CANADIAN NAVAL REVIEW

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Winner of the 2019 CNMT Essay Competition

On the Rise of the Materialists and the Decline of Naval Thought in the RCN

China's 2019 White Paper: Defence in the New Era

Why the Absence of a Canadian Position on FONOPs? (Hint: Look North)

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Today's Policy Questions, Tomorrow's Policy Leaders

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*HMCS **Regina** about to enter Vancouver harbour, 14 November 2019. To commemorate the 75th anniversary of the end of the Battle of the Atlantic, HMCS **Regina** has been painted in a commemorative disruptive camouflage scheme based on one worn by HMCS **Qu'Appelle** in 1944. **Regina** will retain this paint scheme through RIMPAC 2020. HMCS **Moncton** has also been painted similarly.*

Credit: Original photo by LS Sisi Xu, edited by Timothy Choi
***Correction**: original photo by Cpl Jay Naples, Imagery Technician, MARPAC/JTFP*

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Editorial

Not for Sale: Trump, Greenland and Danish Naval Diplomacy

On 15 August 2019, *The Wall Street Journal* revealed that US President Donald Trump had been asking his advisors about the possibility of buying semi-autonomous Greenland from Denmark.[1] Rather than passing the report off as 'fake news,' Trump and other Republicans doubled-down on the idea, justifying it on national security and strategic grounds.[2] The situation escalated to the point that, after receiving Danish Prime Minister Mette Frederiksen's public rebuke of the suggestion (any realignment decision belongs to Greenland, not Denmark), Trump cancelled his September visit to Copenhagen and called Frederiksen 'nasty' on Twitter.

Little-noticed in the media at this time was the presence of a US Navy *Arleigh Burke*-class destroyer, USS *Gravely*, in Greenlandic waters. At the end of its eight-month deployment to northern Europe, *Gravely* was met by the Royal Danish Navy (RDN) warship HDMS *Absalon* on 16 August. The two ships conducted a series of passing exercises, and their helicopters practised landing on each other's flightdecks. All in all, it was completely unremarkable: two warships belonging to NATO allies sailing and exercising together in the North Atlantic. What could be a better sign of normal diplomatic relations?

But there was, in fact, something unusual in this meet up. HDMS *Absalon* was no regular patrol ship. It was not part of the RDN's 1st Squadron dedicated to everyday sovereignty assertion and maritime security duties in the northern waters off Greenland and the Faroe Islands. Rather, *Absalon* is in 2nd Squadron, Denmark's primary combat force of five new warships built specifically for the country's post-Cold War expeditionary-focused defence policy. Sharing a common hull, the two *Absalon*-class 'support ships' and the three *Iver Huitfeldt*-class air-defence frigates (one of which, *Peter Willemoes*, immediately preceded and succeeded *Absalon* in the Arctic region) of the 2nd Squadron were designed to facilitate long-endurance operations far away from the Danish mainland as part of international missions under the United Nations and NATO. They replaced the Cold War-era near-coastal defence force structure designed primarily to halt the Soviet Baltic Fleet. With the demise of the USSR, homeland defence was seen as no longer necessary, and the strategic situation enabled Denmark to align its defence structure much more closely with its internationalist foreign policy in the post-Cold War world.[3]

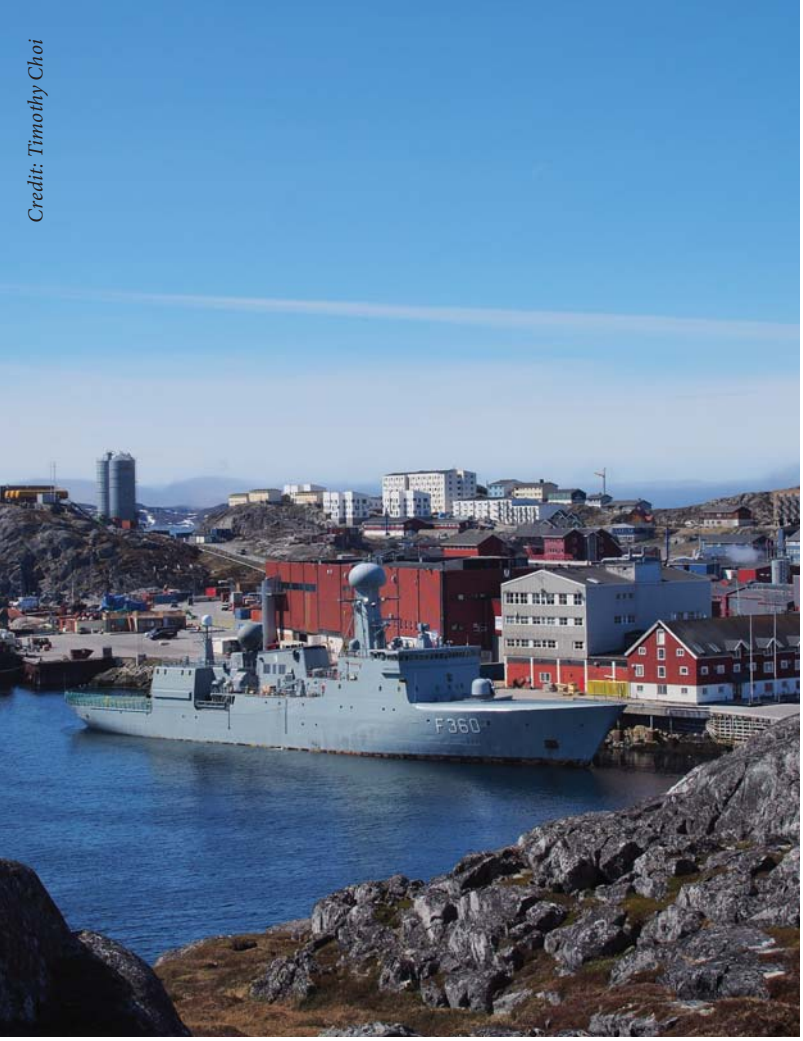
Credit: MC2 Jessica Dowell, US Navy

*The 'support ship' HDMS **Absalon** (left) and destroyer USS **Gravely** conduct sailing exercises off the coast of Greenland, 16 August 2019. This summer marked the first time Denmark's combat-oriented 2nd Squadron operated under the country's Joint Arctic Command.*

At the time of the new fleet's conception, it was not considered likely that the ships would be deployed to Greenland. Unlike the 1st Squadron, 2nd Squadron's ships do not have ice-strengthened hulls. Their 6,000-7,000 ton hulls make use of advanced sensors and the Standard Flex (STANFLEX) modular system, allowing them to switch out weapons and utility equipment as needed. This allows the re-use of existing legacy systems such as Harpoon missile launchers and 76mm OTO Melara guns, as well as accommodating newly-procured 35mm Oerlikon close-in weapons systems (CIWS). By re-using many of the weapon modules from the first generation STANFLEX ships of the *Flyvefisken*-class, the costs of the new ships were kept down, and maintenance can be more easily conducted.

Furthermore, the two *Absalon*s are equipped with an extra deck compared to their *Iver Huitfeldt*-class cousins, allowing them to load and carry the equivalent of seven Leopard II main battle tanks via a stern ramp. In contrast, the *Iver Huitfeldt*-class ships are equipped with a midships 32-cell Mark 41 vertical launch system and a SMART-L long-range surveillance radar paired with an active phased-array radar to provide area-air defence. Employed together, the 2nd Squadron's vessels can conduct a number of high-end warfare missions, from fleet escort in contested areas to amphibious landings on hostile territory.

So why were *Absalon* and *Peter Willemoes* in Greenland, which is already attended by 1st Squadron's rotating force of four *Thetis*-class and three *Knud Rasmussen*-class patrol ships? The answer stems from a 250-page review, "Defence Ministry's Future Tasks in the Arctic," published in June



Credit: Timothy Choi

*The **Thetis**-class offshore patrol ship HDMS **Hvidbjørnen** seen docked in Nuuk's main harbour, May 2019.*

2016, which surveyed the increasing commercial, social and military activities occurring in the region and the future role of the Danish military. The recommendations from it were put into action in December 2016 in a budget agreement by the government adding 120 million DKK (approximately $24 million CAD) in funding for certain Arctic military activities over the next several years. Crucially, the review noted that airspace sovereignty was not then a task of Denmark's Joint Arctic Command, and accordingly there was a lack of long-range airspace monitoring capability in existing Danish military forces in the Arctic region.[4] This gap could, at least in the short term, be cheaply filled by deploying a 2nd Squadron frigate, with its much better aerial surveillance radars, during the ice-free summer months when traffic is at its highest and the region is in need of greater monitoring capacity. The funds for Arctic frigate deployments were thus included in the December 2016 budget agreement, though it was not until summer 2019 that the first such deployment was carried out.

That *Absalon* and *Peter Willemoes* were chosen for this task highlights one of the options proposed in the review regarding the replacements for the 30-year-old *Thetis*-class that would have to be acquired in the late 2020s. The review suggested that due to an expected need for greater armament, better aerial and underwater sensors, and increased transportation capacity, a reasonable starting point for the replacement ships could be an ice-capable derivative of the *Absalon*-class, though it would have to be reduced in size to sail in some of the Greenlandic and Faroese inland waters.[5] In the meantime, the existing *Absalon* and *Iver Huitfeldt*-class ships can operate in the region with geographical and temporal limitations, contributing greatly to the aerial picture.

And thus, USS *Gravely*'s visit off Greenland was met by the 'support ship' *Absalon*, which may be more appropriately called an amphibious frigate. This was an impressive show of force in a region that had until then been tended to by the minimally-armed ships of 1st Squadron. Photos of the passing exercise showed *Absalon*'s midships modular missile deck fully packed with 16 Harpoon anti-ship missile canisters (most NATO frigates carry a maximum of eight, and *Gravely* had none) and at least 24 Evolved Sea Sparrow anti-air missile cells. These were in addition to the permanent bow 5" gun and the pair of 35mm Oerlikon Millennium CIWS guns fore and aft.

By having a 'peer' vessel meet the American ship at a time when the political relationship had been inflamed, Denmark was able to carry out, intentionally or not, naval diplomacy in the form of James Cable's "expressive force": the ambiguous use of naval force to "emphasize attitudes" and "lend

Credit: Danish Defence Gallery

*Although the United States currently has a lack of icebreakers, such was not always the case. Here, the US Coast Guard Cutter **Northwind** approaches the Grønnedal naval station in Greenland some time during the Cold War.*

Credit: Timothy Choi

The third and latest ***Knud Rasmussen****-class patrol vessel, HDMS* ***Lauge Koch****, conducts boarding exercises in front of Sermitsiaq Mountain's distinctive peak in the Nuup Kangerlua fjord off Nuuk in May 2019.*

verisimilitude to otherwise unconvincing statements."[6] While *Absalon*'s deployment was never accompanied by any specific demands to Denmark's erstwhile American ally, it did emphasize attitudes – i.e., that Greenland was part of the Danish realm – and perhaps lent verisimilitude to unconvincing statements on the importance of Arctic sovereignty to Denmark. In publicizing *Absalon*'s presence alongside *Gravely*, Denmark was arguably able to head off Danish citizens who might doubt their military's ability to ensure the sovereignty of the Danish realm. A lack of Danish naval presence might have been used by American Trump supporters to argue that Denmark was failing to spend enough on Greenland's defence and the United States should acquire and defend the territory instead. Admittedly, it seems unlikely that such concerns would have exacerbated the political situation, but foreign actors seeking to inflame relations between NATO allies might have taken note and used the situation to their advantage. In any case, the political drama between the two countries could not have come at a better time for Denmark. If the Americans had to send a naval ship while the US President was disrespecting Danish sovereignty, at least it was when Denmark had its own heavy naval units in the Arctic for the first time.

While passing exercises between NATO allies are hardly unusual, how the event is interpreted by the public may differ wildly. What we today call national security is not the sole province of governments and militaries: the passion of the public cannot be ignored. To the extent that they would look past their seablindness and take notice (or be encouraged to do so by foreign actors), the public has the power to frame and transform otherwise innocuous cooperative exercises into something laden with political conflict. (Canadian readers need only recall consistent public concerns over their navy and coast guard's inability to monitor foreign transits in the Arctic.[7]) In the charged political atmosphere between Denmark and the United States in mid-August, images of an American destroyer dwarfing a regular Danish escort (or unescorted!) off of Nuuk, Greenland, might have inflamed the discourse.

Thankfully, the deployment of *Absalon* provided the presence of a robust (but friendly) force reminding all involved that Greenland's sovereignty was wholly, and ably, being asserted by Danish defence forces. Lest it seem farfetched for one NATO ally to view another as a threat, in November 2019, Denmark's Defence Intelligence Agency emphasized Greenland as the country's top security item, highlighting specifically Trump's interest in buying the territory.[8] Although *Absalon*'s deployment was originally meant to be a stop-gap measure for improving aerial surveillance, the increasing great power interest in Greenland makes it likely future deployments will take on roles serving greater political purposes.

Tim Choi

Notes

1. Vivian Salama, Rebecca Ballhaus, Andrew Restuccia and Michael C. Bender, "President Trump Eyes a New Real-Estate Purchase: Greenland," *The Wall Street Journal*, 16 August 2019.
2. Daniel Lippman, "Trump Greenland Gambit Finds Allies Inside Government," *Politico*, 24 August 2019.
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4. Danish Ministry of Defence, "Forsvarsministeriets fremtidige opgaveløsning i Arktis," *Forsvarsministeriet*, June 2016, pp. 61, 73.
5. *Ibid*., pp. 234-236.
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7. For examples, see Paul Koring, "Canada Should Beware the Ice Dragon," *iPolitics*, 9 February 2018; Dennis Patterson, "Canada Must Assert Sovereignty over the Arctic While There's Still Time," *National Post*, 2 November 2017.
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Winner of the 2019 CNMT Essay Competition

On the Rise of the Materialists and the Decline of Naval Thought in the RCN

Captain Hugues Canuel, RCN

Credit: Irving Shipbuilding

*The first **Harry DeWolf**-class Arctic and Offshore Patrol Ship is escorted back to Irving Shipbuilding after being launched via submersible barge in Bedford Basin, 15 September 2018.*

The launch of the lead Arctic and Offshore Patrol Ship (AOPS) on 15 September 2018 came with much fanfare.[1] As the first class of vessels designed specifically for the Royal Canadian Navy (RCN) to operate in the North since the 1950s, the AOPS project is said to be a symbol of innovative thought, fruit of a deliberate reflection on the particular circumstances of Canada as a 21st century maritime state. In another sense, it is anything but. The navy did not call for this capability, it originated with the 2005 election platform of then-Opposition leader Stephen Harper.[2] The last innovation in terms of ships which can be attributed directly to naval planners is the *Kingston*-class Maritime Coastal Defence Vessel (MCDV), the first of which was launched in 1995.[3]

The MCDVs commenced operations as the study of maritime affairs reached a pinnacle in Canada – from Fred Crickard and Peter Haydon's *Why Canada Needs Maritime Forces* (1994) to *Canadian Gunboat Diplomacy: The Canadian Navy and Foreign Policy* published by the Centre for Foreign Policy Studies at Dalhousie University in 2000, and the navy's own *Leadmark: The Navy's Strategy for 2020*.[4] These milestones punctuated a remarkable growth through the 1990s in the study of maritime affairs inside the RCN and among the civilian academic community. Regrettably, this period was followed by a steady attrition of the intellectual capital dedicated to these matters. The challenge of delivering the future fleet has since consumed the RCN leadership, which is now focused on material acquisition and the management of limited resources, a trend highlighted in the navy's latest strategic plan.[5]

This article cautions that such single-mindedness may also strike an irreversible blow to the RCN's capacity to generate independent and innovative naval thought in the coming decades. This is not to say that Canadian Admirals deliberately set out to undermine the institutions and processes which gave rise to this unprecedented period of intellectual reflection. A number of factors – some within the RCN's grasp, others well beyond – contributed to the gradual starvation of that movement. This article will review the rise of maritime studies in Canada and its precipitous fall, raising the prospect of a navy narrowly committed to delivering the future fleet in a context disturbingly void of intellectual reflection. But first an introduction to contrasting schools of thought is warranted.

Materialists vs. The Intellectual School

In the latter half of the 19th century there was a dramatic 'industrialisation' at sea as navies transitioned from the age of sail to the steam era. Controversy soon followed, particularly in the Royal Navy (RN), as voices claimed

Credit: Corporal Martin Roy, Formation Imaging Services

*The Maritime Coastal Defence Vessels HMCS **Moncton** and HMCS **Summerside** tie up at Sydney Marine Terminal, Nova Scotia, during Exercise Frontier Sentinel in May 2012.*

that new technologies made Nelsonian teachings irrelevant. The debate led to a divide between 'materialists' who were pursuing victory through technological superiority, and partisans of the historical school who were concerned that the RN had "managed to forget almost entirely the principles on which its great victories in the early nineteenth century had rested."[6] The dispute was never truly resolved and the influence of the schools of thought ebbed and flowed through successive 'revolutions in military affairs' in the RN and that of the other major sea powers.[7]

RCN Admirals, by and large, left higher professional education and intellectual reflection to their adopted mentors, first the RN and then the US Navy after the Second World War.[8] Most approached their task in strictly materialist terms. Based on the resources available at the time, what fleet mix would make the best contribution to the naval strategy formulated by larger powers within a context of collective defence, whether the British Empire until 1939, the Allied war effort in 1939-1945, and NATO thereafter? Content until the 1980s to provide the means to meet alliance needs, Canadian Admirals saw this approach tested severely by the uncertainties of the post-Cold War era, necessitating unprecedented reflection on the fundamentals of sea power.

Although its proponents did not use that term, one can draw parallels between those RCN officers developing an interest beyond the material factor in the wake of the Cold War and earlier pillars of the British historical school. For the purpose of this article, though, *intellectual* school may better describe the Canadian context. Naval figures and academics concerned with maritime affairs did not necessarily preach history as the sole vessel of wisdom but rather affirmed that technology and material factors were not enough "to help understand the present and plan for the future."[9] In other words, an intellectual approach was necessary to conciliate policy, strategy, tactics and equipment to avoid "a mismatch between a possibly prevailing set of military assumptions and Canada's wider domestic and international security needs."[10]

Rise of the Intellectual School

Admittedly, some champions of the new intellectualism did not take up that cause by choice but through desperation. Political leaders sought to reap a large peace dividend after the Berlin Wall fell, forcing the RCN into a troubling high-wire act. On the one hand, the fleet had achieved an exceptional level of material readiness in the early 1990s with the ongoing delivery of 12 *Halifax*-class frigates, the recent modernisation of the four *Iroquois*-class destroyers, the upgrade of three *Oberon* submarines in the mid-1980s, initial plans for an Afloat Logistics Support Concept (ALSC) as a replacement for three aging replenishment vessels, and the construction of the *Kingston*-class MCDVs. On the other hand, naval planners would soon face a challenge as the government of Jean Chrétien, which was elected in 1993, set about implementing deep budget cuts to fight the crippling national deficit.

