CANADIAN NAVAL REVIEW

VOLUME 16, NUMBER 2 (2020)

For Want of a Nail, the Kingdom was Lost

Foreshadowing Humanitarian Tasks for the Royal Canadian Navy

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Today's Policy Questions, Tomorrow's Policy Leaders

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Canadian Naval Review is published by the Brian Mulroney Institute of Government at St. Francis Xavier University. It is a professional journal examining a wide range of maritime security issues from a Canadian perspective. In particular it focuses on strategic concepts, policies, operations, history and procurement of the Canadian Navy, plus national security in general and marine/ocean affairs. This initiative brings together members of the Canadian defence and academic communities.

Canadian Naval Review has three primary objectives:

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

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Credit: MS Dan Bard, Canadian Forces Combat Camera

*A pair of CH-148 Cyclone helicopters fly alongside HMCS **Winnipeg** as seen from HMCS **Regina** as they bid a socially-distanced farewell to friends and family on the Victoria shoreline before heading to RIMPAC exercises on 6 August 2020.*

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Is it Time for a New Concept of Canadian Seapower?

Canada is heading into a new, dangerous and rapidly transforming geopolitical maritime environment. Now is the time for rethinking what constitutes Canadian seapower and how it will be used to defend Canadian national security. New weapon technologies are being developed, and in some cases are already being tested, that will rewrite how maritime battles will be fought and won in the future. But even more significantly, the existing geopolitical framework is entering a state of flux with serious ramifications for Canada. Historically, Canadian leaders have protected Canadian maritime security by tying Canada to the strongest maritime power. First it was the British and now it is the Americans. Therefore, existing concepts of Canadian seapower have been straightforward – develop a navy that can fight alongside the biggest and strongest navy in a specialized role. These were hard roles but ones that did not require considerable independent thought. Once the specific role was picked, the challenge was learning and maintaining the ability to engage in the task, no further strategic thought was required. However, this will soon change.

Canada is in the process of rebuilding its navy – it is building or preparing to build replacements for its frigates, destroyers and replenishment vessels. In addition, for the first time since the 1950s, a class of patrol vessels for the Arctic is being added to the fleet. This is one of the most substantial procurement policies for the Royal Canadian Navy (RCN) since the end of the Second World War. Questions arise, such as how will this new fleet defend Canadian security into the 2060s, and when will the fleet need to be replaced? It is highly likely that the ships will not simply follow the roles of their predecessors. Rather they need to be prepared for new roles based on different concepts of Canadian seapower that need to be much more independent and fluid than they have been in the past. Canada will need a navy that can fight alone and for more specific Canadian objectives and less for allied objectives.

There are at least five new types of technologies that require a rethink of how navies respond to threats, including: hypersonic long-range missiles; underwater autonomous systems; Artificial Intelligence; cyber warfare; and directed energy weapons. While space limitation precludes a detailed consideration of the impacts of these new technologies, it is possible to offer some observations. The naval battlefield of the next 40 years is one in which the speed and range of conflict will be greatly enhanced. An attack by an enemy armed with long-range, manoeuverable hypersonic weapons will threaten to overwhelm most existing defensive systems. If such an attack were to occur at the same time that the same naval units were also attacked by underwater autonomous vehicles, the complexity of the defensive response is apparent. The development of Artificial Intelligence systems also suggests that it will become increasingly possible for a future enemy to launch a coordinated attack that will be beyond the ability of existing defensive systems to counter. Going into the future, Canadian naval vessels will need to be able to defend and fight at a much higher rate of action or have the means to avoid conflict in the first place.

Complicating this, Canada does not have the ability to develop its own national responses to these technological threats and will continue to depend on its allies for the technical means to respond. But unlike in past years when Canada made some contributions to new technologies, it will increasingly become a consumer of the defensive capabilities necessary to exist in a hostile maritime environment. This requires Canada to remain closely allied with the major maritime powers.

There are four developing geopolitical trends that could change this requirement: worsening relations with the United States; disintegrating relations with European NATO allies; stagnant or deteriorating relations with like-minded Asian states; and challenges from new or renewed enemies. These trends may require fundamental rethinking of how Canada uses seapower to protect its national interests in the coming decades.

Credit: Lockheed Martin

A hypersonic weapon is fired from a B-52 bomber in this August 2020 graphic from Lockheed Martin. New technologies and potential shifts in geopolitical concerns require Canada to rethink how and for what purpose its seapower is employed.

*A sailor stands watch while HMCS **Fredericton** transits the Bosphorus Strait in Istanbul during **Operation Reassurance** 4 March 2015. Turkey's foreign policy has come under increasing criticism from other NATO members in recent years, calling into question its future position in the alliance.*

Since the Second World War, Canada's relationship with the United States has been the core means to defend Canadian security. Canadian concepts of seapower are tied to those of the United States with Canada as a junior partner. What happens if the United States does not want or does not value that relationship in the future? The way the administration of Donald Trump has acted is a disturbing reminder that it is dangerous for Canadians to assume that the relationship will always be without fundamental challenge. It is possible that Trump is an anomaly and that once he is gone from office, relations between Canada and the United States will return to normal. However, it is also possible that he has unleashed forces that will change the relationship with Canada. The special relationship may not be so special. This could mean that Canada's ability to integrate so closely with the United States in terms of maritime security is lost. This would require that Canada develop an ability to act on its own when the United States will not stand with it.

It is also clear that unfriendly outside forces are learning to attack the solidarity of the Western alliance system through social media and other new tools. Significant divisions are developing and many suspect that these forces – probably led by Russia and China – will intensify their efforts to sow discord. Social media has already played a key role in dividing the UK from the European Union. Can Turkey and Hungary's continued participation in NATO be counted upon? What about other members? What does Canada need in terms of naval power to protect its maritime relations and trade with Europe (and the UK) if the NATO alliance is reduced or lost?

Canada's relationships with like-minded Asian states, such as Australia, Japan, South Korea and India, is equally confounding going into the future with major impacts for the RCN. Canadian policy-makers continually dismiss Asian initiatives to contain China and seem unable to build strategic relations with Japan, India and Australia. As China's power grows, these states are now developing new relations amongst themselves and redeveloping their own naval capabilities. Canada has always had a desire to develop its capabilities in the Pacific region but its continuing inability to work strategically with these countries will keep it isolated in the region. As China grows more powerful, what will Canada need to do with these like-minded states to protect its interests and security? This will involve Canadian seapower but the question is what will it look like, and how can it be done?

Finally, Canada has enjoyed a period of peace and stability since the end of the Cold War in which it could pick conflicts that it wanted to join, and always did so in concert with others. The geopolitical reality was that Canada did not face any direct threat. This is now changing. As Russia has rebuilt its strength, it has also become increasingly assertive against Western interests. This can be seen in an increase in naval activity and challenges to Western naval actions. But even more challenging is the development of China as a near-peer competitor to the United States. China now has the second largest navy in the world in terms of offensive power (some have said it has the largest navy, depending on how and what you count). It has amazed most observers with the speed of its naval procurements as well as its determination to become a naval power of the highest rank, willing to use its power to defend its interests – a fact of which Canada has increasingly been made aware in recent times.

Ultimately the combination of a new fleet, a new maritime weapon environment and a new geopolitical reality means that Canada needs to think about how it will use the navy in the coming years. The question is how does Canada prepare to use the navy that it is now starting to build? It cannot continue as it has in the past. It will face revolutionary changes to both weapon technologies and Canada's position in the world. Does Canada retreat to do nothing and hope no one notices, or does it start to prepare for a future in which the possibility of conflict with China and/or Russia increases at a time when Canada's relations with its allies and friends are uncertain? Now is the time to start thinking about what the future of Canadian seapower will look like. It must be a future in which Canadian seapower is more independent but robust and ready to meet the challenges of the next 40 years.

Rob Huebert

For Want of a Nail, the Kingdom was Lost[1]

Vice-Admiral (Ret'd) Sir Jeremy Blackham

Credit: Corporal Jerome Lessard, IMAGERY SCT-OPTIC/ Canadian Armed Forces

A Royal Canadian Air Force member moves pallets of COVID-19 response supplies to/from a CC-177 Globemaster transport aircraft during ***Operation Globe 2020*** *in Panama, 25 July 2020.*

This article deals with aspects of readiness for crisis – any crisis. It will focus on the United Kingdom, but the discussion has broad applications. I believe COVID-19 is a wake-up call for all governments. A global pandemic was No. 2 on the UK's national risk register at the time of the COVID-19 outbreak and so one might have expected preparations to be particularly well advanced. They clearly were not. Since my experience lies within the defence and security field, the article focuses on that sector, but the principles and problems identified are applicable to a greater or lesser extent to other forms of public business.

I have previously written on the dangers of basing strategy and political actions on a misunderstanding of the real, as opposed to the theoretical, capability of military and security capabilities. In this article I want to take that discussion a little further.[2]

During the Cold War the UK used to conduct an annual NATO-wide exercise known alternately as Wintex and Hilex. These exercises, which required fairly full permanent manning of war headquarters, ran 24/7 over a period of two or three weeks. They incorporated a scenario which started with an increasingly dangerous period of tension between NATO and the Warsaw Pact, leading to conventional war and then escalating through tactical nuclear use up to the point of the release of nuclear-armed ballistic missiles. Headquarters were exercised in mobilizing reserve or lower readiness units, deploying them to operational deployment positions, testing communications and logistic support, taking control of industry, calling up reserve personnel and so on, testing all the procedural elements of such activity. Players took the roles of senior political figures for the purpose of seeking political approval of all these measures, and the real holders of senior military command posts played their own roles, insofar as their real day-to-day operational commitments permitted.

Having participated in several of these exercises, I realise that what we never tested was the actual reality of such measures. Did the people we called up actually exist? Did we have on our shelves the additional stores, munitions,

etc., that we were enthusiastically supplying to the front lines? Were the lower readiness units we were bringing forward actually manned and did we know where the personnel required were? Did we really have the stockpiles we were using? Was industry actually in a position to supply the additional requirements we were deploying? And so on. It quickly became clear to me that the answer in almost every case was NO. We were playing a game of fantasy and then feeling that we had shown that we were ready for war.

When I was Assistant Chief of Naval Staff (ACNS) in the mid-1990s,[3] I decided to run a Royal Navy (RN) only exercise, called Regeneration, to be played over a longer period, which was based on a similar scenario to that of Wintex. The difference was that this time when personnel were mobilized, they had to be named; we had to know where they were and whether they were fit. When extra stores or munitions were required, someone had to go to the appropriate depot and actually see them, or have a date by which industry could supply them. Units brought forward had to be seen to be in a fit operational state, or a plan to achieve higher readiness actually agreed and the capacity to do so demonstrated. I could go on. The exercise proved to be so difficult that we had to terminate it early. Readers will not be surprised to learn that the answers were, to say the least, scary.

Even so, there were still things we did not test. What, for example, would happen if the supply lines, which were increasingly global in nature and operated on a 'just-enough/just-in-time' basis, were interrupted by events related to the crisis? What would be the effect of a decision not to stockpile key items but rather to surge production or purchase all of a sudden in the midst of a vast increase in demand from several countries simultaneously? What would happen if states on which we depended for materials decided to give priority to their own needs, and we had no indigenous source of manufacture or supply? What would happen if the states which had become our principal suppliers turned out to be on the other side in a crisis?

You will immediately recognise some of what happened in the UK and elsewhere during the COVID-19 pandemic, especially in respect of personal protective equipment (PPE), even when the vast majority of states were on the same side. In 2016 the National Health Service (NHS) was subjected to a stress test to assess its readiness to deal with a global pandemic. To what extent were things in the UK made worse during the pandemic crisis by the fact that this exercise was conducted? Conducting this stress test was assumed by the establishment – and, to be fair, by the World Health Organization (WHO) – as proof that we were well prepared but in fact the exercise highlighted

Credit: Cpl Mark Schombs 4 CDSB Garrison Petawawa Imaging

Members of 1 Canadian Field Hospital set up flooring for the Mobile Expandable Container Configuration during Exercise Collaborative Canuk at Canadian Forces Base Kingston on 9 September 2015.

some serious shortcomings. Despite finding some major gaps, no investment to plug them appears to have been made. The report and its recommendations were neither published nor actioned.

As we can see from this example of the NHS, the problem is not confined to the Ministry of Defence. It may well be government-wide. In 2001 a serious outbreak of Foot and Mouth disease in cattle caught the Agricultural ministry napping. I had good reason to know that no adequate plan existed, and the army had to be brought in to sort out the logistics, while the disease continued to spread.

The growth of globalization, whilst bringing hugely increased wealth to many states and individuals, has meant we increasingly rely on 'someone else' to make the required products more cheaply. A global supply chain has

been created, fine-tuned to the just-enough/just-in-time philosophy, which allows companies to avoid investment in stock holding and to acquire one day's worth of consumption every day whilst taking advantage of lower wages in other parts of the globe, and allowing their own indigenous industries to collapse. The desire for profit for some has trumped the assessment of risk for all. Private greed may have trumped national interest; and at times this wealth was used to persuade political parties to accept this paradigm.

But there were always warnings. The blockade in 2000 of oil refineries in UK by striking tanker drivers, operating a fleet of tankers precisely sized to just-enough/just-in-time dimensions, almost brought the country to its knees. The just-in-time strategy collapsed rapidly under this kind of pressure. The threat of even temporary closure of the Strait of Hormuz would almost certainly lead to immediate petrol rationing as the UK knows from its experience during the Suez crisis of 1956. Yet the UK is proposing after Brexit to reduce its emergency fuel stocks to a level below the EU-directed levels. British policy of outsourcing offshore energy needs has led to several near misses in that during extreme conditions overseas companies will usually be bound to serve their own countries first. How much more difficult might it be to obtain supplies in a major security crisis?

It gets worse. Despite a brave attempt in 2006 by Lord Drayson, then Minister for Defence Procurement, to create a UK defence and security industrial strategy giving the country at least 'national industrial sovereignty' over some key capabilities, nothing has been done to ensure that this is so. Instead, the UK has increased its dependence on potential enemies for huge swathes of its information technology (IT) and related capabilities. This is an area which of course spreads far beyond immediate defence and security arrangements and has tentacles deep into the lives of almost all ordinary citizens. In this case, there is at least some reason to believe that the UK government has specifically decided to ignore the warnings it has received.[4]

The UK has also in many areas either abjured stockpiling strategic items or failed to replace them when they have become time expired on the assumption that surge production, or at least surge purchase, will be possible in a crisis. For that reason, we have in some areas allowed our home industry to collapse in pursuit of cheaper prices in other countries. But suppose that the crisis is an international or even a global crisis in which there is intense competition for the same supplies and those states that manufacture the item feel compelled first to meet their own needs before those of other customers. What then? Should we be thinking beyond simple cost issues in deciding what

Credit: Timothy Choi

Container cranes overlook Burrard Inlet in Vancouver on 3 September 2018. Despite the immense global infrastructure established to enable maritime trade, much of it is structured around the 'just-enough/just-in-time' mode of supply.

Credit: Niel Owen via Geograph.org.uk under CC BY-SA 2.0 license

Grass mounds cover fuel tanks at the defunct Flax Bourton underground fuel depot in this March 2014 photo. It was part of the UK's Government Pipelines and Storage System, built to store aviation and other fuels during the Cold War.

industry to retain? But, of course, any industry needs to be continuously fed with orders if it is to survive and this can be expensive.

And what happens if producers of major military components or weapons are allowed to stop production? In the case of the UK's T42 anti-air warfare (AAW) destroyers' main armament, Sea Dart, we purchase a stock of missiles calculated on the known annual expenditure of practice firings across the planned life of the ship class, and its numbers. But what if the weapon production line closes? In this case, the UK significantly extended the life of the T42-class destroyer in order to save costs by delaying its successor, the Type 45, thus increasing peacetime usage and allowing missiles to deteriorate beyond utility. As a result, the RN became unable to embark full outfits of weapons to operational ships. Fortunately, no crisis occurred which required the expenditure of a significant number of missiles; experience teaches us that weapon expenditure in conflict is always greater than anticipated.

