during this period of tremendous uncertainty in order to be able to respond to a broad set of potential crises.

This article has suggested a possible robust Arctic strategy that builds on the 2024 defence policy. It has also outlined an implementation way ahead in order to encourage further discussion. It is hoped that the Canadian government will urgently pursue the necessary climate research, particularly with respect to the AMOC's future, and then make any required changes to its defence policy.

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Les Mader served 37 years in the Canadian Armed Forces, including with the naval reserve and artillery units in Canada, West Germany and Cyprus.

We Must Remember

Jane Nighswander

To my grandfathers, great uncles and aunts. To every man and woman who fought, lost and sacrificed, and the families that suffered with you. You all changed the course of our existence. Thank you.

The wind blows, icy rain soaks into my uniform proving it really wasn't meant for these kinds of conditions. People huddle together like penguins under their patterned umbrellas. Those still arriving zip up their raincoats, gripping their to-go coffee cups which made them late in the first place. The trumpets start, some shouts of command, and the marching begins. Some will remember how they marched, how despite the wind and rain they moved in unison, unphased by the small discomforts for they represented something far greater.

I will remember something different. I will remember the couple discussing their weekend plans, what restaurant they considered visiting and whether they served margaritas or not. How some left early because it was rainy and cold. How most kept their heads down to answer the ding of a message or watch a six second video with no real importance or meaning.

I will remember how it was only the sound of the cannons that made them look up, and the margarita talk silenced. At the eleventh hour on the eleventh day of the eleventh month, two minutes of silence was called for and I will remember the whispers. Only one day a year is reserved to remember the 2.3 million plus Canadians who served Canada in the First World War (1914-1918), the Second World War (1939-1945), the Korean War (1950-1953), and since then, and sacrificed for our country.[1] More than 118,000 of them having their last moments surrounded by screams and shrapnel.[2] They served. They died. To keep us free. To keep us safe. And we can't stay quiet for two minutes? Most of us in Canada live in the luxurious absence of war. The significance of our freedom is lost in work, Netflix shows and our own self pities. Yet when November eleventh rolls around we hardly blink an eye. We think of it as a long weekend, a time where we can sleep in, plan trips and spend another day in our pjs. Most of us can't comprehend what that day really means.

For my grandfather, William Lawrence, he would remember the day he had to say goodbye to his family and high school sweetheart, not knowing whether he would ever see them again, feel the warmth of their hugs or comfort of their voices. He left his home, job and the dreams of a young man because Canada needed him more. He and his brother enlisted in the Royal Canadian Navy in 1942. Like us they didn't know what war was. What it felt like.

Credit: Provided by Author

Brothers William and Hubert Lawrence unexpectedly ran into each other near Halifax in 1943. With months of little contact, this was a glimpse of hope. Both William and Hubert survived the war, married and had families.

What it meant. At the beginning it was like any other job. He signed the contract. He got the uniform. He said farewell to his past life and started his training at HMCS *Discovery* in 1942. No amount of training could prepare any human being for the job at hand. He would remember the day he boarded HMCS *Edmundston*. How at age 21

Credit: Provided by Author

Brothers William and Hubert Lawrence as they unexpectedly met up on the shores of Halifax in 1943.

he was the eldest of his crewmates. How most of his crew were still just boys and had never been on a boat before let alone seen the ocean, yet their job was to master and protect it, or die trying.

He would remember the convoys. The days at sea which turned to months, then years, in the unforgiving treachery of the Atlantic. He would remember the ice that grew like mold that, if not removed, would cause the ship to capsize into the cold depths of the sea. He would remember the day when the ocean was no longer his happy place but a black abyss that helped camouflage the enemy. How despite the rolling of the ship, the yells and shouts, the blast of fire power and depth chargers, and the loss of fellow sailors, he couldn't waver or falter. As Leading Telegraphist, it was him and only him who could receive, interpret the dits and dahs and respond to communications from other ships. Transmitting up to 84 words a minute,[3] no amount of cockroach-infested food, no bouts of seasickness, or sleepless nights was an excuse to make a mistake, for one wrongly interpreted message could have taken the future of each and every sailor.

His brother, Hubert Lawrence, would remember something different. As a Stoker he lived and breathed the fumes of the ship. Below sea level, with no forced ventilation, he fought for his country in the confined space of engines and boilers at temperatures estimated to be up to 45 degrees Celsius.[4] It was by the sweat of his brow and power of his body and will, along with every other Stoker, that the convoys kept moving. He would remember the day he was summoned to speak with his Captain, when only moments later a torpedo barrelled through the engine room killing all men in its vicinity. If it were moments earlier, it would have been him. But he didn't escape unscathed. A piece of shrapnel from the explosion buried deep into his flesh, too close to his heart to operate. It lived with him through every new ship and crew he transferred to. Through the passing of war and until the end of his days. To never be forgotten. Like everyone who fought, they carried a piece of war far too deep to ever be removed.

I will remember when the Remembrance Day ceremony was over, how my mother squeezed my hand and tears pooled in her eyes. I said to her "I wish he could have been here with us." "I don't," she replied. "Once he made it home, he never once came to one of these. He couldn't." "Why not?" I asked. "Because he didn't want to remember. None of them did."

With the passing of time, we forget that freedom is a privilege. A gift, passed on from the efforts of others. It's our job to remember. Our job is to remember those who fought, remember those who served, remember those who sacrificed. We must remember so they don't have to.

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Making Waves

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

Aegis-Capable Platforms Could be Recruiting Tool

Lieutenant John Adam (USN)*

It's an exciting development for the Royal Canadian Navy (RCN) that the new *River*-class destroyers will be Aegis capable. Having the advanced combat suite will enable the navy to work more closely with its US counterparts in a wider range of mission areas and will greatly increase the lethality of the fleet.

The crewing concerns that the RCN is currently experiencing, however, give me pause. If the RCN is struggling to maintain crews on the current classes of ships, how will it be expected to maintain a more advanced platform? With Aegis, a whole other rate (Fire Controlmen Aegis) is needed. This is in addition to the other rates (Cryptological Technicians, Fire Controlmen, Gunners Mates, etc.) whose equipment interacts with Aegis in some way. If you consider all these rates, each ship will need anywhere between 16-30 more sailors who are Aegis specialists. Multiply that by the 15 planned ships, and that's at minimum 240 sailors needed. Each ship will essentially be gaining a whole new department. This doesn't include personnel needed shoreside for maintenance and training.

Critics have justifiably pointed to the high pricetag of the project – as high as $80 billion according to recent documents[1] – fearful of the class turning into a money-pit, a situation the US Navy (USN) knows all too well given the recent issues with the Littoral Combat Ship (LCS) program. But the Canadian government can ensure a much higher return on investment, and alleviate the crewing issues the navy is going through, if it uses the new ships as a recruiting tool.

I think the solution to this issue could be a simple one. A special program centred around training a new generation of sailors in the Aegis combat suite should be established. The pitch here is simple; you'll be the first group of Canadians since the 1990s to operate a cutting-edge defence system that allows the military to operate not just with the Americans, but with navies worldwide.

After going through basic training, recruits would go to school in New Jersey at the land-based test site that was recently established by Lockheed Martin. There they could learn from and train alongside their American counterparts. Some kind of bilateral agreement could also be made with the United States whereby these recruits would spend time on American destroyers to get on-the-job experience. By the time they return to Canada, these young sailors will be the subject matter experts, instructing superior chiefs and officers on the new capabilities of the RCN. This will be quite the experience for such junior personnel and will ultimately make the military more attractive to young people.

A bonus-based incentive, similar to the one the US Navy has for submariners, could be used to draw in young Canadians who show an aptitude for math, science and engineering. Other incentives could include automatic advancement in rank after the completion of their training. A possible commissioning route could also be established for sailors within the program. It could involve sailors earning their commission after serving 5-10 years on an enlisted contract. This could help with retention, giving sailors a goal to work towards during their initial years in the service.

With the building of the destroyers scheduled to start this year, the Canadian Armed Forces (CAF) should get ahead of the curve and begin recruiting for the ships now. Waiting until the ships are built to crew them will ultimately put their initial deployments behind schedule. Anyone who has been on a pre-commissioning unit will know the first months are filled with working out the kinks of new equipment, especially for a brand-new class. The CAF should also look into preparing agreements not just with the United States, but with contractors so that the shoreside facilities are ready to go when the ships come online.

Credit: US Navy via Trident Newspaper

*At this facility in Dahlgren, Virginia, during a 19-month period between 2022 and 2023, RCN sailors tested the layout of the **River**-class destroyer Command Information Centre where the Aegis weapons system will be operated.*

Credit: Google Earth screenshot

The US Navy's Combat System Engineering Development Site at Moorestown, New Jersey, develops, hosts and tests the latest versions of Aegis. Work on Aegis for Canada's ***River****-class destroyers has been taking place here since 2023.*

A program of this nature would serve several purposes:

1. It will ensure that the RCN is properly prepared to deploy a new class of vessels, and that institutional knowledge on how to maintain them is present.
2. The new technology will make the military seem more attractive and exciting, as well as a legitimate job opportunity. It's tough to sell the navy to a younger generation if they're just going to be toiling away on old ships.
3. Although expensive, programs such as this would give young Canadians a chance to earn a livable wage in a steady job with good opportunities for advancement. With the cost of higher education having increased in recent years, this is a recruiting angle that, I think, both the CAF and US military have gotten away from. At the very least, the increase in citizens earning a comfortable living could help justify the cost of the program. The economic impact of a young, thriving workforce can be in the billions of dollars.

If handled properly, the *River*-class destroyers will not just modernize the fleet, but also its workforce. The Canadian government should take this opportunity not just to make its military more lethal but also more attractive to a new generation.

Notes

* Lieutenant Adam (USN) has served on USS *Antietam* (CG-54) in Japan and USS *Copwens* (CG-63) in San Diego. He is currently the exchange officer at MARPAC HQ in Esquimalt, BC. This commentary presents the views of the author.