This dramatic change in geopolitical and budgetary circumstances caught naval staff flat-footed. By the end of the Cold War, Western military leaders were well-practiced in the methodology of threat-based planning

Credit: Walter E. Frost via Vancouver Archives

*Showing the typical profile of the Cold War RCN surface fleet, HMCS **Columbia** enters Vancouver on 11 July 1970.*

Persian Gulf - Enroute, a painting by Richard Rudnicki, depicts HMC Ships ***Athabaskan****,* ***Terra Nova*** *and* ***Protecteur*** *sailing towards the Persian Gulf in 1991 – a fleet similar to what could be seen at the height of the Cold War.*

– i.e., determining what means one needs to face a specific threat, in this case the Warsaw Pact.[11] They also used NATO force goals – agreed commitments of national forces to the alliance – to justify their budget and equipment plans. Force goals were a particularly potent tool for the RCN to illustrate how the proposed fleet mix met the demands of collective defence since NATO specifically called for Canada to provide autonomous task groups to fight Soviet submarines in the Atlantic.[12] But politicians and civil servants demanded that Canadian military requirements be expressed and justified in national terms in the post-Cold War era. Neither threat-based planning in a world where the threat had seemingly vanished nor force goals promulgated by an alliance struggling for a *raison d'être* would suffice.

RCN Admirals grasped the urgency of shaping an effective narrative regarding Canadian naval affairs, especially as they were yet to obtain funding for more major acquisitions including: new helicopters; the next generation of submarines; and the ALSC (eventually relabelled the Joint Support Ship). In this concern, they were not alone. A small but increasingly vibrant academic community dedicated to maritime affairs also took it upon itself to explain to government and the general public why Canada still needed a navy in the new world disorder. Their written submissions and speaking appearances shaped the maritime dimension of the 1994 Defence White Paper, with the navy emerging among the three services "the most unscathed."[13]

The need to explain military requirements in national terms was not the sole reason behind the urge for intellectualisation then overtaking the Canadian Armed Forces (CAF). The Somalia affair started as an army problem – leading to the disbandment of the Airborne Regiment in 1995 – but the inquiry which followed also identified enduring systemic issues affecting all three services. They included the lack of higher schooling among the officer corps as well as a lackadaisical approach to professional military education, leaving senior leaders ill-prepared for the circumstances of the post-Cold War era.[14] In a pivotal 1997 report, Defence Minister Douglas Young proposed sweeping reforms to training and education which were quickly implemented across the CAF.[15] A decade later, military analyst David Bercuson could draw the following conclusion:

> Not just the army, but the entire Canadian Forces at first *crawled*, then *wandered*, then *stumbled*, but eventually began to march forward with determination to a new professionalism rooted in the history and values of Canadian society, based upon a fighting ethos, with a democratic ethic and with one of the best-educated officer corps of any armed forces anywhere.[16] (Emphasis in the original.)

Return of the Materialists

By the early 2000s, the RCN had achieved a balanced approach to the profession. Senior officers and non-commissioned members had outgrown the technical challenges inherent to introducing new vessels and technologies in the 1990s, and achieved tactical excellence at sea during repeated operational deployments at home and abroad. They willingly sought advanced education and continued professional development without falling into the careerism and managerial mantra decried during the later decades of the Cold War. The 2001 *Leadmark*, updated in 2005, provided the Canadian rationale for the use of sea power in support of unique national requirements.[17] Officers and sailors grew increasingly comfortable operating with the other services in a joint environment as well as with partners and allies overseas. They could publish their views in *Canadian Military Journal* (launched in 2000) and *Canadian Naval Review* (launched in 2005). That same year, however, a decision made far inland in Toronto boded ill for this intellectualisation trend.

The Canadian Forces College (CFC) was then, and remains today, the only establishment tasked to deliver professional military education to senior CAF officers (majors/lieutenant-commanders and above). One core deliverable was the Command and Staff Course (now known as the Joint Command and Staff Programme). Its curriculum included one term dedicated to service-specific education. Unlike the three other joint terms, in that two-month period all candidates were divided into single service syndicates dedicated to the study of service doctrine as well as environment-specific issues at the operational and strategic levels.[18] However, CAF leadership accepted CFC's proposal in 2005 to eliminate the 'service term' as

Credit: Canadian Forces College

Although the Canadian Forces College in Toronto now provides courses for all services, it was originally used only by the Royal Canadian Air Force.

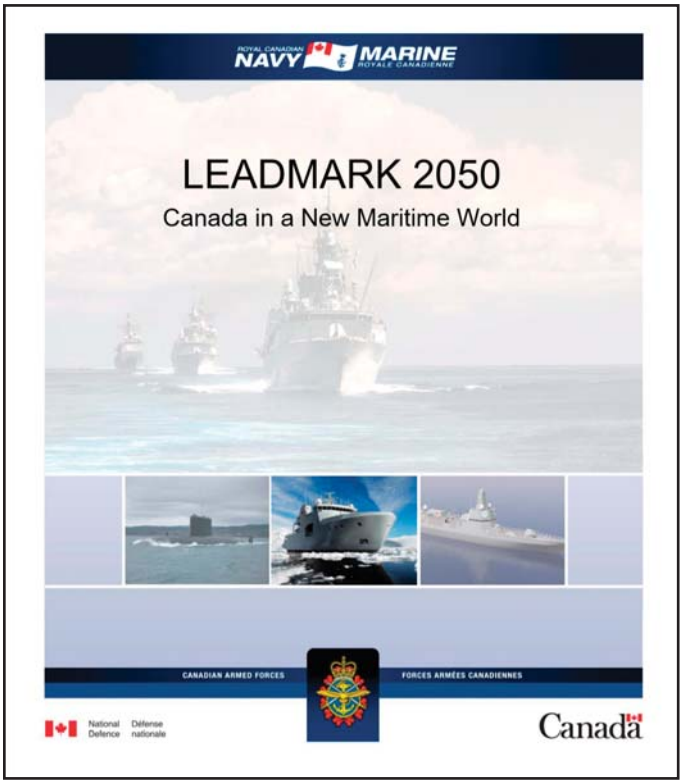
it did not conform to the college's mandate of delivering *joint* military education.[19] The decision made sense from that perspective and seemed to cause little controversy among the three services. The army appeared satisfied to rely on its Doctrine and Training Centre to "contribute to land warfare intellectual development," while the Royal Canadian Air Force (RCAF) assigned a similar mandate to the School of Aerospace Studies and the Aerospace Warfare Centre.[20]

The Royal Canadian Navy, however, did not have a similar institution. To paraphrase Allan English's discussion of the RCAF, the RCN did not have a place to study the means "to achieve professional [sea] power mastery, which consists of an expert comprehension of [sea] power, the ability to apply that understanding effectively as well as the ability to contemplate and debate [sea] power in terms of future force structure."[21] To this day, the RCN's training establishments and the Canadian Forces Maritime Warfare Centre (CFMWC) remain centres of excellence at the tactical level, with the latter tasked to "develop and deliver maritime tactics and operational manoeuvre doctrine in support of Canada's maritime forces."[22] This leaves higher headquarters responsible for the navy's institutional and intellectual development, with the Director General of Naval Force Development (DGNFD) assigned – among a wide range of competing tasks – the development of naval strategy, concepts and doctrine. Such arrangements appear to have generated little reflection on the Canadian dimension of sea power, at least in the public domain, with the notable exception of 'the son of *Leadmark*' in 2017.[23]

This absence of reflection is mirrored in the scarcity of submissions by serving officers in professional publications, including *Canadian Naval Review*, which is particularly dispiriting as one of *CNR*'s goals is to encourage such writings. This may be attributed in part to the gradual elimination of nearly all officer positions dealing with questions of sea power, across the CAF, beyond the small circle employed behind closed doors at DGNFD. The cancellation of the service term at CFC was accompanied by the elimination of the college's Maritime Studies Programme. RCN officers still serve on staff but they are not employed in posts dedicated to naval issues.[24] The navy also elected to abandon its defence fellowship at Dalhousie University in 2015, confirming the low priority accorded by the RCN's leadership to the intellectual factor.[25]

An Irreversible Decline?

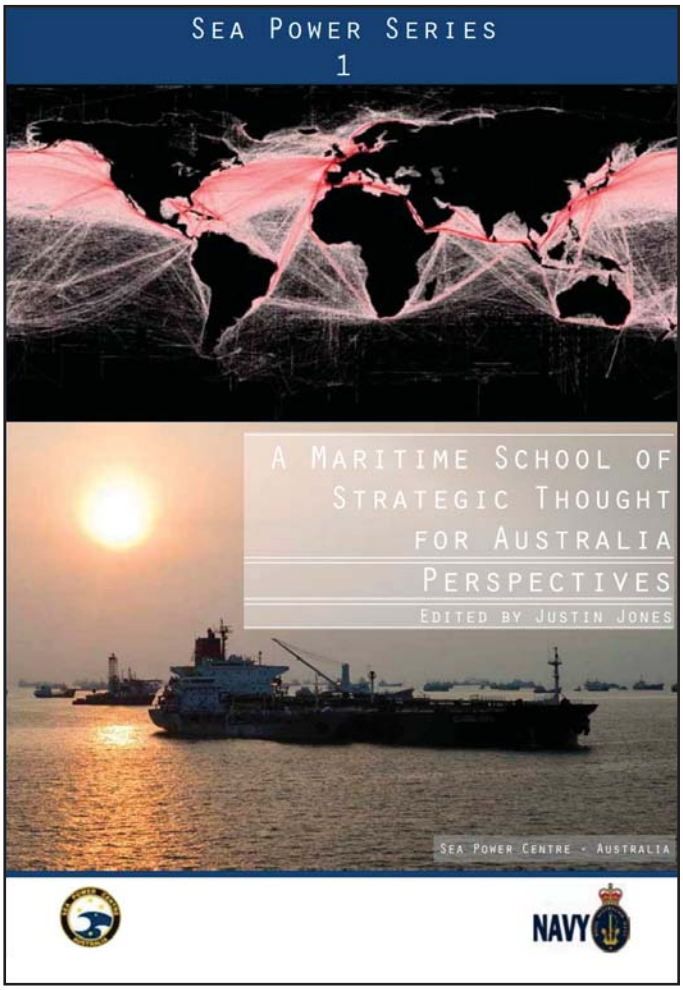
This accretion of successive but uncoordinated decisions leaves the RCN ill-equipped to reflect upon the evolving fundamentals of sea power in the 21st century, let alone generate original thought of the kind germinating in dynamic institutions found among partner navies, such as the Sea Power Centre - Australia. A few dedicated civilian academics continue researching and writing about naval affairs, only by their own choice though. The RCN itself has seemingly given up the ability to forge independent and innovative naval thought adapted to Canada's unique circumstances, as well as shaping education for its senior officers and the non-commissioned corps beyond the tactical level. One cannot doubt the importance of fleet recapitalisation in the coming decades. However, pursuing



Credit: Royal Canadian Navy

The Royal Canadian Navy's doctrinal document, ***Leadmark 2050****, was made available with little fanfare in 2016.*

Credit: Sea Power Centre – Australia



The Sea Power Centre – Australia had its roots in the early 1990s as an autonomous research centre within the Royal Australian Navy, and has produced numerous papers in different categories, such as the Sea Power Series.

this materialist effort in a void of intellectual reflection presents risks that warrant due consideration in the immediate term.

Simply reverting to past decisions will not provide adequate solutions for the future as the RCN would be ill-advised to 'contract out' its intellectual effort to institutions beyond its control. Perhaps the mandates of existing establishments – CFMWC in Halifax or the Naval Officer Training Centre in Esquimalt – could be expanded and resources allocated to stand up a small faculty dedicated to the study and teaching of sea power in the Canadian context. Exploring these options in greater detail, as well as more innovative approaches such as partnering with Canadian universities or naval centres overseas, would necessitate a much longer article. Nevertheless, one hopes that this short commentary may launch a fuller reflection on the decline of naval thought in the RCN before the trend becomes irreversible.

Notes

1. CBC News, "What's that in the Harbour? An Arctic and Offshore Patrol Ship," 16 September 2018.
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4. Fred W. Crickard and Peter T. Haydon, *Why Canada Needs Maritime Forces* (Nepean: Napier, 1994); Ann Griffiths et al. (eds), *Canadian Gunboat Diplomacy: The Canadian Navy and Foreign Policy* (Halifax: Centre for Foreign Policy Studies, Dalhousie University, 2000); and Canada, *Leadmark: The Navy's Strategy for 2020* (Ottawa: Directorate of Maritime Strategy, 2001).
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China's 2019 White Paper: Defence in the New Era

Joe Varner

Credit: Zhong Kuirun, China Military Online

China's first indigenously-built aircraft carrier, ***Shandong*** *(hull 17), in Sanya, Hainan Province, during its commisioning ceremony 17 December 2019.*

On 24 July 2019, China published its first defence White Paper in four years, *National Defense in the New Era*. The document outlines the strategic guidance for the People's Liberation Army in what China has termed a 'new era.'[1] The White Paper was subsequently translated into English by the Chinese Communist Party's Xinhua News Agency and made available on the internet for foreign consumption. This defence White Paper, China's tenth, is 40 pages in length and contains 15 appendices and is probably its most significant document since 2010.[2]

It should be noted that White Papers in all countries come and go, and few are implemented in full usually due to cost, and/or change in government priorities, or just the amount of time involved in documents geared to five, 10 and 20-year horizons. In public policy you judge a government on what it says it will do, what it does, and how it spends money to reach its policy objectives. With this in mind, interested international observers are likely to question the impact of *National Defense in the New Era,* and ask how it differs from past Chinese White Papers. This article will examine the document in terms of Beijing's view of the international security environment and the United States as strategic competitor, its assessment of the Asia-Pacific region, and China's national security objectives. The article will then discuss what the new White Paper means for the future regional and global security environment.

The Global Security Environment

The White Paper commences with a review of how China sees the global security environment. It asserts to the world that "China is always a builder of world peace … and a defender of the international order," and that China is "never seeking hegemony, expansion or spheres of influence."[3] In China's view, there has been a redistribution of power in the international system in that there is no one superpower anymore, and this has led to a multi-polar system. This trend toward multi-polarity, and the decline of the world's only superpower (i.e., the United States), has led to greater instability and strategic competition, and the world is no longer a "tranquil place."

It is clear that Beijing views the United States as the biggest threat to international stability and security and the White Paper warns about American "growing hegemonism, power politics, unilateralism."[4] But the document does not stop at examining the United States, it also looks at US allies and other significant states in the world. It notes that "NATO has continued its enlargement, stepped

up military deployment in Central and Eastern Europe, and conducted frequent military exercises." As well, it notes that "Russia is strengthening its nuclear and non-nuclear capabilities for strategic containment and striving to safeguard its strategic security space and interests." Furthermore, it points out that "[t]he European Union (EU) is accelerating its security and defense integration to be more independent in its own security." In its summary of the international security environment, the document also notes that the Iranian nuclear issue has taken an unexpected turn, and that there is no easy political solution to the Syrian issue.

The White Paper suggests that China has a newfound interest in international regimes to counter US influence, military power and tendency to unilateralism. Given the dislike the Donald Trump administration has illustrated for international regimes, Beijing sees an opportunity and a void that it can fill, suggesting that the United Nations needs to take on a more powerful role in world affairs. Clearly, China now sees a new role for international bodies in checking American military power, in addition to strengthened Chinese strategic partnerships with countries such as Russia, acquisition of modern weapons and high technology, and strengthening arms control and non-proliferation regimes. The document is transparent in its statement that the goal of Chinese defence policy is countering the United States and replacing it as the world's superpower.

The Asia-Pacific Region

After discussing the global picture, *National Defense in the New Era* moves to what Beijing views as its most important geographic region, the Asia-Pacific region. The White Paper sees the region as "generally stable," with increased "major country competition."[5] Here the document is solidly focused on US and Chinese competition in a region where Beijing sees the United States as an outside power causing trouble. In China's perception, the United States "is strengthening its Asia-Pacific military alliances and reinforcing military deployment and intervention" to contain China as it has in the past. The White Paper adds that:

> [T]he U.S. has adjusted its national security and defense strategies and adopted unilateral policies. It has provoked and intensified competition among major countries, significantly increased its defense expenditure, pushed for additional capacity in nuclear, outer space, cyber and missile defense, and undermined global strategic stability.

China singles out those states that it sees as US allies and partners in disrupting the region, particularly South

Credit: PA1 Nate Littlejohn, US Coast Guard

*A small boat from US Coast Guard Cutter **Stratton** sails in front of the Chinese Coast Guard Ship **2901** in the Yellow Sea, 6 October 2019, while supporting maritime sanctions against North Korea.*


Credit: US Army

The first set of Terminal High Altitude Air Defense (THAAD) missile launchers arrive in South Korea, 6 March 2017.

Korea, Japan and Australia. The document notes that the US deployment of the Terminal High Altitude Area Defense (THAAD) system in South Korea has "severely undermined the regional strategic balance." The White Paper further states that "in an attempt to circumvent the post-war mechanism, Japan has adjusted its military and security policies and increased in-put, accordingly, thus becoming more outward-looking in its military endeavors." The document also singles out Australia for its military alliance with the United States and its military engagement in the Asia-Pacific region "as seeking a bigger role in security affairs."

Not surprisingly, the document claims that Chinese policy in the Asia-Pacific region has been a resounding success and suggests a China-led security architecture for the future. It seems that Beijing views the Asia-Pacific region in almost the same manner as Imperial Japan did immediately before and during the Second World War. According to China, "Asia-Pacific countries are increasingly aware that they are members of a community with shared destiny." Beijing points to what it views as the new China-centric regional dynamic and holds up the Shanghai Cooperation Organization and Conference on Interaction and Confidence-Building Measures in Asia (CICA) as examples of its diplomatic success. The document points out China's renewed regional engagement in the South China Sea, with members of the Association of Southeast Asian Nations (ASEAN), regional counter-terrorism efforts, and increasing bilateral military-to-military diplomacy with other Asian countries.

National Security Objectives

As is the case for defence White Papers everywhere, China's national security objectives reflect its view of the world and its interests. According to the document, there has been an increase in China's "overall national strength, global influence, and resilience to risk,"[6] but "safeguarding national political security" to uphold President Xi Jinping's vision remains an overriding objective. The list of national security objectives and priorities is much more comprehensive than the 2015 document.

The White Paper asserts that the fundamental goal of national defence in this 'new era' is to: deter and resist aggression; safeguard national political security, the people's security and social stability; oppose and contain Taiwan independence; crack down on proponents of separatist movements such as Tibet independence and the creation of 'East Turkistan'; and safeguard national sovereignty, unity, territorial integrity and security. Other strategic national security objectives include safeguarding China's maritime rights and interests, and security interests in outer space, electromagnetic space and cyberspace, as well as safeguarding China's overseas interests and supporting the sustainable development of the country.