One might compile a long list of examples, but much more important is the question of what to do about it, and how to break the current paradigm. Let me start with a theorem which I believe can be shown to be true by many examples. In general, prevention or preparation either to avert or to meet a crisis is cheaper in both blood and treasure than mounting huge efforts to deal with it after the crisis occurs. Losing large numbers of people or equipment or emerging from a crisis in poor shape is likely to bring highly disagreeable consequences. One of the key factors in deterrence is to understand that because an item is never used against the threat for which it is designed does not necessarily mean that you should not provide it since its provision may prevent, or ameliorate the event you wish to avoid. For example, nuclear deterrence rests absolutely on this principle, although in that particular instance there are other important factors to be considered. Simplistic criteria such as 'we haven't used this for 10 years, so we don't need it' will obviously not meet the circumstances of a global pandemic, or an unexpected conflict.[5]

The issue is not, however, simply whether we should or should not stockpile items. Should we, for example, preserve the ability to manufacture crucial items for ourselves rather than hope to be able to increase our imports of a particular item in a crisis? This leads to the question of which are the relevant items. Should we, where possible, maintain production lines in reserve so that they can be re-activated? Which production lines can be switched off and then switched on again *ad lib?* What is the opportunity cost of doing this and how do we select the relevant items? And when we, after due consideration, decide to use offshore suppliers, how should we choose them? Would sovereignty of manufacture ensure supplies but make them unaffordable? The question is rather would it increase the chances of a successful outcome in whatever military or security campaign was being waged, and is the cost justified by the price of failure?

None of these questions is easy to answer, but that cannot be a reason for shirking the responsibility. Here we enter the realm of strategy and of the estimation of strategic risk, and the premium we are prepared to pay to mitigate or obviate that risk. There are several categories of risk. There are those contingencies which, while very serious, do not appear very likely and moreover will by their nature take time to develop. They might be managed on the basis of taking a risk about the level of stockpiles required. Thus supporting industries with regular orders may not be necessary if, but only if, they can be obtained and brought into active service within the likely warning time. For example, some platforms and some already

developed technologies might be obtained in that time; others like a nuclear deterrent cannot and must therefore be maintained continuously.

Other contingencies may be less threatening but much more likely. For these, some capabilities may be regarded as required in any combat, and so need to be permanently maintained at some agreed level. And there will a range of contingencies in between these two extremes when judgements must be made between the likely warning time and the size of reserve stock to be held. You might have to accept supplies after operations were actually underway, or delay the operations. You might decide that you have other less important stores and reset your purchasing priorities, or rely on other states to assist you. This last clearly needs careful mutual coordination ahead of any operation.

Further obvious questions arise over manning, training, readiness, sourcing of items to be purchased, etc. To what extent, and at what level of training and availability, and above all at what notice, must the capacity to generate these resources, by definition in excess of the capabilities required for normal peacetime operations (if such a thing still exists), be maintained? It is, in this context worth recalling that in 1982, when the UK armed forces found themselves ordered to go to war against Argentina, the operation was able to get underway swiftly. This was because there was still, since it was taking place during the Cold War, a reserve of almost all the necessary resources which allowed a substantially augmented force to be put together quickly to deal with an unforeseen crisis. Even then the force had expended almost all its ammunition when the surrender came. Moreover, the UK had at that time the defence industry to commence replacing lost units and platforms more or less immediately. This is less the case today. The UK is now in a situation where any significant platform losses will leave it much more vulnerable for a considerable period after a conflict, even if it wins. But the Falklands experience is something of a red herring. What is relevant is whether we, or any state, could assemble and sustain a sufficient force fit to do what is necessary at very short notice in the event of a sudden and unforeseen crisis today. Your answer to that question will tell you a great deal.

I have listed examples of what I see as a challenging intellectual and management problem in a world which looks, post-COVID-19, likely to be even more unstable and potentially dangerous than before the pandemic. I must now try to pull these together.

Of course, there is no single universal answer to all this. I cannot answer the detailed questions for each individual country. It will depend on their national vision and ambition, their confidence in the reliability of any alliances or trade agreements they may have and their assessment of potentially hostile states. It will depend too on the strength of all the links in a supply chain of trained people, facilities, stores and spares, fighting equipment and munitions, fuel, food, etc., when each of those links may be under great pressure from the course of events, and some states in the chain have a different view of things. It will depend on the foresight of all those involved in the process both now and at the time of the crisis when it may be too late to address serious deficiencies.

Credit: Mass Communication Specialist 3rd Class Jonathan Clay, US Navy

*Three Iranian patrol craft, left, pass near the ocean surveillance ship USNS **Invincible**, right, as USS **Jason Dunham** provides escort through the Strait of Hormuz.*

Credit: CPT J. Scott Detweiler, US Army National Guard

A US Air Force airman manoeuvres a forklift through the Strategic National Stockpile Warehouse, 27 August 2020, in Colchester, Vermont, while supporting Vermont's COVID-19 control efforts.

There may, however, be certain common principles, not all of which are comfortable. If we have learned anything from the COVID-19 crisis, it is that preparation for foreseeable crises is essential, and *ad hoc* measures to repair the gaps after the crisis has broken are likely to be less effective, much more expensive, have widespread negative consequences and may create more human casualties. Democratic politicians must face the need to make difficult and unpopular decisions to invest in the deterrence or mitigation of potentially dangerous events. Deterrence and mitigation measures will need to rise in the order of public expenditure priorities. This almost certainly requires a domestic political consensus which many democratic countries find difficult to achieve. It will require some very plain and clear explanations of what is needed, and why, to deal with foreseeable contingencies. Here the COVID-19 experience just might help us.

The particular questions and, of course the particular answers, will necessarily vary from state to state, but here are some which are particularly relevant to defence and security:

- What is our national ambition and what therefore constitute our enduring interests?
- Are we prepared to defend those interests? Would we let them go if we judged the price too high?
- What should our defence and security posture be and at what readiness?
- Have we got the wherewithal to equip and train the ready security forces identified in the previous question?
- What additional forces might we need and at what readiness?
- Do we have stockpiles or reasonably assured supplies at least for all foreseeable operations at the appropriate readiness?
- What equipment is so critical that we judge it necessary to have our own manufacturing capability to ensure availability in extreme circumstances? Where can we sensibly take a risk?

Many of these types of questions will apply to contingencies other than defence and security threats. This is the realm of national contingency planning and it is not possible to provide a universal template for the solution. There may even be no solutions to some of the problems for some states, but this too is useful information to guide national policy and strategy formulation. Given the risks that face the next generation, both man-made and natural, it would surely be reckless to duck this vital issue. Clearly there are many questions that need to be answered regarding preparedness and logistics – and these would make for excellent topics for future research.

Notes

1. Anonymous poem, known and quoted in several slightly differing versions:
   For want of a nail the shoe was lost.
   For want of a shoe the horse was lost.
   For want of a horse the rider was lost.
   For want of a rider the message was lost.
   For want of a message the battle was lost.
   For want of a battle the kingdom was lost.
   And all for the want of a horseshoe nail.
2. Vice-Admiral Sir Jeremy Blackham, "'Jam Yesterday and Jam Tomorrow, But Never Jam Today,'" *Canadian Naval Review*, Vol. 15, No. 2 (Fall 2019), pp. 32-34.
3. At that time the only Assistant Chief of the Naval Staff (ACNS) and effectively First Sea Lord's chief of staff.
4. This is the case at the time of writing – early June 2020 – but there are now some signs that the government is rethinking.
5. Interestingly, virtually none of the conflicts, with the possible exception of the Second World War, in which the UK has been involved since the start of the 20th century were foreseen a mere two or three months before their outbreak, well within the decision-making time of even urgent operational requirements. The major exception is the Second World War and even that started several years before Hitler wished it.

Vice-Admiral Sir Jeremy Blackham is a retired Royal Navy officer with wide experience of ship and task group command, combined operations, and equipment policy and procurement. He is a frequent lecturer and contributor to relevant professional journals.

Foreshadowing Humanitarian Tasks for the Royal Canadian Navy

Sergeant (Ret'd) Simon Wells

Credit: US Air Force photo by Nicholas Pilch

US military personnel helped put out burning embers from the 363,000 acre LNU Lightning Complex wildfire in California, 20 August 2020. Militaries around the world have been called on to assist civilian authorities in addressing acute and chronic climate change challenges.

Climate change and mass migration are changing and complicating the security environment, often in relation to each other. Climate change causes myriad consequences, migration and displacement being major ones, which require urgent humanitarian intervention. The Royal Canadian Navy (RCN) anticipates some humanitarian role in its future fleet, but policy-makers and naval leadership need to consider the possibility – or arguably the eventuality – that humanitarian assistance will become a significant tasking for the force. It is possible that the Atlantic and Pacific Fleets could have to assist massive populations in complex disasters. International governance and military thought increasingly indicate states' duties to respond to humanitarian need.

The RCN has quietly served as a workhorse for the government of Canada for several decades, re-organizing from a blue-water carrier fleet after the Second World War to a smaller fleet of over-worked, under-resourced hulls and sailors. For example, despite two major accidents at sea in the last decade (HMCS *Protecteur*'s collision with *Algonquin*, and the fire onboard *Protecteur*) and a slow procurement system, in 2016 it coordinated with the US Coast Guard to seize over $1 billion (CAD) of cocaine in just one series of operations, and thousands of kilograms of drugs in other operations.[1] It has frequently deployed ships and senior staff, including two task force commanders, to Combined Task Force 150, a multinational naval partnership to support security in Middle Eastern and East African waters, and *Operation Hestia* incorporated two ships into the disaster assistance response in Haiti after the earthquake there in 2010.

Although the National Shipbuilding Strategy (NSS) is now recapitalizing the RCN (and coast guard) fleet, the navy may not be preparing its future fleet (or its current fleet, for that matter) for the changing security environment which is characterized by climate change, migration and a range of other regional and human security threats. Global climate change-driven effects are a major cause of mass migration, which has cascading effects on local and regional populations. Naval procurement quite correctly focuses on enriching warfighting capabilities, but current efforts don't seem to recognize the urgency of humanitarian threats or the likelihood of naval deployments for humanitarian assistance. A scan of global climate change trends and migration effects reveals that both RCN fleets could find themselves tasked with humanitarian aid missions that require foresight and planning now.

Climate Change and Mass Migration

There is growing recognition of the alarming pace and scale at which climate change and mass migration affect the contemporary security environment, and recognition that these phenomena are causally linked. Climate change causes arable land and resources to become scarce and produce unpredictable yields, and the land's inhabitants are often forced either to leave or to compete for what remains. It also complicates and amplifies existing concerns in international and regional security.

Thus far, climate change has not directly caused international or inter-state conflict. Instead, it exaggerates conditions of insecurity that lead more readily to conflict situations within states or regions. Rising sea levels, dramatic changes to precipitation, and highly volatile events like droughts, floods and storms have an impact on human vulnerability and conflict. The resulting resource scarcity and un-inhabitability of areas are linked to conflict at local and regional levels and affect the impoverished and women very acutely.[2] Pressed further by a range of stressors at the governmental and trans-national levels, resource competition, poor environmental governance and trans-boundary natural resource pressures threaten to evolve into conflict in already-stressed populations.[3]

For example, in the Sahel region in Africa climate change has led to migration and conflict. People leave their land or change their land use as their livelihoods (especially herding, farming, and fishing) become threatened and the land becomes increasingly degraded.[4] This pushes people to move into other areas where the local population may also be hardpressed to continue its livelihoods, thus leading to conflict.

Global climate-driven hazards are compounding, often causing food and resource insecurity initially, political and health insecurity in succession, which could lead the affected regions into conflict.

Population concentration places additional demand upon impoverished and vulnerable regions, sometimes beyond their limited ability to support their population. While land-locked states in the Sahel prosper from exports to their regional coastal neighbours, fluctuations in precipitation and temperature can damage their ability to sustain their own agricultural needs, as well as produce and distribute goods to neighbouring states that rely upon their supplies. Thus it is clear that populations don't need to be transitory to be extremely vulnerable to climate-related hazards. It is also known that smaller migrations cascade forward as they deplete resources in their places of origin and places of refuge, 'snowballing' into bigger migratory groups that consume more, more quickly.[5] In this way one can see how small-scale displacement can lead to mass migration, and to acute demand for humanitarian assistance. Inversely, with over 40% of the world's population living within 100 kilometres of a coastline and 10% of the global population in coastal areas less than 10 metres above sea level,[6] the threat of rising sea levels is just as dangerous as drought.

The Sahel is not the only place threatened by climate change. There is growing international recognition from the scientific, military and political communities that


Credit: Corporal Darcy Lefebvre, Canadian Forces Combat Camera

*Members of the naval reserve unit HMCS **Chippawa** assist local civilians in loading sandbags for a dam in the Portage Diversion, Manitoba, as part of flood damage mitigation during **Operation Lentus** on 7 July 2014.*

climate change will result in threats that will fundamentally challenge the fragile peace that exists today: flooding, famine, migration to highly unstable regions, and drought threaten intense resource scarcity and competition.[7] There are also direct security implications for military forces: one estimate placed US Naval Station Norfolk in its entirety at risk of submersion by rising sea levels, and with it the home of the US Navy's (USN) Second Fleet and a significant portion of the USN's power.[8] A 2010 article by then-Lieutenant-Commander Ray Snook in *Canadian Naval Review* noted that rising sea levels would also pose a challenge to RCN bases.[9] Climate change affects the existing security environment and creates further volatility and complexity. Displacement and migration are the products of rapidly changing security and environmental conditions. These inland effects, not often considered as naval issues, may constitute the crises that militaries and their navies could be called upon to alleviate with military, constabulary and/or diplomatic missions.

Policy, Strategy and Procurement

Canada's 2017 defence policy, *Strong, Secure, Engaged*, acknowledges that "rapid and forced displacement can


Credit: Corporal Johanie Maheu, Formation Imaging Services

*Members of the Royal 22e Régiment disembark from one of USS **Bataan**'s landing craft during **Operation Hestia**, the Canadian Armed Forces' participation in humanitarian operations following the 2010 earthquake in Haiti.*

Aircraft carriers, amphibious assault ships and other US naval ships are seen here at Naval Station Norfolk on 20 December 2012.

strain institutions and test the resilience of host populations,"[10] but Canada remains unprepared to alleviate these conflict drivers at the whole-of-government, grand strategic level. There is some recognition of the changing security environment in the strategic posturing of the RCN. *Leadmark 2050: Canada in a New Maritime World*, published in 2016, introduces its strategic concept with discussion of Canada's seafaring history but more importantly seafaring trade interests.[11] There is acknowledgment of the interconnectedness between Canadian economic vitality and international stability. *Leadmark 2050* also directly discusses climate change, noting that it will alter the RCN's operating environment, intensify weather behaviour, affect agriculture, and project onto coastal regions "social consequences, which will add to already significant pressures facing many coastal states."[12]

The social consequences are of interest to Canada and the RCN because they could affect Canada after an event. *Leadmark 2050* specifically recognizes maritime security issues related to migration and good order abroad.[13] Although the RCN is not primarily intended to serve as a humanitarian organization, its soft power capabilities are valuable public relations and diplomatic tools. Canadian naval procurement, obviously tailored to naval warfare, does not appear to anticipate *prolonged* humanitarian action, which forces an observer to question either how committed Canada will be to international disaster assistance or if it fully comprehends the scale of potential humanitarian tasks in the future.

There are contingency plans for natural disasters, but there is no meaningful, substantial whole-of-government plan that incorporates the navy as a key partner. Defence procurement is a contentious and frustrating topic in Canadian federal politics, but there is at least some forward movement toward closing the strategic support capability gap that exists in the RCN today. In a 2017 report the Senate of Canada recommended even greater depth in strategic support capabilities by procuring two Auxiliary Oiler Replenishment (AOR) ships in addition to the two planned Joint Support Ships being built under the National Shipbuilding Strategy (NSS), in order to provide persistent fleet and operational support deployed at sea in the long term.[14] The Joint Support Ship (JSS) concept envisaged by *Leadmark 2050* is one that is capable of supporting humanitarian operations,[15] so this increased depth and breadth of capability can be extended to rapid response to disaster and displacement if needed.

The NSS, which envisions economically stabilizing work in Canada on new and refitted vessels, has progressed much slower than naval leadership and procurement authorities might have hoped. Seaspan Shipyards in Vancouver began construction in mid-2018 of the two JSS to be delivered for an estimated $3.4 billion, expecting to deliver the first in 2023 and the second in 2025.[16] This schedule has now slipped significantly. If the RCN (and the Canadian Coast Guard, for that matter) hopes to remain ready for both prolonged, deep-water naval operations and for humanitarian missions and operations-other-than-war, shipbuilding and refits must be executed on time.

Some pragmatic action has taken the RCN in the right direction. MV *Asterix*, a private shipping hull, was purchased to be converted into an interim replenishment ship with the intent of bridging the gap between the retired replenishment ships and the promised JSS. It was handed over to the RCN in January 2018 and has been deployed extensively, earning praise from its crew, commanders and allies. On 31 July 2020 the first Arctic and Offshore Patrol Ship, HMCS *Harry DeWolf*, was delivered to the RCN which is now conducting post-acceptance trials on the ship. *Harry DeWolf* will increase naval capacity greatly. In September 2019, the government announced a $12 million purchase of ship-to-shore connector systems from Navamar, Inc., which would enable the Joint Support Ships with "an enhanced and robust capability to transfer cargo and equipment from the ship to the shore," potentially "to deliver relief supplies for people in need" amongst other tasks.[17] The ship-to-shore connectors have equally important combat operational applications, but the humanitarian and operations-other-than-war that it enables are important to the RCN. The navy's strategy considers disaster relief as a means to promote global stability and project soft power,[18] so there are also international security and diplomatic interests associated with these missions.