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Addressing Personnel Shortages

Mikaël Perron

In Broadsides (*CNR*'s online discussion forum), there have been a lot of posts and comments about equipment procurement. The discussion often centres around what the Royal Canadian Navy (RCN) should get – how many ships, what type of ships, how they should be equipped and so on. But regardless of what type of naval vessels the RCN operates, the greatest challenge it faces is workforce shortages. The problem was well stated by the head of the RCN, Vice-Admiral Angus Topshee, in a video released on YouTube last fall.

The recent proposal by the government to increase defence spending to 2% of Gross Domestic Product (GDP) by 2032 will put pressure on Canadian Armed Forces (CAF) personnel. The intention to acquire up to 12 submarines will require many more sailors while we are already 20% short! Plus, the RCN is competing with the Royal Canadian Air Force (RCAF) which also requires a large number of new technicians for its existing aircraft, on top of ensuring a smooth transition to entire new fleets.

Back in 2015, under the previous Conservative government, it looked as if the RCN was going to end up with fewer ships (rumours mentioned the eventual purchase of only 11 Canadian Surface Combatants (CSC)). At that moment, I submitted a few suggestions under the Defence Renewal Program, an initiative that allowed anyone in the Department of National Defence (DND) to submit ideas (as I did) on ways to improve things, such as a new way to manage an inventory or proposals on defence strategies. One of my suggestions was a new fleet manning concept that would have allowed the RCN to operate with 11 CSC. That proposal was based on people, our greatest resource. We could maximize the use of fewer assets with the right number of qualified people but definitely not the other way around!

I suspect that people who follow and contribute to *CNR* and Broadsides come from many horizons and possess different backgrounds. Since it is the very existence of the RCN that is in troubled waters, I say that we all must submit our outside-of-the-box proposals to help, no matter how irrelevant we believe them to be.

For my part, I served as a Marine Engineering Technician for 11 years and almost as long as an Aviation Systems Technician (AVN tech) and have been a maintenance technician in the civilian industry for almost nine years now. Many of my proposals focus on those trades but some encompass the entire CAF.

In a Broadsides post about the *Vigilance*-class proposal, I mentioned some possible upgrades that could be done with the Naval Reserve. I would propose that, first, the MESO trade be eliminated. There would not be any Marine System Engineer (MSE) or Combat System Engineer (CSE) trades in the Naval Reserve units away from the coasts. Second, trades that can be trained by simulation or otherwise easily would remain in units across the country. The reserve units would be pushed toward small boat operation to support the fleet and the civilian population in case of crisis. Boatswains would be trained to maintain and operate small boats, trucks and trailers on top of supporting the Regular Force boatswains.

Third, in Halifax and Esquimalt, the CSE and MSE trades would have a duplicate in the Naval Reserve. People already qualified in the Regular Force would be able to join the reserve upon retirement and keep doing their job alongside Regular Force personnel. In the manner of the RCAF, they would support the Regular Force with their experience. They would be primarily employed in shore maintenance teams or support training organizations just like the Air Reserve on A-class status. They would also maintain their refresher training and be eligible for B-class contracts to replace personnel on maternity/paternity leave or other personnel shortage. For example, they could replace an injured sailor during a high readiness deployment if all their training is up to date.

Fourth, the Naval Reserve would be primarily a small boat force but those who qualify would be able to support the main fleet and deploy with it. There are very fine people in the Naval Reserve and I believe that it has much more potential than is actually being used.

The advanced training of previous generations of sailors and aviators made them enjoy their trade and keep the ships and aircraft operating even through technical difficulties. Thanks to the cost-reducing measures of the early 1990s, planners at National Defence Headquarters (NDHQ) had to come up with cheaper ways to fill the CAF ranks. In 1997, the RCAF conducted a re-organization of its trade structure to create fewer, but more interchangeable, trades. The RCAF's 13 MOC 500 trades were amalgamated into three on-aircraft occupations which are now identified as Aviation (AVN), Avionics (AVS) and Aircraft Structures (ACS). This required fewer instructors but less in-depth knowledge was a side result. The RCAF lost a lot of expertise through the amalgamation in the 1990s but this could only be noticed once the people from the previous trade structure retired. The situation was then stretched because many of those retired technicians went to work for third-line maintenance contractors but are almost all retired from their civilian jobs by now.

The RCN later went that way but with more immediate bad side effects. The training for the CSE/MSE section of the RCN and the Aviation, Avionics, Air Weapons and Aircraft Structures Technician trades of the RCAF must be reviewed. I believe that training should be more aligned toward the civilian equivalent in order to get civilian qualification on release from the CAF. People want to balance their personal and their professional life. In order to interest them, you need to provide them with more advantages to take with them into their future civilian professional life. I am myself a graduate of the Marine Engineer Technician Training Program (METTP) that provided me with a civilian technician certificate that opened the door to my current civilian job.

*Naval Reserve sailors with HMCS **York** conduct a search-and-rescue exercise using small boats on Lake Muskoka, 20-23 June 2024.*

*Sailors of HMCS **Montreal**'s Marine Systems Engineering department take part in a drill during **Operation Reassurance** in the Mediterranean Sea on 26 February 2022.*

I propose that the CAF develop a Technical Academy for its technical trades that would provide the naval, air and land technicians with a college degree to be recognized in every Canadian province. Such a program would bring back the in-depth theory and a choice of specialization toward the end of training. The more in-depth knowledge of the initial training would address the capacity to fill gaps of personnel in time of crisis or the transfer from one speciality to another one. A more profound knowledge level will help personnel to keep operating older platforms to the very edge of their service life but also to understand and master new technology coming online.

For the CAF in general, it must regenerate the capacity to train incoming recruits in their respective trades without delays. At least 10 years ago, there were way too many people on 'PAT' – platoon awaiting training. The statistics indicated that we had people but a lot were untrained! People were also getting fed up awaiting training.

For trades with no civilian equivalent or just without technical training, we could stand-up a new scholarship for military service. This is an initiative to encourage enrolment in the Canadian Forces and to give more options for young people upon release from the CAF. It is possible to design a new scholarship system for non-commissioned trades whose training is quickly achievable in the months following boot camp. Members of these targeted trades would be automatically included in the system. One-tenth (as a suggestion) of their gross salary would be deducted upon their initial enlistment and if they complete the latter with an excellent record, they would be given a scholarship of the amount deducted from their pay, the latter tax-free upon their release. If their record does not allow it or if they choose to do so, they would have a taxable return of contribution upon release or a tax-free re-enlistment bonus. Those joining designated trades in the CAF who already have post-secondary education qualifications or special family circumstances such as dependent families may choose to be excluded from the program (all of this would be assessed on a case-by-case basis). Members continuing after their initial enlistment would return to the standard pay system. It goes without saying that scholarships would be awarded in instalments until graduation. It should be noted that this initiative would generate little additional cost, would encourage young people to save and would allow the training of a disciplined and educated workforce for the national economy.

Another financial proposition could be to get joining members into a defined contribution retirement plan for the first 10 years, then transfer them to the actual defined benefit retirement plan upon re-engagement. It would get more people interested in serving the country for a few years. Ten years is great to get recruits trained and then for the CAF to get a good return on investment. In those 10 years, people get to know if they are interested in making it a life career. It also gives the opportunity to evaluate the promotion potential of each individual.

One of the current problems of the military is the accessibility of family housing. The cost of occupying the housing is determined according to the principle of equity with the local economy which is not fair for military personnel

who have a constant salary throughout the country independent of the local economy. The cost of living allowance previously granted in certain localities did not take into account the price of housing. The price of family housing must be determined according to the salary only, like the single quarters and based on the prices of the currently least expensive base. An additional allowance could be studied in certain regions when the military is unable to provide family housing. The cost of living allowance should also be brought back and the point of reference should be the base with the lowest cost of living and go up from there. The CAF could also start a dedicated First Home Savings Account (FHSA) adapted to military needs with expanded limits that would compensate for numerous postings. The accumulated money would be accessible upon release. Over the last few decades, the CAF got rid of many military quarters. It would be a great investment to reconstitute lodgings for military families. The service could also develop a daycare network adapted to the special needs of military families to allow for parents to do their duty worry-free.

If some of these propositions seem expensive, let's remember that DND is not actually able to spend all of its budget and has to return money to Treasury every year! We should go further than we actually go. There are financial, training, work organization proposals but imagination is the only limit. It is a crucial time for the very existence of the CAF and all options should be explored!

Two Per Cent of GDP = NATO Commitment

Poseidon

We all know about paying dues to organizations that we have voluntarily joined. If you wish to be a member in good standing, you must pay all your dues: not five-eighths, not two-thirds, but the entire amount.

Canada's membership dues in the North Atlantic Treaty Organization (NATO) are 2% of Gross Domestic Product to be spent on national defence. That is a large amount, but Canada is a wealthy country with a fast-growing population, now 41 million people. Canada is officially the worst laggard in NATO when it comes to paying its dues. Other members used to rival Canada for the bottom spot, but they have paid-up while the Canadian government keeps making excuses and setting a long-term timeline for when it will comply – the latest being 2032, eight years from now!

This issue should be an embarrassment to us all. The required expenditure is *not* sent overseas to some foreign entity. Most of it is spent right here in Canada to build ships for the navy, aircraft for the air force and armoured vehicles for the army; and to recruit and train adequate numbers of Canadians to defend our own country. That seems eminently reasonable to me – we should not depend on other countries to defend us because we can't defend ourselves. If we don't pay our dues to defend ourselves, then we are handing over some of our sovereignty to other allies.

If Canada was paying its dues, Canadian servicemen and women would not need to operate, and potentially fight, with antiquated ships, aircraft and tanks. Yes, they have been updated and refitted, but a 35-year old ship (HMCS *Halifax*) should be replaced very soon – not 10 years from now.

Question: Why couldn't it have been a Canadian aircraft tasked to shoot down an unmanned high-altitude Chinese intelligence collection balloon several years ago over Canadian Arctic territory? Answer: We couldn't do it. We didn't have the capability. We had to ask our NORAD partner, the United States, to do it for us, with an F-22 fighter. Pretty sad!