The White Paper notes that the Japanese-administered Senkaku Islands in the East China Sea, which are also claimed by China, are "inalienable parts of the Chinese territory." It vows that Beijing will defend its national sovereignty and territorial integrity via patrols in the waters near the disputed islands.[7] Other states that claim parts of the South China Sea are told that the sea is an inalienable part of China. The White Paper says "China exercises its national sovereignty to build infrastructure and deploy necessary defensive capabilities on the islands and reefs in the South China Sea."[8]

The document trumpets the success of President Xi's Belt and Road Initiative (BRI) to expand China's trade and diplomatic engagement across the globe.[9] Like virtually all defence documents around the world, *National Defense in the New Era* argues that the protection of the country's global interests, including Chinese people, organizations and institutions, is a key strategic objective for the People's Liberation Army. To advance what can be only described as a global strategic agenda, Beijing is developing and deploying "far seas forces," "overseas logistical facilities," and capabilities for "diversified military tasks." The document cites China's new Logistics Support Base in Djibouti set up in 2017 as a huge success confirming the military component of the Belt and Road Initiative. Furthermore, the document notes that China will continue to develop its role in humanitarian and disaster relief operations internationally to contribute to a more peaceful world. In real terms, the Chinese approach calls for the deployment of the Chinese military around the globe in much the same manner as the United States and former Soviet Union did during the Cold War.

Photos taken by the Japanese Self-Defence Force of the joint Russian-Chinese bomber patrol that occurred 23 July 2019 off the Japanese coast. The top photo shows a Chinese H-6 variant, and the bottom a Russian Tu-95.

With regard to Taiwan, the document uses plain language not seen in previous defence White Papers. It states that:

> To solve the Taiwan question and achieve complete reunification of the country is in the fundamental interests of the Chinese nation and essential to realizing national rejuvenation. China adheres to the principles of 'peaceful reunification' and 'one country, two systems,' promotes peaceful development of cross-Strait relations, and advances peaceful reunification of the country. China has the firm resolve and the ability to safeguard national sovereignty and territorial integrity and will never allow the secession of any part of its territory by anyone, any organization or any political party by any means at any time. We make no promise to renounce the use of force and reserve the option of taking all necessary measures.[10]

Other points discussed in *National Defense in the New Era* include defence modernization and reform of the military command structure but without providing a great amount of detail.[11] The White Paper also points out that there has been a reduction of 300,000 troops,[12] and discusses China's domestic battle to root out corruption in the military and the party.[13] For the first time since 2010, there is a significant review of Chinese defence spending and the economics of protecting the motherland.[14]

What's New in the Document?

What is the impact of *Defense in the New Era* on the global security environment? Most significantly, in a break from the past, China sets its sights on the United States as a strategic competitor, and portrays it as a hegemon acting unilaterally and outside the rule of law, and interfering in the Asia-Pacific region.[15] In some ways, this White Paper picks up where two American defence documents left off. Both the US 2017 National Security Strategy and 2018 National Defense Strategy laid out in clear terms that China is the main strategic competitor of the United States.[16] As Anthony Cordesman notes, *Defense in the New Era* contends that every major aspect of Chinese military activity and development in the world is peaceful while suggesting that the United States is out to cause trouble on a global scale.[17] The White Paper states that Washington is rebuilding and relocating military assets in the Western Pacific, and conducting multilateral naval exercises with Japan, Australia, India and European navies.[18]

The document examines the role of the Chinese military in Beijing's new more assertive approach to global affairs. It refers to itself repeatedly as a 'great power' in the world. In a new twist, the document is almost written to address the Pentagon's 2019 assessment of Chinese military power in its annual report to Congress.[19]

Furthermore, as noted earlier, the document warns the world that the South China Sea, East China Sea and Yellow Sea are Beijing's territory, key national security interests, and a no-go zone for anyone but China. Taiwan, Tibet, Hong Kong and Xinjiang are part of China and outside interference means war whatever the cost.[20] There is no mention of the police activities in Xinjiang, China's Turkic Muslim province, but there is a clear undercurrent in the document that illustrates China's concerns with internal dissent and strife and the view that foreign interests are behind the dissent.[21] In the Chinese leadership's mind, this outside interference is by the United States (and United Kingdom in Hong Kong).

Although *Defense in the New Era* focuses on the United States as a strategic competitor, it saves its most strident language for Taiwan. Reunification with Taiwan is tied to the success of China as a great power, and set to be President Xi's great legacy.[22] As well for the first time, the White Paper singles out Australia, South Korea and Japan as threats to security and stability.

On the use of force, the document states that China reserves the right to defend its overseas bases and interests and will not rule out being the first to use force to do so.[23] What is new is that *Defense in the New Era* has an unprecedented emphasis on maritime defence geared to protecting overseas assets linked to the Belt and Road Initiative. It gives direction to "build a combined, multifunctional and efficient marine combat force structure."[24] In addition to the usual tasks navies perform, such as protecting maritime traffic and sea lines of communication, it further

Credit: Zhang Lei, China Military Online

*Sailors from the People's Liberation Army Navy look on as a crew member of the Republic of Singapore Navy frigate RSS **Stalwart** introduces them to the ship's bridge during a Chinese-ASEAN maritime exercise on 24 October 2018.*

directs the People's Liberation Army Navy (PLAN) to build far seas forces, develop overseas logistical facilities, and enhance capabilities in accomplishing diversified military tasks. The document outlines Beijing's growing power projection capabilities and directs maritime strategy to shift from "near seas defense" to "the combination of near seas defense and far seas protection."[25] The 'far seas' strategy is consistent with the Chinese leadership's plan to make China a maritime superpower as set out at the Communist Party's 18th Congress in 2012.[26]

In 2018 the PLAN overtook the US Navy to become the world's largest navy, with more than 300 warships compared to the American fleet of 287 vessels.[27] PLAN has 235,000 personnel, one operational aircraft carrier, four nuclear-powered ballistic missile submarines, five hunter-killer nuclear-powered submarines, 61 conventional patrol submarines, 17 destroyers, 54 frigates and 158 minor warships of various types and auxiliaries under naval command.[28] China commissions about 14-18 new warships of various design per year.[29] The Chinese navy routinely patrols the South China Sea, East China Sea, Pacific and Indian Oceans, and its anti-piracy action groups have remained in the Red Sea off Yemen since 2009. While China currently has only one operational aircraft carrier of limited capacity, another is undergoing trials and a third is being built. China is projected to have at least six aircraft carrier battle groups by 2035 which could have a considerable impact on the naval balance of power in the Pacific and beyond.[30]

Conclusion

In conclusion, defence White Papers are written for both domestic and foreign audiences, and that should be kept in mind when reading them. *Defense in the New Era* is a surprising document in terms of its strident tone regarding the United States (and its Asia-Pacific allies) and Taiwan – a tone that has not been seen in previous defence White Papers. One could legitimately ask if the document is simply playing to a domestic audience and laying out its view of the world as other states do in their defence policy documents. In fact, as noted earlier, the Chinese White Paper answers the 2017 US National Security Strategy, the 2018 National Defense Strategy, and the Pentagon's 2019 Report to Congress.

What is clear in *Defense in the New Era*, however, is that China has matured in its strategic thinking and that it no longer considers itself just a regional player but a strategic rival to the United States. China now has global interests in a way that it has not before. In addition to vast trade and financial networks, this includes the infrastructure projects of President Xi's Belt and Road Initiative and China's first oversea military base in Djibouti. China is building military forces, including a large robust navy, to protect those interests.

Credit: Japan Coast Guard

Chinese Coast Guard ships accompany Chinese fishing vessels in the waters off the Senkaku/Diaoyu Islands, August 2016.

The fact that the White Paper was released prior to China's Seventieth Anniversary military parade showcasing a series of new weapons should not be lost on any international observer. Beijing has used the document to call out the United States and its allies in a way not seen before. *Defense in the New Era* also demonstrates a concern about internal security and domestic harmony that is particularly worrying in terms of Taiwan and Hong Kong. In both cases, reunification and complete integration is the ultimate goal of domestic policy.

In much the same manner, territorial disputes in the South China Sea and East China Sea with neighbours such as Vietnam, the Philippines or Japan will not be tolerated and are considered by the Chinese leadership to be an attack on China. Having set out a series of 'red lines' on territorial disputes, and specifically called out American allies, there is a sinister undertone that suggests that states in the Asia-Pacific region must choose between the United States and China, and peace or potentially war.

According to Andrew Erickson:

> Observers should look elsewhere for the latest insights on the specifics of PLA development, but no one should miss the ambition, assertiveness, and resolve permeating this official policy document. Real and consequential actions will follow from these sometimes vague but often forceful statements. Prepare for trouble ahead: we have been warned.[31]

In this 'new era,' *National Defense in the New Era* predicts a China-led security architecture for the Asia-Pacific region, a Delian League of sorts, which in real terms means 'Beijing's way or the highway.'

A pair of People's Liberation Army tank destroyers from China's Djibouti Logistic Support Base conduct live firing exercises at a range in Djibouti.

Notes

1. People's Republic of China, *China's National Defense in the New Era*, The State Council Information Office of the People's Republic of China, July 2019, available at http://www.xinhuanet.com/english/2019-07/24/c_138253389.htm. This is the same source cited by China expert Andrew Erickson at the US Naval War College and China Maritime Studies Institute. See Andrew S. Erickson, Full Text of 2019 Defense White Paper: "China's National Defense in the New Era" (English and Chinese versions), available at http://www.andrewerickson.com/2019/07/full-text-of-defense-white-paper-chinas-national-defense-in-the-new-era-english-chinese-versions/. These documents do not have numbered pages. Therefore in the notes below we will differentiate by sections/sub-headings as a means to clarify documentation.
2. See *China's National Defense in the New Era*; and Dennis Blasko, "Steady as She Goes: China's New Defense White Paper," War on the Rocks, 9 August 2019.
3. *China's National Defense in the New Era*, section with the sub-heading "Never Seeking Hegemony, Expansion or Spheres of Influence."
4. Quotations in this paragraph are found in *China's National Defense in the New Era*, sub-heading "The International Strategic Landscape is Going Through Profound Changes."
5. Quotations in this section are found in *China's National Defense in the New Era*, sub-heading "The Asia-Pacific Security Situation Remains Generally Stable."
6. Unless otherwise specified, quotations in this section are found in *China's National Defense in the New Era*, sub-heading "China's Security Risks and Challenges Should Not be Overlooked."
7. Jesse Johnson, "China Defense White Paper Singles out Japan over Security Shift and Blasts U.S. for Undermining Global Stability," *The Japan Times*, 17 November 2019.
8. This quotation is found in *China's National Defense in the New Era*, sub-heading "Safeguarding National Territorial Sovereignty and Maritime Rights and Interests."
9. Quotations in this paragraph are found in *China's National Defense in the New Era*, sub-heading "Protecting China's Overseas Interests."
10. This quotation is found in *China's National Defense in the New Era*, sub-heading "Resolutely Safeguarding China's Sovereignty, Security and Development Interests."
11. *Ibid*. See also Ben Lowsen, "China's New Defense White Paper: Reading Between the Lines," *The Diplomat*, 30 July 2019; and Blasko, "Steady as She Goes."
12. *China's National Defense in the New Era*, sub-heading "Resolutely Safeguarding China's Sovereignty, Security and Development Interests"; and Lowsen, "China's New Defense White Paper."
13. *Ibid*.
14. *Ibid*.
15. In "Steady as She Goes," Blasko notes that the 2010 White Paper first mentioned "international strategic competition," and the 2008 version mentioned "global [or international] military competition."
16. See Lowsen, "China's New Defense White Paper"; Anthony Cordesman, "China's New 2019 Defense White Paper," Center for Strategic and International Studies, 12 November 2019; US Department of Defense, "Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2019," 17 November 2019, available at https://media.defense.gov/2019/May/02/2002127082/-1/-1/1/2019_CHINA_MILITARY_POWER_REPORT.pdf; and US Department of Defense, 2018 National Defense Strategy, 5 February 2018, available at https://dod.defense.gov/Portals/1/Documents/pubs/2018-National-Defense-Strategy-Summary.pdf.
17. Cordesman, "China's New 2019 Defense White Paper."
18. See Cary Huang, "China Takes Aim at US for the First Time in Defence White Paper," *South China Morning Post*, 6 August 2019.
19. US Department of Defense, "Military and Security Developments Involving the People's Republic of China 2019"; see also Cordesman, "China's New 2019 Defense White Paper."
20. *Ibid*.
21. *China's National Defense in the New Era*; and Blasko, "Steady as She Goes."
22. See Lowsen, "China's New Defense White Paper."
23. *China's National Defense in the New Era*.
24. *Ibid*.
25. *Ibid*.
26. See Huang, "China Takes Aim at US for the First Time in Defence White Paper."
27. For a discussion of this see Eric Heganbothom, "How China's Navy is Modernizing," no date, available at https://chinapower.csis.org/china-naval-modernization/; Kyle Mizokami, "China Now has More Warships than the U.S.," *Popular Mechanics*, 20 May 2019; and Nick Danby, "China's Navy Looms Larger," *Harvard Political Review*, 5 October 2019.
28. *Ibid*.
29. See David Lague and Benjamin Kang, "The China Challenge: How China is Replacing America as Asia's Military Titan," Reuters, 23 April 2019.
30. See H.I. Sutton, "China's Aircraft Carriers Fueling New Arms Race," *Forbes*, 15 October 2019; and David Axe, "Is China on the Verge of Becoming an Aircraft Carrier Superpower?" *The National Interest*, 22 October 2019.
31. Andrew Erickson, "China's Defense White Paper Means Only One Thing: Trouble Ahead," *The National Interest*, 29 July 2019.

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Why the Absence of a Canadian Position on FONOPs? (Hint: Look North)[1]

Adam P. MacDonald

Credit: LS Mike Goluboff, MARPAC Imaging Services

*MV **Asterix** leads (left to right) HMCS **Calgary**, USS **Michael Murphy** and HMAS **Melbourne** in formation en route to Vietnam through the South China Sea during **Operation Projection** on 19 September 2018.*

Conspicuously absent from the mission set of the Royal Canadian Navy's (RCN) increasing activities in the Asia-Pacific region are freedom of navigation operations (FONOPs). Canada has committed to becoming a credible and reliable security partner for the region but has by and large remained silent on the South China Sea (SCS) maritime disputes. While there has been no official ask by Washington, which regularly conducts FONOPs in the SCS, there is growing momentum to organize and coordinate like-minded states to display a united stance against China's maritime claims there. Furthermore, the RCN's increased transit of and operations within the waters in dispute may one day be assertively opposed by Beijing via China's growing maritime capabilities. Given the possibility of such pressures becoming more manifest in the not-so-distance future, why has Canada not developed a policy regarding FONOPs?

US Freedom of Navigation Operations

Freedom of navigation (FON) is a core interest in a world where trade travels via the oceans. It is a national interest of the United States to enable the unencumbered flow of commerce and the unimpeded mobility of American military power. Both are seen as vital to global prosperity and security. FONOPs became formal US policy via the 1983 Oceans Policy declaring that the United States would oppose 'excessive claims' by coastal states which would restrict FON and contravene the United Nations Convention on the Law of the Sea (UNCLOS). (While the United States has not acceded to UNCLOS, it accepts it as part of customary international law.) FON legally enables vessels and aircraft (both military and civilian) to transit the seas and airspaces above them for peaceful purposes.

The American FON program has two elements: the diplomatic component which involves publicizing rationales and issuing various diplomatic instruments opposing coastal state claims; and the military component which conducts FONOPs. FONOPs are intended to demonstrate, in a visual manner, opposition to excessive claims, either territorial (the drawing of maritime boundaries) and/or jurisdictional (the rules imposed by the coastal states) in nature. This is done via warships sailing in these waters without seeking prior permission and in some cases conducting operations (like launching helicopters and boats) which are in contravention to the (according to the United States) illegal regulations of the targeted coastal states. FONOPs, therefore, are not simply transits but

rather surgical, political operations. They are not meant to threaten the physical security of a coastal state but rather to register opposition to a state's claim via a visible display of FON in the maritime spaces in question.

'Excessive' coastal state claims can include the drawing of various maritime zones beyond their prescribed limits and/or imposing regulations within these spaces which restrict FON. US FONOPs are conducted regularly against a number of states, including competitors, partners and allies, with yearly reports published detailing the number of operations conducted, against whom and what claim(s) they are opposing.[2] There is no discrimination in terms of which states are subject to FONOPS, but those conducted in the SCS, particularly against China, have an increasing strategic salience to them.

The South China Sea: The Frontline of FONOPs

The SCS is arguably home to the world's most complex set of maritime disputes, involving multiple claimant states with dozens of overlapping claims. China has the largest claim – it claims all the topographical features and upwards of 90% of the maritime area in the SCS – and has conducted the most reclamation work with runways, docks and military facilities constructed on several newly created artificial islands supporting the Chinese military, coast guard and maritime militia which regularly patrol there. Despite the 2016 Permanent Court of Arbitration (PCA) ruling stating that China's 'Nine-Dash Line' claim to the SCS has no legal basis based on UNCLOS,[3] Beijing (which did not participate in the proceedings and refuses to abide by the ruling) continues to assert ownership over these waters.

The United States views China's maritime claims as not only excessive but fundamentally different in the threat they pose compared to the claims of other coastal states elsewhere in the world. They are different for four reasons. First, China has a 'full house' of excessive claims, both in the drawing of various maritime zones and in their jurisdiction within these. If accepted, China's claims would undermine UNCLOS and could encourage China to claim other maritime areas in the region, such as the Taiwan Strait. Second, acceptance of such claims could set a precedent for other actors, such as Iran and Russia, to claim adjacent waters further undermining FON and UNCLOS. Third, China's growing naval and maritime constabulary capabilities and their deployment on artificial islands could further challenge American (and other) warships operating in these areas, threatening US military freedom of movement locally. And fourth, if the US Navy leaves the region, it would have detrimental impacts on Washington's regional leadership role and relationships, which would contribute to altering the regional balance of power in China's favour and enable its reach into other regions at the expense of the United States.[4]

The military developments in the SCS, however, are not in and of themselves decisively determining the regional and global balance of power. Instead they are indicative of a battle of resolve over the degree to which the United States and others will acquiesce to China's claims and actions to enforce them. The administration of Donald Trump has continued the use of FONOPs in the SCS – i.e., warships sailing in proximity of Chinese-claimed islets[5] – in what appears to be one of the 'frontlines' of its larger great power competition with China. This is a competition Washington is increasingly pressuring its allies to support.[6]

The United States has not yet asked for the participation of its allies, but there appears to be growing coordination among Western and regional allies in transiting and

Credit: US Navy

This 21 May 2015 still image from a US Navy P-8A Poseidon video shows Chinese dredgers and support vessels conducting reclamation work at Mischief Reef in the South China Sea.

operating in the SCS in opposition to China's claims.[7] Canadian warships increasingly transit and operate there (often in conjunction with allies), but so far have avoided conducting FONOPs. Chinese forces regularly monitor Canadian military assets throughout the region now. Ottawa did issue a statement encouraging all parties to abide by the 2016 PCA ruling, but by and large has remained silent about China's rejection of the ruling, the maintenance of its excessive claims and increasing military activities there. With the increasing possibility of an American request to participate in some capacity in these operations and/or more assertive Chinese moves against RCN warships and aircraft in the region, why has Canada remained silent on FONOPs?