There is understanding in the RCN that climate change and migration are drivers of humanitarian needs that the organization might need to meet, and there are existing and planned capabilities that will meet those needs when they arise. Still, there are shortcomings in the RCN's preparedness for the potential scale and complexity of future humanitarian tasks that could be illuminated by exploring some possible missions.

Credit: Timothy Choi

*A model of the **Protecteur**-class Joint Support Ship is on display at the Seaspan Vancouver Shipyards office lobby.*

An exploration of possible missions or tasks for the RCN driven by climate change and migration could include discussion of the African Atlantic coast, the Pacific Ocean theatre, and the evolving general humanitarian environment. Volatility and unpredictability are products of the complexity of climate change, which make prediction of acute humanitarian needs difficult and the threat environment broad and rich.[19] Examination by geographical region aligns with the west-east fleet structure of the RCN, perhaps foreshadowing which fleet might respond to disaster in each region.

Atlantic Coast of Africa

The long west coast of Africa contains too numerous states to describe comprehensively the effect of climate change on each; however, strategic pressures can be understood from a continental perspective. One-third of global refugees and displaced people are African, and the Sahara Desert continues to expand while the sub-Saharan Desert boundary continues to erode. Sea level rise would affect a quarter of the African population and increased serious weather events threaten vulnerable people, as almost one million displaced in Nigeria by weather events in 2000 alone demonstrates.[20] The east coast of Africa is already an area of international concern for stability and security, but let's look at the western coastline for an overview of some possible humanitarian naval tasks.

The acute effects of climate change that are now occurring multiply the vulnerability of people in this region. Obvious humanitarian support operations could include delivery of aid, disaster relief and constabulary support. There is also the threat of a pandemic or epidemic striking this crowded, hot, often impoverished region that is proximal to the ocean. In addition to the focus of Canadian foreign affairs and security agencies, the private and non-profit sectors also recognize the extreme risk that the states along the West African coast face from disease: international business leaders recently began donating millions of dollars to mitigate and respond to Coronavirus vulnerability in impoverished states.[21] The RCN Atlantic Fleet should develop contingency plans to support large-scale responses to public health catastrophes along the Atlantic coast of Africa, and to complex natural disasters with public health dimensions or consequences.

Pacific Theatre

The 'Ring of Fire' – from the west coast of the Americas to the east coast of Asia and Oceania – is the disaster-prone region surrounding the Pacific theatre. All manner of natural disasters already pose significant risk to the Pacific states, including earthquakes, tsunamis and flooding. Climate change represents a risk multiplier that can and does complicate the immediate effects and the consequences of disasters and conflict.

In 2018 alone, 4.94 million people were internally displaced by natural disasters in just four countries: the Philippines, Indonesia, Japan and Vietnam.[22] Two of the four highest number of displacements caused by natural disaster in 2018 occurred in the Philippines, displacing almost 2.5 million people. And, in that year 16.1 million of the total 17.2 million people displaced by disasters globally were affected by weather-related events, not geophysical (earthquake) events.[23] These displaced people will lead to societal and regional strains.

The RCN's Pacific Fleet should ready itself to deliver mass humanitarian aid and medical supplies. The new Joint Support Ships (JSS) could enable long-range, blue-water missions to deliver aid in amounts a typical disaster response simply cannot support. A reserve of supply ships (AORs) held back near Canada could allow JSS deployment with a humanitarian response task group without compromising military and constabulary missions in waters nearer to Canada. The stellar performance at sea of *Asterix* thus far demonstrates the agility future support ships can provide new missions.

The Evolving Humanitarian Environment

The humanitarian and human security fields are no longer niches. The complex systems of vulnerability and insecurity, conflict, climate-driven disaster and state security are interdependent. States and their militaries should pivot to address these urgent threats. The global community

Credit: Corporal Yongku Kang, Canadian Armed Forces

*HMCS **Shawinigan** docks at Porto Grande, Cape Verde, on 16 February 2020 as part of **Operation Projection - Africa**.*

recognizes interdependence and is more forcefully calling upon states to respond. In early 2020, the United Nations Human Rights Council delivered a non-binding ruling that refugees should not be returned to their place of origin if they are fleeing a climate emergency, and the United Nations High Commissioner for Refugees warned that "we must be prepared for a large surge of people moving against their will … we're talking about millions."[24] Although we cannot expect every state to adhere to a non-binding ruling, it is becoming accepted that climate change should inform decisions on sovereignty when it comes to refugee status, a form of humanitarian assistance.

If climate change continues, a host of threats could evolve and further complicate the humanitarian environment. Global warming beyond 1.5˚C will have consequences that are not yet fully qualified or quantified but will include: problems associated with food distribution, poverty and public health, especially in developing states; infectious disease; deteriorating air quality; and changing risk of storms and heatwaves.[25]

While the RCN does not have the capability to address air quality in an affected micro-climate, it does have the ability to carry large amounts of food, medicine and equipment around the world at relatively short notice if the government of Canada asks it to. As international governance and grand strategy change to acknowledge and respond to climate change, states and militaries – in particular Canada and the RCN – must prepare to stage humanitarian operations and support interventions when called upon to do so. And they must consider these missions to be important security tasks. Just as land forces were asked to take on reconstruction in Kandahar, Afghanistan, for example, so too might Canada's maritime forces be asked to step outside the traditional maritime security realm and assume missions and tasks that enhance our collective security.

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Canadian Civil-Military Relations: 1962 and the Cuban Missile Crisis

Bill E. Featherstone

The Canadian involvement in the Cuban Missile Crisis is relatively unknown. Why it has remained so for the past almost 60 years is a mystery. After President John F. Kennedy's television address on 22 October 1962, the United States went to alert, Defense Condition (DEFCON) 3. (The United States has DEFCON states of alert from 1 (highest), nuclear war imminent, to 5 (lowest), normal state.) Canadian Minister of National Defence (MND) Doug Harkness went to Prime Minister (PM) John G. Diefenbaker to request the comparable alert, Ready State of Military Vigilance, for the Canadian Forces. He was denied. Harkness subsequently advised his Chairman (CCOS) and the three service military chiefs (COS) to 'quietly' prepare, as he continued for the next two and one-half days to seek authority to match the US alert. On 25 October, Diefenbaker finally agreed to match DEFCON 3, only after the United States went to DEFCON 2. Issues of civil-military relations became evident in that short period of time and this article explains them.

Credit: Alexandra Studio / Library and Archives Canada / PA-052510

Douglas S. Harkness, Minister of National Defence during the Cuban Missile Crisis, is pictured here during his tenure as Minister of Agriculture in 1957.

Harkness has been accused of putting the Canadian military on full alert without authority. It is quite remarkable when looking at the meager Canadian literature about the crisis, how inaccurately the actions of MND Harkness have been characterized. He has been either scapegoated for putting the military on alert without authority,[1] or praised for taking action while Diefenbaker stalled for almost three days.[2] Neither of these allegations is accurate. He never went beyond telling his CCOS to prepare 'quietly' until authority could be obtained.

Credit: Abbie Rowe. White House Photographs. John F. Kennedy Library and Museum, Boston

US President John F. Kennedy (left) meets with Prime Minister John G. Diefenbaker (centre, seated) on 20 February 1961. Others pictured include Canadian Secretary of State for External Affairs Howard C. Green (right, seated), US Secretary of State Dean Rusk (left, standing), Canada's Ambassador to the US Arnold Heeney (centre, standing), and US Ambassador to Canada Livingston T. Merchant (right, standing).

An article published in 1979 by Jocelyn Maynard Ghent, "Canada, the United States, and the Cuban Missile Crisis," lays out the disconnect between Diefenbaker and Kennedy during the crisis. Ghent's article has been widely read and referenced by many authors including the seminal works of Peter Haydon. According to Ghent, the root of the problem started with the differing attitudes of the United States and Canada toward communist governments, specifically Cuba. Many Canadians felt "they shared with Cuba the status of an economic satellite to American industry."[3] This of course contributed to ongoing anxiety for the Americans, as Canada continued to trade with Cuba. From 1958 through 1962, Americans were particularly concerned about what they viewed as a Canadian lack of cooperation in addressing the Soviet threat in the hemisphere. During the crisis, Diefenbaker was banking on the Canadian public to share his perspective but he grossly miscalculated the popularity of Kennedy in Canada. The Canadian public was particularly upset with his taking almost three days to support fully the American forces at the onset of the crisis.[4]

Ghent also notes an informal agreement set up at the inception of the North American Air Defence (NORAD) Command in 1958 that in the event of a crisis, the President and the Prime Minister would consult about the 'risks and repercussions' of joint military proposals for action. Diefenbaker certainly was aware that he was entitled to some form of consultation. It became common knowledge that the PM was very disturbed that he had not been consulted by Kennedy.

Credit: Naval History and Heritage Command, USN 711212

An aerial reconnaissance photo of Mariel naval port in Cuba, taken 5 November 1962, shows Soviet ships in the process of removing the missiles that had been placed in the country.

Ghent contributes to the confusion with her claim about the Canadian War Books being withdrawn prior to the crisis. The War Books, only recently made available to the public, provided instructions and procedures for going to and conducting war, and were developed after the Second World War as nuclear tensions increased with the onset of the Cold War. They were designed to be 'progressively' amended. In other words, they were never withdrawn, only amended and noted until a new version was issued. They specifically described who had authority to proceed to various states of readiness. Ghent states: "[a]lthough the correct procedure to follow was *open to question*, Harkness and his senior military advisors were in immediate agreement on the necessity for an alert."[5] This is troubling because there was nothing 'open to question' regarding the War Books, which gave the CCOS and the COS the authority to proceed to the Ready State of Military Vigilance.[6] The only, but serious, complication that arises is the unsubstantiated claim that the War Books had been withdrawn. If they had been consulted at the time of the crisis, it would have been clear they were never intended to be withdrawn. Furthermore, there is no evidence of any order to have them withdrawn. At best, it was an assumption. Ghent further states: "[t]he old war books, which were no longer in use, gave authority to the Prime Minister and his cabinet. The new war books, not yet approved by cabinet, gave it to the Defence Minister."[7]

Her characterization of the 'old' and the 'new' War Books is incorrect. They were never referred to as such. They were continuous as they had been since 1948 with *progressive revisions* to allow existing versions to remain in force, until the revisions were complete.[8]

Ghent notes:

> Harkness decided therefore that he must consult Diefenbaker. Telling the Chiefs to 'get ready,' he left to confer with the PM, completely confident that the matter would be a mere formality. Diefenbaker, however, refused to give an alert until Cabinet could meet and discuss the situation the

> next morning [23rd October]. Believing that he has no other recourse, Harkness returned to the Chiefs of Staff meeting and authorized the alert on his own.[9]

The last sentence is just fanciful editorializing. Harkness never ordered an alert of any kind. His direction to the military never went beyond "get ready unobtrusively as possible."[10]

Ghent does not make the distinction between the Ready State of Vigilance and the three stages of General Alert. She is not alone in her explanations of what occurred in the Canadian response during the crisis, but she does appear to be one of the first with the publication of her article in 1979. She is quoted in most subsequent articles about Canada's role in the crisis, including several by Peter Haydon, in which he also pushes the unsubstantiated withdrawn War Books narrative.[11]

A more recent account of Canadian involvement in the crisis comes from a book written by Erika Simpson entitled *NATO and the Bomb: Canadian Defenders Confront Critics*.[12] She deals with the Cuban Missile Crisis in a few pages, and most of what she says is inaccurate. One of her endnotes for this section states: "Harkness had gone ahead and put the Canadian Forces on equivalent alert status to US DEFCON 2 without receiving Diefenbaker's approval."[13] She gives two references for this assertion, one is the 'Harkness Papers' published simultaneously in the *Ottawa Citizen* and *Calgary Herald* in 1977.[14] The other is an alleged comment Harkness made in a letter to Brigadier-General J.A. Clark in November 1962, which states "we began immediately to take precautionary military actions and within approximately forty hours of the President's announcement, we had reached the same state of readiness in our air defence forces as those of the US."[15]

These assertions of hers are problematic. The Harkness Papers do not mention the Canadian military going to any alert status, prior to the PM giving authority, let alone DEFCON 2. The alleged Harkness comment in his letter to Clark ironically is confirmation of what he stated in his papers. If you do the math, approximately 40 hours after Kennedy's speech would be about late morning of the 24th of October. This was when upon hearing the new information that the United States had gone to DEFCON 2, Diefenbaker begrudgingly told Harkness to proceed and issue the Canadian alert, but only to equivalent DEFCON 3. This was, ironically, authority the CCOS and COS already had. These facts are clear and hardly ambiguous.

In his 1977 memoirs, Diefenbaker appears to have had some awareness of the 'alert' controversy surrounding Harkness as he states: "[a]s to the popular notion that Mr. Harkness, under the influence of the Canadian military and the United States Pentagon, engaged in a clandestine authorization of a full alert on 22nd October, I [Diefenbaker] do not believe it to be true."[16] Apart from getting the date wrong (it was 23rd October) this does, however, seem to be an attempt at obfuscating what Harkness actually did.

Diefenbaker was silent in his memoir as to what directions Harkness actually gave to the CCOS on the 23rd of October. It is very likely the PM had no comprehension of the drama unfolding and knew little about the War Books or the provisions within them. The consistent indecision

Credit: Library and Archives Canada / 24-513P-CT / CT644

*A CS-2 Tracker anti-submarine aircraft lands on HMCS **Bonaventure** in an undated photo. **Bonaventure** and other elements of the RCN contributed their anti-submarine warfare capabilities during the Cuban Missile Crisis.*

Credit: National Archives, identifier 6817196 via NHHC

President John F. Kennedy signs the order authorizing the quarantine of Cuba on 23 October 1962.

of Diefenbaker on all matters became extremely difficult for government staff and committees to deal with. Diefenbaker's demeanour on the political stage as a leader is well documented as being consistently indecisive. Basil Robinson, a former civil servant who wrote a book about Diefenbaker, notes the fact about Harkness and the chiefs of staff informally bringing the military to "a state of maximum preparedness short of declaring the formal alert."[17] Robinson's choice of words here are significant.

At the height of the crisis, the disconnect between civil authority and military leaders, and field command/operations was palpable. There are no records of meaningful dialogue amongst the leadership until the 25th of October when the authority to match DEFCON 3 was given.

The problems between Diefenbaker and Kennedy were highly political, and at this time primarily had to do with Canada's refusal to put the military on alert in concert with the United States. As mentioned, Diefenbaker had been insulted that he was not consulted by Kennedy regarding the pending blockade of Cuba. The consultation was something Diefenbaker perhaps had some reason to expect. His reaction and obsession with it, however, completely clouded his judgement and ability to deal with the overall crisis.

As Joseph Jockel, who has written extensively about NORAD, states "[t]he Canadian government saw the right to be consulted on matters of war and peace as the *quid pro quo* for NORAD's establishment."[18] In his book *No Boundaries Upstairs*, Jockel notes that both the US and Canadian governments had established an informal agreement of having the fullest possible consultation on North American defence considerations.[19] But by 1962, this consultation process was almost non-existent and had thus become the mantra of the NORAD critics. Canada and the United States did not see each other in the same light as far as a partnership was concerned. According to the critics, "influence in military alliance is roughly proportional to the power of the nation-state, and the US considered Canada a small, minor power."[20]

It is unclear if Diefenbaker had any detailed knowledge of Secretary of State for External Affairs (SSEA) Howard Green's surveillance efforts for the United States. Apparently surveillance of Soviet and Cuban military movements was undertaken at the Canadian Embassy in Cuba during the summer of 1962.[21] It is clear from the evidence that Diefenbaker, waiting for almost three days to show political or military support for the United States after the 22nd of October, exacerbated the crisis. Diefenbaker's actions adversely affected the overall civil-military relations and the command leadership. The binational alliance between American and Canadian forces, however, provided a clear understanding of the potential threat facing the continent. Canadian field forces simply had no direction from the civil or military leadership in Ottawa during the first 48 hours of the crisis.

Diefenbaker had issues of distrust of the military, dislike of Kennedy and little understanding of how NORAD and NATO functioned. These were not the only reasons for his delay in giving the authority to match the US alert, but they were contributing factors. The greater issue was the Canadian military leadership not understanding the status of, or simply ignoring, the authority that was available

to them in the War Books. Civil-military relations were breaking down.