I served for 35 years in the Royal Canadian Navy and loved it – but Canada's federal government could have done a much better job of giving us the tools we needed for the job. Numbers and quality suffered. We did the best we could with ships which were far beyond their best-before date. Thankfully, we did not have to engage newer, faster, more powerful enemy vessels – like a *Sovremenny*-class Soviet destroyer – but we would have if necessary.

Credit: PH1 Stephen P. Davis, US Navy

Port view of the Soviet ***Sovremenny****-class destroyer* ***Okrylenny*** *somewhere in the Mediterranean Sea, 22 December 1989.*

Canadian Naval Shipbuilding and the Fallacy of 'Sunk Costs'

Dan Middlemiss

> "Why is free will wasted on a creature who has infinite choices but pretends there are only one or two?" (Steve Toltz, *A Fraction of the Whole*, 2008)

In a late June announcement about the designation of the former Canadian Surface Combatant (CSC) as a *River*-class guided missile destroyer (DDGH), the Minister of National Defence (MND) Bill Blair said that he was "very confident" that a construction contract would be in place for the new warships "before we have an election."[1] Blair stated, "[w]e're very hopeful that ... we'll be able to deliver the very first of these ships by the early 2030s. Hopefully nine of them by 2040, and ultimately all 15 of them being delivered by the 2050s."[2] The first ship would likely not be ready for operations until 2035.

A contract signing would mark an historic milestone for what promises to be the most expensive procurement project ever for the Canadian Armed Forces (CAF) and the Royal Canadian Navy (RCN). The 15-ship project is part of the National Shipbuilding Procurement Strategy, renamed the National Shipbuilding Strategy (NSS), launched with fanfare in 2010. For a variety of reasons, the project has fallen years behind schedule – initially the first ships were to be delivered in the 2015-2017 period, then cutting steel on the first ship was planned for 2020, and then the covid-19 epidemic and supply chain problems delayed construction until late 2024 or early 2025.

Moreover, the cost estimates for the project have increased from the original estimates of about $14 billion[3] to some $84.5 billion as estimated by the Parliamentary Budget Office (PBO) in 2022.[4] The Department of National Defence (DND) still maintains that the production costs for all 15 warships will range between $56-$60 billion, a projection that Ottawa first made in 2019 and has not altered since.

There has been much discussion about the capabilities and performance of the new warships, but most commentators agree that the RCN urgently needs the ships and that they must be built as planned, despite uncertainties about rising costs, delivery delays and limited capabilities. Both supporters and critics of the project appear to agree that it is far too late in the procurement process to change direction, and that there is no other option but to proceed. There is no Plan B for the warship project.[5]

But perhaps it is worth reconsidering the situation facing the RCN and whether or not Ottawa has truly exhausted all options for its fleet recapitalization efforts.

Is Plan A Working?

The first consideration should be to assess what the navy is trying to achieve and how well its plans are unfolding. Among the questions planners should be asking are the following. What are the emerging threats and how imminent are they? What is the RCN's Concept of Operations for the navy? Can Canada's shipbuilders deliver on time? Will the navy be able to crew the ships produced? What will be the crew training and maintenance costs for any new warships? Are there other platform options available – smaller, less complex warships, optionally crewed or uncrewed ships, and submarines – for more and quicker bang for the buck?

A paramount concern should be the rapidly evolving threats to Canada in the near term. The prospect of conflict and of being drawn into such conflict is growing for the CAF. Our current Chief of Defence Staff (CDS) has

Credit: Mona Ghiz, MARLANT Public Affairs

On 28 June 2024 at Irving Shipbuilding, Bill Blair, Minister of National Defence, and Vice-Admiral Angus Topshee, Commander of the Royal Canadian Navy, unveiled the name and classification of the Canadian Surface Combatants as ***River****-class guided-missile helicopter-capable destroyers (DDGH).*

Credit: Senior Airman Joshua Hastings, US Air Force

The first of the Flight III ***Arleigh Burke****-class destroyers, USS* ***Jack H. Lucas*** *(DDG 125), was commissioned 7 October 2023 in Tampa, Florida. Having been in continuous production since the 1990s, the* ***Arleigh Burkes*** *have received multiple upgrades and technology insertions, an approach that the RCN seems hoping to adopt for the* ***River****-class destroyers.*

stated that Canada will have only five years to prepare for emerging threats from Russia and China, while the previous CDS has remarked that these states already consider themselves to be at war with Canada. Recent polling indicates that many Canadians believe that war is now more likely, and a majority think Canada is not prepared for conflict.[6]

How likely is it that the RCN will receive its first DDGH by the early 2030s and nine of them by 2040? By the traditional standards of Canadian naval shipbuilding, this is a very optimistic delivery schedule. To achieve that objective there will have to be: no further construction shutdowns because of pandemics or major supply chain problems; no worker shortages or shipyard strikes; no major construction obstacles; no change in government nor interruptions in government approvals of follow-on flights; no major operational issues encountered in sea trials; and success in recruiting and retaining sailors. To satisfy all these conditions will require more good fortune and skillful management than has been achieved under the NSS to date. There are solid grounds for a pessimistic view of likely delivery schedules and costs.[7]

But how could it be otherwise given the peacetime, capacity-building objectives of the NSS? To help re-establish, maintain and sustain a Canadian shipbuilding industry over the long term, the NSS was predicated upon stable demand for shipyards so as to eliminate the boom-and-bust cycles that had befallen the industry in the past. Note that these NSS objectives are essentially economic in nature and are oriented to providing a predictable tempo of construction for the two main Canadian shipyards. As such, NSS projects must not be surged to meet unexpected circumstances, nor can construction be redirected to the other shipyard because both will be wholly engaged with their own projects.

Despite some recent calls to place Canada's defence industry as a whole on a 'wartime footing' to meet a deteriorating external security environment, these efforts, especially in the naval shipbuilding sector, have seemingly fallen on deaf ears. The end result is that the RCN will get its warships when Canadian shipbuilders are able to build them according to their economic needs, and not before. Moreover, even under the best circumstances, the number of new destroyers will be insufficient to meet all the navy's mission requirements.

Given the shortage of available *River*-class warships in the 2040 and beyond time-frame, it is likely that the RCN, in the absence of viable Canadian Naval Task Groups (CNTG), will continue to contribute a single DDGH to a US carrier battle group in US-led maritime operations, much as is done now. But will this be the most cost-effective use of the RCN's scarce resources, especially when there may be increasingly urgent missions in home waters, particularly in the Arctic?

It is difficult to escape the conclusion that the RCN's most pressing need is for more warships now, not a few ships 15 years from now.

To further complicate matters, officials have indicated that they intend to modify the basic *River*-class in subsequent production flights in order to inject technology upgrades on a continuous basis. While this approach sounds reasonable, it is fraught with the potential to add more risk to the project and, based on experience from other warship programs, could lead to more delays and escalating costs. Naval design changes on-the-fly almost certainly result in expensive production surprises requiring extra space, weight and power.

Is it time to acknowledge that, at best, Canada will be able to produce a limited number of arguably Tier-2 warships in the medium term? If that is the best outcome of the current procurement approach, should Ottawa pivot to procure more, cheaper, task-built, Tier-2 warships from what is globally available between now and 2035?

Credit: Merzoug Gharbaz, Wikimedia Commons

The 3,700-tonne Algerian frigate ***Erradii****, seen in 2015, is one of two MEKO A-200 class ships built for Algeria by Germany. Australia's recent fleet review suggested acquiring some less capable general-purpose frigates like the MEKO A-200 to supplement the Type 26-based* ***Hunter****-class frigates, using a combination of domestic and foreign shipyards.*

The 'Sunk Costs' Fallacy: An Error of Reasoning

Psychologists and economists have acknowledged that for individuals as well as governments, sometimes it seems hard to let go. So much time, energy and money have been committed to a particular relationship or project that we just cannot say, 'no, it's not working out, it's over.' Enter the 'sunk costs' fallacy. Essentially, this refers to the phenomenon in which someone justifies a continued investment of resources based on the cumulative investment to date (the 'sunk costs'), notwithstanding evidence suggesting that the cost of proceeding now outweighs the expected benefits.

Past investments and spending should have no effect on future planning, to think otherwise is irrational. And yet there is a general tendency to assess risks in terms of wasted time and money already spent, rather than as costs of missed opportunities and of continuing on a manifestly flawed course of action.

But people and organizations are prone to loss-averse thinking – we have spent so much time and effort to date that we cannot afford to waste our investment. For the RCN, part of the 'investment' is its commitment to the idea of its return to a true blue-water fleet centred around large, multi-mission platforms such as the *River*-class destroyers. For Irving Shipbuilding, this is its big chance to sup at the public trough, and in any case, many will argue, Irving is too big to fail. For politicians, it is difficult to admit potentially embarrassing failure and the need to do something else – governments, apparently, can no longer be seen to make mistakes or poor decisions despite ample evidence to the contrary.

We should only be considering the costs versus benefits which lie ahead. Time, effort and costs expended in the past are irrelevant because they cannot be recovered. Ottawa needs to re-evaluate how it assesses shipbuilding costs and benefits. What are the real opportunity costs involved for the immediate future? Should we cut our losses now and seek speedier options going forward? Or, should we stay the course and possibly have the navy go down with its ships?

Other states (United Kingdom, Australia, the United States, Japan and South Korea) are seeking options to accelerate their current naval recapitalization programs to get more ships in the shortest possible time. Lately, hi-lo fleet structures are in vogue – i.e., Tier-2 warships that can be built cheaply and quickly. This contrasts with Canada's dogged pursuit of large, complex and expensive multi-mission platforms.

This discussion is not about making a case for a particular warship or a particular fleet structure for the RCN. It is a plea for a fundamental re-assessment of where Canada stands in terms of the maritime requirements of today, and impending threats, and what Canada truly requires from its naval forces. Have we really covered all the bases and have we accurately evaluated the benefits and costs of our current course of action? Can we speed up the acquisition of badly needed hulls? The stakes are high so it is time for serious reflection. Alas, people, and their governments, often abandon forward-looking analysis just when it is most necessary.