There are a number of reasons explaining the reluctance. In particular Canada wants to avoid making relations with China worse since they are already at historic lows with Chinese tariffs on Canadian products and the detention of two Canadians in retaliation for Ottawa's arrest of Huawei executive Meng Wanzhou based on a US extradition request. As well Ottawa is attempting to gauge regional views on how Canada and other Western powers should be involved in local matters pertaining to FON. Arguments about the lack of resources or capacity for the RCN to conduct such operations are not persuasive because FONOPs do not take a long time to execute and can be conducted during transit to and from other missions. There is, however, a larger extra-regional rationale which has not been discussed in the public domain: the precedent that agreeing to conduct FONOPs in Asia would have on waters closer to home in the Arctic.

Possible FONOPs in the Arctic

The United States has largely played a minor role in Arctic politics since the end of the Cold War, and the region has been considered a low priority. A series of recently released policies and political commentaries, however, indicates a substantial re-evaluation of the Arctic. This new attention results from the perception of the Arctic becoming an arena of geopolitical competition given Russia's growing northern military forces, China's increasing economic influence, and the overall deepening of Sino-Russian relations which could challenge existing regional processes and structures.[8] In preparing for a more competitive and contested environment, then-US Secretary of the Navy Richard Spencer in late 2018 highlighted the need for the US Navy and Coast Guard in the near term to be ready to conduct FONOPs in the Arctic to guard against any attempts to restrict freedom of navigation.[9] As FONOPs are surgical missions against perceived excessive maritime claims by coastal states, there are two possible targets: Canada (the Northwest Passage); and Russia (the Northern Sea Route).

The United States and Canada have a small set of maritime disputes in the Arctic which are well-managed and for decades have been of low political importance. Of these the one that appears the most intractable in terms of reaching a solution amenable to both sides is the *status* of the Northwest Passage (NWP). This is not a dispute over Canadian ownership over the NWP. It is a dispute about whether it is internal waters (conferring full sovereignty to regulate its use) as Ottawa claims, or an international strait which connects two parts of the high seas together as Washington argues. If it is an international strait, foreign vessels enjoy the right of transit passage without the prior approval of Canada. Since 1988, a stable, functional agreement has been in place in which both Ottawa and Washington retain their opposing views but this does not inhibit work between their coast guards.[10]

Credit: MC3 Josiah J. Kunkle, US Navy

*The Littoral Combat Ship USS **Gabrielle Giffords** (LCS 10) sails through the South China Sea, 18 November 2019, two days before it conducted a FONOP within 12 nautical miles of Mischief Reef. **Giffords** is the first LCS on deployment with the new Naval Strike Missiles – their two quad box launchers can be seen in front of the bridge.*

Former Secretary of the Navy Richard V. Spencer speaks with the commanding officer of the Amphibious Dock Landing Ship USS ***Comstock*** *(LSD 45) in Seward, Alaska, 17 September 2019.* ***Comstock*** *was part of a US Navy and Marine Corps Arctic Expeditionary Capabilities exercise.*

It remains unclear whether and under what circumstances the United States would conduct a FONOP through the NWP, but it would be prudent for Canada to prepare for such an eventuality. Ottawa could try to dissuade Washington from doing so by highlighting the strategic unsoundness of such an operation which would undermine North American security by illustrating that others, including competitor navies, could sail in these waters without prior permission as well. This, however, is unlikely to succeed because while the United States is concerned with continental security, ensuring universal access through any body of water the United States believes to be an international strait is a global, grand strategic interest on which it is unwilling to compromise. If Washington is determined to conduct a FONOP, Canada could use appeals to the longstanding security relationship to receive unofficial prior notice (as the United States does not announce its FONOPs in advance) which would at least ensure the operation goes smoothly, avoiding accidents or incidents. Faced with such a possibility, the Canadian government could also decide to issue permission without being explicitly asked in an attempt to alleviate some of the expected public backlash.

The current talk of conducting FONOPs in the Arctic does not appear to be a lever the Trump administration is using against Ottawa as retaliation or to get concessions on other policy matters. It is hoped that the deep common interests underpinning Canadian-American security relations at multiple levels will mitigate the negative effects such an operation would have on the larger relationship. In response to an American FONOP, Ottawa could issue fines for violating Canadian shipping regulations as a mostly symbolic action or it could bring the issue to an international court. The risk of losing such a case, though, would most likely inhibit either side from seriously considering it, re-orienting efforts towards other less zero-sum diplomatic avenues. A legal route, as well, could undermine relations if Washington did not participate, particularly if any ruling went against it, and the United States continued to maintain its original position and the right to use FONOPs to enforce it. It is likely that any American FONOPs in the NWP would be dealt with in a responsible way between the two countries, but the precedent of sending warships to register political opposition to Canada's claims that the waters of the NWP are internal waters could open the door for other countries to conduct such operations. There is no obvious state which would pursue such a route, but American FONOPs in the NWP could reinvigorate discussion from others who oppose Canada's claims (such as the EU) as to the passage's status.

Like Canada's NWP claim, Russia asserts full sovereign control over the waters of the Northern Sea Route (NSR), which it is promoting as an international shipping route. The United States opposes Russia's position, specifically the designation of internal waters around and between the many Arctic island archipelagos and the Russian mainland. The United States argues that these waters are an international strait where transit rights must be respected.[11] It attempted to assert such freedoms in the 1960s. In response, US Coast Guard ships were aggressively opposed by Soviet ships blocking their transit, ultimately causing them to cease the operation. The United States has not tried to conduct a FONOP in the NSR since then and there are concerns that doing so now would not only further degrade Russia-West relations but threaten regional stability. The Arctic plays a central role in Russia's national security and economic prosperity, but whether the military build-up in the Arctic is primarily offensive or

Ships of the Russian Northern Fleet return to Severomorsk in September 2019 after conducting tasks in the Arctic and along the Northern Sea Route.

Credit: Cpl Neil Clarkson, 14 Wing Imaging

*HMCS **Shawinigan**, a Maritime Coastal Defence Vessel, prepares to transit Bellot Strait, Nunavut, as part of **Operation Limpid** on 13 September 2016.*

defensive is hotly debated. For the United States, this may be a distinction without a difference as Russia's full sovereign claims over the NSR are seen as illegitimate regardless of whether the build-up is a defensive move to protect its coastline or an offensive move to establish a base for future expansion of maritime ownership into the Arctic.

Canada would be placed in a very difficult position for three main reasons if American FONOPs are conducted against Russia. First, Canada and Russia share similar (although not exact) legal rationales for their claims in Arctic waters and thus any FONOP against Russia would in effect be a statement that Canada's claims are also illegitimate and subject to FONOPs as well. Second, any American pressure on other Arctic states to support or participate in such operations would leave Canada in an almost impossible situation given the first point. And finally, conducting FONOPs may undermine the cooperative nature of the region, in which Russia fully participates, including the institutional landscape Canada has been vital in constructing. While Canada has eased somewhat its wariness of NATO's involvement in the Arctic, reservations remain about what posture the alliance should adopt given concerns about eroding regional relations.

Canada's FONOPs Conundrum

Canada is a firm supporter of UNCLOS and promoter of FON, but the possibility of American FONOPs in the Arctic along with the uncertainty that the United States would allow its position with respect to the status of specific maritime areas (such of the NWP) to be legally challenged has contributed to Ottawa's avoidance of developing a position on FONOPs. Like many Western states, Canada is concerned about the strategic intentions of China and Russia towards the international order. However, as it pertains to maritime issues there are a number of congruencies between Canada and these two powers which make it unrealistic that Ottawa would conduct FONOPs against them. Canada and Russia share similar legal rationales for their Arctic claims and the straight baselines enclosing the NWP as internal waters are similar to those China has drawn around the Qiongzhou Strait between Hainan Island and the mainland.[12]

These factors do not imply that Canada should renounce FONOPs or completely avoid any area of the world where there are maritime disputes. Instead, Canada should develop a tailored FON approach for each region which takes into consideration the geopolitical realities and differences of each, as well as the nature and extent of the disputes in question.

For the Asia-Pacific region, Canada should continue to transit, train and operate in the SCS as a passive way of asserting FON, but Ottawa should avoid contributing to FONOPs which involve sailing near Chinese-controlled topographical features. Coordination of such activities, however, should be strengthened with the United States and allies to ensure operations are being conducted in the passive (to inhibit China, or others, from becoming more expansionist in their territorial and jurisdictional claims) and active (sailing within 12 nm of Chinese-claimed islets and rocks) assertion of FON. It is important to note, also, that not all maritime claims are equally legitimate, and while the NWP and Qiongzhou Strait share similar legal rationales, China's claims in the SCS are fundamentally different in justification – as noted, China's claim has been rejected by the 2016 PCA ruling – and geopolitical importance than Canada's Arctic waters claims.

As for the Arctic, Canada should not skirt away from the issue of FON, especially as the region becomes an increasingly accessible and navigable space. Discussion about FON is an opportunity for Canada to gauge China's perspectives, and those of other states, on this matter. For example, it is unclear if Chinese warships will seek consent from Arctic coastal states before entering their territorial waters and/or Exclusive Economic Zones (EEZs), as Beijing argues foreign warships must do in Chinese territorial waters/EEZs in East Asia. On this point, there is the risk of a double standard forming on China's views of FON, placing restrictions on foreign military forces transiting and operating in its waters but capitalizing on FON

to ensure Chinese naval forces have access to others' maritime spaces without prior permission. As China becomes a major maritime power with an expanding commercial fleet and blue-water navy increasingly operating further from its home region, however, China will most likely begin to favour FON as an enabling function of power projection into other regions.

Russia's claims of sizable parts of the NSR as internal waters are not seen as legitimate by the United States, but unlike the SCS these claims do not threaten regional stability as no other state has a competing claim and they do not constitute a vast area of the Arctic Ocean. Canada should caution against FONOPs in the Arctic at this juncture as unnecessarily provocative but should monitor to see if Russia develops more expansive views about the geographic extent and nature of control it has in the maritime realm, particularly in its EEZ and continental shelf claim. Here, Canada must be prepared to join with its regional allies in developing strategies to push back against Russian claims of full sovereignty in these spaces, should it happen, including possibly within the confines of NATO.

Increasing naval operations in East Asia are slowly pressuring Canada into clearly articulating its position with respect to FONOPs. Having no position is becoming untenable as evident by the Department of National Defence issuing a statement that "[t]he Royal Canadian Navy does not conduct so-called Freedom of Navigation operations aimed at challenging the territorial claims of other nations" to refute allegations that an RCN ship transited the Straits of Taiwan as a FONOP (which it did not).[13] There is still an absence of a fully declared position or policy, including the rationales underpinning it, from the government of Canada.

Whether a region-specific FON strategy could be maintained in the long term is uncertain. This is particularly so as the Arctic becomes an accessible maritime environment ever more connected within an increasingly competitive international system. Ottawa's NWP designation could once again come into US crosshairs, not because of being a security risk, but rather a necessary casualty in its larger strategic manoeuvring to preserve FON on a global scale against Chinese and Russian attempts to restrict it in their home regions. To Canada, therefore, it may be its major ally, the United States, which poses an equal if not more intractable challenge than China or Russia in constructing a FONOP policy.

Credit: Aerographer's Mate 1st Class Gene Swope, US Navy

*A Dolphin helicopter takes off from the US Coast Guard icebreaker **Healy** to fly scientists to a remote ice floe in the Arctic Ocean, August 2005.*

Notes

1. This paper is based on a presentation given at the E3 CDA Institute Conference at the Balsillie School of International Affairs on 7 May 2019.
2. For the most recent available report see US Department of Defense, "Annual Freedom of Navigation Report, Fiscal Year 2017," 31 December 2017.
3. The Permanent Court of Arbitration did not adjudicate on the ownership of various topographical features in dispute, but rather ruled on their status as rocks and islets – not islands – which in effect drastically reduces the type and size of maritime claims China (and others) could make to the South China Sea. Beijing's argument that these were 'historic waters' was ruled as having no legal validity.
4. China's maritime claims not only threaten freedom of navigation for foreign military forces, but also the right to resources of other claimants as well. "Philippines Asks China to Stop Coast Guard from Taking Fishermen's Catch in Scarborough," Reuters, 11 June 2018.
5. The United States has no official position on who owns these features but rather opposes the maritime zones claimed by China beyond those prescribed in the 2016 Ruling – a 12 nautical mile territorial sea around rocks and a 500 metre safety zone around low tide elevations.
6. Robbie Gramer. "Trump Wants NATO's Eyes on China," *Foreign Policy*, 20 March 2019.
7. "Future South China Sea FONOPS Will Include Allies, Partners," *USNI News*, 12 February 2019; Richard Javad Heydarian. "Coalition of the Willing Builds in the South China Sea," *Asia Times,* 19 June 2019.
8. Examples include the 2019 "United States Coast Guard Arctic Strategic Outlook," the 2019 Report to Congress, "Department of Defense Arctic Strategy," and the May 2019 Arctic Council Ministerial Meeting speech by US Secretary of State Mike Pompeo.
9. "Maritime Security Dialogue: A Conversation with Hon. Richard V. Spencer, Secretary of the Navy," Center for Strategic and International Studies, 6 December 2018.
10. The agreement, however, does not cover US naval vessels, including submarines, or American-flagged civilian vessels. "Agreement Between the Government of Canada and the Government of the United States of America on Arctic Cooperation," E101701 - CTS No. 1988/29.
11. President of the United States, "National Security Presidential Directive/NSPD-66," 9 January 2009, para 5.
12. Michael Byers and Emma Lodge. "China and the Northwest Passage," *Chinese Journal of International Law*, Vol. 18, No. 1 (March 2019), pp. 57-90.
13. "Canada again Sails Warship through Sensitive Taiwan Strait," *National Post*, 11 September 2019.

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How Does the RCN Prepare to Fight in Hypersonic Missile Environments?

Matthew Beaupré

Credit: Xu Yu, China Military Online

China displayed its DF-17 hypersonic weapon during the National Day parade in Beijing on 1 October 2019. Note the hypersonic glide vehicle is mounted externally on a relatively small ballistic missile body, suggesting a medium range by ballistic missile standards.

On 1 October 2019, the Chinese military displayed its DF-17 hypersonic missile which is capable of deploying a hypersonic glide vehicle, the first in service anywhere in the world. It can cruise at speeds of Mach 5 or greater, and approaches its target while manoeuvring at low altitude.[1] Furthermore, American analysts have estimated that this weapon system has a range between 1,000 and 1,500 miles.[2] By comparison, the American Harpoon anti-ship missiles are publicly advertised to have high-subsonic speeds (less than Mach 1) and over-the-horizon ranges exceeding 67 nautical miles.[3] If these characteristics are not fearsome enough on their own, consider that there are currently no air defence systems capable of defeating missiles of this or the hypersonic anti-ship cruise missile (ASCM) variety.[4] This is partially due to their ability to manoeuvre at high speed and low altitude in their terminal phase. Current sensor systems have trouble tracking hypersonic missiles and a Mach 6 missile would hit a ship in roughly 15 seconds if detected at the radar horizon 15 nautical miles away.[5] Reaction time would be slim and it seems unlikely that even the most modern fleets would be able to operate within range of these missiles for long.

Based on these capabilities, the hypersonic missile appears to be ushering in a new era of maritime missile strategy for which today's Royal Canadian Navy (RCN) needs to prepare. The RCN will soon have to address the question of how it will fight and defend itself in a hypersonic missile environment. The ongoing effort to design and build the new mainstay of Canada's fleet, the Canadian Surface Combatant (CSC), must address the serious questions that hypersonic missiles of all varieties pose. Furthermore, consideration of this set of issues has been made time sensitive as a result of the technological advancement of potential adversaries in this area.

Lockheed Martin, the company responsible for the majority of American hypersonic development, will not test its hypersonic missile until some time in 2020, with production likely still years away. This puts the US Navy, its allies including Canada, and global partners in a difficult position.[6] Those navies that do not possess these weapons, the ability to utilize them to their full extent, or the means to defend themselves against them may face serious ramifications for these shortcomings. Given the speed and flight characteristics of hypersonic missiles as well as their considerable range, the American preference for shooting first from outside the range of the opposition may be forcibly turned on its head.[7] Should a major war occur, the US Navy, the RCN and their allies may be forced to fight at a disadvantage – unable to engage at extreme range and unable to defend themselves on the surface from the hypersonic missiles engaging them.

This new reality will not only create new technical challenges to which the CSC will likely need to be adapted over its service life, but it will also contribute to a tactical shift which will last at least until adequate countermeasures are developed. Creating a ship that can adapt technically and tactically to the challenge of hypersonic missiles will not be easy and it may require substantial resources to do so. Neither of these challenges, however, should be addressed alone. The principles of interoperability and cooperation with the United States and Canada's other North Atlantic Treaty Organization (NATO) allies will be necessary in the process.

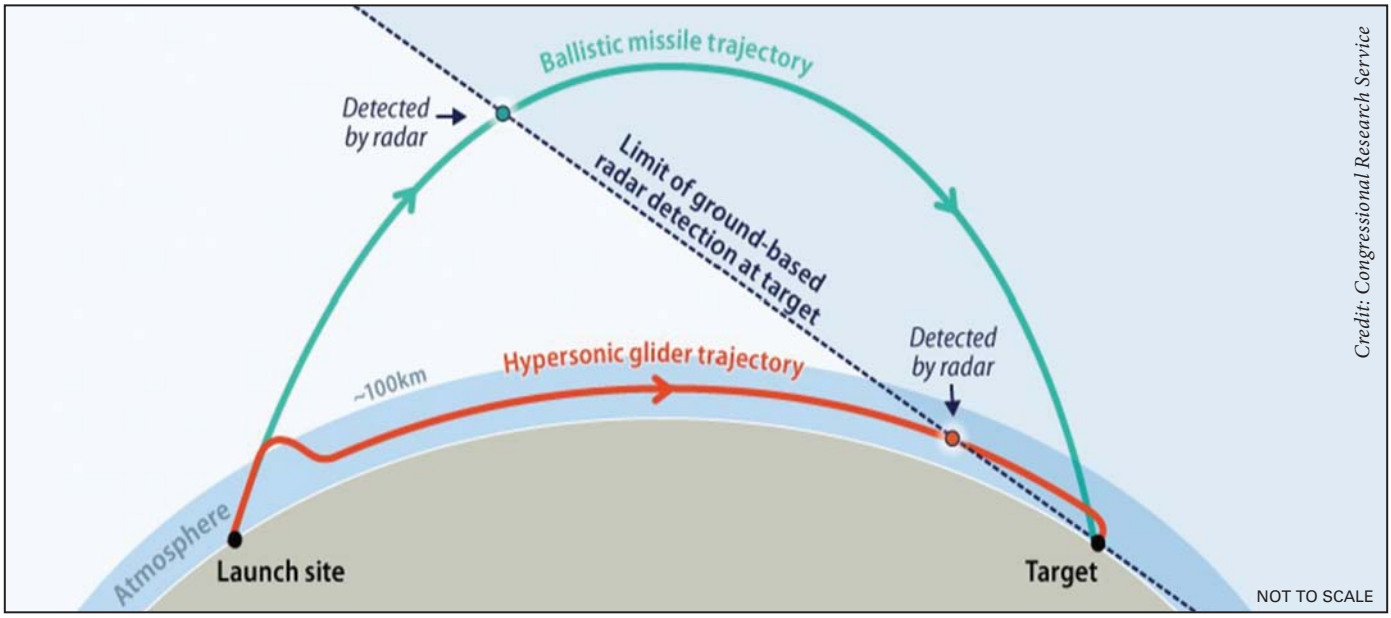
Developing Supporting Assets and Systems

Before discussing what may be required of the CSC during its service life, it is important to discuss the behind-the-scenes needs that the RCN must address prior to fighting in a hypersonic environment. These needs primarily revolve around intelligence, surveillance and reconnaissance (ISR) assets and information integration both between services and among allies. The need for over-the-horizon sensors and sensor integration for offensive and defensive action will be the primary issue for resolution in this respect.