The issues described here occurred within a very short timeframe. From President Kennedy's speech in the early evening of the 22nd of October 1962 until about mid-day on the 24th of October, a period of about 40 hours elapsed. In that short time, Canadian civil-military relations, from the military leadership perspective, collapsed. The PM compounded this as he delayed bringing Canadian forces to a comparable alert of US DEFCON 3, and only responded when the United States raised its alert to DEFCON 2.

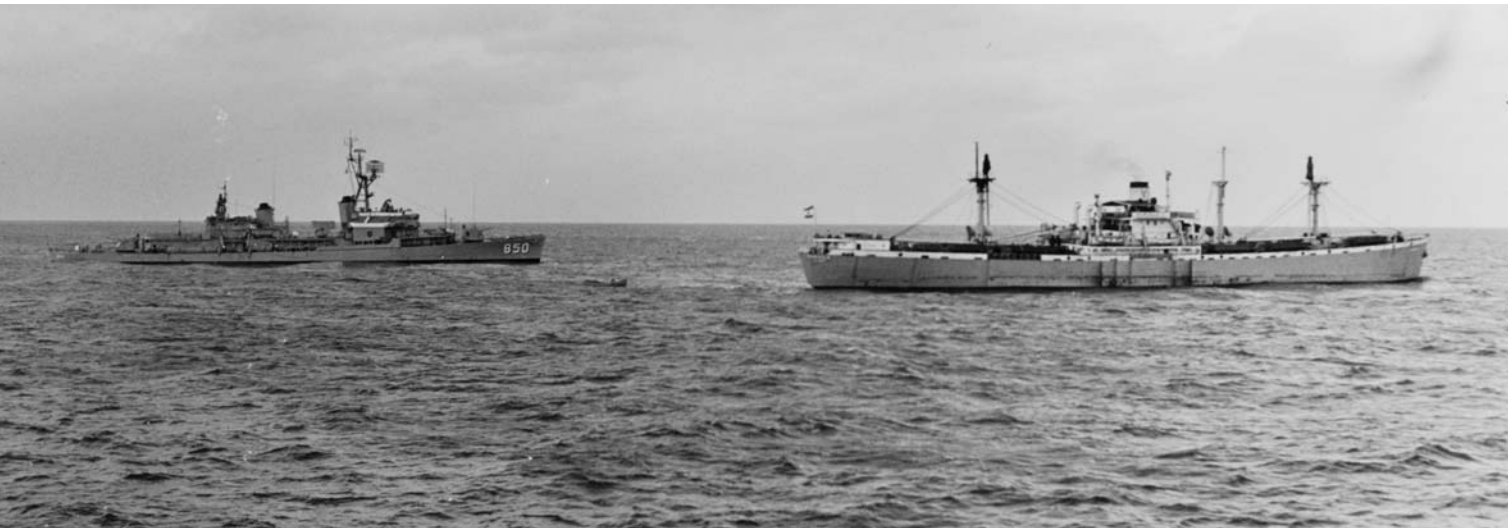
In 1962, the theories of civil-military relations were not as developed as they are now. In the senior Canadian military leadership, the essence of a functional relationship between the civil sphere and the military sphere was still rather unknown. Samuel P. Huntington's theories of 'objective' control were only five years old and other variations were yet to come. The notion of the reporting relationship was understood as the military being subservient to civil authority, but the mechanics of how that should function were not sufficiently understood. Effective civil-military relations demand respect for the spheres of responsibility that the civil and military leadership should have, including knowledge about and within their respective roles.

In the case of the Cuban Missile Crisis – and indeed in any crisis this would be the case – there was an onus on the PM and Cabinet to understand the capability and limitation of the military forces at their disposal. There was an equal responsibility for the leaders of the military services to advise the PM through the Minister of National Defence what those limitations might be. Dialogue between the two spheres is critical for any expectation of sensitivity from the military about the political prerogatives in play, or conversely, executive competence from the civil leadership.

In 1962, the crux of the problem was that the CCOS and COS apparently did not have thorough knowledge of the status and operational authority of the DND War Books. As well, there was an imperative for strategic communication between the civil and military leadership to ensure coherence of duties and responsibilities. This of course supposes a healthy and shared understanding of each other's role, and that appeared to be absent.

The historical record shows that there was very little communication or shared understanding. There is much to suggest that Diefenbaker rarely, if ever, inquired as to the nature of the military at his disposal, let alone its limitations. His autocratic style of leadership seemed to freeze everyone around him into a state of inaction. Some commentators have suggested that Diefenbaker's reticence regarding decisions gave Harkness and the CCOS no choice but to proceed without authority. This notion is completely ridiculous. As noted previously, Harkness never went beyond his own authority – i.e., directing the CCOS to prepare 'quietly' until proper authority to proceed could be obtained. Authority is the essence of civil-military relations. If the status of the War Books was so clear and unequivocal, as so many authors suggest, the silence of Harkness (and others) about it is problematic. Whether the leadership had full knowledge of their authority detailed in the War Books is unknown and speculative only. Regardless, there is no evidence that they investigated their options. This all is very troubling and is an abdication of their responsibility.

Both the civil and the military sphere have culpability from the perspective of a breakdown in civil-military relations. How much blame each element should take has



Credit: Naval History and Heritage Command, USN 711187

*A party from USS **Joseph P. Kennedy Jr.** DD-850 boards the Lebanese freighter **Marucla** near Cuba on 26 October 1962 during the height of the Cuban Missile Crisis.*

Credit: National Archives photograph 306-PS-60-16402 via NHHC.

Cuban leader Fidel Castro (left) and Soviet Premier Nikita Khrushchev met at the United Nations, September 1960.

been debated *ad nauseum*. However, the lack of rigour exhibited by the military leadership for not acting on the War Book provisions implies a greater burden of blame on them. It created an unnecessary domestic crisis in the face of a potential international catastrophe. At the same time, it contributed to the delay of Canadian support for the United States.[22]

Most of the literature about Canadian involvement in the Cuban Missile Crisis centres around an assortment of accusations against Harkness for ordering the military into an alert without proper authority. Those accusations are completely without merit. Central to those accusations is the controversial status and operational content of the Canadian War Books during the crisis. Having no War Book in service during a revision process, even if it is imperfect, makes no sense at all. There must be something to direct operations.

Final Thoughts

Some of what has been written during the last several decades about Canadian involvement in the Cuban Missile Crisis needs to be further scrutinized. It cannot be rewritten, nor should it be. It was written with the knowledge that was available at the time. Unfortunately, after all this time, there are still questions that remain unanswered. The narrative here is based primarily on newly acquired/released material. None of the parameters of normative civil-military relations seems to fit. This was an example of novel civil-military relations, characterized by an abdication of responsibility by senior civilian leaders, but primarily by the military leadership.

There is no proof of dereliction of duty on the part of the military leadership, other than their silence. There is also no evidence of War Books being withdrawn, thus necessitating Harkness to consult with Diefenbaker. The military leadership was silent and unresponsive to its duty of responsibility. This is further reflected in the 50-plus years of relative government silence regarding Canadian involvement in the crisis in the defence of North America. Canadian UN peacekeeping missions during the Cold War and afterwards have all received well-deserved acknowledgement of the combined efforts of the Canadian Armed Forces involved. Surely, Canadian military involvement in the Cuban Missile Crisis deserves no less.

Notes

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4. See Haydon, *The Cuban Missile Crisis*, pp. 130-136.
5. *Ibid*., p. 168. Italics are mine.
6. Library and Archives Canada (LAC) RG2, Cabinet Defence Committee Documents, Vol. 2752, File D-1-6-1, "Memo to Cabinet: Revised DND War Book," 9 January 1962; also Appendix 'A,' dated 18 December 1961; also DND War Book, October 1961, RV150, page 11, para 2.07, "The CCOS will inform Standing Group of the calling of a 'Ready State of Military Vigilance' at his discretion."
7. Ghent, "Canada, the United States, and the Cuban Missile Crisis," p. 169.
8. Documentation received from LAC supports the 'progressive revision' process. See LAC, RG 2, Vol. 2750, File: CDC – Vol. VI, "Memo for Cabinet Defence Committee: Gov. War Book," September 1948.
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12. Erika Simpson, *NATO and the Bomb: Canadian Defenders Confront Critics* (Montreal: McGill-Queen's University Press, 2002), pp. 118-122.
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Power Estimates for an Arctic AIP Submarine for Canada

José Cañadas Méndez*

In this article, a credible Arctic patrol submarine in terms of roles, possible routes, distance and duration will be discussed. The propulsion power and total power required for such patrols will be estimated, including a brief examination of the ratings of electric motor(s) and battery systems.

In July 2019, the Naval Association of Canada published an interesting article "Towards a Renewed Canadian Submarine Capability," by Jeffrey F. Collins.[1] After an introduction and a brief history of Canadian submarines, the article analyses the Canadian need for new submarines, capabilities and procurement options. The article ends by asking "whether Canadian decision-makers will commit to renewing this capability." That question remains unanswered but several changes in technology have occurred that might make an Arctic-capable submarine possible for Canada.

In 2019, three relevant news items passed unnoticed. The first one was a short notice in *Jane's* on Swedish Saab-Kockums performing tests on its new 'double-Stirling' engine, doubling its power from 75 to 150 kW within the same volume.[2] The second was released by French Naval Group, stating that its land-based, full-scale fuel-cell second generation (FC2G) had achieved more than 6,000 hours of operation and successfully passed tests under similar conditions as if fitted in a submarine, reaching the equivalent of an 18-day submerged patrol.[3] The third was issued from the Spanish company Navantia which, after several years of delays, has managed to get the S-80 submarine program back on track and expects to deliver S-83 (the third unit) to the Spanish Navy in 2026.[4] This would be the first submarine ever to be fitted with fuel-cell air-independent propulsion (AIP) based on hydrogen reformation technology.

These announcements may indicate that it is the moment to think about an AIP submarine that could patrol the Canadian Arctic under the ice. "Does this conventional submarine exist? The answer is not just yet, but it could in the very near future," wrote David Dunlop in 2018.[5] Now in 2020, it's high time to explore the sailing requirements and feasible solutions provided by state-of-the-art technologies. This article will try to build on the steps already taken in previous documents about the future Canadian submarine fleet.[6]

As a disclaimer, this article does not pretend to be 100% accurate, especially because access to relevant information is difficult. Hence it has not been possible to contrast the data as I would have wanted to. If this article relies on available data about the S-80 submarine, this is merely because data about it has been easier to find than for other AIP submarines. In this way it will gain the visibility it has not received in some analysis, despite being in a much more advanced state of construction than other boats such as Type 216, Type 212 CD or the *Attack*-class, for which the keel has not been laid down up to now.

An illustration of the Saab Kockums-designed A26 ***Blekinge****-class submarine, Sweden's next submarine equipped with the Stirling Air-Independent Propulsion system.*

A Credible Arctic Submarine for Canada

Why would Canada need submarines, and why would it need them in the Arctic? These are good questions, but not the focus of this paper. However, we will discuss this briefly.

The first Spanish S-80-class submarine, S-81 ***Isaac Peral****, is seen here in Navantia's shipyard at a December 2019 ceremony marking the structural completion of its pressure hull.*

According the RCN's document, *Leadmark 2050*, "submarines are weapons of strategic deterrence whose presence – actual or inferred – can alter an adversary's decision-making across an entire maritime theatre of operations. They are the RCN's ultimate warfighting capability, a platform through which Canada can control a substantial ocean space or deny it to others."[7]

There are several significant reasons for putting submarines in the Arctic: surveillance and control and deterrence. This being said, let us focus on what might be a feasible scope for Canadian submarines:

- Passive surveillance (low speed) of Arctic shipping routes and Canadian waters in any season.
- Deterrence, i.e., showing through adequate Water Space Management the ability to reach any point under sea ice at any time of the year.[8]

A patrol to achieve these targets could, for example, be departure from Halifax (NS), going north toward Alert, bordering the archipelago, southwest to Banks Island, east through M'Clure Strait, past Melville Island and through Lancaster Strait reaching Baffin Bay again, then back to Halifax. Other patrols could be from Victoria (BC) to the North Pole bordering the archipelago and return, or from Victoria (BC) to Halifax (NS) via the Bering Strait and Northwest Passage, or vice-versa. These examples show possible transits under an ice-covered Arctic, which could allow loitering for surveillance purposes in a number of chokepoints, for example, Hudson Strait, Melville Sound, Amundsen Bay, or near Alert. Once a threat is detected, the AIP submarine might use the local geography to its advantage and intercept the prey, or follow it.

Manoeuvres and sprints would draw down the batteries, which means that the submarine would have to find a quiet spot to loiter at very low speed to recharge. Since AIP submarines have diesel engines as well, batteries may be charged either from the AIP system (underwater, without surfacing) or from diesel engines (when snorkeling/snorting is possible, meaning there is no ice above and no enemies around). When possible, it is more economical to charge batteries by the diesel engine generators, and use the AIP in situations when this is not possible. In any case, these patrol routes would not involve going deep into the Arctic Ocean to play 'games' with much faster nuclear boats that could simply drive around at will in such a large area.

The above patrol routes have not included St. John's (NL) RCN base, or Nanisivik on Baffin Island. Should Nanisivik be able to operate year round, with capability to prevent thick ice from building up close to the jetties, then other patrol routes might be studied. Under such a scenario a smaller submarine in terms of endurance and fuel/oxygen capacity would suffice. For this case to be considered, full mapping of the seabed around Nanisivik base should be carried out (if not already done).

If we assume that submarines are necessary, and that they should travel to the Arctic, then we need to examine the needed capabilities. This will be the focus of the rest of the paper.

Establishing the needed or desired range (in nautical miles (nm)), speed (in knots (kts)) and endurance (days) is key to determine the sailing requirements of any combat ship or boat. Basically it is necessary to make a reasonable estimate for the following three questions: How far do we expect to deploy the submarine under ice? How fast will the submarine be required to sail? For how many days?

A 2018 computer-generated image of S-81 ***Isaac Peral****, first of the Spanish S-80-class submarines.*

Let's work some figures on that. It should be noted that there is one implicit restraint: energy storage capability in terms of fuel and oxygen.

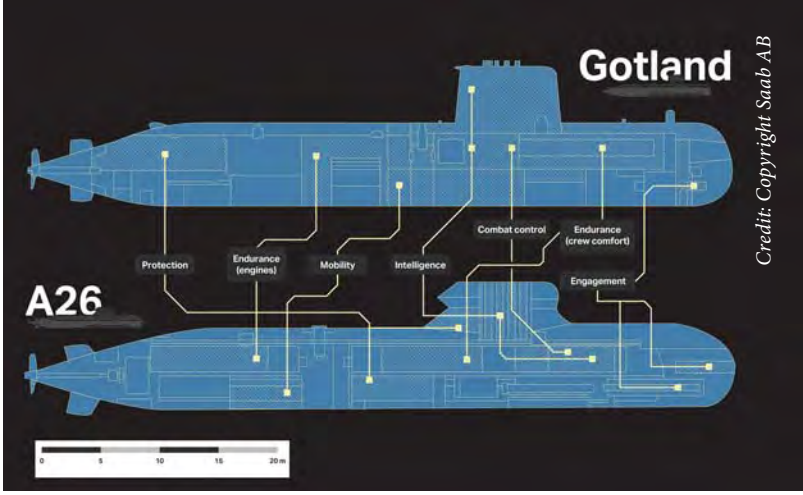
This section builds on the superb service paper written by Lieutenant-Commander Simon Summers.[9] The aim of this section is to develop his work further and provide some numbers to start figuring out the future RCN submarine, to define some feasibility windows or assumptions – for parameters such as under-ice patrol speed, range and endurance – thus determining a future Canadian submarine's preliminary sailing requirements.

In winter, nearly 4,600 nm (8,500 km) would be ice-covered on such patrol routes.[10] On top of fuel and oxygen required for the patrol routes, fuel and oxygen reserves for an additional 20-30% range should be added, part of which might be used to recharge batteries after high-speed bursts or used to increase the time on station monitoring in order to detect or identify incoming threats. Reserves of fuel and oxygen also have to be considered as the ice cap – even though estimated for the median worst condition – varies year to year, and the boat might require some additional fuel to reach the moving border of the ice layer. Furthermore, for safety reasons, since it is not possible to emerge and break the ice to call for assistance in an emergency, a certain amount of reserve would be critical to reach a gap in the ice (a recurrent polylnya) or an appropriate place to break the ice. This leads to a required under-ice range on AIP of approximately 6,000 to 6,500 nm, including a 30% reserve.

Now a look into the speed, propulsion power, patrol time (in days) and energy needed will allow us to select an appropriate balance.