Notes

1. As quoted in Michael Tutton, "Halifax Shipyard Tests Steel-cutting Methods as First New Destroyer Expected by 2035," Canadian Press, 28 June 2024. A federal election must be held by late 2025.
2. Jesse Huot, "Canadian Defence Minister Speaks about Upcoming Navy Ships, National Defence Budget," CTV News Atlantic, 28 June 2024.
3. James Cudmore, "Cost to Build Navy's New Warships More Than Doubles to $30B," CBC News, 1 December 2015.
4. Canada, Parliamentary Budget Office, "The Life Cycle Cost of the Canadian Surface Combatants: A Fiscal Analysis," 27 October 2022, p. 8.
5. See the well-reasoned account in Richard Shimooka, "No Other Option: Politics, Policy, and Industrial Considerations in the Canadian Surface Combatant Program," Ottawa, Macdonald-Laurier Institute, 20 December 2021. Also, Ian Mack, "Emerging Lessons from the National

Shipbuilding Procurement Strategy," Calgary, Canadian Global Affairs Institute, March 2019, p. 10.

6. See, Steven Chase, "Chief of Defence Staff Says Canada, US, have Five Years to Prepare for New Threats from Russia and China," *The Globe and Mail*, 19 July 2024; David Pugliese, "Russia and China at War with Canada, Says Gen. Wayne Eyre," *Ottawa Citizen*, 26 October 2023; and Alex Balligall, "Nearly One-third of Canadians Think World War is Likely: 55 Percent of Respondents Believe Canada is Not Ready for Conflict, Poll Finds," *Toronto Star*, 31 May 2024.
7. See, Philippe Lagassé, "Defence Policy and Procurement Costs: The Case for Pessimism Bias," in Thomas Juneau and Philippe Lagassé (eds), *Canadian Defence Policy in Theory and Practice*, Volume 2 (2nd ed.; Cham Switzerland: Palgrave Macmillan, 2023), pp. 133-150.

China's Shifting Strategy in the Pacific Islands

Rachel Martin

China's strategy in the Pacific island region is shifting from large-scale funding and investment to a more targeted approach in an attempt to tailor its outreach more closely to the interests of the autonomous Pacific islands countries.[1] These islands are of geostrategic importance, serving as a buffer zone and a potential jumping-off point for pan-Pacific military operations. As a result, China sees naval expansion in the region as important both to bolstering its own defences and to countering the US military posture in the region.[2]

China has sought political inroads in the Pacific islands through soft-power mechanisms such as the Belt and Road Initiative (BRI), a global infrastructure development strategy launched in 2013 which provides states with grants, loans and investment.[3] The BRI has funded major infrastructure – for example a USD $1.4 billion nickel and cobalt mine in Papua New Guinea (PNG), the Stinson Parade Bridge in Fiji, and a variety of public and government infrastructure in Vanuatu – but projects under the initiative have dwindled in the Pacific islands since 2019 in the face of China's economic setbacks and regional criticism.[4] BRI projects have faced criticism from locals and outside commentators for being 'showy' and of poor quality, as well as for their negative environmental impacts and lack of benefits for average citizens. The needs of the general public in the islands have been better outlined by the UN Sustainable Development Goals (SDGs) and the Pacific Island Forum's (PIF) 2050 Strategy for the Blue Pacific Continent,[5] which acknowledge the reliance of the countries on marine resources for nutrition, employment, economic input, and culture and recreation. A decline in these resources has led the islands to be heavily dependent on foreign assistance. Threats such as climate change, extreme weather, and illegal, unreported and unregulated (IUU) fishing, therefore, shape more immediate interests for the Pacific island countries, which tend to centre on sustainable economic development, environmental protection, disaster mitigation and resource protection.

China's outreach to the Pacific island countries has not only been affected by a lack of attention to these interests, but also by the longstanding involvement of the region's historical development and security partners – particularly the United States, Australia and New Zealand – which have each signaled their renewed attention to the region through financial commitments[6] and security arrangements in response to China's recent inroads.[7] The Pacific island countries, although recognizing their need

Credit: Senior Chief Charly Taufest, US Coast Guard

*On board the US Coast Guard cutter **Harriet Lane**, three Fjiian officers observe a fishing vessel in the Fiji Exclusive Economic Zone on 15 February 2024 as part of combined efforts at countering illegal fishing actvities.*

for foreign assistance and expressing a willingness to work with all potential partners, have expressed concern about agreements with states which could disrupt regional peace and stability. Western criticism and warnings surrounding China's continued pursuit of security deals with the islands, alongside allegations of political inference and bribery, have undermined the efficacy of China's efforts in the region.

In recent years, however, China has sought to reframe its outreach in the Pacific islands by better tailoring its approach to the interests of the islands under its Global Development Initiative (GDI). The initiative, launched in 2021, aligns more closely with the UN SDGs, focusing on smaller, more sustainable projects, and has amassed a Group of Friends comprising over 60 states. The GDI and China's Global Security Initiative (GSI), launched in 2022, remain introductory initiatives aimed at improving China's relationship with the Pacific island countries in the hope of eventually strengthening China's strategic position in the region. These initiatives have been described as a simple repackaging of China's existing regional strategy, although they do give some insight as to China's anticipated pathways to more extensive security cooperation. The GSI, for example, explicitly states a desire to address the "legitimate concerns" of the countries and aims to strengthen security dialogue and cooperation, encourage exchanges between defence academies, and train personnel from the Pacific islands in Chinese law enforcement and defence academies.[8]

China has been largely unsuccessful in establishing a naval base or investing in potential dual-use port infrastructure in the region, but it has improved its relationship with a handful of Pacific islands through training initiatives and policing deals.[9] China and Fiji have held a policing agreement since 2011, involving the exchange of intelligence, training and the supply of high-tech equipment, but in recent years China has established several new policing deals. In April 2022, China finalized an agreement with Solomon Islands which, according to a leaked draft, allows for the deployment of Chinese police and military personnel to maintain 'social order' in the country. An element of the draft, allowing Chinese naval vessels to visit Solomon

Credit: PRC National Bureau of Surveying, Mapping, and Geographic Information, via Wikimedia Commons

A 2016 map showing China's Belt and Road Initiative corridors. Although the Pacific Islands are not highlighted, they have nonetheless received attention as part of the initiative.

Islands to support its forces stationed there, has been met by warnings from Washington, which hopes to prevent the establishment of any permanent Chinese military presence in the region.[10] In May 2022, Samoa and China signed a security deal under which China will build a police fingerprint laboratory and a police training academy on the island, both of which are currently under construction. And, most recently, in February 2024, media outlets revealed a policing deal between China and Kiribati after it was discovered that Chinese police are operating in the country to aid with community policing and a crime database program. These agreements have been met with concern from outside observers who believe that they could pave the way for China to undermine the sovereign rights of these islands.

The GDI and GSI provide a clear indication that China is tailoring its regional strategy in the Pacific islands to meet the interests of the countries and appreciates the value of low-level agreements which may eventually be expanded for wider strategic effect. This includes taking a more politically targeted approach to cooperation with the countries, as seen by China's increase in funding to Solomon Islands and Kiribati since their diplomatic switch from Taiwan to China in 2019, despite an overall decrease in foreign humanitarian assistance to the region.[11]

China may, however, be hard-pressed to make significant progress in fulfilling its regional security interests, such as establishing a naval presence in the region. This will be the case so long as the traditional security partners of the Pacific island countries remain engaged in the region and continue to contribute to its development to meet the needs of the islands.

Notes

1. The Pacific island countries consist of 14 sovereign states: the Cook Islands, the Federated States of Micronesia, Fiji, Kiribati, Nauru, Niue, Palau, Papua New Guinea, the Republic of the Marshall Islands, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu. Together they have a population of about 2.3 million. Some also consider Timor-Leste (East Timor) to be a part of the group. Note that China's strategy is targeting the autonomous Pacific island countries and not the Freely Associated States (FAS) or any territories.
2. The United States maintains forces at military bases in Hawaii, the US territories of the Northern Mariana Islands (which include Guam), American Samoa and the Marshall Islands.
3. Mainly from China's policy banks, including the Export-Import Bank of China (EximBank) and China Development Bank.
4. Meia Nouwens, "China's Belt and Road Initiative a Decade On," in *Asia-Pacific Regional Security Assessment 2023*, International Institute for Strategic Studies, 2023, pp. 90-115.
5. The 2050 Strategy for the Blue Pacific Continent is a framework designed to advance the region's goal of creating a sustainable, resilient and integrated 'Blue Continent' by improving education, health care, cultural identity, strengthening regional partnerships for simplified access to development finance, and addressing climate change and climate-related disasters.
6. Australia revealed a near USD $2 billion package in May 2023 aimed at boosting its influence in the region. It includes $371 million in funding to expand and improve the Pacific-Australia labour mobility scheme, and $1.4 billion to "build Pacific peace and security," alongside the announcement of the resumption of annual 2.5 per cent increases in official development assistance from 2026-2027. Daniel Hurst, "ADF to Expand Pacific Links in $1.9bn Budget Package to Boost Australia's Influence," *The Guardian*, 9 May 2023.
7. The United States has shiprider agreements with many Pacific island states which enable local law enforcement personnel to embark on US Coast Guard and US Navy vessels to conduct joint patrols of their maritime boundaries and enforce regulations, in particular to combat IUU fishing. An addendum to the Samoa shiprider agreement, signed in April 2023, grants the USCG expanded power within Samoa's Exclusive Economic Zone to conduct these patrols without a Samoan officer present. Department of Homeland Security, "US and Independent State of Samoa Sign Addendum to Existing Maritime Law Enforcement Agreement in the Pacific," *US Coast Guard News*, 5 April 2024.
8. People's Republic of China, Ministry of Foreign Affairs, "The Global Security Initiative Concept Paper," 21 February 2023.
9. In 2018, Australian media reported that China and Vanuatu held preliminary talks regarding the establishment of a Chinese military base in Vanuatu (which both countries denied), and noted concerns surrounding the potential dual use of the Chinese-funded Luganville wharf. David Wroe, "China Eyes Vanuatu Military Base in Plan with Global Ramifications," *The Sydney Morning Herald*, 9 April 2018. In 2019, another potential deal, in which China's Sam Group would lease the Solomon Island of Tulagi, the site of a former Japanese naval base, was blocked by the Solomon Islands government. Jonathan Barrett, "Solomon Government says Chinese Company's Lease of Island 'Unlawful,'" Reuters, 25 October 2019.
10. Malcolm Davis, "Australia Must Prepare for the Possibility of a Chinese Base in Solomon Islands," *The Strategist*, Australian Strategic Policy Institute, 13 March 2022.
11. "2023 Pacific Aid Map Reveals Chinese Aid in Retreat," Lowy Institute, 31 October 2023.