In the defensive realm, the RCN will need to develop, individually or jointly, the capacity to detect and track multiple hypersonic missiles. According to US defence officials, both existing space- and surface-based sensors are insufficient to do so.[8] Hypersonic threats are harder to see from space than targets normally tracked by American space-based sensors and the relatively low altitude flight paths of hypersonic missiles make them more difficult to detect from the ground at a distance than ballistic missiles.[9] Acquiring access to technologies which address these concerns would provide much improved reaction time (minutes instead of seconds) and may allow time for retaliatory action if not adequate defence. Defence in this respect will also be improved with additional development of machine learning and artificial intelligence to help speed up decision-making.

In the offensive realm, it may eventually become necessary for the RCN to adopt hypersonic missiles of its own. In order to use these missiles to their full capacity, the RCN must have the capability of acquiring targeting information well over the horizon. This will likely entail a combination of data provided by ships, aircraft, drones and satellites. Canada has, in theory, already begun addressing this offensive issue with satellites. The RADARSAT Constellation Mission, launched in summer 2019, utilizes three synthetic aperture radar-equipped satellites to track shipping through clouds and at night in several passes (up to four over the Canadian Arctic) per day.[10] This capacity is useful for finding and tracking targets at extreme range but a single satellite constellation does not provide enough coverage or an adequate number of daily passes for up-to-date combat information.

Should the RCN wish to fire before its opponents, gaining the ability to 'see' over the horizon, or at least further than the enemy, will be essential. Several elements may go into this besides building up national ISR capacity. For instance, developing the capability – weapons or tactics – to disable either enemy sensor or data-sharing systems would be a useful means of blinding the enemy. If



A not-to-scale diagram illustrates the targeting challenge posed by hypersonic glide vehicles. By travelling at the edges of or within the atmosphere, they reduce the distance at which radars on the ground can detect them compared to traditional ballistic missiles.

An illustration of the US Hypersonic Test Vehicle (HTV)-2, which flew in April 2010. HTV-2 was a prototype built by DARPA.

Canada's ISR capacity is not sufficient, blinding the enemy by disrupting/disabling sensor or data systems may be the best means of leveling the playing field. More important, however, would be the development of joint ISR capacity to the maximum extent possible. The RCN already recognizes the need to integrate command and control but managing the information required to operate in a hypersonic environment may take this need to the next level.[11]

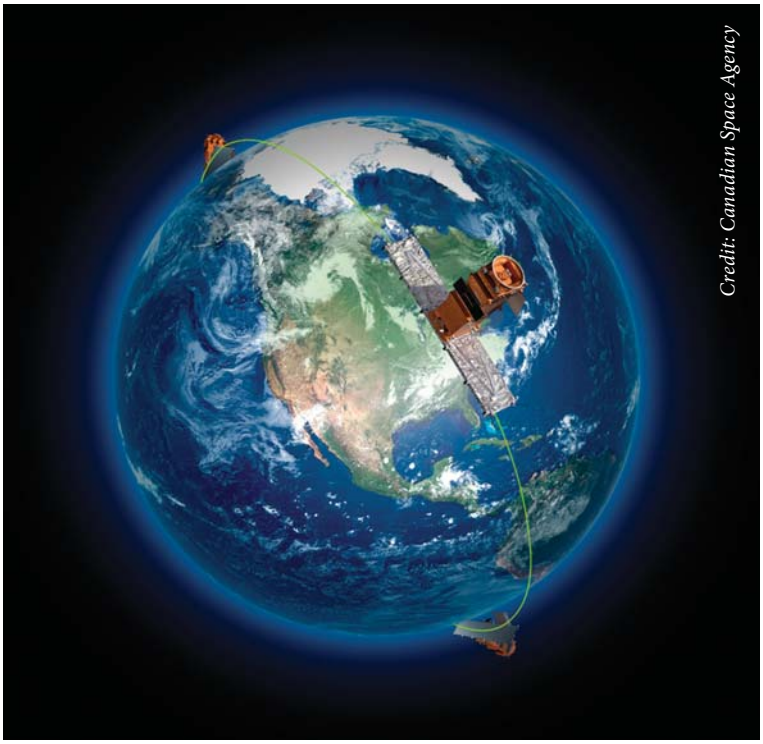
Information distribution will need to be integrated, not just among the three branches of the Canadian Forces, but also among allies on a massive scale. When a weapon system is both high speed and manoeuvrable, forces within its range will have to distribute intelligence and coordinate their responses. When the same weapon has a range in excess of 1,000 miles (if opposition ISR and command conditions allow it to reach the upper thresholds), then the required communication and coordination capacity will expand exponentially. In a hypersonic environment, therefore, the RCN will not only have to 'see' further, it will also have to absorb, interpret and communicate information at high speed while maintaining the highest standard of information and interoperability.

Preparing the Canadian Surface Combatant

The Department of National Defence's document outlining the future of the Canadian Navy, *Leadmark 2050,* devotes attention to several areas that will not only affect the CSC's design, but also its deployment and the nature of its on-board systems. Of special note to the discussion of the influence of hypersonic missiles are: the focus on survivability; the ability to be deployed globally (including the ability to conduct independent ocean crossings) in littoral areas and in a forward posture; technological 'agility'; and the necessity for combat effectiveness in sustained high-intensity engagements.[12]

In order to ensure the CSC can be deployed globally, an evaluation needs to be conducted regarding the ability of existing electronic countermeasures (ECM) to defeat an incoming hypersonic missile through the manipulation or disruption of its sensors and/or guidance systems ('soft-kill'). This will be essential to survivability and the ability to deploy in all environments. If the ability to prevent a missile from reaching its target by critically damaging or outright destroying it ('hard-kill') is not possible, then there is currently no other option. The hypersonic missiles themselves must have target-seeking devices to guide themselves to a target and disruption of these may be an exploitable weakness as it is with other weapon systems. The missile's speed, however, may still limit reaction time enough so as to negate the success of these systems as well. Furthermore, such soft-kill measures have been estimated to be only about 75% effective even against more conventional missiles.[13] In combination with the RCN's emphasis on survivability and the possibility that current electronic and chaff-based countermeasures would be ineffective, this would suggest the need to develop a hard-kill capacity in addition to an effective ECM capacity.

At this time, the future of hard-kill point defence systems for navies would appear to lie with directed energy weapons. High-energy lasers, microwave weapons, electromagnetic railguns and hypervelocity projectiles have all been suggested as new missile defence systems thanks to their various combinations of range, negligible cost per shot, ability to fire many times and ability to be brought to bear quickly.[14] Based on current American projects such as these, it may be worthwhile to determine the extent to which outfitting the CSCs with such systems would be feasible in the future. Despite the lack of functional hypersonic hard-kill systems at this time, it is imperative to



With three satellites, Canada's RADARSAT Constellation Mission provides much more frequent coverage of the globe than the previous single RADARSAT 2 body.

consider where and how such systems could be mounted when they come into being. The United States, and by extension Canada, will not have defensive capabilities against these missiles until the mid-2020s at the earliest.[15] By that point the first CSC will be rolling off the production line and modifications may be needed in a timely manner.[16]

This is of course conditional upon the ship being able to supply power to these weapon systems, something which is by no means guaranteed if the new hard-kill systems are based on directed energy. The problem with all of the aforementioned options is that even the American *Zumwalt*-class, which is capable of generating 80 megawatts of power, far more than most other surface combatants, is not entirely capable of sustained use of systems of the type needed to fight off hypersonic threats.[17] If these energy-based weapon systems are the way forward, it is important to note that no modern naval ship class has had its power plant completely changed out for a different type. Changing a power plant in a ship is a huge undertaking and building a new ship may be more feasible.[18] This is unlikely to be within the budget of the RCN considering the timing of the CSC project. It would be a hard sell to ask for new ships so early in the CSC career without a substantial and immediate threat.

Fortunately, there may still be options available. *Leadmark 2050* mentions a need for "containerized mission modules, which will offer additional flexibility in warship employment where requirements do not need to be embedded in platform design."[19] If one of these containerized modules could be equipped to provide an extra power plant or a large amount of electrical storage capacity, it may be possible to install these systems without resorting to a massive overhaul or new building program. If providing a containerized power plant were possible, however, it would still suffer from many drawbacks. These may include large size, significant excess weight and an increased chance of fire, none of which are welcome onboard a warship.

If unwilling or unable to retrofit, reconfigure, or redesign the CSC so it can utilize these new high-power consumption weapon systems or to build a new ship that is capable, the only remaining option is to adopt hypersonic missiles. If the CSC receives a system like the MK 41 Vertical Launch System, which is already used by a number of Canada's allies, including the United States, the integration of a shipborne hypersonic cruise missile would likely not be that difficult materially.[20] The difficulty would be in the issues of ISR and command and control. The future CSC may have to be retrofitted early in its service life with new electronic and communications equipment in order to support a new weapon system of this type. This would

Electronic warfare and other 'soft-kill' measures, such as the Elbit Systems unit housed within this semi-conical unit on the masts of the upgraded ***Halifax****-class frigates, may be one of the more reliable ways to reduce the hypersonic threat.*

undoubtably be expensive due to the need for over-the-horizon sensor capability but, short of massive power supply upgrades, there is no other way to achieve the desired range from shipboard systems. This additional expense could reduce the number of CSCs the government can afford to purchase.

It may also be worthwhile to look into the feasibility of intercepting hypersonic missiles by adapting existing systems, either air-defence missiles or other systems such as the Close-in Weapon System (CIWS). Adaptation of these existing systems is made relevant because of the addition of heat shielding to missiles. As shielding is needed for in-atmosphere transit at hypersonic speed (or re-entry by anti-ship ballistic missiles), such shielding may be sufficient to defeat lasers by increasing the amount of time necessary to destroy the missile.[21] Longer range missile detection would certainly help with the adaptation of existing systems as it would provide more time for an air-defence missile system to calculate an interception vector. Furthermore, to have a chance of interception with a defence system like a missile, increased detection range is necessary so that hypersonic missiles can be engaged before they start their high-speed manoeuvres in their terminal phase.

Credit: John F. Williams, US Navy

A program manager at the Office of Naval Research holds half the empty sabot containing a hyper velocity projectile, which sits to the left of the monitor. Designed to be fired from conventional guns like the 5"/62 to be fitted on the Canadian Surface Combatant, it is hoped that the much higher velocities of these smaller, more streamlined shells will provide ships with increased anti-missile capabilities.

The improvement of these defensive systems may still be useful even if the directed-energy weapons path proves fruitful. In order to protect against saturation attacks from multiple directions it may be necessary to equip a ship with multiple systems capable of defeating more conventional anti-ship missiles as well as hypersonic missiles. Given the lack of reaction time involved, maximum coverage with minimum response time may require several installations of point defence on a ship in order to provide 360-degree security. *Leadmark 2050*'s focus on littoral environs means that having multiple systems may also be beneficial for survivability beyond just missile defence. Fighting in the littoral regions requires systems such as these which can rapidly react to the threats posed by small craft.[22]

Tactical Shift

Given the lack of both hypersonic weapons and defences against them in a form available to the RCN, either through its allies or domestic design, there is a need for a tactical stopgap. In his discussion of tactical options open to the US Navy, Jon Isaac outlines four possible choices that leverage existing American assets to diffuse the hypersonic threat. These are: the dispersal of force to dilute saturation attacks and provide more targets; an increased utilization of submersible assets, especially guided-missile submarines; an increase in conventional missile deterrence; and operations to disrupt technologies (especially ISR and command and control) that support hypersonic strikes.[23]

While these may not be directly transferable to the RCN given its lack of assets, the requirement to transform tactical doctrine will nonetheless influence Canada as well. This will, of course, be tied to the need for the RCN to work with its larger ally in any major wartime scenario. As a result, learning how to function in new US formations and tactical systems which address the hypersonic issue will be an ongoing task. An emphasis on the role for submarines also means that the RCN will have to ensure the operational capability of its submarine force. Making the *Victoria*-class diesel-electric submarines and their crews as capable as possible may be the most important stopgap available. Against a hypersonic adversary, a non-hypersonic-armed CSC will almost certainly be out-gunned or, at the very least, out-ranged. This makes a well forward screen of attack submarines an operational necessity. The *Victoria*-class submarines would likely be the only RCN asset capable of operating in the hypersonic environment and they will be needed to stop hypersonic-armed enemy ships from getting into range of other allied vessels.

Finally, a full spectrum electronic and cyber capacity to deal with the systems and ISR assets used to control hypersonic missiles will likely need to be employed. Given budgetary and manpower constraints, this may be well beyond the capacity of the RCN – or even the Canadian Armed Forces as a whole. Regardless, an effort should be made to build this capacity in order to support Canada's allies and international partners.

Conclusion

Leadmark 2050 acknowledges the need to address many of the issues discussed here. It emphasizes the need for increased range, ISR expansion and integration with command and control, jointness, cyber offence and defence, and the need to project power ashore.[24] This would suggest that the RCN is mentally prepared to enter the hypersonic missile age. Like many things, however, the navy's ability to move forward with these ideas is contingent upon funds. The realization of extreme-range engagement and hypersonic missile defence capacities – both technically and organizationally – will not be cheap in money, skill, or time. The RCN and government decision-makers will have to decide whether these weapon technologies are reasonable to pursue, how this decision will alter the perception of Canadian power, and how policy should be shifted to account for this change in power perception. Luckily for Canada, it has a substantial background in military and ISR cooperation and interoperability thanks to the country's longstanding NATO and Five Eyes commitments. Canada's integration in these alliances provides

Credit: LS Dan Bard, Formation Imaging Services Halifax

*Canada's **Victoria**-class submarines may be the backbone of any future warfare scenario due to their relative immunity to hypersonic missiles. HMCS **Windsor** is seen here returning to Halifax on 17 December 2015 after NATO exercises Joint Warrior and Trident Juncture.*

it with substantial avenues for cooperative development and ISR integration should it wish to pursue these technologies. The sticking point for this optimism, however, is that until such technical and organizational issues can be ironed out, the West is behind the curve.

Despite Canadians' perception of the country as an international peacekeeper, Canada currently has less than friendly relations with two major powers which are approaching serviceable hypersonic capacity. A failure to address the issues surrounding the new reality of hypersonic naval warfare is to risk jeopardising the RCN fleet modernization efforts and the funds sunk into building the Canadian Surface Combatant.

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Making Waves

Notes from the Field: A First-Hand Look at the CSC's New Radar

Tim Choi

Many illustrations and models are publicly available regarding the new Canadian Surface Combatant (CSC), but little has been revealed thus far regarding its actual systems. Although based on the British Type 26 Global Combat Ship, there will be many differences in the Canadian version that have yet to be outlined, such as the primary radar system which has been visible in publicity material but otherwise left unremarked. Recognizing this and seeking to educate Canadians, Lockheed Martin (LM) invited a representative of *Canadian Naval Review* (*CNR*) to receive a briefing and tour of its Solid State Radar production, integration and testing facility in Moorestown, New Jersey, on 10 December 2019. The author, *CNR*'s photo editor, arrived at the LM facility alongside a trio of Japanese defence journalists who were invited based on the fact that Japan's new Aegis Ashore ballistic missile defence facility is using the same building blocks that will go into the CSC's radar. That same family of radar technology has also been accepted for use on Spain's future F-110 frigates.

The version closest to installation, Japan's Aegis Ashore, has been given the designation SPY-7(V)1 by the US government. The version designed for the CSC and Spain's F-110 will use the same hardware but will be scaled down for shipboard use. Much like the competing offering – Raytheon's SPY-6 – the LM SPY-7 will also likely receive different variant designations depending on how many sub-components (see below) it comprises. SPY-7 builds upon LM's experience in Solid State Radar technology, such as the Q-53 antenna for the US Army and the much larger, modular Long Range Discrimination Radar (LRDR). We were shown both of the latter two radar systems in the final stages of production under the same roof at the Moorestown facility. Despite dramatic differences in size (one for portable counter-battery fire, the other for continental ballistic missile defence), there were clear similarities in the arrangement of the physical frames and electronic elements.

So what exactly is this new radar for CSC? It is an Active Electronically Scanned Array (AESA), succeeding the legacy Passive Electronically Scanned Array (PESA) used in radars like that of the SPY-1D featured on in-service Aegis warships and which are nearing the end of their production run at Moorestown. Technologically, the biggest difference is that while the old SPY-1s had their radar signals transmitter buried deep in the hull, the new AESAs have

A less commonly-seen rendering of the Canadian Surface Combatant from the aft quarter. The larger of the square panels on the mast is the Lockheed Martin S-band SPY-7 variant radar, while the smaller square will be the X-band radar produced by MDA in Richmond, BC.

multiple, much smaller, transmitter-antenna units built directly into the backside of the array's surface. These units, called sub-arrays, are modular and can therefore be easily removed for repair – in as little as 30 seconds according to a video shown to us. An additional benefit of this approach is the elimination of design requirements for carefully fitting waveguides and other electromagnetic considerations throughout the ship's superstructure to accommodate signals propagation from transmitter to antenna, as in the PESA arrangements. As completely digital signals, the capability of an AESA radar can be changed primarily using software.

The idea of multiple sub-units that can be added together in a modular fashion to increase an antenna's range and sensitivity might be familiar for those who follow warship developments closely. It has been a widely advertised characteristic of Raytheon's SPY-6 family of new radars which are to be installed on the US Navy's Flight III *Arleigh Burke*-class destroyers. While the basic units of the SPY-6 are to be the 2-foot cubed Radar Module Assemblies (RMAs), Lockheed Martin's most basic units are shoebox-sized sub-arrays. The long axis of these shoeboxes is perpendicular to the face of the overall antenna. LM highlighted how the nature of these sub-arrays means maintenance can be performed without shutting down the entire antenna: only the particular sub-array being repaired needs to be turned off, while the others continue to operate normally with only minimal hindrance to the radar's efficacy. Raytheon's publicity materials makes similar claims, but the sensitivity of such cutting-edge technology makes it challenging to make any more precise comparisons.