Table 1 has been made considering that at low speeds the propulsion power required (in kW) is a function of a power of the speed, with such power estimated as 2.5. At higher speeds, say 20 knots upwards, the power is typically 3 and above.[11]

From the table a few observations can be made:



*A Saab graphic compares Sweden's current **Gotland**-class submarine with the in-construction A26 **Blekinge**-class. The latter employs improved Stirling Air-Independent Propulsion engines.*

- compared to 5 knots, patrolling at 7 knots requires more than double the propulsion power from the AIP system; 8 knots requires more than triple the power (see column 2).
- the speed of travel greatly affects the energy units (see last column).
- 100 energy units are needed to cover 6,500 nm at 5 knots (this is assumed as our reference).
- 131 energy units are needed to cover the same distance at 6 knots.
- 202 energy units are need to cover the distance at 8 knots (i.e., 54% more than at 6 knots).
- at 6 knots a 5,000 nm patrol can be performed in five weeks; 1,500 nm extended range (reserve) can be achieved within 10 additional days.

Increasing the energy units means a lot of added weight and volume in the form of stored fuel and oxygen. So, reducing the patrol time by increasing the speed, leads to an increase in the fuel and oxygen that need to be carried. Calculations will need to be made to decide if it is worth carrying additional energy in order to reduce patrol time. A patrol speed of 6-7 knots may represent a balanced rate and provide the ability to cover up to 6,500 nm within about six weeks (39-45 days depending on velocity).

On top of that, the conventional transit time (using snorkel) from Victoria (BC) or Halifax (NS) to the ice cap may be estimated at about one week at 10 kts (1,680 nm) or less. By adding these two weeks, transit to and from, to the

Table 1. Estimates of Propulsion Power, Patrol Time and Energy Needed at Different Speeds

Patrol speed (kts)	Propulsion power as V2.5 (V = velocity)	Power related to 5 kts (%)	Days to cover 5,000 nm	Days to cover additional 1,500 nm	Energy to cover 6,500 nm as (%) to 5 kts
5	55.90	100	42 (41.7)	12.5	100
6	88.18	158	35 (34.7)	10.4	131
7	129.64	232	30 (29.8)	8.9	166
8	181.02	324	26 (26.0)	7.8	202

above, the total endurance of the patrol would be in the range of 45 to 60 days (30+15 at best or 45+15 at worst), a quite reasonable value.

Propulsion and Power Estimates

Again according to *Leadmark 2050*, considerations about the capability of a new submarine include:

> the ability to contribute to joint operations in the littorals through a broader range of strike weapons, intelligence, surveillance and self-defence capabilities than are resident in the Victoria class. Also critical is an enhanced capacity to host, insert, support and extract special operations forces; the ability to remain fully connected to naval operational networks at depth and speed; the ability to operate and recover autonomous underwater vehicles; and the ability to operate even more covertly, using air-independent propulsion.[12]

As well, a key strategic consideration would be the ability to operate in all three of Canada's ocean environments, including operations under ice.

Considering the requirements and expected capabilities stated in *Leadmark 2050*, the following assumptions will be introduced for the boats:

- Able to host a complement of about 50 (as in the *Victoria*-class submarines), plus additional berthing and habitation for some 10 to 15 special operation forces, including food and supplies, for a minimum of 60 days.
- Strengthened hull, sail, rudder, hydroplanes and sensors to deal with ice blocks and to make it possible to break through the ice layer.
- Sufficient buoyancy required to crack the ice cap.
- Large oxygen storage both for the crew and for AIP.
- AIP systems should be redundant to allow the submarine to safely exit from below the frozen surface area in case of a system failure.

This painting of the first nuclear-powered submarine, USS ***Nautilus****, transiting under loose sea ice is on display at the Submarine Force Museum in Groton, Connecticut.*

The above assumptions lead to a boat design with a submerged displacement of about 5,000 to 5,400 tonnes, such as the Australian *Attack*-class, the biggest non-nuclear/diesel electric (SSK) submarine under development, as a starting point for reference.[13] It is said that this submarine will be able to host present and future capabilities, including an AIP system yet to be determined. However, whether it can fit in the needed AIP system, fuel and oxygen, as well as an ice-strengthened hull for Arctic operations is to be further studied. A trade-off study of capabilities needs to be done with naval engineers and shipbuilders to determine the extent of the modifications.

Based on available data for Navantia's S-80 plus (3,400 tonnes, submerged)[14] and extrapolation to the *Attack*-class (5,400 tonnes, submerged), we get the data shown in Table 2.

As shown in Table 3, the power needed for auxiliary services and 'hotel loads' is estimated at about 170 kW under patrol and transit conditions, for a complement of 32 to 40 submariners. This figure includes 10% power margin for future growth. Estimates for a 5,400 ton Arctic submarine may be set to 200 kW including a similar margin for growth. Therefore, total power requirement for a 6-knot patrol may be estimated at about 400 kW: 200 kW for propulsion plus 200 kW for auxiliaries. Similarly, for a submerged transit at 7 knots, some 500 kW would be required, of which nearly 300 kW would be devoted to propulsion.

Table 2. Estimated Propulsion Power for Different Speeds for Two Types of Submarines

Tonnes (displ.)	Estimated propulsion power (kW) required for different speed (knots) values.											
	4 kts	**6**	8	**10**	12	14	**16**	18	20	**21**	22	23 kts
3,400 (S-80 class)	56	**150**	320	**600**	1000	1570	**2300**	3200	4400	**5100**	5900	7000
5,400 (Attack class)	75	**200**	430	**800**	1350	2100	**3050**	4300	5900	**6800**	7800	9400

Note: Bold numbers are reference points: 6 knots as patrol speed; 10-12 is usually a transit speed for submarines; 16 knots may be the cruise speed of a task force; 21 knots as a reasonable maximum speed for the submarine.
Note: values have been rounded and are not fully accurate due to lack of available data and the nature of this article, but as reasonably precise as possible.
Source: Cambios de régimen del submarino S80. CN G. Matres Manso. Boletín técnico de Ingeniería, E.T.S. Ing. Armas Navales (Spain, December 2013).

Table 3. S-80 Submarine Electrical Consumption (kW) of the Auxiliary Systems When Submerged

Consumption (kW)	Economy (2-4 kts)	Patrol (4-6 kts)	Transit (7-12 kts)	Attack (12-18 kts)
Submerged safety	26	27	27	27
Systems	13	70	68	57
Propulsion aux. systems	3	10	11	24
AC (50, 60 & 400 Hz)	24	50	48	60
Subtotal	66	157	154	168
Total (10% growth margin)	73	173	170	185

One more design parameter may be inferred from Table 3: the rated power of the propulsion electric motor(s) (EM). Obviously, the maximum speed requirement should be set by the RCN and/or Department of National Defence (DND), which will be decisive to select the power of the electric motors. While a multitude of factors are to be considered to select the electric motor(s), including volume, weight, efficiency, ease of maintenance, overhaul intervals, etc., one sensible idea would be to divide the maximum power required into two motors of the same rating, coupled via a traditional gearbox or tandem connected. This would offer full redundancy in case one motor fails during an under-ice transit, would reduce the number of operating hours of one or both motors under normal operation, and would even reduce energy losses.[15] Should these motors be rated above 3 MW, the boats might cruise to the patrol scenario or escort ships at up to 16 knots by operating only one motor.

An additional possibility for a Canadian Arctic submarine would be two permanent magnet electric motors, rated 3.6 to 4.0 MW each. Running them together would boost the boat to a maximum speed of +21 knots, or up to 20 knots at about 80% load. Operating just one such motor, loaded slightly above 80%, would make a 16-knot cruise speed enabling the boat to travel along with and protect a Canadian or allied task group.

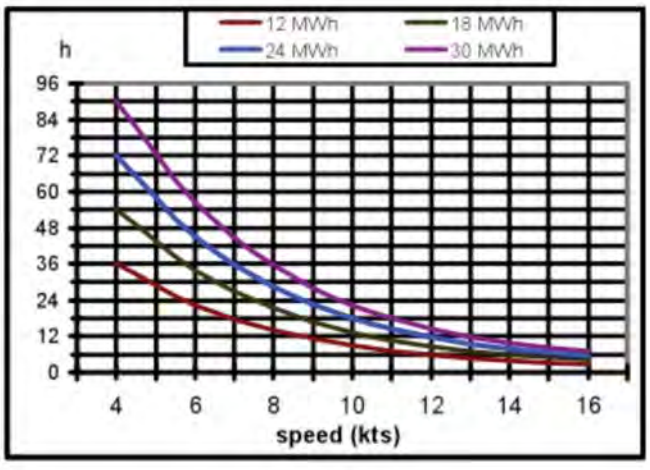
The energy storage system deserves deep and careful attention. Let us briefly go beyond the purpose of this article and have a quick look at the matter. Figures 1 and 2 provide some basic estimates based on previous power and speed calculations, including 200 kW for hotel, sensors and combat system loads, for different values of stored energy (MWh). For this purpose, batteries are assumed to discharge evenly from 100% to 25% of their capacity.[16]

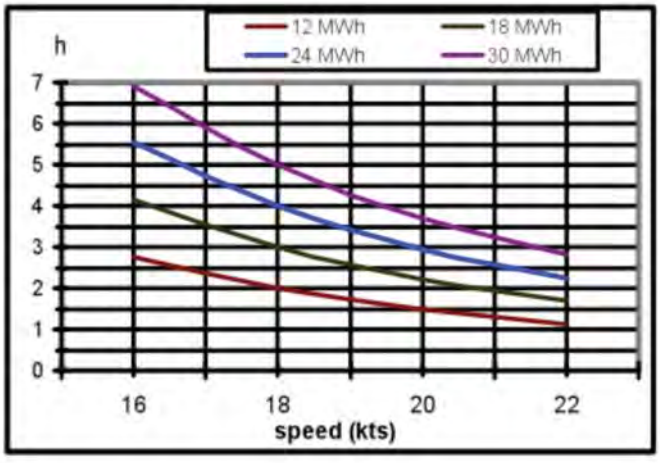
From the graphs we can see, for instance, that a 24 MWh battery system would run the boat (including hotel, sensors and other loads) at 20 knots for nearly three hours or, alternatively, at 4 knots for three days. Obviously, the higher the energy of the batteries (MWh), the longer the time submerged.

Nowadays Lead-acid batteries offer some 50-60 Wh/l energy density. When Lithium-ion (LIB), Zinc-ion or any other promising battery technology is developed and made submarine-capable, an energy density of up to 400 Wh/l is expected to be reached. Then the 24 MWh batteries would take up a volume of about 60 m^3 in the submarine. This value can be compared to the room requirements of the AIP system and fuel storage.

LIB batteries are increasingly coming on the markets, however this technology has not proven robust enough (as yet) to be utilized in most submarines. Only Japan has recently launched the first submarines fitted with LIB – the latest *Soryu*-class *Oryu* (27SS) and *Toryu* (28SS),

Figures 1 and 2. Basic Estimates of Time-span of a Fully Charged Battery System vs Speed, Without Recharging, for a 5,400 Tonnes Submarine





Credit: Jacek Symanski, Navy Public Affairs

*HMCS **Victoria** dives near Esquimalt on 20 February 2012. The long distances between either of Canada's two naval bases to the Arctic creates extra challenges for any potential AIP-equipped replacements.*

launched in October 2018 and November 2019 respectively. The Japanese navy is expected to continue that path with 29SS, its next generation of boats.[17] Similarly South Korea has recently awarded a contract for three KSS-III batch-2 submarines for delivery by about 2026, which will also be fitted with LIB.[18] Since these projects are not yet completed we will have to wait to study the results and experiences.

In order for Canada to procure a state-of-the-art submarine by the late 2030s, it is advisable to establish and fund a research and development program to develop, in a 15 to 20 year frame, a new generation of submarine-capable batteries, if such a program does not already exist. Although there is less discussion of them, Zinc-air or Zinc-ion batteries are inherently safer, less vulnerable to degradation, better at handling big power peaks and use cheaper raw materials than LIB. But, compared to Lead-acid batteries, both these technologies offer about one-fifth of the weight for similar performance.[19] This effort would also create benefits for the Canadian economy by supporting national stakeholders, companies or research entities, to take the lead in this promising field.

Conclusions

We have laid down a few frame parameters for an Arctic AIP submarine preliminary design. In order to be capable to move under the ice cap at any time of the year, the article shows some estimates on patrol speed (from 5 to 8 knots) and duration of the patrols: nearly seven weeks to cover 6,500 nm at 6-7 knots, plus two weeks in transit to/from the patrol area. Preliminary power requirements for a 5,400 tonne boat are also shown, which could be summarized, grossly speaking, as 200/300/400 kW for propulsion at 6/7/8 kts, plus up to additional 200 kW for hotel loads, sensors and auxiliary systems. Electric motor(s) for such a boat should be rated between 6,000 and 10,000 kW (6 to 10 MW) depending on the requirement for maximum speed. Similarly the energy storage requirements for the batteries and capabilities (speed vs endurance) have been estimated within the range from 12 to 30 MWh.

Notes

* The native language of the author is Spanish, therefore, he asks for understanding about grammatical (or other) errors. This article is based on unclassified information publicly available on the internet. Since some public information may be speculation, contradictory or inaccurate, the author has worked it out at his best judgement, by using basic engineering principles.

Acknowledgments: Thank you to those who first reviewed the text and provided their comments: Tomás B., Rafael G., Colin P., Pierre-Yves, Trevor, Mark C., Greg Sp., 'Oviguan,' and especially to Dr. Ann Griffiths for her dedication and patience on further editing the text.

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9. Lieutenant-Commander Simon Summers, "Air-independent Propulsion: An Enabler for Canadian Submarine Under-ice Operations?" Canadian Forces College, Service Paper, 2017-18.
10. Under-ice distance has been grossly estimated on google maps, considering the median line of ice as on March 17th within the period 1981-2010. As a rule of thumb rule, the ice cap may be assumed to start at about 60º north.
11. In math terms power required is a power of the speed (v^2, v^3, here assumed as $V^{2.5}$ where V is the speed).
12. Royal Canadian Navy, *Leadmark 2050*, p. 50.
13. See, for example, David Dunlop, "Does Canada Need a Submarine Fleet?" *Starshell*, spring 2019; and Dunlop, "The Case for Canadian Submarines."
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15. Electric motors always have some energy losses (typically 3-5%) in the form of heat, some due to mechanical friction, and some due to electromagnetic fields.
16. For further reading on the regime changes (i.e., how batteries discharge at low load, medium load, high load) and discharge of batteries, see Cambios de régimen del submarino S80. CN G. Matres Manso. Boletín técnico de Ingeniería, E.T.S. Ing. Armas Navales, Spain, December 2013.
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18. See Xavier Vavasseur, "MADEX 2019: DSME on Track with KSS III Batch 2 Submarine Program for ROK Navy," *Naval News*, 23 October 2019.
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Making Waves

A Response to "The NSS: Flawed Premises"

Ian Mack

Dialogue about the National Shipbuilding Strategy (NSS) is always welcome, especially in *Canadian Naval Review*. But the article by someone as distinguished an academic as Dr. Dan Middlemiss left me concerned.[1] I worry about the conclusion a reader might reach that there was no logical basis for the National Shipbuilding Procurement Strategy (NSPS, the original name for the present NSS program) developed over the years 2008-10, and that it is doomed to failure.

I have written many papers for the Canadian Global Affairs Institute that explained where and why we may have erred in launching the program so quickly. Taken as a group, I believe that the collective errors identified in hindsight and the likelihood of challenges ahead pale in comparison to the dark shadow cast by Dr. Middlemiss. Nor do I expect any NSS naysayer to be swayed by what follows; rather I offer this note to ensure that the public dialogue is informed by the perspectives and rationale for decisions of one of us who executed the program.

To develop NSPS, we are guilty as charged for not enlisting external independent review by shipbuilding experts. But we did a degree of homework. As Dr. Elinor Sloan pointed out in the first issue of Volume 16 of *CNR*, the NSPS Office was informed by the Industry Canada-commissioned Mott MacDonald report of March 2009 entitled "Economic Analysis of National Shipbuilding Procurement Practices" and by a Canadian Association of Defence and Security Industries (CADSI) Report in May 2009.[2] There were also consultations with First Marine International. Canada had no think tanks to ask nor had the Canadian government been in the practice of asking distinguished Canadian industrial experts for advice for decades before 2008 – something our allies do regularly. The small NSPS Office did travel to the UK to consult over its Terms of Business Agreement with BAE Systems (since abandoned), a form of NSS following on from their Maritime Industrial Strategy of 2005 as developed by Sir John Parker. But neither the UK nor Australia had an equivalent NSS at the time, both states adopting somewhat similar approaches to Canada around 2017 and one of them after seeking advice from Canada. In hindsight we might have hired RAND, although the studies done for Australia in 2015 could be read as vindication of the NSPS approach taken. Finally, the archives hold many papers generated based on the research conducted to justify NSPS to a curious Canadian government by then Commodore Pat Finn and the NSPS Office he led.