Comment on Gilmour Commentary in Vol. 20, No. 1

David Morse

In *CNR* Volume 20, Number 1 (Making Waves), Jeff Gilmour comments that "Australia ... recently announced it is having two large aircraft carriers, which can operate its F-35B aircraft, built partially in Spain." The origin of this assertion is unclear but not reflected in any official Royal Australian Navy (RAN) plans.

The RAN did indeed contract Navantia to build two Landing Helicopter Dock (LHD) hulls – HMAS *Canberra* and HMAS *Adelaide* – that were then finished in Australia by BAE and then commissioned into service in 2014 and 2015. They are a variant of the Spanish *Juan Carlos* which does operate Harrier jets but the RAN versions are not configured for this. Their flight deck is sized and equipped for multiple helicopters up to Chinook size. The RAN ships are not capable of fixed-wing operations; the most obvious limitation being the flight deck which is not strengthened for vertical take-off and landing. The ski jump on the bow was retained simply to avoid the cost of significant redesign. The ramp may give the impression of a fixed-wing capability but it is misleading.

The RAN has no capacity to operate fixed-wing aircraft – it is the preserve of the Royal Australian Air Force. The F35 fleet is exclusively A model, conventional take-off and landing. The RAN probably has enough on its plate with Aegis destroyers and nuclear submarines (SSNs) without the massive undertaking of fixed-wing carriers.

Notes from the Field:

Saab Makes Its Case

Ann Griffiths

Credit: Sgt. Patrik Orcutt, US Army

*A Swedish **Visby**-class corvette seen during a Swedish-led bilateral exercise with the United States on 15 November 2020.*

I was invited – at Saab's expense – to visit Sweden and meet with Saab and Swedish defence officials and tour Saab's naval facilities. I accepted the invitation and in May I flew to Stockholm. There were other Canadian and American media/defence analysts in the group. Aside from the gorgeous weather (which Saab undoubtedly arranged for us) and the beautiful scenery in Sweden, we were given extensive and high-level briefings. The plan was clearly to tell us about what Saab is doing, and can do, in the naval industry with the hope that we would write about the experience and (perhaps) influence government decision-makers. In addition to two posts written for *CNR*'s online discussion forum (Broadsides), this commentary is a summary of the trip and my impressions of Saab's naval projects.

The visit began with a visit to the Vasa Museum. For those of you who have not heard of the ship, it was a cutting-edge warship built for the Swedish Navy. Unfortunately, it sank on its maiden voyage in 1628 about a kilometre from where it was launched. The king was not amused. It rested underwater for centuries before it was raised, dried out and made into a museum. Despite its many years in the Baltic Sea, the ship was in remarkably good shape when it came out of the water in 1961. It is displayed with most of the original elements intact – including beautiful, intricate carvings – although the cannons had been removed and sold by early salvors, ropes had to be replaced and some of the carvings had to be restored. We can learn two lessons from this ship. First, the design of a ship should not be compromised by adding too many extra bells and whistles because even I could see that the ship was very top heavy. (Another, less relevant, lesson in 2024 is do not leave the cannon gun-ports open.) And the second lesson is that the Swedes have been building warships for a long time (the navy was established in 1522).

The briefings in Stockholm where we started the tour were general. They included a discussion of both Swedish naval policy and Saab's products. In terms of the former, Sweden's navy has historically focused on the Baltic Sea, understandably so. Sweden does not have access to the Atlantic (or Arctic) Ocean, although it has access to the North Sea from its western coast. A focus on the Baltic is natural but comes with challenges given its heavy traffic, significant undersea infrastructure – communications cables, energy pipelines and military sensors – and, of course, Russia. Since the end of the Cold War, exposure to unfriendly states has decreased as East Germany was re-integrated with the rest of Germany, and Poland, Lithuania, Estonia and Latvia are now members of NATO. That leaves Russian access to the Baltic more limited than in Soviet times, now only via St. Petersburg and Kaliningrad, where the Russian Baltic Fleet is located. But as we know, the disappearance of the Soviet Union has not reduced the threat in the Baltic – indeed, Russia is more aggressive than the Soviet Union was in its latter years. This is the foundation of Sweden's quick embrace of NATO after Russia invaded Ukraine in 2022, thus ending several hundred years of Swedish neutrality. Since Sweden has been working with NATO informally for years, most of its military systems are already NATO-compatible, with some exceptions.

As for Saab, the core areas of the company, as outlined by Micael Johansson, President and CEO, are underwater systems, fighter systems (eg., fighter jets), command and control sensors and advanced weapons systems. Saab does not just focus on naval capabilities, and in 2023 only 25% of its sales were naval. Its sales relating to air were 39%, the largest category, followed by land at 27% and other at 9%. Most of the sales were concentrated in Sweden (42%) and Europe (23%). Only 11% of sales were in North America.[1]

Credit: SAAB-Kockums

*Saab Kockums has constructed various versions of the Saab Lightweight Integrated Mast for both foreign and domestic warships, including the **Visby**-class corvettes and Singapore's Multi-Role Combat Vessel.*

The more specific briefings began after we moved to Karlskrona in the south of Sweden. The briefings included a number of interesting projects on which Saab Kockums[2] is working. Our first briefing in Karlskrona was about composite technology and design. This reflects Saab Kockums' focus on research and development (R&D) as it continues to explore lightweight alternatives for surface ships.[3] They have been working with composite technology for many years, but perhaps the most cited examples are the *Visby*-class corvettes that have joined the Swedish Navy over the past 20 years.[4] This class of ships has incorporated a carbon-fibre/steel sandwich for some parts of the structure. The idea behind using composite material in warships is that it makes the ship less heavy than steel ships. The lower displacement means that the ship can carry a greater payload and increase its speed while using less power. The other good thing about using composite material is that it does not rust which lowers maintenance costs. As well, using the composite material for the superstructure reduces the radar signature. The focus now seems to be using the composite material for the superstructure of ships, so the final product would be a hybrid of composite and steel structures.

In another briefing we learned about the Combat Boat Next Generation (CB90 NG), an updated version of the CB90 fast assault craft – and I can attest to their speed because we had a ride in one – which has been in use since the 1990s. The CB90 NG is designed to have stealth technology, manoeuvrability, a new combat management system, advanced sensors and attack capabilities through the Trackfire system. The plan is for them to be used in minelaying (and mine countermeasures), boarding operations, maritime checkpoints and escorts, and landings. They have gun mounts and can have the capacity to launch mortars and Hellfire missiles.

Sweden is in the process of integrating autonomous platforms into the Royal Swedish Navy (RSwN), including the Piraya uncrewed surface vessel (USV) and Enforcer 3 combat boat (a variant of the CB90), so we were briefed on their construction and their use. We saw a demonstration of an autonomous boat which had the Self-propelled Acoustic-Magnetic (SAM) mine-countermeasures suite on board. The boat is modular and the control system is 'vessel agnostic' and 'plug and play' which means that it can be inserted to other frames. In addition to various sensors and cameras, the boats can be equipped with significant weaponry in the assault mode. These autonomous boats (which also can be remote-controlled) are designed to have a role in: assault; mine countermeasures; intelligence, surveillance, target acquisition and reconnaissance (ISTAR); logistics; electronic-warfare; and search and rescue. Saab's US subsidiaries are working with the US Navy in San Diego to test and refine the boats.

Another example we were shown is the autonomous underwater unit AUV62-AT. The briefing for this unit was very technical and thus far beyond my understanding but from what I gathered, the unit has multiple settings and

Credit: SAAB-Kockums

Preparing to go for a ride on a CB90 patrol boat off Karlskrona in summer 2024.


Credit: SAAB-Kockums

*Two A26/**Blekinge**-class submarines are being built at Saab Kockums' shipyard in Karlskrona, Sweden. Mid-life upgrades of existing submarines, which involve cutting the hull in half to insert additional capabilities, are also taking place. In this photo we can see the modules of one of the submarines which will soon be joined.*

programming capacities. It is being used for training for anti-submarine warfare. The unit can be pre-programmed into a pattern, with varying signatures and sound levels, which is useful for ships to train to locate and identify submarines.

These were the tasty appetizers – the main course was submarines. This was likely the motivation for Saab to invite Canadian defence analysts/journalists (the motivation for inviting the Americans was less obvious). Saab/Sweden is hoping that Saab Kockums will be able to compete in Canada's submarine procurement program, after the Canadian government's process of 'exploring' the idea is complete. The representative of Saab Canada (Simon Carroll) and the Chief Engineer of the A26 program (P.O. Hedin) in separate presentations listed the reasons why Saab/Sweden would be "the ideal submarine partner for Canada." These reasons include that we share a common Arctic climate and common defence threats, we both hold progressive societal values and have compatible cultures, and both countries have the requirement of cost-effective solutions for the needs of the armed forces. The fact that Swedish people are proficient in English was also touted as a benefit.

Sweden is currently building two A26 submarines (*Blekinge*-class) for the use of the Swedish Navy, the second of which will be complete in 2028. These submarines are fairly small, designed for Swedish operations in the Baltic Sea. But just because the Baltic is small does not mean that submarine operations there are easy. As noted, the Baltic Sea is shallow and an area of high traffic and significant underwater infrastructure, not to mention GPS jamming by Russia and thousands of sea mines left over from WWII, so operating there is challenging. Because of the traffic, it is noisy so detection can be difficult, and, because the sea is brackish and warm, there are layers in the water which make it easy for submarines to hide.