Building 155 houses the Solid State Radar Integration Site, which allows for testing of the technology going into the Long Range Discrimination Radar in Alaska, and which will also be used in the Canadian Surface Combatant.

Both companies' modular approaches to radar technology are enabled by the use of gallium nitride semiconductors (GaN). This replaces silicone which traditionally forms a key part of radar electronics. GaN is more efficient and temperature-tolerant, generating more powerful signals despite lower power requirements and at the same physical size.

The core technology of all this, and indeed the sub-arrays themselves, is already being delivered to the US military in the form of the Long Range Discrimination Radar (LRDR). Based out of Clear, Alaska, the LRDR is the next phase of the US intercontinental ballistic missile defence program, providing detection and tracking data for the interceptors at Fort Greely, Alaska. It is comprised of two array 'faces,' each with 10 rectangular panels divided into two rows. These panels are each 27 feet tall, around 10 feet wide, and made up of dozens of sub-arrays – the exact number depends on the panel's position within the overall array face. At Moorestown, the LRDR panels are assembled in a hall built in 2015 and dedicated to LM's Solid State Radar (SSR) production. Upon completion of the LRDR, the hall will be used to produce antennas for the SPY-7 variants. This new SSR hall is an extension to where the current SPY-1D panels are assembled.

The 460th SPY-1D panel was laid face down in front of us, a massive brass-coloured octagon with 21 'columns' (similar in profile to railroad iron tracks), that was trucked in and will be packed with electronics at the facility. In the new SSR hall, each assembly station has a monitor showing production progress to encourage worker efficiencies through competition. To move the massive LRDR panels, they are placed, with grid-like slots for sub-arrays facing up, on bright orange sleds with four 'legs.' Then compressed air is blasted through these legs to create a hovercraft, and only eight personnel are required to manoeuvre the panel. During our visit, panels 9 and 10 of the first 20 LRDR panels were in the final verification stages, towering vertically over us before moving into a 50-foot-tall calibration hall, filled with numerous tightly-packed, dark grey, anechoic pyramidal shapes absorbing excess electromagnetic energy.

So what does this mean for the CSC? In essence, the ships

The backside of the array being tested at the Solid State Radar Integration Site. Note the waffle-like grid structure: these are populated by 'sub-arrays' that are the actual transmitters for radar signals.

will be getting roughly SPY-1D performance in terms of range but with a smaller footprint. LM was reluctant to specify its relative capability in terms of precision and tracking, although the use of the same sub-arrays for the much more demanding task of continental ballistic missile defence, in which actual warheads need to be differentiated from decoys, speaks in favour of it. The CSC's radar configuration will actually be comprised of two four-face arrays: the S-band based on the SPY-7 and LRDR sub-arrays; and an X-band illumination radar paired with each S-band array to provide terminal guidance for semi-active homing missiles like the SM-2. This physically smaller X-band radar will be produced in Canada by MacDonald, Dettwiler and Associates (MDA) out of Richmond, British Columbia (readers may recognize them from the RADARSAT series of satellites). The S-band arrays are currently planned to be assembled in Moorestown, but Lockheed Martin is apparently exploring possibilities for Canadian participation.

Recognizing the potential for naval use, the engineering of the LRDR's sub-arrays includes measures that would ready them for the maritime environment, such as saltwater resistance. As a result, it would seem that adapting the LRDR and Aegis Ashore/SPY-7 components for CSC and F-110 use would not require significant hardware changes. This likely played into the Canadian preference for a bid that would require minimal changes and is relatively 'proven.'

To demonstrate the LRDR sub-arrays as technology that was relatively mature and ready for use in the CSC, we were taken to the LRDR test and integration building, Building 155. There a single panel of the LRDR array is established as a fully active scaled version of the system being established in Alaska. After climbing four flights of stairs, we reached a platform with numerous computer monitors, and the backside of an LRDR panel in front of us. Here we had our first view of active sub-arrays: a grid of brassy rectangles – not unlike the mailboxes one sees in apartment buildings – each with blinking red and green lights indicating their active status. At the bottom and top of the array were four large diameter pipes, feeding all-important coolant between the sub-arrays and the building's exterior surface. The 27-foot tall panel angled towards and above us, disappearing behind numerous beams and supports inside the overall test and integration structure. This arrangement is sufficient to test configurations of sub-arrays to Technology Readiness Level 7 ("demonstration of system prototype in operational environment") and has already been used to track satellites in orbit. With all software and tactical processors the same as the ones in Alaska, Building 155 can allegedly verify 90% of the LRDR's requirements before everything is moved to Alaska. Relatively mundane things such as cooling, piping and cabling, as well as software issues such as IP addresses and networking, can all be tested and vetted in Moorestown. This helps to narrow down any troubleshooting issues that may develop in Alaska.

It became clear during the tour that one of the key selling points of the LM solution for the CSC is Moorestown's long history as a site for integrating both the software and hardware sides of high-end naval sensors. Scattered throughout the main campus are four buildings resembling partial superstructures of in-service Aegis warships. With both SPY-1 antennas and separate illumination radars like the SPG-62, these buildings test radar configurations specific to individual ship designs. There was even one that appeared to be for the Norwegian *Nansen*-class

Credit: Screenshot via Google Earth

The Lockheed Martin Moorestown facility is home to a number of testing sites for various Aegis warship radar and software configurations. One of these will be converted to test the hardware and software that will form the Canadian Surface Combatant's radar sensors.

with its distinctively smaller SPY-1F antennas. In the next few years, one of these buildings will be converted to test the CSC's radar suite; the first of Lockheed Martin's naval AESA arrays, based on by-then proven sub-components used by the newest US ballistic missile defence radar.

Emphasizing LM's investment in integrating the physical and digital spaces, our tour was capped off with a visit to the Surface Navy Innovation Center (SNIC). Funded by LM and the US service branches, it serves as a test hub for new technologies. In it, a physical replica of the combat information centre of an *Arleigh Burke*-class destroyer was built, with different prototypes for new consoles to test what the navy initially proposed, and what eventually got built and implemented into actual warships. With each iteration, opportunities became available to integrate new technology, and problems with initial assumptions were identified. Given that poor user interface was a partial cause of the USS *John S. McCain*'s collision in 2017, this would seem to be a wise approach. Building upon this idea, the SNIC also seems heavily invested in the possibilities of virtual and augmented reality. We were given the opportunity to wear a virtual reality headset, allowing us to 'walk' through the simulated interior of a warship. This allows LM and the US Navy to test designs to ensure, for example, sufficient clearance between bulkheads and consoles.

In sum, although the Canadian Surface Combatant and the Spanish F-110 will be the first in the world to operationalize the SPY-7 at sea, it is based on not just technology but actual components that have already been tested and approved for use in Alaska in the most sensitive US homeland defence system. While additional testing and integration will have to be done to ensure the array's compatibility with the CSC's combat system, that should at least be made more straightforward due to LM's own experience with SPY-1 and the Aegis weapons system's components.

The Future of Canada's Maritime Fleet in the Arctic

Peter Barron

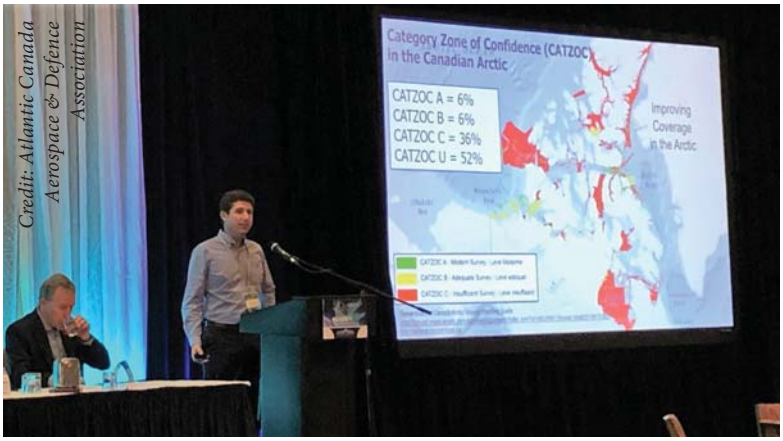
Only six per cent of Canadian Arctic waters is sufficiently charted to modern standards. That was the message Dr. Ian Church of the University of New Brunswick revealed to a crowd of maritime and aeronautic industry leaders at the Maritime and Arctic Security and Safety (MASS) conference in St. John's, Newfoundland, in November 2019. It's a telling fact, illustrating where Canada currently stands in its maritime sovereignty in the North. It's also a starting point, a reference for how much farther this country, its industries and people must go to understand the changing Arctic.

In this brief commentary, I would like to summarize what was discussed at the 2019 MASS conference.

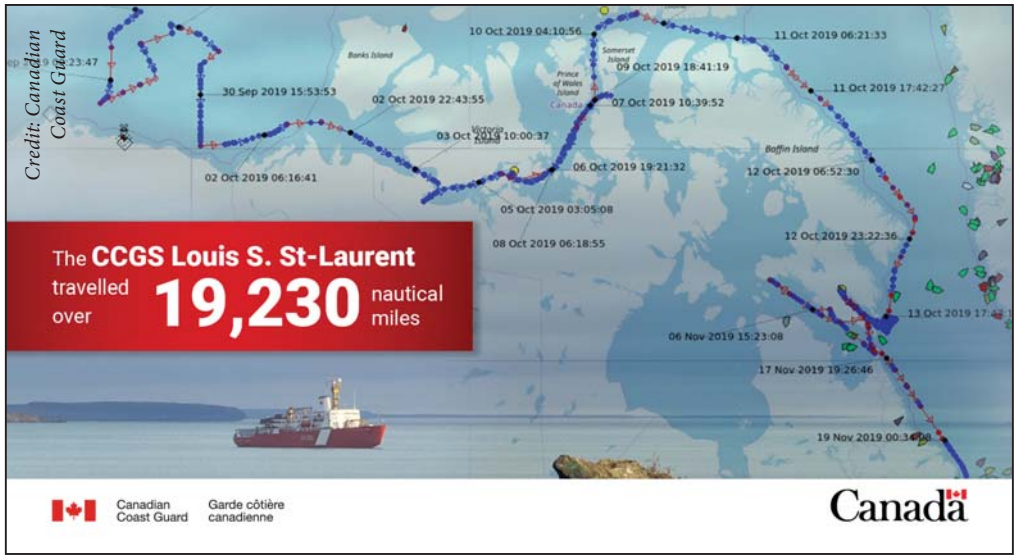
The Current State of the Canadian Fleets

Rear-Admiral Craig Baines of the Royal Canadian Navy (RCN) kicked off the conference by discussing the pillars of the RCN's 2017-2022 Strategic Plan. At the forefront of the plan in terms of the Arctic is 'Presence.' Currently the ice-navigating capacity of the RCN is limited, with four vessels venturing North in the past two years and staying primarily to the eastern and central regions of the Arctic. However, with the upcoming delivery of the ice-strengthened *Harry DeWolf*-class Arctic and Offshore Patrol Ships, the scope and presence of the RCN in the North should expand in the coming years.

The Canadian Coast Guard (CCG) Deputy Commissioner Andy Smith presented a hard look at the CCG's current *Polar*-class icebreakers. The oldest ship, CCGS *Louis S. St-Laurent*, was built in 1969 which means it is currently 50 years old, and the CCG intends to sail the ship for another 10 years. While CCGS *Louis St-Laurent* is the oldest ship, the other ships are also getting on in years. Icebreaking in Canada can be exceptionally difficult, and will take a toll over time even on the best built ships. The CCG's polar and medium-sized icebreaking fleet divides its time between the North in the summer, and the St. Lawrence seaway, Great Lakes and East Coast in the winter/spring.



Dr. Ian Church speaks at the Maritime and Arctic Security and Safety 2019 conference in St. John's in November 2019, highlighting the relative paucity of modern-day surveys of Canadian Arctic waterways.



*An illustration showing the Canadian Coast Guard icebreaker **Louis St. Laurent**'s journey through the Arctic in summer 2019.*

The busy schedule leaves little downtime for repairs, or dry docking, which are vital to older vessels nearing the end of their operational life. And, as noted, older vessels comprise much of the CCG's icebreaking fleet.

Deputy Commissioner Smith further discussed how essential icebreaking capabilities are to economic security in Canada. He compared icebreakers to snowplows which make movement of goods and people in this country possible during harsh winters. Canadian companies like Transport Desgagnes, The Woodwards Group of Companies and NEAS Inc. depend on Canadian icebreaking services to provide northern communities with supplies and fuel.

The lack of capability to operate in the North is part of the reason why the National Shipbuilding Strategy, introduced in 2010, aims to supply what the Canadian Arctic fleet needs: new ships.

Looking Forward

Much of the MASS conference was made up of industry players who were there to solve the most pressing issue facing the maritime elements of the Canadian Arctic: building ships. Matters of both security (economic as well as political/state) and safety require enough ships to cover the whole of the Canadian Arctic archipelago.

From shipyards to smaller companies which provide any level of systems and technology to these vessels, all were present at MASS, and it was made clear that the National Shipbuilding Strategy is indeed a nation-wide endeavour.

A representative of Davie Shipyard, located in Quebec City, spoke of the ongoing Project Resolute and the conversion of three former supply vessels owned by Trans Viking. These ships are being converted to act as interim CCG icebreakers to take Canada through the period when older CCG vessels retire but the new ships being built at the Seaspan shipyard in Vancouver and the Irving Shipyard in Halifax are not yet ready. CCGS *Captain Molly Kool* is the first of the three currently in operation.

A representative of Seaspan Shipyard spoke of the CCG Offshore Fishery Research Ship, CCGS *Sir John Franklin*, the first vessel produced through the National Shipbuilding Strategy. Another two vessels for the CCG are being built. And on top of that another 16 multi-purpose vessels with light icebreaking capabilities are to be built. Seaspan also referred to its partnership with Genoa Design, a Newfoundland-based Naval Architecture firm, and the need for Canadian suppliers.

Canadian suppliers and supply chains were foremost in mind when technology and defence giant Lockheed Martin spokesman, Simon Hughes, spoke about working with the federal government and Irving/Halifax Shipyard on the Canadian Surface Combatant project (under the National Shipbuilding Strategy). This will involve building 15 new Canadian combatant ships, to replace three destroyers that have already been removed from service and, eventually, 12 frigates. Currently supply chains are being decided, all of which must meet Canadian content standards. Part of Lockheed's success in winning the competition as a subcontractor to Irving/Halifax shipyard was its projection that the project would add

*The interim icebreaker CCGS **Molly Kool** is shown here at end of its inaugural Arctic voyage in 2019.*

$17 billion of value production into the Canadian economy over the length of the project (over 20 years).

The Future of the Fleet

We are now beginning to see the fruits of the National Shipbuilding Strategy which began almost 10 years ago, and things are only getting better. The shipyards are beginning to ramp up production, which means more work in the shipyards, more Canadian supplies to be procured, and more Canadian companies to be involved. And ultimately it means a larger, newer Canadian fleet to serve and protect Canadian Arctic maritime interests.

If anything can be taken from the 2019 MASS conference, it's that the path ahead of us is clear. In the coming years we'll see the Canadian federal fleet have a larger presence in Canada's Arctic waters, which will allow for safer and more secure commercial and private navigation of those waters. More bathymetric data will be collected as well, and a more complete survey of Canada's internal waters will be conducted. Perhaps one day we will finally see what lies under the other 94 per cent of Canadian waters.

The Challenges of Opening Arctic Waters to the World

Joshua Nelles

The Canadian Arctic, including the Northwest Passage, is likely to become a northern shipping route for both cargo and passenger ships. With this in mind, I would like to discuss two related points.

First, unlike shipping routes in other parts of the globe which have been well-travelled for centuries, the Arctic remains largely an unchartered or under-charted region. Currently, just over 50% of the Arctic sea floor is not surveyed at all, and most of what is surveyed was surveyed on average 50 years ago. Ships entering the Arctic today have no idea what's beneath them. With this in mind, how do you know where to go when the map is 50 years old, or non-existent? In years past, when referring to this northern frontier, the answer was luck. Today however, the answer will soon be multi-beam sonar. Thankfully, the solution is relatively simple with today's technology. Put multi-beam sonars on ships and a world reveals itself.

In August 2010, a cruise ship named *Clipper Adventurer* ran aground in Coronation Gulf while touring the Arctic. The crew had decided to take the ship on a short cut through a passage that seemed safe but had never been transited by that ship before. The soundings were spotty but appeared deep enough for the ship. What they did not count on was an underwater cliff. If the ship had been a bit west or east of its track, it would have missed the cliff – but because charts were incomplete and/or out of date, the cliff was not marked. At the time of the grounding, the closest rescue vessel was CCGS *Amundsen* 500 miles away. Luckily, *Amundsen* was on a survey mission and had multi-beam sonar installed, the only Canadian Coast Guard vessel to have it at the time. The ship used this sonar to get close enough for a rescue. Without that multi-beam sonar, *Amundsen* might have met with the same fate.

Multi-beam sonar is like other sonars in that it emits soundwaves in a fan shape to map the seabed. Unlike other sonars though, multi-beam sonars can map the seafloor in 3D by utilizing multiple soundwave beams at once instead of the single beam found in other sonars like a typical ship's echo sounder. This increases the accuracy of the charts because it shows details such as cliffs and outcrops, not just the depth of water.

Since the *Clipper Adventurer* incident, more multi-beam sonars have been installed on Canadian Coast Guard vessels. These sonars work while the ships are going about their everyday business. After the ship is finished for the season in the Arctic, the data is collected and analysed, after which it is given to various organizations for use. With every trip of a vessel with a multi-beam sonar installed, the Canadian Arctic becomes safer.

With climate change, there are more ships, especially cruise ships, plying the Arctic waters than ever before.

Credit: Canadian Coast Guard

The cruise ship MV ***Clipper Adventurer*** *is seen here run aground in the Canadian Arctic in August 2010.*

All Canadian Coast Guard icebreakers have now been equipped with multi-beam echo sounders, allowing them to map the sea floor more quickly and accurately. This is the Kongsberg EM712, which has been installed on CCGS ***Pierre Radisson*** *and* ***Des Groseilliers****.*

This brings me to my second point. The Arctic is so much more than what is beneath its frozen waters. It is a vast and sweeping, but barren landscape. In addition to being incredibly beautiful, much of this beauty stems from it being remote and far from the trappings of what we call civilization and thus the amenities provided in a much more populated south. Most tourists are used to 9-1-1 help being minutes away, and brochures advertising the adventurous northern trek may be leaving out some details in their selling points. Could this remoteness be jeopardising the safety of tourists?

Is the solution to offer more amenities like hotels, or will this negatively transform the northern landscape and the lives of the people who live there? Canada has many natural wonders but the Canadian population usually sees the ones in the South. In Niagara Falls, for example, one can enjoy a sweeping vista, and gaze into an awe-inspiring example of nature's power. But turn your head even just a little bit and the view suddenly shifts to a modern panorama – the cityscape. You'll be hard pressed to find advertising displays of Niagara Falls that do not include the cityscapes, especially at night.