Credit: Timothy Choi

A model of the Offshore Oceanographic Science Vessel as seen in the office of Seaspan Vancouver Shipyard. It is scheduled for construction between the first and second Joint Support Ships.

We are also guilty for launching the NSPS "without a serious attempt to overhaul the procurement system beforehand," as Dr. Middlemiss phrases it. The fact is that we were under pressure to adopt quickly a new way of procuring ships for the government's fleets. We had an urgent RCN requirement to re-launch the Joint Support Ship (JSS) project procurement after the original procurement process had gone awry. We also were keen to advance the equally urgent Arctic and Offshore Patrol Ships (AOPS) – a priority for the government of the day – and the Canadian Surface Combatants (CSC). Furthermore, the Canadian Coast Guard had briefed an entire fleet renewal plan to government and needed to avoid multiple Requests for Proposals (RFPs) for each as had happened in 2008 with the *Hero*-class. And while we did identify procurement system issues from the forensic analysis of the terminated JSS process and make a number of recommendations that were not implemented by the policy owners, an overhaul of the entire procurement system was beyond the mandate of the NSPS Office.

The question of whether there was adequate Canadian government shipbuilding work to address the 'boom-and-bust' cycle is often raised. And such work could have been sourced from both government requirements and through export opportunities as Dr. Middlemiss rightly mentions. In terms of the government's requirements, the estimates developed by the NSPS Office indicated about 35 years of work for the Combat Package (awarded to Irving Shipbuilding) and 25 for the Non-Combat Package (won

by Vancouver Shipyard), based on estimates of the size of the blue-collar workforce required. These workforce estimates were presented to Canadian shipyards during consultations in 2009 without pushback. As for work from exports, mature shipyards were closing throughout the Western world at the time that NSPS was being developed because of a lack of export shipbuilding work which indicated minimal likelihood of seeing meaningful international demand under NSPS. The suggestion that we should have looked out 100 years in the uncertain world we face was never contemplated, especially in a country where naval capabilities have never been top of mind.

That said, there were three other important assumptions made. First, such a capability was essential for Canada in supporting the RCN's mission as the states around the Pacific poured money into naval fleet growth. Second, the existence of the capability would enable decision-makers in the 2020s to look ahead and plan for further work in terms of complex ship life-extensions or new build projects. And the final point, the ability of a shipyard to plan beyond building one class of ships, was seen to be a welcome opportunity for the NSS yards compared to past experiences.

Dr. Middlemiss also questions the 'build in Canada' policy covering "every project rather than focusing on those with the longest production runs." It was understood that the 'build in Canada' policy could be detrimental to efficiency for small ship runs of one to three vessels as was the case in the first four projects in the Non-Combat Package. However the policy had been uncontested since its inception and the suggestion that it be set aside was rejected. In hindsight I would add that without the production hours for the four Non-Combat Package projects, NSPS might not have been viable in the short term.

It has been argued, and Dr. Middlemiss discusses this, that there was no additional capability built into NSPS to surge to accommodate new or changing requirements, as occurred when the RCN had to lay up HMCS *Protecteur* earlier than planned after a serious fire onboard as the ship approached obsolescence. But I must note that the question of new and urgent requirements was indeed considered. To respond to such an event/necessity, my expectation was that the two selected shipyards could respond by focusing more on design and assembly of ships in their own yards but in partnership with other shipyards to build modules if desired or needed – then a common practice in the Western world and employed on the UK's two new aircraft carriers. Davie Shipyard was unsuccessful under the NSPS but clearly was an option to work with either shipyard if the need arose. I also note that we have recently seen the development of a partnership between Vancouver and Heddle Shipyards to offer to build the Polar Icebreaker. And, it must be pointed out that the first JSS has been given additional priority in Vancouver since the fire on *Protecteur*.

In terms of job growth, it has occurred, with hiring continuing and further shipyard growth anticipated. But NSPS also had its eye on job growth more broadly in the Canadian marine industry sector which would be enabled by building ships in Canada. The article in the first issue

Credit: Maritime Forces Atlantic

*Some crew members of HMCS **Harry DeWolf** familiarize themselves with their new Multi-Role Rescue Boat, built by Rosborough Boats of Nova Scotia, on 2 September 2020 in Halifax.*

Motor Vessels ***Kaministiqua*** *(left) and* ***Rt. Hon. Paul J. Martin*** *sit in Heddle Drydock facilities at Port Weller, Ontario, winter 2020. Heddle teamed up with Seaspan to bid on the Polar Icebreaker project, and the Port Weller facility would be responsible for contributing major modules to that project.*

of Volume 16 of *CNR* by Dr. Dave Perry reports on Canada's marine sector job growth to date.[3] Furthermore, the unique NSPS 'value proposition' committed the two NSPS shipyards to invest in ongoing marine sector growth. But while technical job growth matters to the prosperity of Canada, the primary focus was on achieving strategic partnerships to deliver ships which would be affordable once the shipyards and supplier relationships had matured – a process still underway. And the addition of new projects would make NSS sustainable beyond the 2030s – hence, and in time, a sustainable and affordable shipbuilding capability in Canada.

As with Canada, the NSS equivalents in Australia and the UK also risk budget challenges and delivery time challenges for follow-on build programs when there is slippage in earlier shipbuilding projects or gaps in production work. Clearly, what matters is the size of the gap – a two-week holiday shutdown is not a problem but it is potentially devastating after 4-5 years in terms of expense to rehire and relearn during restart. Most shipyards suffer gaps between build programs. As one of those involved in the NSPS design I expected such gaps would occur but captured in months and not years. Many international yards have kept key people on the payroll during such gaps to ensure that the cost escalation is manageable when back in business. And one should note that Australia has used additional ships of ongoing programs to fill lengthy gaps, as Canada appears to have done with AOPS (adding two for the Coast Guard).

Two tactical contracting issues were also raised by Dr. Middlemiss. The first suggests that the 'Cost Reimbursable Incentive Fee' model to contract for production work encourages excessive man-hour invoicing to inflate fees. This is a misunderstanding of the model which shares in savings when the shipyard delivers ships for less than the negotiated target cost but can penalize them in terms of profit if they exceed some threshold over target. The second comment suggests that the CSC procurement competition was "without any direct reference to cost" and thus rendered Canada with no leverage. This is not so as the CSC RFP called up a reference point design and a related assumption set that established a relative cost estimate. Once in contract and as design changes are made, Canada could leverage the cost estimate provided during subsequent negotiations. I also would note that this is a common practice for 'modified military off-the-shelf' warship procurement.

NSPS was not only about rebuilding a productive Canadian complex ship construction capability. The shipbuilding work was also understood to be a key enabler to growth in the broader Canadian marine sector which would supply the shipyards. It was understood that a significant premium would initially be paid to get the selected shipyards on their feet with modern equipment that could enable efficiency. It is well known that it takes a run of at least three ships of class (not nine as has been suggested) to achieve a level of learning that produces a fair productivity assessment – this being a milestone just now becoming a reality in NSS. It was never about 'propping up shipbuilding' while I was engaged in the program (2008-2017) and I doubt if the situation has changed since. Rather, we need patience and an ongoing fair assessment based on sound research to ensure that our new Canadian shipbuilders reach expectations and maybe even exceed them someday.

Notes

1. Dan Middlemiss, "The National Shipbuilding Strategy: Flawed Premises," *Canadian Naval Review*, Vol. 16, No. 1 (2020), pp. 26-28.
2. Elinor Sloan, "Naval Shipbuilding Strategies in Australia, Britain and Canada," *Canadian Naval Review*, Vol. 16, No. 1 (2020), pp. 14-19.
3. Dave Perry, "The First Decade of the NSS," *Canadian Naval Review*, Vol. 16, No. 1 (2020), pp. 36-38.

Is There a Plan behind China's Recent Behaviour?

Ann Griffiths

Does China have a long-term plan for its foreign policy? In the West political actors tend to think in the short term, to the detriment of strategic planning. But we often assume that China takes a long-term view and has better strategic vision than we do. If this is true, the recent international behaviour of China is puzzling.

Since Xi Jinping became President of China in 2012, he has changed the country's tune. From hiding its light and biding its time, Xi has made it clear that he's working from a new song book. In his first major foreign policy speech in early 2013, Xi talked about the 'China Dream,' the "great rejuvenation of the Chinese nation." This has meant a far more robust/aggressive foreign policy. His predecessors focused on the economic development of the country and, while this is still important, there is now a much greater focus on building up the military.

In China the emphasis was traditionally placed on the army as it concentrated on its land borders. There is still some focus on continental borders. A border dispute with India resulted in fatalities in May 2020, the first lethal fighting between China and India since their brief war in 1962. China does not admit to fatalities among its personnel, but since India had 22 deaths in close quarters fighting, it is likely that there were some casualties among Chinese forces as well. India has worried about China for some time, and in 1991 it adopted its Look East policy to provide a counterweight to the influence of China. The *Look* East Policy changed to the more robust *Act* East Policy in 2014.

China has recently broken with its long tradition to place much more emphasis on its naval forces, to the point that the People's Liberation Army (Navy) (PLAN) is perhaps the largest navy in the world (depending on what you count). And India has turned attention to its navy to counterbalance an increasingly active PLAN in the Indian Ocean. India's annual Malabar naval exercise has increased from a bilateral exercise with the US Navy, to include Japan and now Australia. As well, China's Belt and Road Initiative has caused concern in India, as has Chinese acquisition and/or control of ports in Pakistan in the west of India and Sri Lanka in the south.

In recent years, China has pushed its 9-dash line maritime claim. This claim includes virtually all of the South China Sea (SCS), a region through which vast quantities of cargo transit to and from China, Taiwan, South Korea and Japan. China's claims include the islands and reefs in the sea as well as the Spratly Islands, Paracel Islands, Scarborough Shoal, and various boundaries in the Gulf of Tonkin. Control of the SCS would give China control of potentially lucrative oil and gas fields, fishing areas and important shipping lanes. Since 2013, despite assurances that it would not militarize the region, China has been building on the Spratly Islands and the Paracel Islands what are clearly military facilities. The Philippines protested China's claim and took China to the Permanent Court of Arbitration, which in 2016 ruled in favour of the Philippines. China ignored the ruling. And since no one has been willing to force China to abide by the ruling, it continues to push its claims. This has affected relations with the other South China Sea claimants – Brunei, Malaysia, the Philippines, Taiwan and Vietnam. As well, after widespread domestic protest, Thailand recently announced that it is withdrawing from an agreement with China to build a canal through the Kra Peninsula so China can bypass the Malacca Strait.[1]

China provoked a maritime confrontation with Indonesia starting in late 2019 – although of course in this case, as in others, the story is told differently within China. This

Credit: Mass Communication Specialist 3rd Class Chris Cavagnaro, US Navy

The aircraft carrier USS ***George Washington*** *along with three American, two Japanese, and two Indian warships sail in formation in the Pacific Ocean on 30 July 2014 as part of Exercise Malabar 2014.*

Credit: Vietnam Coast Guard

Chinese Coast Guard vessels escort the oil rig Hai Yang Shi You 981 in May 2014 as it moves within the Vietnamese continental shelf 120 nautical miles east of Ly Son Island. After clashes with Vietnamese vessels, including the sinking of a Vietnamese fishing vessel, the rig was withdrawn.

happened when a Chinese coast guard vessel and fishing boats entered waters off the coast of the northern Natuna islands. Indonesia says the islands are in its exclusive economic zone but China claims the region as part of the SCS 9-dash line. Indonesia issued diplomatic protests. Until this year Indonesia had been keeping out of the maritime disputes with China, but with more assertive Chinese actions in what Indonesia considers its maritime territory, Indonesia has joined the cause against China.

But that is not the end of it. President Xi has made it clear that he wants Taiwan back in the bosom of China during his tenure – this is part of his 'China Dream.' China has been busy peeling away the few states that recognize Taiwan by means of threats and economic inducements. Chinese naval forces are increasingly patrolling around Taiwan, and have conducted live fire exercises near it. As well, Chinese strategic documents have quietly stopped using the word 'peaceful' when talking about reuniting Taiwan with China.

The list goes on. China is challenging Japan's control of the Senkaku Islands (known in China as the Diaoyu Islands) in the East China Sea. This is done via military overflights, naval incursions, fishing boat and naval militia incursions, coast guard patrols, economic punishments and aggressive statements. Japan is now beefing up its navy, and rethinking its pacifist constitution.

Until recently Australia was happy to capitalize on trade with China – so much so that China is now Australia's largest trading partner – but the honeymoon seems to be over. Australia discovered that China had been interfering in its political process which has caused pushback. It introduced new rules about foreign financing of political parties and candidates, and has paid more attention to Chinese influence in education and the media. As well, when Australia called for independent analysis of the source of the COVID-19 virus and the World Health Organization's handling of it, a Chinese diplomat was withering in his criticism – referring to Australia as gum on the bottom of China's shoe.

We don't need to discuss the testy relations between the United States and China. This goes beyond personal antipathy between leaders, it can be found deep in threat assessments conducted by the US military. The US Navy has increased its freedom of navigation patrols in the South China Sea, and its transits of the Taiwan Straits, which China refers to as aggression. The recent US Department of Defense report to Congress outlines a number of concerns with Chinese military technology and weapons capability.[2] We also don't need to mention the sticky relations Canada now has with China.

Where once China was quietly buying its 'friends,' it is now alarming them with aggressive tactics. It is the largest trade partner of many Indo-Asian countries, but its actions are causing some states to reconsider their options. In just a few years, Xi has frightened and/or annoyed India, Japan, Indonesia, Australia, Vietnam, South Korea, Taiwan, and so on. And this is just looking at the maritime arena! He has pushed states that historically were not inclined to close relations with the United States – eg., India and Vietnam – into US arms.

One of the strengths of the United States has always been its many friends and allies around the world. At a time when the United States has insulted its friends and allies and indicated a lack of commitment to them, China could be building a stable of friends and allies (or at least allowing states to remain neutral in the geopolitical contest). But it is doing the opposite. As it stands, right now China has few allies and fewer real friends. When push comes to shove, can it count on North Korea (maybe), Pakistan (maybe), Iran (maybe), possibly Russia (or possibly not),

and countries in Africa that rely on it for investment and trade?

Is there a plan behind all this? President Xi's aggressiveness and over-blown rhetoric work well to distract the domestic audience from a slowing economy. This is undoubtedly a large part of the reason for doing it. This policy should, however, be handled with care; ramping up nationalism is much easier than tamping it down! And for the external audience, the behaviour is increasingly counterproductive. 'Wolf Warrior' China has shown its true face – and it's not a pretty one.

Notes

1. "Big blow to China as Thailand scraps KRA canal project," MSN, 4 September 2020.
2. US Department of Defense, "Military and Security Developments Involving the People's Republic of China," Annual Report to Congress, August 2020.

The Australian 2020 Defence Strategic Update

Colonel (Ret'd) Brian K. Wentzell

Credit: Lauren Larking

Australian Minister for Defence, Linda Reynolds, speaks at the launch of the 2020 Defence Strategic Update and the 2020 Force Structure Plan at the Australian Defence Force Academy, 1 July 2020.

The Australian government released its 2020 Defence Strategic Update to the public on 1 July 2020. The document was accompanied by the 2020 Force Structure Plan.[1] These documents supersede the 2016 plan and reflect the fact that relationships amongst states along the crescent of Indo-Asia from Japan to India are evolving quickly. The spreading, and increasingly aggressive, political and trade activities of the People's Republic of China (China) are forcing the countries of Indo-Asia to re-evaluate their foreign and security policies. Thus, Australia has had to re-evaluate its defence strategy and military plan to counter the activities of China.

As we have seen, and as the Australian 2020 Defence Strategy discusses, China has shown little respect for the rights of other states. States have the legitimate right to conduct operations in, on, under and over the international waters of the East China Sea and South China Sea. But, as the document has noted, the Chinese navy (PLAN) and Coast Guard routinely harass foreign fishermen and mariners pursuing their legitimate activities. As examples to demonstrate the aggressive behaviour of Chinese government agencies, we can see the Chinese interference with the activities of Philippine fishermen in historic fishing grounds, and the exploitation of resources in maritime zones claimed by Vietnam. The PLAN and the maritime militia are the seagoing challengers and both have been very successful in their operations. These activities have been supplemented by Chinese civilian fishing fleets that occupy traditional fishing grounds of other South China Sea states. In addition, air elements of the Chinese Armed Forces have harassed US military aircraft operating in international airspace over the South China Sea for several years.