In acknowledgment that the Canadian navy operates in the larger expanse of oceans, the version that has been put forward as an option for Canada – the C71 – is an expeditionary variant that would be more suitable to Canada's needs. This would involve adding a section to the two modules of the A26 subs. It was made clear in the briefings that Saab Kockums is willing to work with Canada to develop the submarine and provide in-country support. The features of the C71 (as per the draft plans) would be as follows:

- long-range endurance;
- approximately half the crew size of the *Victoria*-class;
- modular design for easy maintenance and upgrades;
- multi-mission portal to facilitate use of uncrewed undersea vessels (UUVs) (and special forces/divers);
- under-ice capability;
- Air Independent Propulsion (Stirling-Kockums);
- compatibility with US systems;
- stealth, low noise signature;
- multiple sensors;
- combat system allowing multiple weapon systems/torpedoes; and
- emphasis on habitability (crew comfort, gender neutral).

Obviously it is much too early to nail down costs, but it was stressed that the C71 would be "cost-effective."

So what are the lessons learned from this visit? First, Sweden and Saab are clearly energetic and enthusiastic about showing their talents and products. Second, they are on the cutting edge of some naval products. Third, they would dearly like to be considered for Canada's new submarine project. They have many years of experience building submarines and they will have a hot assembly line starting in 2028. They stated that they would be happy to work with Canada to customize a submarine for the Canadian navy. Design would take three years and then the build would occur – conveniently right as they are finishing the second A26. Fourth, despite all this, it looks like Canada is not focusing on the Swedish/Saab C71 proposal but rather looking elsewhere. But we'll have to wait and see where Canada's continuing exploration of the options leads.

Notes

1. All statistics were provided by Saab.
2. Kockums is a shipyard in Karlskrona owned by Saab.
3. It should be noted that other companies are exploring composite materials for use in ships, for example, Damen Schelde Naval Shipbuilding (DSNS) in the Netherlands.
4. For more information on these interesting ships, see "Visby-class Corvettes," *Naval Technology*, 21 June 2024.

A View from the West:

RIMPAC 2024: Commitment to Indo-Pacific Security Amid Global Crises

Jocelyn Sandhu

The 29th biennial Rim of the Pacific (RIMPAC) Exercise kicked off in Hawaii on 27 June this year. RIMPAC is the largest naval exercise in the world, and this year included 29 countries contributing 39 surface ships, three submarines, over 150 aircraft and around 25,000 personnel.[1] Over five weeks of training, participants took part in sea- and land-based scenarios designed to simulate a variety of complex operations, including RIMPAC's largest-ever humanitarian aid and disaster relief exercise and the sinking of a decommissioned 40,000-ton amphibious assault ship. It took place against the backdrop of ongoing conflicts in Europe and the Middle East, heightened opportunities for miscalculation in contentious areas like the South China Sea, and widespread military expansion. RIMPAC represents an important opportunity for countries both within and outside the Indo-Pacific region (IPR) to demonstrate their collective commitment to meet challenges there, and to strengthen their relationships.

Naval exercises are events that have both practical and political functions; they respond to the current strategic environment but also play a role in shaping it. RIMPAC represents a microcosm of the strategic environment in the IPR. Invitations to the exercise and level of participation are useful indicators of American intentions for alliance-building in the region, the concerns of regional states, and priorities of extra-regional participants. For example, in 2012, just one year into the US policy 'pivot' to Asia, potential flashpoints in the region – such as in the South China Sea, between China and Taiwan, and along the Korean Peninsula – seemed manageable, while China's rapid military expansion was overshadowed by then-orthodox enthusiasm for economic engagement. Blocs which today have created a divide between Western-aligned states and states like China and Russia that promote an alternative status quo had yet to emerge. As such, Russia was a first-time (and last-time) participant in the exercise in 2012, and China participated in the 2014 and 2016 iterations. China's involvement in the exercise was considered a welcome addition by those who saw China's exclusion to be counterproductive in cooling tensions between Washington and Beijing.[2]

Flash forward to RIMPAC's 26th iteration in 2018. By this time any goodwill that had led the United States to invite China to the exercise had soured. The ascension of Xi Jinping to China's presidency in 2013 ushered in a period of more direct pushback against aspects of the US-led international order that did not suit Beijing, while its moves to militarize artificial islands in the South China Sea led China to be disinvited from the exercise entirely. In the meantime, participation in RIMPAC grew steadily, from 22 participants in 2012 to 26 in 2018, with countries like Vietnam and Sri Lanka joining the exercise for the first time, marking new highlights in their defence relations with the United States.[3]

The following years brought new challenges in the form of a proto-isolationist US administration and the COVID-19 pandemic. Despite this, RIMPAC continued, albeit with at-sea-only events in 2020. At the same time, countries

Credit: Mass Communications Specialist 1st Class John Bellino, US Navy

*HMCS **Max Bernays** and HMCS **Vancouver** are seen moored together in Pearl Harbor during RIMPAC 2024.*

Credit: Mass Communications Specialist 1st Class John Bellino, US Navy

*German Navy frigate FGS **Baden-Wurttemberg** (F 222), right, and German Navy **Berlin**-class replenishment ship FGS **Frankfurt Am Main** (A 1412), are moored at Pearl Harbor during RIMPAC 2024.*

outside of the IPR articulated their interests and goals for the region in new official strategies. These strategies renewed focus on the importance of the IPR's waterways and ports to global trade, as well as recognition that any disruption there could be detrimental to the global economy and security. This led to more European participation than ever at RIMPAC 2024, including contributions from Belgium, Denmark, Germany, Italy and the Netherlands, all of which have dedicated policies for the Indo-Pacific or have committed to support the European Union's strategy for the region. Despite ongoing wars in Ukraine and Gaza, RIMPAC 2024 attracted a strong and diverse level of participation (including from Israel), suggesting that commitment to Indo-Pacific security is a long-term imperative for these countries and that it is understood that security challenges elsewhere have the ability to affect security in the Indo-Pacific and vice versa.[4]

RIMPAC is not the only recurrent and expanding naval exercise in the IPR. Amid concerns over Chinese belligerence, deepening Sino-Russian ties, and renewed tensions on the Korean Peninsula and between China and Taiwan, exercises such as the US-Philippines' Sama Sama Exercise and Australia's Exercise Kakadu, have grown to become multinational events. While efforts to promote deeper Japanese and South Korean cooperation have been derailed before, the current security environment has spurred sufficient mutual interests to allow South Korea to set aside the unthinkable – aligning with its colonial oppressor – in favour of cooperating at sea with Japan to address the emerging China-Russia-North Korea bloc. India, too, has put aside alignment concerns to expand its annual Malabar Exercise to include the United States, Japan and Australia in the wake of China's renewed encroachment on India's Himalayan border and sphere of influence.

These expanded exercises not only signal strategic alignments, they also work to shape the strategic reality in the IPR into one where countries concerned about challenges to the status quo see deepening their partnerships as a necessary step to preserving regional peace and stability. An example of this sort of challenge occurred almost immediately before the 2024 RIMPAC Exercise when Beijing launched an unprecedented push to deny the Philippines control in its internationally-recognized waters, leading to several confrontations involving water cannons, boat ramming and bladed weapons. These incidents serve as a stark reminder of what is at stake in the region: free and open navigation, governed by international law and principles of sovereignty that benefit every country.

As one of the first participants of RIMPAC back in 1971, the exercise represents one of Canada's longest security commitments in the IPR. Feedback from prospective partners of Canada's security engagement in the region has focused on the need for Canada to demonstrate reliability and maintain a consistent presence in order to be seen as a viable partner.[5] The Royal Canadian Navy (RCN) has made up a significant part of Canada's security presence in the region, maintaining deployments and activities with countries there well before the release of Canada's "Indo-Pacific Strategy" (IPS) in 2022. Amid personnel shortages and ageing vessels, the RCN still provided HMCS *Vancouver*, Arctic and Offshore Patrol Vessel HMCS *Max Bernays* and MV *Asterix* to participate in RIMPAC 2024. HMCS *Vancouver* is also one of three ships deploying to the Indo-Pacific this year, including HMCS *Montreal* which left Halifax in April, and HMCS *Ottawa* which will deploy in the fall, fulfilling for the second year the commitment of deploying three frigates to the region annually.

Aside from being an invaluable learning experience for sailors, RIMPAC has always been about signaling a country's commitment to the Indo-Pacific region and its ability to maintain its commitments. The RCN's longstanding presence at this global platform has helped project this message.

Notes

1. US Navy, "RIMPAC Participants," US Pacific Fleet, 2024.
2. In hindsight, China's invitation could have been a mistake on the US part as it did little to ease tensions and China took the opportunity to collect intelligence on other participants. See Ben Werner, "China's Past Participation in RIMPAC Didn't Yield Intended Benefits of Easing Tensions," *USNI News*, 24 May 2018.
3. Nick Childs, "RIMPAC 2018: An Exercise in Maritime Maneuvering and Messaging," International Institute for Strategic Studies, 27 June 2018.
4. See Didi Tang, "To Counter China, NATO and its Asian Partners are Moving Closer Under US Leadership," AP News, 9 July 2024.
5. Jeremy Paltiel, "In the Indo-Pacific, Canada has Core Interests but Weak Clout," *Policy Options*, 15 September 2023.

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Dollars and Sense:

Defending Canada with a 2% of GDP Defence Budget

Dave Perry

In July 2024, NATO allies met in Washington, DC, to celebrate the 75th anniversary of the world's most successful military alliance. The event featured three days of celebrations of alliance unity, resolve and support for Ukraine amidst sweltering (even for DC) heat and humidity.

The summit was significant for Canadian defence and the future of Canada's navy. Most notably, after the summit officially concluded, Prime Minister Justin Trudeau held a press conference flanked by Minister of National Defence Bill Blair and Foreign Affair Minister Mélanie Joly. After extolling his government's record on defence, noting that it had already made a commitment of $175 billion in funding to the military, the Prime Minister stated that "Canada fully expects to reach NATO's 2% of GDP spending target by 2032."[1]

This statement is an important, if highly qualified, move that will help reframe the Canadian defence landscape. It marks the first time a Canadian leader has officially made the commitment to live up to the defence pledge outside of the commitments made implicitly by signing NATO defence communiqués at the summits in Vilnius and Wales. The primary qualification that must be attached to this announcement relates to both funding and planning. There has as yet been no official commitment of funding to back the political commitment, and its believability hinges on the government coming forward with a funding decision.