The same can be said for other tourist attractions. However, this is not the case in the North, not even close. When cruise ships like *Clipper Adventure* take tourists North to view the sweeping landscapes, they will see small communities that dot this landscape. Major discussions will need to be had to determine how much the North should change – if at all – in order to accommodate the convenience and safety of cruise ship passengers. These discussions must include local residents, and examine both the feasibility and the desirability of increased development in the North.

While those discussions are held, the main concern for ships in Arctic waters is safety. As it stands today, if something were to go wrong with a cruise ship more serious than a grounding, it is simply not that easy for help to arrive quickly. Currently the Canadian Coast Guard Auxiliary is training local crews in the North for a first responder role. However, this does not include the equipment necessary for a major incident, and even locally-based responders could be hundreds of miles away from the location of an incident.

The Canadian CH-149 Cormorant search-and-rescue (SAR) helicopter has a maximum range of 750 nautical miles. But there are few places in the Arctic to refuel a Cormorant helicopter, or anything else. In 2018, another cruise ship – *Akademik Ioffe* – ran aground. It was lucky that its sister ship was in the area as was a Canadian Coast Guard ship. A Hercules aircraft was sent from Trenton, Ontario to Kugaark, Nunavut, to provide an on-scene commander to the rescue, but even a long-range aircraft took over 14 hours to reach the ship that had run aground. Thus far the cruise ships have been lucky, and no lives have been lost. But response takes time. If an oil spill occurred, it could take at least a week before proper oil spill equipment could arrive on the scene.

Akademik Ioffe *ran aground in the Gulf of Boothia on 24 August 2018, spilling 80 litres of fuel oil.*

With the challenges of incorporating both commercial shipping and tourism in the Arctic, we can take solace in the advanced technological century in which we live. With multi-beam sonar, hopefully we can solve the problems of old and inadequate charting, and make navigating in Canadian Arctic waters safer. The more difficult challenge is for Canada to find answers to the questions that are bound to be asked as the Arctic opens its doors to the rest of the world.

A View from the West

Interview with Dr. James Boutilier

Brett Witthoeft

After almost five decades of public service, first with Royal Roads Military College, then with Maritime Forces Pacific, Dr. James Boutilier retired on 30 October 2019. Over the course of his long and influential career, Dr. Boutilier was instrumental in educating future Canadian Armed Forces leaders and highlighting the importance of the Indo-Pacific region by serving as Special Advisor to 12 Commanders of Maritime Forces Pacific. Ahead of his retirement, Dr. Boutilier's staffer sat down with him to discuss how the Canadian military and Indo-Pacific region have evolved over his career. (The interview has been edited for clarity and flow.)

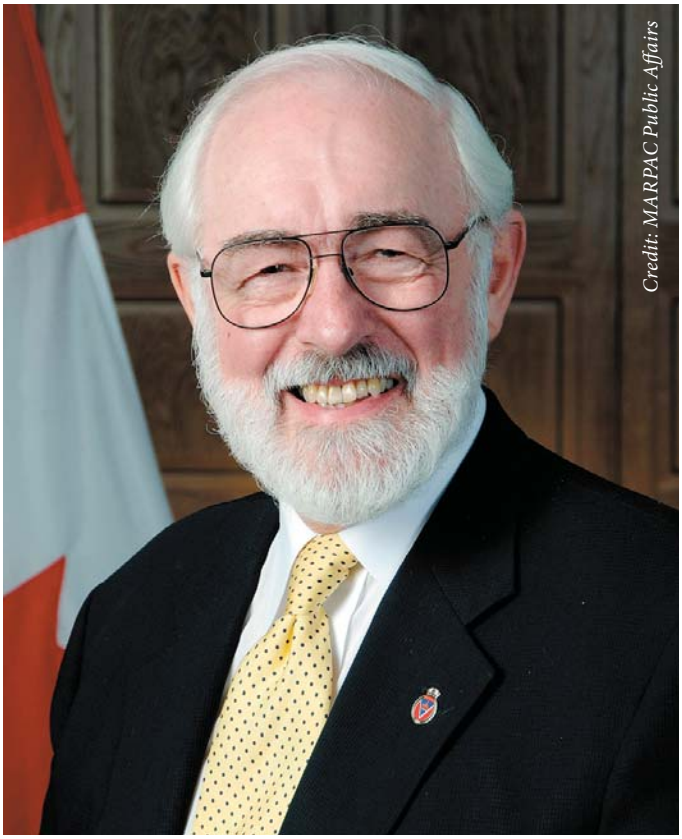
How did you begin your career studying the Indo-Pacific region?

After completing a PhD in History at the University of London in 1969, I began my professorial career with a brief stint in Fiji, and my focus was on the Pacific Islands. Even after I left Fiji in 1971, I continued to conduct research on Oceania and I am – so far as I know – one of the very few people whose career has spanned both Oceania and Asia. After roughly 17 years of researching and writing on the Pacific Islands, I began to devote more of my attention to Asia in the late 1980s. By that time, the rise of China was being recognized as an inescapable phenomenon, and the Pacific Islands were becoming more marginal in terms of great power competition.

When did you join the public service?

My first public appointment was as an assistant professor in the History and Political Economy Department at Royal Roads Military College (RRMC), where I began teaching in September 1971. At the time, RRMC was a two-year institution that was meant to prepare students for further studies at the Royal Military College in Kingston. Moreover, RRMC was primarily focused on science and engineering subjects, and while students were expected to round out their educations with humanities and social studies classes, those classes were sometimes an afterthought. When I first arrived at RRMC, there was one European history course, and I taught 95 to 100 science and engineering students who took the course somewhat involuntarily each year. This was pretty difficult going for them, given the demands of their core program; and many thought that history was peripheral to their main studies.

I should also note that my initial foray at RRMC was difficult going for me as well, given my professorial ambitions.



Credit: MARPAC Public Affairs

A portrait of Dr. James Boutilier.

For example, I assigned the 99 students in my first class two essays each for their course assignments. As anyone with basic arithmetic knows, 99 times two is 198, and 198 times 45 minutes to grade each essay means about 150 hours of marking! As a result, I graded for at least four hours a day, five days a week, in order to accomplish this Herculean task, and was careful never to make this mistake again!

How did Royal Roads evolve over the years?

When RRMC became a four-year, degree-granting institution in 1975, faculty were added to all the non-science departments. The program was still very conventional in that courses focused on Western and European issues, so I lobbied in the early 1990s for increased coverage of Asia. I taught courses on the Pacific including the 1905 Russo-Japanese War, Asia in the 20th century and contemporary defence and security in Asia. If I recall correctly, those courses were the only ones on Asia offered in the Canadian military education system at the time. I also initiated a plan that was unique in the military college system: offering a night-time course. This evening course enabled not only the RRMC cadets to take the class, if they so desired,

Credit: Timothy Choi

Commander of the Royal Canadian Navy, Vice-Admiral Ron Lloyd, gives a keynote speech at the 2018 Maritime Security Challenges conference spearheaded by Dr. Boutilier.

but also permitted staff from nearby Maritime Forces Pacific (MARPAC) to attend as well. This was an interesting exercise, and the result – among other things – was that I was later asked to brief a Canadian parliamentary committee, which was soliciting commentary for the 1994 defence White Paper, on the latest security threats in Asia. The MARPAC commander of the day, Rear-Admiral Dick Waller, asked me to travel with him to San Diego to give testimony at a parliamentary fact-finding mission.

I would be remiss if I did not acknowledge that I have had the great pleasure of teaching many RRMC students over the years who have gone on to senior command positions. Despite the small size of the student body, RRMC punched well above its weight, producing Canadian Armed Forces luminaries such as the current Chief of the Defence Staff (CDS) General Jonathan Vance, previous CDS General Walt Natynczyk, former Commander of the Royal Canadian Navy Vice-Admiral Ron Lloyd, and, of course, several members of the eminent Greenwood RCN family.

How else did you help raise awareness of the Indo-Pacific region?

In 1971, alongside Dr. Fong Woon, I helped establish what is now known as the Pacific and Asian Studies Department at the University of Victoria (UVic). This program began as a single year-long multi-disciplinary course on Asia writ large, and Fong and I invited a range of professors from different UVic departments to contribute, pro bono, as a means of offering this Asia course. There was material on Japan, Southeast Asia, the Pacific Islands and cultural coverage of the region to give an introduction to Asia. Slowly, through the 1970s, that program attracted more students, and UVic decided to create a Centre for Pacific

Credit: PH1 Brien Aho, US Navy

*HMCS **Toronto** leads the USS **George Washington** carrier strike group in the Arabian Gulf on 3 June 2004. With their multi-purpose capabilities, the **Halifax**-class frigates have become regular escorts for American carrier groups.*

and Oriental Studies, and appointed Professor Jan Walls as the director. The Centre eventually morphed into the current Pacific and Asian Studies Department with its own professors and staff, and I was an adjunct professor there from 1971 to 1995, when I left RRMC.

How did you come to join the Royal Canadian Navy?

Despite its value, RRMC came under the threat of closure several times over the years, and eventually this threat came true in the mid-1990s. In 1995, RRMC closed and I took a year without pay to help establish what is now Royal Roads University, during which time Rear-Admiral Bruce Johnston asked me to join his staff at MARPAC as a policy advisor. His argument was that he had spent the majority of his career in Ottawa and Halifax, and consequently knew little about Asia, and thus needed assistance in understanding the region. At the time, there were some serious reservations in Ottawa about having a policy advisor on the coast, as Ottawa alone formulated policy. However, Rear-Admiral Johnston pushed the appointment through, and I began work at MARPAC in July 1996.

I should note that my joining MARPAC was far from my first encounter with the navy. As a young man, I joined the RCN Reserves as a cadet and subsequently served as a navigating officer from 1956 to 1964, and I served in the latter capacity with the Royal Navy Reserve from 1964 to 1969 while studying in London.

How have the Indo-Pacific region, and Canada's views of the region, changed over the years?

When I became engaged in the study of Asia in the late 1980s, Canada was reasonably active in the region, particularly in Southeast Asia. For example, there was a Canada-Association of Southeast Asian Nations centre in Singapore, there were Department of Foreign Affairs and International Trade (DFAIT)-funded non-governmental organizations, including the Canadian Consortium on Asia-Pacific Security (CANCAPS), and DFAIT Minister Joe Clark had a genuine interest in Asia and the Pacific Islands, which was a rarity. When the Cold War ended, Canada began to lose its way in Asia. While organizations like CANCAPS continued through the 1990s, funding began to dry up, and CANCAPS eventually ceased to function. There was an international non-governmental organization in which Canada was a member, the Council for Security Cooperation (CSCAP), currently located in Kuala Lumpur at the Institute of Strategic and International Studies (ISIS) Malaysia, which was also funded by DFAIT and held regular meetings in Canada, and Canadian representatives went to Asia to attend CSCAP meetings. After the turn of the century, funding again dried up, and Canada's representation in CSCAP ended. That meant that the two main organizations for Canadian Track 2 diplomacy in Asia were no more.

The years of Jean Chrétien and Paul Martin were characterized by high-profile Team Canada ventures into Asia, particularly to China. It is not clear what the Team Canada ventures achieved; they mostly appeared to be theatre designed to maintain existing linkages. A case in point is that, while the overall size of Asian economic activity has grown since then, Canada's share has remained the same. Canada has failed to penetrate the Asian markets to the degree that we would have liked. This could be because Canada has few world-class firms, but a lack of vision and energy toward Asia by successive governments is also to blame. A failure to engage consistently has worked to Canada's disadvantage. There has also been a failure to appreciate the links among trade, diplomacy and security: showing interest and involvement in regional security issues will yield more receptivity to trade issues than focusing solely on trade. Canada probably should have spent more effort on the small and middle economies of Southeast Asia – in addition to Japan and South Korea – for greater returns.

I always characterized the period from the 1990s onward as the Rip Van Winkle years: as the importance of Asia grew, Canada was asleep. The dramatic downturn in several Asian economies during the 1997 Asian financial crisis may have discouraged greater attention to the region and, along with political challenges in Europe – especially the then-Yugoslavia – Ottawa focused its

Credit: Matthew5000, Wikimedia Commons

Perhaps few signs are more clear of Asia's increasing importance to Canada than the signs at Vancouver International Airport where Chinese shares equal space with Canada's official languages and other Indo-Pacific region languages rotate through the digital screen on the right.

Credit: Timothy Choi

*The Five Eyes community will become ever more important to Canada's role in the Indo-Pacific. Here, HMNZS **Te Kaha**, one of New Zealand's two frigates, is seen October 2018 receiving its midlife upgrade at Esquimalt, BC, by Lockheed Martin Canada.*

attention elsewhere than Asia. After 9/11, the US 'global war on terror' and Canada's participation in the war in Afghanistan both served to reinforce the natural indifference in Ottawa toward Asia. The irony is that this was the very time that China in particular began its stellar economic growth. This growth, however, coincided with the Stephen Harper government which was deeply antithetical to China. Bit by bit, Russia also began to resurrect, which raised arguments to revitalize the North Atlantic Treaty Organization (NATO) and renew Canadian commitments in the Atlantic

With the 2008-2009 global economic meltdown, which created profound economic turbulence, the view grew that Canada needed to diversify away from its traditional areas (trade with the United States was about 87 per cent of Canada's total at the time) to reduce vulnerability. On the one hand, there was a powerful impetus to diversify, but on the other, there were major distractions (Afghanistan, NATO obligations), and we entered what I call the Potemkin era, when Canada was superficially dedicated to Asia, but this rhetorical dedication was not supported by material resources. At the same time, the navy, one of Canada's principal agents of influence in Asia, was laying the groundwork for the mid-life refit of the frigates, which meant that the RCN was unable to engage in Asia to the extent that it would have wished.

The Harper government eventually awoke to the importance of Asia and China, but this was not a sustained offensive, and what interest was shown in Asia was mainly exhibited by the business community. At the same time, slowly and steadily, the 'Asianization' of key urban areas – Toronto, Vancouver, Ottawa and Calgary – began to change the provincial and federal political landscape. In broader terms, western Canada exerted a greater influence in the national electoral process, so the importance of Asia became more difficult to ignore at the domestic level, never mind the international level. I would argue, parenthetically, that it is part of the Canadian DNA to be all things to all people, and Canada has had real trouble prioritizing where to place its attention and effort.

How do you think the Royal Canadian Navy sees the Indo-Pacific region?

There's a new generation of naval leadership attuned to the importance of defence and security in what's currently called the Indo-Pacific region. The profound change of tone in China since 2012 argues powerfully for yet more attention to the regional security dynamic. In the post-Afghanistan, post-mid-life refit era, the RCN has committed itself to a more robust engagement program in the region. This is, of course, easier said than done given the distances involved and the long line of requests for the RCN's services, from NATO to the Caribbean, which take the RCN's limited assets to the ends of the world. We are seeing a greater receptivity from the US Navy (USN) to work with allies, and greater willingness from the Japanese to engage with the RCN and Royal Australian Navy. At the same time, there are mounting anxieties about China's end game in the South China Sea and its Belt and Road Initiative, including the emergence of proto-naval ports in Asia.

Changes in Asia have been so profound that – my work notwithstanding – senior leadership would have been forced inevitably to pay more attention to the region. In the 1990s, the USN invited Canada first to supplement – then outright replace – USN vessels in carrier battle groups. This was the period when the USN was strongly advancing the 1,000-ship construct; when the Americans came to the major realization that they couldn't adequately address the complex array of modern maritime security all alone, and encouraged Canada to participate more. Canada has received massive returns in its close

Credit: Timothy Choi

The biennial Maritime Security Challenges (MSC) conferences in Victoria, BC, have become world-renown. Here, naval theorist and MSC regular attendee Dr. Geoffrey Till (left) speaks with Dr. Boutilier in the closing panel of MSC 2018.

cooperation with the USN, from access to missile data, to mid-ocean refueling, to access to invaluable intelligence.

What needs to be done going forward to improve Canada's participation in the Indo-Pacific region?

Ottawa has failed abjectly to understand the new security dynamic and to articulate clear foreign policy statements which adequately capture new realities. For example, as Jonathan Manthorpe notes in his book, *Claws of the Panda*, China has become more predatory and problematic. What does this mean for Canada and its security commitments? What should Canada's position be if there were to be hostilities toward Taiwan from the mainland?

Chinese influence operations in Canada and in like-minded countries like Australia and New Zealand have served as a wake-up call. Now, more than ever, Canada should increase cooperation, starting with the Five Eyes community (Australia, Canada, New Zealand, the UK and the United States), and including others such as France, Japan and South Korea. To be fair, China has legitimate great power ambitions, but its behaviour is deeply disturbing, and its values are clearly antithetical to Canadian values. China isn't necessarily keen to start a war, but it will achieve its objectives by other means. Russian President Vladimir Putin and Chinese President Xi Jinping have operated from the same playbook in the Crimea and the South China Sea, and Canada needs to give more thought to its position in the face of these provocations. Canada should be alert to these challenges, as the West either hangs together or hangs separately.

What would you list as among your greatest career accomplishments?

I have had the great pleasure to provide advice on Asian security dynamics to several Ministers and Deputy Ministers of National Defence, including Minister Harjit Sajjan, at the Shangri-La Dialogue annual Defence Ministers' Summit in Singapore, over the years. I have also had the pleasure of sailing in many MARPAC ships during their Asian deployments. This gave me the opportunity to brief ships' companies, and host academic roundtables between Canadian officials and local security experts on board those ships while in port.

The Maritime Security Challenges conference series is one way I have attempted to generate greater awareness of Asia and encourage key regional actors to come to Canada. Over the decades, I've established a reputation in Asia that has worked to Canada's advantage, as Asia is a part of the world where age, status and reputation still matter a great deal. I've had the good fortune of getting to know a great many decision-makers, and I hope that this has reinforced in their minds an appreciation of Canada's commitment to Asia.

Dollars and Sense:

Slightly Delinquent: Canadian Defence Burden Sharing

Dave Perry

Is 'slightly delinquent' in President Donald Trump's eyes when it comes to burden sharing a good thing, or a bad thing? That was his comment at the December 2019 NATO head of state meeting about how much of the defence burden Canada shares. While this was overshadowed by Prime Minister Justin Trudeau's later 'hot mic' gossiping about the President that resulted in Trump referring to Trudeau as two-faced, the burden-sharing question had already surfaced, with Trump calling other allies falling short of NATO spending targets delinquent.

The 70th anniversary celebration of the NATO alliance in London in December was always going to place Canada in a tricky position. At the previous NATO head of state meeting, NATO's burden-sharing arrangements had come under significant scrutiny from Trump, so whoever won the 2019 Canadian election could have expected once again to face scrutiny about how much of the collective defence tab Canada picks up. For years Canada (and many other allies) have fallen well short of the spending targets agreed to at the 2014 NATO summit in Wales. At this meeting allies committed to stop their declines in spending and spend 2% of Gross Domestic Product (GDP) on defence, and to spend 20% of this on equipment acquisition and related research and development by 2024.