China has learned from history the importance of the complete control of adjacent seas. Such seas contain economic resources for exploitation and provide a security buffer to adjacent areas on the land. As the defence document points out, China has little interest or incentive to share these seas with other states or users, despite the rights of states, legal entities and persons under international law. The adjacent seas provide a security buffer zone for China and it does not welcome foreign navies, air and military forces in them. These actions remind one of the American efforts to make the Caribbean Sea an American lake. It did not turn out well with the emergence of a long-term Communist regime in Cuba dispatching the idea to the dustbin of history. The future will reveal the long-term success or failure of China in its similar endeavours.

Having outlined the changed security environment, the 2020 Defence Strategy then turns to the implications for Australia. From an Australian perspective, the actions of China are disturbing. As the Defence Strategy stresses, Australia is a law-abiding state which respects the laws of the sea. The diminution of the sanctity of the laws of the sea by any one state is a threat to all other maritime states. The failure of China to respect the decision of the Permanent Court of Arbitration of 12 July 2016 underscores its disrespect for the legitimate rights of another state in the resources of the sea. Such behaviour is unacceptable in the modern interconnected world; however, China's behaviour remains unchecked by other states.

Credit: LSIS Bradley Darvill, Royal Australian Navy

Commodores Kunissery Mallath (left, Indian Navy), Robert Plath (centre, Royal Australian Navy), and Erwin Aldedharma (right, Indonesian Navy) sign copies of the minutes from the inaugural Trilateral Maritime Security Workshop held 25-27 November 2019 in Fremantle, Australia.

China is an important trading partner with Australia. Nearly 46% of Australia's international trade is transacted with China. Australia depends upon China to purchase rare earth minerals, iron ore and coal from it. Australians purchase significant quantities of consumer goods from China and there are many Chinese students at Australian universities. The Chinese have invested large sums of money in real estate developments throughout Australia. Thus, as the Defence Strategy points out, Australia has a significant economic dependency upon China.

A country with a heavy dependency on a single state is at risk of political, economic, military and other pressures from the dominant trading partner. Canada is similarly exposed to the United States. However, strong national institutions and deliberate policies for diversification of sources of supply for strategic and other resources can reduce the impact of such dependency. Australia can seek alternative sources of supply, however, the impact of the loss of Chinese markets for Australian exports cannot be ignored. Alternative purchasers must be found. Australia has much work to do, aside from implementation of its new Defence Strategy.

As the Defence Strategy notes, India is one market opportunity for Australia to reduce the influence of China. India produces consumer goods in competition with China and other states. Its democratic traditions are more compatible with Australian values and history, and the countries share a common language. It is also a country that needs access to natural resources such as iron ore and rare earth minerals, which Australia has. Indian students could be invited to attend Australian universities. The Defence Strategy concludes that it is time for Australia to market its economic and educational opportunities to the Indian people and their federal and state governments.

Australia has a unique opportunity to work with like-minded countries stretching from Japan to India to develop strong economic, social, trade and security relationships to counter the resurgent, but 500 year old, Belt and Road Initiative of China. It is time for Australia and its citizens to seize the initiative and turn this opportunity into reality.

Notes

1. Australia, 2020 Defence Strategic Update and 2020 Force Structure Plan, July 2020.

A View from the West: *Maritime Domain Awareness and Piracy in Asia*

Shannon João Sterrett

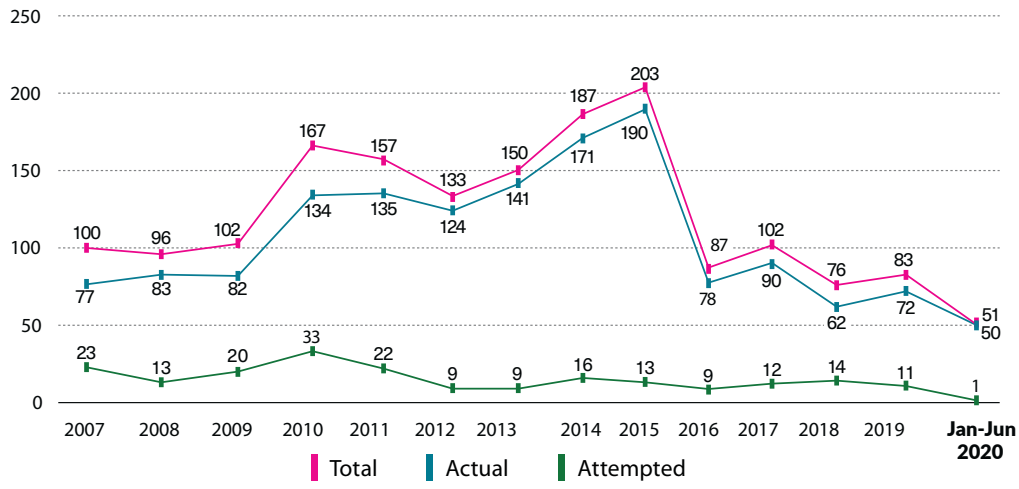
From 1995 to 2013, Southeast Asia accounted for almost half of the world's piracy attacks. However, better security at ports and anchorages, improved awareness and vigilance by vessels, enhanced coordination among regional, national and international agencies, and the establishment and development of international networks of information sharing has improved the situation since 2013. The Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia (ReCAAP) reported that these counter-piracy efforts reduced the number of cases in Asia to 83 incidences[1] of piracy and armed robbery (actual and attempted) against ships in 2019, compared to 203 in 2015. Analysts agree that improvements in counter-piracy in Southeast Asia are generally due to increased regional cooperation and the prioritization of maritime domain awareness (MDA).

Since the beginning of 2020, however, Southeast Asia and the Strait of Singapore have experienced a resurgence of piracy and armed robbery at sea as states struggle to contain the COVID-19 virus, which has caused economic reverberations that have disproportionately impacted the most vulnerable.[2] Southeast Asia experienced a three-fold increase in piracy and armed robbery in the first quarter of 2020, recording 29 incidences, compared to 10 during the same period in 2019, with many more cases likely unreported. Moreover, the 51 reported attacks from January to June of 2020 is the highest number since 2015.[3] With some of the most affected Southeast Asian states cutting defence budgets, countries becoming more insular, worsening economic conditions, and the continuation of adversarial regional politics, it is likely that MDA will be further eroded in the region, which means that piracy and armed robbery will continue to increase.

Piracy and armed robbery[4] at sea are estimated to drain between USD $7 to 12 billion from the global economy annually.[5] Southeast Asian waters are particularly susceptible given regional socio-economic inequality, a history of piracy in the area, the geographical challenges posed by multiple islands, and the massive scale of trade that flows between vital chokepoints. The Straits of Malacca and Singapore (SOMS) are crucial to global trade, as nearly 120,000 vessels transit these waterways per year – a third of global maritime commerce.[6] These straits often experience the highest density of piracy and armed robbery against ships in Asia.[7] The Strait of Singapore has been especially affected by piracy in 2020, with 16 incidents in the first half of the year, compared to only seven incidents in 2018.[8] Moreover, the SOMS only had eight recorded incidents during the first half of 2019, indicating a doubling of piracy attacks this year.[9] This is not just a regional problem, but a global one due to the significant trade that transits through the region. With 80% of global trade by volume (70% by value) transported by sea, 60% of that passes through Asia, making SOMS one of the most important chokepoints in the world.[10]

Improving MDA has been the region's response to piracy and armed robbery. A strong MDA framework involves

Figure 1. Number of Incidents in Asia (2007-2019 and Jan-June 2020)



Credit: ReCAAP

Source: Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia (ReCAAP) Information Sharing Centre (ISC), "Piracy and Armed Robbery Against Ships in Asia: Half Yearly Report, January-June 2020," 30 June 2020.

reciprocal interrelations whereby technical data from the sea, such as reports of piracy and attacks, are transmitted to operational agencies, such as navies, law enforcement authorities, intelligence agencies and information-sharing agencies. These agencies can then organize and act upon such information.[11] This relationship has been critical to countering piracy in Southeast Asia. However, it is this relationship that is potentially being eroded because of the COVID-19 pandemic. MDA agencies in Southeast Asia – such as the International Maritime Bureau's (IMB) Piracy Reporting Centre (PRC), Singapore's Information Fusion Centre (IFC), and the Information Sharing Centre (ISC) of ReCAAP[12] – are at risk of becoming less effective particularly if national naval resources are cut.

The close proximity of states in Southeast Asia means that attacks can cross national maritime borders which complicates jurisdiction and who is responsible for pursuing or investigating perpetrators. In these areas, regional cooperation through developing a shared MDA is especially important. The PRC, IFC and ReCAAP's ISC, which involve participation from multiple countries, focus on reporting, fusing and sharing maritime threat information, and have considerably enhanced MDA in Southeast Asia by receiving and processing information which is then distilled into actionable intelligence for naval forces. Although enhanced MDA development has generally led to decreased levels of piracy in Southeast Asia, the disruption caused by the COVID-19 pandemic and the ensuing economic downturn that could lead to diminished defence resources threaten to bring piracy back to the fore.

MDA may be weakened in Southeast Asia, not from gaps at the international level, but from individual states which are limiting or freezing naval resources, coupled with complicated domestic politics. These limitations at the national level may interrupt the region's responsiveness to piracy. Counter-piracy research indicates that an effective strategy relies on coordination between information-sharing institutions and national law enforcement authorities.[13] However, while the former is continuing to produce data, the latter's capabilities may be threatened amid COVID-19 concerns that is causing decreased resources allocated for defence forces where piracy has been most prevalent, and potentially lower levels of inter-state cooperation as states minimize interactions.[14]

Petty regional politics also hamper the fight against piracy. Neither Malaysia nor Indonesia is a member of ReCAAP due to the former not wanting it to rival the Kuala Lumpur-based IMB, and the latter disgruntled because of losing to Singapore its bid to host the organization. Although both states have expanded their domestic naval capabilities over the last decade, this may not be the case moving forward, and their absence from key MDA institutions harms counter-piracy efforts. Consequently, the lack of coordination both domestically and internationally means that authorities and agencies are often duplicating data, distorting the maritime image, not responding effectively to maritime threats, and wasting resources.

Further aggravating the issue is the reduction of defence spending in some states due to COVID-19, which will likely affect national maritime law enforcement agencies. Indonesia announced it is cutting its defence budget this year by USD $588 million, or 7%, and Thailand announced it would make cuts as well.[15] The Philippines has indicated it will funnel some of its defence budget into funding COVID-19 programs, while Malaysia has scaled back its military spending from 1.5% of GDP throughout the mid-2010s to 1% since 2017 due to strained finances.[16] These cuts may translate into limiting national naval resources that are critical to acting on the information produced by the MDA centres and may enable an increase in piracy.

Credit: Republic of Singapore Navy

*The Republic of Singapore Ship **Daring** sails amongst heavy commercial shipping in this undated photo.*

Credit: Malaysian Navy

Ships from the Malaysian Navy conduct a readiness exercise on 6 February 2020.

Piracy experts note that most maritime crime in Asia is opportunistic and usually driven by socio-economic conditions. The World Bank has already projected negative growth for members of the Association of Southeast Asian Nations (ASEAN) this year, meaning that piracy is becoming an economic option for some.[17] The economic consequences of COVID-19 have hit the region's smaller fisherfolk particularly hard in light of reduced demand and restrictions imposed on the industry.[18] Some are turning to piracy and targeting vessels that are often left for extended periods at sea due to quarantine measures. It seems the current conditions have caused ample opportunities for piracy attacks.

With research indicating that piracy surges from economic inequality, fractures in MDA and in geographically susceptible areas, it is likely that instances of piracy and armed robbery will continue to increase in Southeast Asia. Addressing the problem will be challenging. Not only will domestic conditions need to improve, which could take a while due to the pandemic, regional cooperation will need to be enhanced above 2019 levels. Although it may take some time to discern how the COVID-19 pandemic has affected MDA in Southeast Asia, it is evident that it may have already exacerbated piracy and armed robbery in the region. Fortunately, thus far there has only been minor fracturing in the region's MDA, but even this may prove problematic, as incidents are on the rise and regional cooperation is critical to combat the issue.

Further analysis on whether the Southeast Asian model of MDA could be applied elsewhere is needed. For example, Somali piracy was reduced from around 180 attacks in 2011 to virtually none in the last two years through international deployments in the region along with strengthening the central government. MDA was not important by comparison.[19] However, in other regions, like the Gulf of Guinea, MDA-focused counter-piracy could be particularly effective given multiple states in the region with overlapping waters along with varied capabilities. The international community should pay attention to this issue as the current conditions point to it worsening rather than improving.

Notes

1. 'Incidences' in this article refers to both actual and attempted. The majority of total incidences are actual attacks, with attempted attacks representing a smaller percentage of the figures.
2. Lucy Martin, "Coronavirus: Piracy Incidents Double Across Asia During Pandemic," BBC News, 17 July 2020.
3. ReCAAP Information Sharing Centre (ISC), "Piracy and Armed Robbery Against Ships in Asia: Half Yearly Report, January-June 2020," ReCAAP, 30 June 2020.
4. To clarify, the UN Convention on the Law of the Sea distinguishes between piracy and armed robbery. The former only occurs outside of the 12 nautical mile zone and is beyond territorial water whereas the latter is the term for the same actions that occur within a state's territorial waters. In this article I adopt ReCAAP's definition of piracy which does not make the distinction made by UNCLOS between piracy and armed robbery. When referring solely to 'piracy' in this article at times, I am also referring to armed robbery at sea as well, unless otherwise specified.
5. Adam McCauley, "The Most Dangerous Waters in the World," *Time*, 15 August 2014.
6. *Ibid.*
7. Giacomo Morabito and Bruno S. Sergi, "How Did Maritime Piracy Affect Trade in Southeast Asia," *Journal of East Asian Studies*, Vol. 18 (2018).
8. ReCAAP ISC, "Piracy and Armed Robbery Against Ships in Asia: Half Yearly Report, January-June 2020"; and "Piracy Incidents Rise in Singapore Strait," *Gard*, 6 January 2020.
9. ReCAAP ISC, "Piracy and Armed Robbery Against Ships in Asia: Half Yearly Report, January-June 2019."
10. "How Much Trade Transits the South China Sea?" China Power, 10 October 2019.
11. Darshana M. Baruah, "Expanding India's Maritime Domain Awareness in the Indian Ocean," *Asia Policy*, No. 22 (July 2016).
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Dollars and Sense: Coping with COVID

Dave Perry

It is often a stretch to say that particular events have changed everything, but in the current context, it isn't. The COVID-19 pandemic, and government reactions to it, have completely changed Canada for at least the short term, and likely well into the future given the transformation this health and economic crisis will usher in. In what other post-electoral context would it be normal for a government to be finishing up the summer following a fall election with effectively no progress to report with respect to implementing its campaign commitments? And yet that is where the Justin Trudeau government sits at the time of writing, in mid-August 2020, just after Chrystia Freeland replaced Bill Morneau as Finance Minister. Responding to the COVID pandemic and the economic catastrophe that resulted from the public health measures put in place to mitigate it has consumed the government since mid-March. Understandably, given the magnitude of the problem, little time has been devoted to any other activity of government, including implementing the campaign pledges that won the Liberal government the election.

Then-Finance Minister Bill Morneau speaks on the COVID-19 Economic Response Plan in the House of Commons on 8 July 2020 while Chrystia Freeland and Justin Trudeau look on. Freeland took over from Morneau as Finance Minister a little over one month later.

Across the government of Canada, at least in the National Capital Region, the impact has been widespread, with the bulk of the public service sent home to work from their couches and kitchens. While progressively more staff are returning to the office, downtown Ottawa remains a virtual ghost town given the absence of federal employees from their offices.

The Department of National Defence (DND) and Canadian Armed Forces (CAF) in comparison may have been amongst the least immediately impacted organizations in Canada from COVID. While a sizeable portion of its workforce was sent home, operational activities have mostly continued, with public health modifications. An operationally focused organization, the CAF actually already had some stockpiles of the Personal Protective Equipment that was in short supply elsewhere, and appears initially to be more oriented towards working within the COVID environment than avoiding it. Relatively early on, the navy's quarantining of ship companies before deployments meant ships sailed as otherwise scheduled, and the defence industry that supports the DND/CAF was declared an essential service allowing its support to continue. That is not to say there were no effects. The Irving Shipyard shut down production for a time and both it and Seaspan had to adjust operations, for instance, but the designation as an essential industry meant that the defence industry could continue to operate whereas other sectors were shuttered. Most notably, although thousands of troops put on standby ended up not being needed, many were sent to run care homes in a move not predicted at the onset of the health crisis. While some international operations were scaled back, the army has resumed its summer training, adding face masks to the list of standard issue camouflage.