Credit: NATO

Prime Minister Justin Trudeau speaks with Kyriakos Mitsotakis (Prime Minister of Greece), Ulf Kristersson (Prime Minister of Sweden) and Emmanuel Macron (President of France) during the NATO Summit in Washington DC, 11 July 2024.

However, this is an important political commitment for both international and domestic audiences. Canada's refusal to commit to meet the investment pledge target was leaving it increasingly offside with other members of the alliance. At the NATO Public Forum held adjacent to the official summit, the pledge and its importance came up over and over again during two days of discussions. The need for the investment target to increase to a higher threshold of 2.5 or 3% of GDP came up frequently enough to demonstrate that there is seriousness behind the Vilnius language that 2.0% is the minimum allies must spend. These conversations demonstrated that recognition of the importance of defence spending extends well beyond the United States where, in the lead-up to the summit, American political leaders had called out Canada for failing to meet its investment pledge target. In May a bipartisan group of 23 American Senators signed an open letter calling on Canada to meet the target. In the days immediately preceding the summit, following meetings with leading Congressional members by Trudeau, House Speaker Mike Johnson accused Canada of "riding on America's coattails" on defence while Mitch McConnell, the Senate Minority Leader, posted to social media that "it's time for our northern ally to invest seriously in the hard power required to help preserve prosperity and security across @NATO."[2] As Chris Sands, an observer of Canada-US relations from a Washington think tank noted, Canada's failure to state it would meet the investment pledge target was negatively affecting Canada-US relations.[3] Indicating that Canada would meet the target helps restore some lost reputational credibility.

At home, committing to 2% has set new yardsticks by which Canadian defence commitments will be measured. Ahead of the NATO summit, Pierre Poilievre, the Conservative Party of Canada's leader – and barring significant change in Canadian public opinion, Canada's next Prime Minister – would only commit to 'work towards' spending 2% of GDP on defence. This language essentially echoes the NATO Wales Summit pledge from 2014. Following Trudeau's declaration that Canada expects to reach 2% by 2032, Poilievre has been unwilling to echo the commitment, instead stating "[e]very time I make a financial commitment, I'm going to make sure I've pulled out my calculator and done all the math."[4] Despite Poilievre demurring to make the same financial commitment, Trudeau's statement has likely redefined the discussion of defence in Canada. Having staked out a concrete timeline to honour Canada's alliance investment pledge, future

Credit: Timothy Choi

A model of the Korean KSS-III diesel-electric submarine, with a cutaway showing its large-diameter ballistic missile launch tubes. The KSS-III is one of the likely contenders for the Canadian Patrol Submarine Project. This model was on display at the Hanwha booth at the CANSEC 2024 tradeshow in Ottawa, May 2024.

political leaders will measure any future political party's pledge or government's action against that commitment.

In a news release issued in conjunction with the speech in Washington, Minister of National Defence Blair clarified that the government of Canada expects to reach 2% of GDP spending by 2032 by moving forward with the items that *Our North, Strong and Free* (*ONSAF*) – the defence policy released in April 2024 – committed only to 'explore.' This includes, most prominently, renewing and expanding Canada's submarine fleet, a capability Trudeau committed to acquire on the opening day of the NATO summit. The supporting news release for that announcement indicates Canada is in the market for "up to 12 conventionally-powered, under-ice capable submarines,"[5] and a process to initiate the procurement will begin with a formal Request for Information released this fall. Canada's key capability requirements are "stealth, lethality, persistence and Arctic deployability – meaning that the submarine must have extended range and endurance" and well as "striking capability."[6] This commitment for striking capability aligns with the commitment in *ONSAF* to explore options for "acquiring long-range air- and sea-launched missiles" and indicates that the Royal Canadian Navy (RCN) will be developing an enhanced long-range missile capability on both the *River*-class destroyers (also known as the Canadian Surface Combatant) and the Canadian Patrol Submarines.

The other naval-related commitments that *ONSAF* indicated would be explored but are now to proceed include "enabling our Arctic and Offshore Patrol Vessels [*Harry DeWolf*-class] to embark and operate our maritime helicopters at sea," "acquiring a suite of surveillance and strike drones and counter-drone capabilities," and "making further contributions to the integrated air and missile defence of Canada and North America," all of which will add needed capabilities.

The first of these commitments will significantly enhance the operational capability of the *Harry DeWolf*-class. Given the trajectory of the *River*-class project (at the time of writing still without a build contract, and therefore without a real schedule for delivery), and the advanced age and state of the *Halifax*-class frigates (despite the additional funding for their sustainment pledged in *ONSAF*), the *Harry DeWolf*-class ships are likely to play a more significant role in Canadian seapower for a decade more than originally envisioned when the ship was conceived. *Max Bernays* was deployed to RIMPAC 2024, the first of the class to participate in the Pacific exercise, hardly what was envisioned for the class originally. Fully enabling Cyclone helicopter operations would further enhance the ships' capability and strengthen their relevance in the years to come when their utilization is likely to increase further.[7]

Adding a suite of naval drone and counter-drone capabilities will similarly enhance the capabilities of the RCN in this increasingly important element of warfare. As the war in Ukraine and attacks in the Red Sea have demonstrated, the proliferation of drone technology has provided adversaries with a potent new weapon with which conventional maritime defences are not well positioned to cope if deployed at scale or in combination with missiles

or other airborne weapons. As well, the low barrier to achieve drone capability allows actors with modest means and sophistication to employ it effectively.

Finally, exploring further options for integrated air defence of Canada and North America could mean that the *River*-class destroyers take on an enhanced role in extended missile defence. Their Aegis combat system and cooperative engagement capability, along with a design decision to acquire vertical launch cells capable of firing the entire family of Standard Missiles could allow the ships to play a consequential role in missile defence, including against ballistic missiles. If configured properly, the *River*-class could provide an air-defence bubble around Canada's coast and into the Great Lakes. Even if such coverage was geographically limited, it would be a significant enhancement over what currently exists.

Of course all of these potential capabilities depend on the government actually coming through with the money to make 2% of GDP a reality. The fact that the results of a funding decision to do so have not been produced is worrisome. After all, the Department of National Defence just went through the process of reviewing Canadian defence policy over a two-year period, during which options to spend 2% of GDP were presented to Cabinet, and the resulting policy indicated only that Canada would reach 1.76% of GDP. Certainly, given the government's fiscal track over the next four years forecasted in the 2024 Budget, increasing spending to meet the 2% target would be difficult, with a deficit estimated to be $40 billion this fiscal year, and debt servicing payments already over $50 billion and projected to climb. Absent other information, external pressure to do better than *ONSAF* in terms of defence spending seems more likely to have led to the commitment made by the Prime Minister in Washington than anything else. It is unclear what new information to substantiate the decision could have been brought forward in the three months since *ONSAF* was published that was not presented over the two years during which the document was developed. It is also doubtful that much work could have been conducted to develop detailed plans to reach the 2% threshold in that time frame.

Credit: Commodore Dave Mazur

One of 21 Snyper Mk III drones is destroyed during a West Coast RCN counter-drone exercise in June 2024.

By identifying 2032 as the year by which Canada expects to spend 2% of GDP on defence, the government has bought itself significant flexibility – politically, fiscally and from policy development and implementation standpoints. Politically, the current government will not be the one to deliver on the commitment unless public opinion changes radically and Trudeau somehow manages to stay in office. Fiscally, 2032 falls outside the Finance Department forecast, so determining the magnitude of defence spending required to reach 2% and the choices required to fund spending at that level are both unclear and there is plenty of time to make necessary adjustments.

Lastly, delivering on 2% of GDP will require a paradigm shift in Canada's ability to administer defence. Eight years may be a long time by normal standards, but it is about half the time currently required to complete new capability procurements. The year 2032 is also the one when, in the languid pace outlined in *ONSAF*, the Canadian Armed Forces are expected to return to the Authorized Strength of 71,500 regular forces – the assessed military establishment needed to support its *2017* defence policy. That force size does not account for the new capabilities funded under NORAD modernization, *ONSAF* or a 2% of GDP Canadian military. Other improvements will similarly be needed in Canada's approach to sustainment, real property management and the adoption of digital technologies. Reaching 2% of GDP will represent a financial paradigm shift, and it will not be realized by administration as usual.

Notes

1. Prime Minister Justin Trudeau, Press Conference, 11 July 2024, Washington DC.
2. Judy Trinh, "Canada to Announce Plan to Reach NATO Target, Spend 2% of GDP on Defence: Sources," CTV News, 11 July 2024.
3. Chris Sands, "2024 NATO Summit in Vignettes," Canadian Global Affairs Institute (CGAI), Defence Deconstructed Podcast, 12 July 2024.
4. Michael Taube, "It's up to Pierre Poilievre to Clean up Trudeau's NATO Mess," *National Post*, 19 July 2024.
5. Canada, Department of National Defence, "Canada Launching Process to Acquire up to 12 Conventionally-powered Submarines," News Release, 10 July 2024.
6. *Ibid*.
7. Ian Brodie and Alex Salt, "RIMPAC 2024," CGAI, Defence Deconstructed Podcast, 9 August 2024.

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Warship Developments: Snippets

Doug Thomas

Credit: Royal Canadian Navy account on X

*A rendering of the **River**-class destroyer, previously known as the Canadian Surface Combatant, released in June 2024 alongside the beginning of construction of the Production Test Module.*

Type 26 Frigates

The British Type 26 frigate design is being built in three Commonwealth countries: the United Kingdom, eight ships; Australia, six ships; and Canada, 15 ships. Although termed a frigate, it is larger than some World War II cruisers at about 152 metres (500 feet) long and 8,000 tons standard displacement. It was first named by the British as the Global Combat Ship, and details of weapons and sensors will vary somewhat between countries. For example, the British vessels will specialize in anti-submarine warfare (ASW), assuming the role currently filled by eight Type 23 '*Duke*'-class frigates.