To be sure, the burden-sharing commitments are more nuanced than this, as these 'cash' targets were only one of the three Cs – the other two were capability and commitments. In other words, allies, and certainly this is the Canadian version of events, did not just make a commitment to spend, they agreed to a set of spending targets that had couched language about the "aim to move towards the 2% guideline"[1] by 2024, but this went hand in glove with commitments to generate and use military capability in support of alliance objectives. Canada has for years argued that in both capabilities and commitments, it measures up favourably alliance-wide. The dollars Canada does spend, Canadian officials argue, go to meaningful military capability and Canada has a strong track record of using it to conduct alliance operations and exercises. Canada, it is often noted, has participated in every NATO exercise and operation and, beyond that, it has been a heavy lifter in places like Libya and Afghanistan.

However valid, these arguments have historically only carried Canada so far, particularly with the United States which looks at Canada's defence contributions in a North American context, in addition to the wider NATO commitments. While the Americans undoubtedly care about Canada's capabilities and the contributions it makes with them, they also care about the cash. This was brought into stark relief with the news that in the fall of 2019 the Trump administration had issued a pointed formal démarche, or diplomatic note, to Canada reportedly highlighting the burden-sharing issue and spending specifically.[2]

So where does Canada stand in spending terms, and is it carrying an adequate share of the burden? Just ahead of the London gathering, NATO released updated spending statistics. Interestingly, during the media session between President Trump and Prime Minister Trudeau, neither Trudeau, nor the senior Canadian officials next to him, appear to have checked these publicly available statistics. When Trump put Trudeau on the spot and asked him 'what's your number?' Trudeau flubbed the answer, and then was provided with an incorrect one by the Canadian officials with him.

The official NATO statistic show that Canada remains at the back of the NATO pack on both of the alliance's formal

Table 2: Defence expenditure

Million US dollars

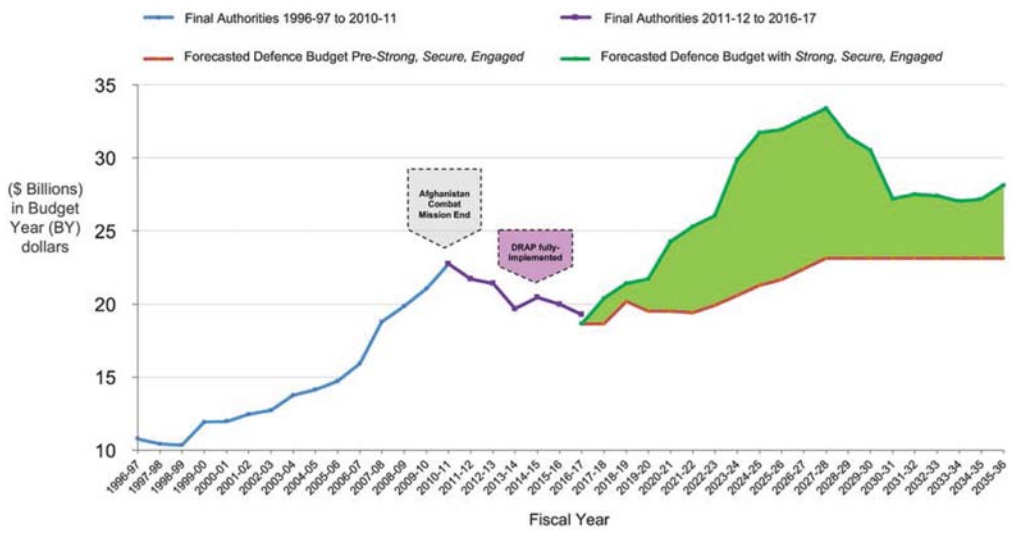
	2013	2014	2015	2016	2017	2018	2019e
United States	680,856	653,942	641,253	656,059	642,936	672,255	730,149
United Kingdom	62,258	65,658	59,492	56,154	55,672	60,308	60,761
Germany	45,931	46,102	39,813	41,590	45,374	49,725	54,751
France	52,316	51,940	43,474	44,191	46,036	50,459	50,729
Italy	26,658	24,448	19,566	22,373	23,852	25,004	24,482
Canada	18,221	18,150	18,685	17,711	23,704	22,400	22,485
Turkey	14,427	13,583	11,957	12,649	12,972	14,145	13,919
Spain	12,607	12,614	11,090	9,971	11,864	13,187	13,156
Netherlands	10,226	10,332	8,668	9,108	9,622	11,162	12,478
Poland	9,007	10,104	10,596	9,405	9,938	11,857	11,902

Credit: NATO, with data sorted by Timothy Choi

In absolute terms, Canada's defence spending within NATO is fairly high, ranking 6th in the 2019 dataset from NATO. (Note that this table shows only the top 10 of the NATO members.)

spending metrics. On overall spending, the share of GDP going to defence is estimated to be 1.31% for 2019. This is the same share as 2018, although actually lower than two years ago, when a one-time pension adjustment pushed the share of GDP above 1.4%. On the equipment spending side, Canada is at 13.1%, slightly above where it had been the year prior. On each measure, Canada falls in the lower third of the alliance, falling at 20th of 29 allies on overall share of spending devoted to defence and 24th on the share of that going to equipment. Interestingly, on the overall spending measure Canada is actually doing well when compared to *Strong, Secure, Engaged* (*SSE*) which had shown a smaller share of GDP going to defence spending in 2019 – 1.22%. On the equipment share, the reverse is true, as the spending on equipment was supposed to have reached 16.8%. At the same time, it should be noted that in absolute dollars, Canada compares favourably, ranking 6th in the alliance in absolute spending, which clearly shows that the unfavourable ranking as a share of GDP is in part the result of a strong economy.

Figure 2: Actual and Forecasted Defense Budget (Cash Basis)



Credit: Government of Canada

Although Canada's defence spending is expected to rise for the next several years, it will peak and level off as major procurement programs reach a steady state as shown in this graph in Strong, Secure, Engaged.

A notable feature of the forecasted spending figures in *SSE* which outlines expected shares of GDP going to defence, is that they stop in 2024 when the share of GDP was supposed to reach 1.4% – presumably because that was the time target for the Wales summit. The policy, however, projected spending forward for a number of years, and the graphical depiction clearly indicates that spending under *SSE* is forecast to peak in 2027/2028 after which it is intended to decline over five years before remaining relatively unchanged over time. As the graphics were presented without any inflation adjustment, this indicates that Canada is forecasted to experience a significant decline in spending as a share of GDP, assuming the economy grows beyond 2027/2028.

If we look through the other financial data in Canada's published defence policy, we can see that the spending spike culminating in 2027/2028 is driven by spending on capital equipment projects. That spending has lagged behind the forecast outlined in the policy, however, as noted above. The Department of National Defence has to this point been spending roughly two-thirds as much as intended on this aspect of the budget. Of the projects itemized in the Defence Capabilities Blueprint, 70% are showing a delay of one year or more in their major milestones, which is the case even for those projects that have had a major milestone achieved within the last year. In other words, 70% of projects are delayed, even those that are making progress. The probable reality of spending associated with *SSE* is that the rate at which spending increases will start to lag, flattening out the spike in spending that was predicted, and stretching it out over more years. That matters in the burden-sharing context because the part of Trudeau's response to the 'what's your number?' question he did deliver accurately was that "we like to talk about a 70% increase in spending." Until such time as equipment spending gets moving as intended, that total increase is in peril.

How much this matters is tough to say. There was certainly much evidence leading up to London to show that Canada was going to face increasing pressure on this issue. But being judged 'slightly delinquent' is likely a win for the government that may have expected a worse verdict. It is safe to say the Americans will remain attentive to this issue, so a Canadian government concerned with managing this aspect of Canada-US relations should be paying careful attention to the implementation of the procurement projects laid out in *Strong, Secure, Engaged*.

Notes

1. NATO, "Wales Summit Declaration," 4 September 2014, available at https://www.nato.int/cps/en/natohq/official_texts_112964.htm.
2. Mercedes Stephenson and Kerri Breen, "U.S. Sent 'Blunt' Letter to Canada Criticizing Defence Spending: Sources," Global News.ca, 24 November 2019.

Dave Perry is Vice-President and Senior Analyst with the Canadian Global Affairs Institute and host of its Defence Deconstructed podcast.

Warship Developments: Snippets

Doug Thomas

US Navy: Multi-Year and Block-Buy Contracts

The Pentagon is attempting to reduce costs in major naval programs through multi-year and block-buy contracts. One example is a contract for two *Ford*-class aircraft carriers from Newport News Shipbuilding, the sole US aircraft-carrier builder, which is expected to save $4 billion. Another example is an order to block-buy nine *Virginia*-class general purpose attack submarines (SSNs) from the two yards capable of constructing nuclear-powered submarines. The submarine contracts will permit the procurement of long-lead parts, recruitment and training of shipyard workers, and investment in facilities to achieve efficiencies in construction.

In a letter on 31 December 2018 the Pentagon formally informed Congress about the block-buy of the two *Ford*-class aircraft carriers. US Senator Tim Kaine, a member of the Senate Armed Services Committee, welcomed the announcement. As he said, "[t]his smart move will save taxpayer dollars and help ensure the shipyards can maintain a skilled workforce to get the job done. Newport News builds the finest carriers in the world, and I know they are ready to handle this increase in work as we make progress toward the Navy's goal of a 355-ship fleet."[1]

The two-ship buy is a contracting strategy the US Navy used in the 1980s to procure the 10 *Nimitz*-class aircraft carriers. The strategy achieved acquisition cost savings compared to contracting for the ships individually. It is understood that the cost of the first *Ford*-class carrier, USS *Gerald R. Ford*, will be in the order of $15 billion – the most expensive single warship ever built. Part of this cost involves research and development applicable to all ships of this type. The research and development costs are substantial as the *Ford*-class aircraft carriers are the first new US Navy aircraft carrier class in more than 40 years, and incorporate much new technology. The *Ford*-class will begin the phased replacement of *Nimitz*-class carriers. With a length of 1,100 foot (335 metres) and displacing 100,000 tons, the *Ford*-class features a new nuclear power plant, a redesigned island, electromagnetic catapults, improved weapons movement, and an enhanced flight deck capable of increased aircraft sortie rates. In addition, the carriers will be operated by a considerably reduced ship's company compared to the *Nimitz*-class. USS *Gerald R. Ford* is scheduled to achieve operational capability in 2020.

USN Bridge Watch-Stander Professionalism

In a previous issue of *CNR* (Volume 14, No. 3), I described two major incidents involving two US Navy guided-missile destroyers (DDGs) in the US Pacific Fleet during 2017. A total of 17 sailors died, and hundreds of millions of dollars of damage resulted from collisions with merchant vessels by the two *Arleigh Burke*-class destroyers. In the same article, I also described the strange incident of the Norwegian frigate KNM *Helge Ingstad* colliding with a tanker which occurred in home waters in late 2018. (*Helge Ingstad* has since been written-off, as a total constructive loss. It has been judged that it would cost more to repair this modern frigate than it would to order a new ship![2])

In these incidents there were a number of contributing factors, however a common thread was poor knowledge on the part of bridge watch-standers of the basics. In this I would include the international rules of the road for preventing collisions at sea, ship-handling and navigation,

Credit: MC3 Connor Loessin, US Navy

USS ***Gerald R. Ford*** *(CVN 78) conducts high-speed turns in the Atlantic on 29 October 2019 after a 15-month post-shakedown availability.*

Credit: General Dynamics Electric Boat

*The **Virginia**-class submarine PCU **Illinois** (SSN 786) rolls out of the construction hall at General Dynamics Electric Boat in Groton, Connecticut, 24 July 2015.*

and confusion and lack of knowledge about what to do in extremis, i.e., in the final moments prior to these collisions.

One year after the American collisions, the USN held a snap assessment of 164 surface warfare officers qualified to be Officer of the Deck (equivalent to Officer of the Watch in Commonwealth navies). They were given a written exam and a practical rules of the road assessment. In the aftermath of the assessment, Commander of Naval Surface Forces Vice-Admiral Richard Brown wrote "Of the 164 officers assessed, only 27 Completed with No Concerns, 108 Completed with Some Concerns, and 29 had Significant Concerns."[3]

In August 2019 the National Transportation Safety Board (NTSB) released a report of the collision between the destroyer USS *John S. McCain* and a Liberian-flagged tanker near Singapore in August 2017.[4] The NTSB report identified a number of safety issues, including the training of navy bridge watch-standers, watch-stander fatigue, faulty/inadequate procedures for transfer of steering, and lack of VHF radio communications between the two vessels leading up to the collision.

Credit: MC2 Joshua Fulton, US Navy

*USS **John S. McCain** enters Singapore following its collision with the merchant ship **Alnic MC**, which tore the 28-foot gap in the hull visible here and resulted in the deaths of 10 US Navy sailors.*

The bottom line is that there were serious issues related to training and employment of bridge personnel and a lack of professionalism by surface warfare officers on the bridges of these two USN destroyers in 2017. Senior officers were relieved of their commands for not providing oversight, and ship commanding officers and key personnel were court-martialed or otherwise punished.

There is much to be learned from these incidents. The deficiencies were not unique to a few unlucky vessels, and I understand that corrective action is being implemented throughout the US Navy. There were serious issues in the case of the Norwegian frigate as well: I do not believe that the investigation is complete, but my understanding is that the command team, and officers on watch at the time of the collision, have much to answer for. Other navies would do well to examine their training of watch-standers.

To conclude: neglect the basics at your peril!

Notes

1. Quoted in "U.S. Navy Pursuing Block Buy of Two Aircraft Carriers - Senator," Reuters, 31 December 2018, available at https://finance.yahoo.com/news/u-navy-pursuing-block-buy-001732784.html.
2. "Norwegian Frigate Helge Ingstad Update," *Navy Matters*, 28 June 2019, available at https://navy-matters.blogspot.com/2019/06/norwegian-frigate-helga-ingstad-update.html.
3. Quoted in "US Navy Finds Most Officers Struggle with Basic Sailing," *Sputnik*, 6 June 2018.
4. National Transportation Safety Board, "Marine Accident Report: Collision between US Navy Destroyer John S. McCain and Tanker Alnic MC Singapore Strait, 5 Miles Northeast of Horsburgh Lighthouse August 21, 2017," 2019, available at https://assets.documentcloud.org/documents/6243999/MAR1901.pdf.

Book Reviews

China's Quest for Great Power Status, by Bernard D. Cole, Annapolis, Maryland: Naval Institute Press, 2016, 320 pages, ISBN 978-1-61251-838-1

Reviewed by Chris Buckham

That China has become a major player on the international stage due its massive population and economic power is without question. However, the role of the development of the Chinese armed forces, specifically the navy, in both the attainment and maintenance of the security of its economy is a very complicated and intricate one. In *China's Quest for Great Power Status*, Bernard Cole has approached this question through an in-depth analysis of the dependence the elements of this triumvirate – armed forces, economy and security – have on the others to maintain their strength. The elephant in the room for China is the effect that this has had on its relationships with the international community. Cole has looped this in as an over-arching influence and looks at the potential impacts as China seeks both to increase its influence and protect its core requirements.

The author has conclusively shown that despite language to the contrary, China's maritime policy diverges clearly in many respects from the accepted protocols of the international community. Areas such as maritime security zones and exclusion zones established in Chinese domestic laws are not in keeping with the international community. This theme is consistent throughout the book as China looks to extend its influence and authority further into the international realm.

Cole has presented an excellent evaluation of the metamorphosis of Chinese naval doctrine and policy in keeping with the emergence of China on to the international stage. The expansion of the People's Liberation Army (Navy) (PLAN), at the expense of the People's Liberation Army, is a key enabler as well as facilitator of this expansion. It is clear that Chinese naval protocols follow a policy of 'active defence' which translates into one of proactive engagement should certain thresholds be crossed. Additionally, the Chinese are taking a long view of their maritime development. As Cole relates, each step in the expansion of maritime capability relates to a corresponding change in the domestic and international perspective of the Chinese government and vice versa.

Maintenance of Chinese Communist Party control of the country remains the bedrock of all policy-making decisions. Cole's evaluation of the Chinese economy and the factors driving it point clearly to a government that understands that it requires steady and sustained growth to accommodate not only its population but also to expand those defence elements (i.e., navy) that protect the access to markets and resources that sustain the growth. As Cole succinctly points out, China finds itself in a conundrum of its own making in that its expansionist tendencies and aggressive nautical claims, while serving to 'feed the beast' of China's economy, often occur at the expense of relations with neighbours both regional and further afield. Cole clearly outlines how China views the world through a very unique lens based upon a paradigm of 'us and them.' This forms the foundation of China's approach to both foreign and domestic policy and has significant ramifications internationally, as Cole rightly discusses.

This is a very interesting book for those seeking a concise, clear and readable initial analysis of China's efforts to attain both great power status internationally and security for its domestic priorities. Cole has done a commendable job of explaining China's complex approach in a comprehensive way that provides clarity without sacrificing context and depth.

Credit: Timothy Choi

*Danish patrol ships HDMS **Hvidbjørnen** (left) and HDMS **Lauge Koch** dock at Nuuk, Greenland, 27 May 2019.*

2020 CANADIAN NAVAL MEMORIAL TRUST

Essay Competition

Canadian Naval Review will be holding its annual essay competition again in 2020. 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 2020 *CNR* essay competition must be received at cnrcoord@icloud.com by Wednesday, **30 September 2020**.
- Submissions are not to exceed 3,000 words (excluding references). Longer submissions will be penalized in the adjudication process.
- Submissions cannot have been published elsewhere.
- All submissions must be in electronic format and any accompanying photographs, images, or other graphics and tables must also be included as a separate file.

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

Naval Captain Bill Wilson Scholarship

The Naval Association of Canada - Calgary Branch is pleased to announce the Naval Captain Bill Wilson Scholarship. The scholarship is designed to encourage academic study of matters relating to maritime security and defence. It will be awarded for the first time in 2020.

The $5,000 scholarship is available to a Canadian student who is applying to, or is enrolled in, a Masters program in military and strategic studies for the academic year 2020-2021.

For information on how to apply, contact Jeff Gilmour at **jeffgilmour@telus.net**.

Battle of the Atlantic Gala

Every spring we remember the Battle of the Atlantic, the longest continuous military campaign in the Second World War.

Save the date. On **Thursday, 30 April 2020**, the Naval Association of Canada will host the Battle of the Atlantic Gala Dinner. It will be held in Ottawa at the Canadian War Museum. On Friday, 1 May, NAC will hold a national conference.

For information about the gala and the conference, see the NAC website (https://**www.navalassoc.ca**).

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HMAS ***Choules*** looms in the smoky haze off Mallacoota, Victoria, while evacuating civilians from the threat of the southeast Australian bushfires, 2 January 2020.

Credit: POIS Helen Frank, Commonwealth of Australia