The Canadian version of the Type 26, the Canadian Surface Combatant (CSC), will be known as destroyers and named the *River*-class. Their individual names will be those of important rivers and many will commemorate previous *River*-class ships which served Canada so well during World War II and during the Cold War. Irving Shipbuilding has started manufacturing the production test module for the ship-class.[1] The test module will allow industry to evaluate and streamline processes and implement lessons-learned into the build process ahead of full rate production starting in 2025. Long-lead equipment items for the first three ships have been ordered and delivery of the first *River*-class destroyer, HMCS *Fraser*, is expected in the early 2030s, with HMC Ships *St. Laurent* and *Mackenzie* to follow. The last of 15 ships is expected to be delivered in 2050.

Chinese Navy (PLA(N)) Forces

The Chinese are building and perfecting the components of naval task groups after studying the example of the US Navy and its role in the Pacific during World War II in defeating Japan, and its world-wide reach since then. A task group is composed of a group of ships with a range

Credit: PLA Navy

Two Chinese Type 075 amphibious assault ships sail in formation in 2022 in an undisclosed location.

Credit: Liu Jian, via PRC Ministry of National Defense

A PLAN Air Cushion Landing Craft (LCAC) approaches its Type 071 Landing Platform Dock (LPD) in the South China Sea in March 2019.

of capabilities sufficient to achieve success in completing an assigned task, such as countering an enemy task group or capturing an island. In some cases, it may be a carrier strike group comprised of one or more aircraft carriers, with supporting anti-air, anti-surface and anti-submarine escorts, and supporting fuel and solid stores (food, ammunition, spare parts, etc.) replenishment vessels. If the objective is to attack a land target, substitute amphibious forces for aircraft carriers and it becomes an amphibious task group. If the objective is further abroad, aircraft carriers could support amphibious landings. The bottom line is that these forces provide a powerful foreign policy tool far beyond Chinese waters.

The People's Liberation Army (Navy) (PLA(N)) has a considerable force of landing ships and landing craft but is currently building up its amphibious forces with very impressive Landing Helicopter Dock (LHDs) and Landing Platform Dock (LPDs) ships similar to Western units. A Chinese amphibious task group may be composed of an LHD with attack helicopters and navy Air Cushion Landing Craft (LCACs) which can place marines on a beach or other target from over the horizon, plus several LPDs, all of which can transport a sizeable number of marine infantry and their vehicles. The infantry and vehicles can be landed by a variety of LCACs and other landing craft from their well decks, and by helicopters, especially those embarked in the LHD.[2]

The Type 075 LHD is an impressive vessel, one of three currently in the PLA(N) with at least one more nearing completion. It has a full-length flight deck: 226 metres (about 740 feet) long and 36 metres (118 feet) wide with seven helicopter landing spots. It can carry 800 troops, is equipped with 28 helicopters and has two LCACs.

Amphibious operations are extraordinarily complex and require much practice to achieve success.[3] The Chinese navy is growing in capability in this type of operation and the new ships are larger and more capable than those they have replaced. China is building a blue-water navy, one that can be self-sufficient for extended periods of time due to accompanying replenishment vessels and is able to project power and defend itself as well. The rapid pace of building a new ocean-going capability rather than the previous coastal and home defence force must present many problems, especially with training, but China seems to be getting on with it.

Another building block of a Chinese blue-water navy is air defence vessels to protect the new aircraft carriers – a role that is performed in the US Navy by Aegis-guided missile cruisers and destroyers of the *Ticonderoga*- and *Arleigh Burke*-classes. The PLA(N) has a few guided missile-equipped frigates and destroyers, but bigger vessels with a much larger missile capacity and space for effective command and control facilities would be needed to defend a Chinese carrier task group from an attack from the air. Additionally, such a vessel could function as the flagship for surface action groups that do not include an aircraft carrier – including amphibious task groups

Since 2014 the PLA(N) has completed eight of the new Type 055 'missile cruisers,' with four more in various stages of construction. The final number may total 16. These ships are 180 metres (590 feet) long, 13,000 tons full load displacement, and a ship's company of over 300. They are fitted with 112 vertical launch cells for anti-ship and anti-air missiles. Due to the assessed size and capabilities of the Type 055, US and NATO officials refer to the ship as a missile cruiser.

The PLA(N) is becoming a well-rounded and very capable force. With enough sea time, experience and effective training, it will be a formidable force.

Notes

1. Canadian Armed Forces, "Canada Starts Construction on CSC/River-class Destroyers," Media Release, 28 June 2024.
2. David Lague, "China Expands its Amphibious Forces in Challenge to US Supremacy Beyond Asia," Reuters, 20 July 2020.
3. One may get some idea of this complexity by consulting one of the available unclassified doctrine publications on this topic. US Department of the Navy, US Coast Guard and US Space Force, "Amphibious Operations," Joint Publication 3-02, 4 January 2019.

Book Reviews

50 North: An Atlantic Battleground, by Alan Easton (Kindle edition edited by Michael Whitby), London: Lewin of Greenwich Organization, 2021 (Kindle Edition), footnotes and photographs, ISBN 978-1-83-978298-5.

Reviewed by Jan Drent

This classic first-person narrative about the Royal Canadian Navy's (RCN) role the Battle of the Atlantic is now available in an electronic version. It's a terrific book that tells the story from the perspective of a commanding officer whose experiences spanned the entire trajectory of the RCN's wartime development. The author was at sea continually from 1940 to the fall of 1944. Alan Easton, 38 in 1940, was older than most of his captain contemporaries. After nautical college in England, he had spent a decade with Canadian Pacific ships on the Atlantic, becoming the second youngest master in the company's history. He married and settled ashore in Canada for a decade, working for Bell Canada in Montreal.

By early 1940 he was in Halifax as a member of the RCN Reserve (RCNR). This was when the brisk growth of the RCN enabled the creation of the Newfoundland Escort Force and the start of anti-submarine escort for convoys across the Atlantic. Easton's descriptions of his 11 months in the corvette HMCS *Baddeck*, which he joined in 1941, illustrate many of the problems caused by the rapid expansion. *Baddeck* was plagued by mechanical problems due to flawed workmanship by builders and sketchy dockyard support. Three-quarters of the ship's company was learning about the sea on the job. Only one of Easton's watchkeeping officers had sea-time. Fortunately, he had a capable and seasoned engineer – initially one with long merchant service time who was followed by an RCN permanent force artificer. The author underlies the importance of experience.

Baddeck's shortfalls included basic equipment – for example, the ship was supplied with inadequate binoculars, donated by the public. After several problems, Easton and his crew were able to transfer to HMCS *Sackville* in April 1942. Here they experienced the difficult convoy battles of 1942 and close encounters with three U-boats off Newfoundland in early August while defending Convoy ON 115. Seven of the book's 21 chapters cover Easton's time in *Sackville*.

In the summer of 1943 Easton took temporary command of the corvette *Battleford* while the commanding office was in hospital and took the ship through post-refit workups out of Pictou, Nova Scotia. Frigates were now joining the fleet and Easton went to pick up *Matane* from builders Canadian Vickers in Montreal in October. He describes work-ups off Bermuda and how ships' companies were now more seasoned; most of his new crew had seen action and all but one of his executive branch officers had at least one year's sea-time. *Matane* was one of the new frigates assigned to an escort group, in this case EG 9, that was based in Londonderry, Northern Ireland, starting in April 1944. EG 9's senior officer, a Royal Navy (RN) commander, rode Easton's ship and he writes about how both adjusted to the arrangement.

After convoy support operations EG 9 reached its new base in Londonderry in April 1944, Easton was appointed to command the destroyer *Saskatchewan*. This ship was part of EG 12 in the summer of 1944, taking part in anti-U-boat patrols off the French coast. During one of these patrols, *Saskatchewan*'s anti-torpedo decoy detonated a torpedo fired at the ship. In early July EG 12 was involved in a night action against small German warships attempting to escort a U-boat out to sea from Brest. The chapter covering this encounter is one of the book's most vivid. *Saskatchewan* crossed to Halifax a month later for a refit. Easton, who had been fighting ulcers for years, was invalided ashore and out of the service.

50 North first appeared in 1963 when there were few published records about the RCN's wartime role in the Atlantic. It is still unique as a Canadian eyewitness view of what it was like to command an escort and to deal with the many challenges of command, from providing leadership to dealing with shore authorities. In Easton's case, while he was an experienced mariner, he had to learn naval tactics and procedures.

Alan Easton was a skilled storyteller. He conveys the atmosphere of North Atlantic weather, the discomforts of being in a bouncing wet ship with perpetually limited sleep and trying to fend off U-boat attacks in poor visibility when 'situational awareness' was minimal or nonexistent. Easton comes across as modest and honest about his own failings such as causing an oil hose to rupture due to inattention while fueling from a tanker using the astern method or losing his night vision because he failed to close his eyes when the gun mounting ahead of the bridge fired just as he was trying to ram a U-boat.

Naval historian Michael Whitby has provided footnotes for this welcome new Kindle edition which provide useful context. He has also added photographs to enhance the narrative and three contemporary action reports. This new edition also has a foreword by Marc Milner and the evocative eulogy given by Vice-Admiral Hugh MacNeil at Alan Easton's funeral in 2001. *50 North* remains, 60 years after its original publication, unrivalled as a description of what it was like to command a Canadian escort in the Battle of the Atlantic.

2025 Canadian Naval Memorial Trust

Essay Competition

Canadian Naval Review will be hosting the CNMT's annual essay competition again in 2025. 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 2025 *CNR* essay competition must be received by **Friday, 30 May 2025**, at **cnrcoord@icloud.com**.
- 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.**
- The use of generative Artificial Intelligence tools or apps in submissions, including ChatGPT and other AI writing assistants, is prohibited.
- 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.

HMCS ***Charlottetown*** pulls into Naval Station Mayport, Florida, 27 October 2023, for a port visit.

Credit: Mass Communication Specialist 1st Class Brandon J. Vinson, US Navy