In contrast, major swathes of the Canadian economy continue to operate remotely, if they are in fact operating, while some sectors such as travel and hospitality, remain crippled by a lack of business. Several provinces were still in the process of deciding how many of the normal hours of in-person public schooling parents can expect their children to receive in a few short weeks at the time of writing. And millions of Canadians who are still working are doing so because their employers are receiving the direct support of the federal wage subsidy or the indirect support of their employees collecting the government's emergency response benefit while they pick up a few shifts a week.

As the summer of 2020 ends, 8.5 million Canadians had drawn on the government emergency response benefit at some point since its introduction, with close to two million applying just in the second week of August.[1]

To deal with the health and economic situation, the government has committed around $200 billion on COVID mitigation and economic supports, pushing this year's

deficit to close to $400 billion and Canada's total debt over $1 trillion. And that was before any of the 'transformational' initiatives mentioned when Freeland was sworn in as Canada's new Finance Minister. For DND and CAF, the more notable, if less discussed, eye-popping number to keep an eye on is the federal government's loss of revenue as a result of a severely weakened economy. As of July, the government was expected to fall more than $70 billion short of its pre-COVID forecasted revenue of $350 billion.[2] In context, pre-COVID federal spending was roughly $350, of which about $100 billion went towards ministerial spending. With the other amounts going to pensions, transfer payments, social welfare programs, or debt repayment that are far more fixed, the remaining $100 billion in ministerial spending is effectively the 'discretionary' component of federal spending, and DND represents roughly a quarter of this. At present, the government is only collecting enough revenue to fund one-third of those expenses.

To be clear, there has been no indication that the Trudeau government is as yet thinking about restricting spending in any way. In fact, the opposite has been suggested, as media reporting around the change of Finance Minister suggested that one of the reasons Morneau was replaced was his lack of enthusiasm for large spending. There is the possibility that the spending taps are now "really going be turned on."[3] But as many in defence circles have observed, there are strong historical reasons to be concerned that the weakened economy and fiscal deficits with which Canada finds itself saddled will lead to defence budget cuts down the road. That has been the pattern experienced dating back over the previous 40 years. In the recessions in the early 1990s and the Great Recession after 2008, the defence budget was significantly cut, along with wider departmental spending. As Eugene Lang has argued, this precedent and the fact that Canada's budget math remains the same, with defence consuming the single largest share of ministerial, or discretionary, federal spending, means we should be prepared to say RIP to *Strong Secure Engaged* (SSE).[4]

If the past serves as a guide, we won't know the impact for another year or two, at a minimum. Following the 2008 financial crisis, it took the Stephen Harper government, which had embraced fiscal balance as a goal, until the 2010 Budget to outline a series of measures to rein in government spending in the wake of its stimulus plan, and the measures took effect starting in April 2010. The Trudeau government is far less concerned about fiscal balance than the Harper government. Trudeau campaigned on running $10 billion a year deficits and returning to balanced budgets in the short term, but progressively moved to a roughly $30 billion a year deficit with no plan to return to balance, pre-COVID-19. And that was before the global COVID-19 pandemic sent interest rates and the cost of borrowing to historically low levels, creating a paradoxical situation in which the cost of servicing Canada's

Credit: Corporal Marc-André Leclerc

Wearing the now-characteristic face masks and shields, members of the Canadian Grenadier Guards decontaminate a room in the Jeanne-Le Ber long-term care centre in Montreal during ***Operation Laser****, the CAF's response to COVID-19, on 17 June 2020.*

Credit: 331 Squadron, Royal Norwegian Air Force

Three Norwegian Air Force F-16s and four F-35s escort an American B-52 bomber in international waters north of Finnmark, Norway, on 3 June 2020. Despite COVID-19, the United States has increased its strategic bomber presence in Europe, with multiple flights over Norway and near Russia this year.

debt has decreased even as the size of the deficit has increased dramatically. On its past fiscal record alone, the Trudeau government would seem less oriented to returning to balance than any other government in a couple of generations.

Another consideration will hopefully factor into any decision to reduce spending on defence – the current strategic climate. This climate features a return of great power competition accompanied by American strategic retrenchment. Starting with President Barack Obama, the United States began shifting its strategic posture. This has meant withdrawing some of its international presence, and adopting a less interventionist stance than many previous administrations. The Donald Trump administration continued this trend and adopted a policy of actively alienating American allies.

This all happened as the Russian government started fielding a generational leap in new military technology that, according to the outgoing commander of US NORTHCOM/NORAD, has placed the US homeland at risk from conventional threats for the first time in generations.[5] Concurrently, China's emergence as a global power, and burgeoning regional hegemon intent on working outside of the accepted international norms, rules and legal structures that have endured since WWII, is even more problematic. Given China's economic strength and, as COVID has demonstrated, strategic role in the global supply chain of many essential goods, it is surely the longer term strategic problem. And this has already manifested itself. As a senior NATO official stated in fall 2019, in terms of security threats, Russia is like a bad storm, whereas China is more like climate change.[6] So unlike the 1990s recession that came on the heels of the Berlin Wall's collapse, or the 2008-2009 recession that occurred during costly war in the Middle East but at a time when Russia was still pursuing partnerships with NATO and China was still thought of as an aspiring trading partner and collegial member of the world community, the current economic crisis is the first to happen since the Cold War in a period of heightened, and rising, geostrategic tensions.

How much this matters to the fate of the defence budget will likely depend on a combination of how intensely Canadians feel the respective economic and geostrategic threats. At the moment, given the perilous state of the economy, it will be a tough sell to convince many Canadians that they should be concerned enough about China that maintaining, never mind increasing, the defence budget should outweigh their concerns for their children's employment prospects. If the defence budget is to survive in the short term unscathed, senior defence officials need to be far more forthright about the changing strategic landscape than they have been.

Notes

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Warship Developments:
Pandemic Sticker Shock

Doug Thomas

The price tag for the Canadian Surface Combatant (CSC) project is under the scrutiny of the Parliamentary Budget Officer (PBO), who will also examine several less-costly frigate projects as possible alternatives to the Type 26 option: specifically, the French/Italian FREMM Multi-Mission Frigate and the British Type 31 General Purpose Frigate. The huge sums expended by the federal government on addressing the impact of the current pandemic will doubtless put pressure on many projects such as the CSC. The House of Commons Government Operations Committee has requested that the PBO analysis be presented by 22 October.

The CSC project is currently estimated at $70 billion (Canadian), a number which has risen steadily in recent years. Approximately half of the CSC build-cost is comprised of labour in the shipyard and materials, according to federal government documents.[1] Other costs will include the procurement, fitting and integration of weapons, sensors, and a command and control system to enable each ship to operate with a network of compatible maritime forces. Also included are a plethora of through-life costs, such as maintenance, refits, manning, training, fuel, translation of manuals into French, industrial benefits packages, and even disposal. These are all included in the project cost even though the expenditures will occur over the span of half a century or more: from designing and laying down the first ship to scrapping the last one. It is no wonder that the Canadian public recoils from the cost of major defence purchases. I remember in the mid-1950s that the price tag for one then-modern *St. Laurent*-class destroyer was $23 million – but that was not a through-life cost.

There have been suggestions that Canada could 'dump' the Type 26 design and go for a cheaper alternative. The CSC project is still in its early stages and costs to withdraw might be covered by savings from a less expensive ship. The following summarizes the features of FREMM and Type 31.

FREMM

The US Navy has selected the FREMM design for its new frigate class (FFG(X)), which is likely to comprise 20 ships. The *Arleigh Burke*-class destroyers (DDG) – the most numerous of the USN's current escort vessels – were too expensive to build in the necessary numbers to achieve a 355-ship fleet. Therefore, a smaller and less expensive combatant was needed and in order to expedite construction, a proven foreign design was to be modified and built in the United States. After going through a selection process to determine the best choice of existing

A rendering of the winning design for the US Navy's FFG(X) frigate, based on the Italian version of the FREMM. Its name was announced as USS Constellation FFG 62 on 7 October 2020 by Secretary of the Navy Kenneth Braithwaite.

designs, a contract was placed in April 2020 for the initial 10 FREMM frigates with Fincantieri's Marinette Marine shipyard in Wisconsin, which is currently building the smaller *Freedom*-class Littoral Combat Ship (LCS). The estimated cost per ship is around Canadian $1.3 billion per ship.

The US Navy wants a frigate that can keep up with aircraft carriers and have sensors networked in with the rest of the fleet to expand the overall tactical picture available to the group. According to Rear-Admiral Ronald Boxall, "[t]he FFG(X) will normally aggregate into strike groups and Large Surface Combatant led surface action groups but also possess the ability to robustly defend itself during conduct of independent operations while connected and contributing to the fleet tactical grid."[2]

In January 2019, the US Navy announced that the new frigate will have a minimum of 32 Mark 41 Vertical Launch System (VLS) cells aboard the ship for primarily anti-air warfare for self-defence or escort missions. The US Navy would like FFG(X) to be able to:

- destroy surface ships over the horizon,
- detect enemy submarines,
- defend convoy ships,
- employ active and passive electronic warfare systems, and
- defend against swarming small boat attacks.[3]

The FFG(X) will be nearly 500 feet long, displace well over 7,000 tons, and be able to keep up with nuclear-powered aircraft carriers. This does not sound like an inexpensive ship. The price tag of C$1.3 billion appears somewhat unrealistic, and through-life costs would have to be

Credit: Babcock International

A rendering of the winning Arrowhead 140 design for the Royal Navy's Type 31 frigates. Five of these ships will form the low-end portion of the Royal Navy's surface combatant fleet, complementing the high-end capabilities of the Type 45 and Type 26. Its hull is based on the Danish ***Iver Huitfeldt****-class frigates.*

added. Nevertheless, if Canada decides to buy a version of FREMM, it should be looking at this one. Surely an updated design with features in common with those of Canada's closest ally makes sense rather than re-inventing the wheel, especially if the object of the exercise is to save money.

Type 31 General Purpose Frigate

The PBO will also look at the Type 31, which is to be built for the Royal Navy (RN) in the UK. These less-capable ships are to cost less than C$500 million each. The RN is a much larger and more complex force than the Royal Canadian Navy (RCN), but it is trying to maintain impressive force capabilities within a limited budget. The RN wanted at least 13 Type 26 frigates, but could not afford that many. The Type 31 will help make up the numbers and will be very useful escorting merchant vessels in the Middle East and representing Britain's interests abroad – thereby freeing-up the Type 26 for high-end tasking. Type 31 is a large ship by Canadian standards. It is smaller than FFG(X) but larger and heavier than the *Iroquois*-class (DDH 280) destroyer and the Canadian Patrol Frigates. It is based on the Babcock Arrowhead 140 design derived from Denmark's *Iver Huitfeldt*-class frigates commissioned between 2011-2013. The Type 31 is meant to be fitted with modular weapons and sensors, which could be rapidly exchanged to replace defective equipment or pivot roles.[4]

Conclusions

Canada is a G-7 state with a population moving toward 40 million people in the next few years. As a maritime state with the longest coastline of any country and world-wide trans-oceanic connections with trading partners, it needs an adequate number of robust and operationally capable frigates to look after its considerable national and international responsibilities. The planned 15 frigates are the minimum number of surface combatants that the RCN's Force Development Staff believes Canada needs to look after maritime defence interests. To complicate the matter, these vessels will be split between two coasts across the continent from each other. The RCN operates in the North Atlantic and North Pacific, and needs robust ships with excellent sea-keeping qualities and endurance in some of the planet's most challenging waters. Since Canada operates its ships for many years – longer than most other First World navies – it makes sense to get it right from the start.

All three designs, if suitably equipped, would be adequate. However I believe that the Type 26 is the best design of the three, for many reasons which I do not have space to discuss in detail here. I believe Canada should build just one class of frigates rather than follow the British example of a mix of Type 26 and Type 31. Fiscal economies would be realized in building, training and through-life maintenance with a single-class, as we have experienced with the RCN's 1955-64 era DDE/DDH fleet and with the current *Halifax*-class frigates. If we must economize in order to maintain the number at 15, then we could split the class into Anti-Air Warfare (AAW) and General Purpose (GP) versions, as had been considered in previous years by force planners. The AAW variant (perhaps six in number) would be fitted with area-air defence weapons and sensors, the remaining GP frigates would be equipped with much less expensive short-range point-defence systems. They would share a common hull and propulsion systems, and a number of other weapons and sensors. Should fiscal and strategic conditions change over the course of their anticipated long service lives, the GP version could be upgraded as necessary.

Notes

1. According to an unnamed federal official quoted in David Pugliese, "PBO to Examine $60 Billion Price Tag of New Warships and Compare to Other Less Expensive Foreign Programs," *Ottawa Citizen*, 8 August 2020.
2. Rear-Admiral Ronald Boxall (USN) quoted in David B. Larter, "Frigate Competition Wide Open: Navy Specs Reveal Major Design Shift," *Defense News*, 10 July 2017.
3. See *ibid*.
4. For more information on the Type 31 frigate, see "More Details of the RN's Type 31 Frigate Emerge," Save the Royal Navy, 15 September 2019.

Book Reviews

The 104th (New Brunswick) Regiment of Foot in the War of 1812, by John R. Grodzinski, Fredericton: Goose Lane Editions, 2014, 219 pages, $18.95 (paperback), ISBN 978-0-86492-447-6

Reviewed by Steven Bright*

Reading this fascinating book by Major John Grodzinski, an Associate Professor of History at the Royal Military College of Canada, is exhausting. This is not because of any tedious writing. Indeed, a crisp narrative style keeps things moving along smartly. Rather, the exhaustion one feels is more metaphoric than literal when considering how far and fast the officers and men of the 104th (New Brunswick) Regiment of Foot moved during the course of the War of 1812.

Marching from Fredericton, New Brunswick, to Kingston, Ontario, a 1,100-kilometre journey in what at times were -27 C temperatures – an excursion which Grodzinski calls "no mean feat" (p. 47) – was just the start. For many months this regiment moved by foot, sail and paddle up and down rapid rivers and muddy roads along the St. Lawrence River, Lake Ontario and in the Niagara Peninsula as the war in which they were fighting shifted in geography and intensity. Getting ahead of and responding to the vicissitudes of the war had the 104th frequently on the move.

The 104th Regiment was not a colonial force. It was a 'fencible' unit of the British Army (i.e., a British regiment raised in the colonies) that was thus "subject to the establishment set by the government in London" (p. 137). That means it was raised and eventually disbanded by the British, as they saw fit, relative to their resources and commitments at home and abroad. Initially raised during the Napoleonic Wars, it was the only regular infantry regiment raised in British North America between 1803 and 1815.

From its first action in May 1813 to its last in October 1814, members of the 104th took part in six major actions, as Grodzinski's book recounts with grace and pace. These actions included a raid on the American naval base at Sackets Harbor (29 May 1813), the Battle of Lundy's Lane (25 July 1814), and the assault on Fort Erie (15 August 1814). All told, the 104th lost 82 officers and men to death in battle, injury, desertion and imprisonment. And throughout that time the regiment quickly learned – in the forge of battle – how to advance in a firing line, siege armed forts, and resupply themselves during near-constant movement.

The author's discussion of how the 104th was involved in various military and maritime aspects of the war will be especially interesting to readers of *Canadian Naval Review*, as indeed to readers in the Greater Toronto Area (myself included), who tend to downplay (or who simply don't know about) the many valuable roles played by water-based transportation in this area for centuries. In the context of the War of 1812, command of the fresh water sea by the British Navy was vital to the success of land-based campaigns in which the 104th and other infantry regiments fought. So, too, was the imperative of the soldiers to learn how to move in and out of (and in some cases, build) the many bateaux used to ferry men, weapons and provisions between Kingston, York and Newark. Grodzinski's chapter covering April to June 1813 (pp. 57-86) is illuminating on this topic.

What this book does not do, however, is paint even the faintest of outlines of the broader civilian society in which the numerous movements and battles occurred. What of the residents of muddy York, Kingston or Newark, for instance, coping as they were with the challenges of war at their proverbial front doors? How did they feel about all of it? And what of the many politicians, clergy and journalists passing their judgements on the fluidity, costs and aims of a war that wended its way through the streets and lives of people in Lower and Upper Canada? More colour on the toll of war on soldiers and citizen alike in the colonies would have helped round out the story.

That said, this is an excellent read for generalists in particular. It reveals some of the human dramas of 1812-1814 that are almost completely obscured by today's busy lives and equally busy lakeside highways. Three appendices and a useful bibliography add to the value of this slim volume, as do the maps and photos. In the hands of the author, this book takes readers along for an exhausting but highly rewarding read.

Note

* For the sake of transparency, I should note that the author of this book was a member of my oral examination committee when I defended my MA thesis at RMC in 2005.

Battleship Yamato: Of War, Beauty and Irony, by Jan Morris, New York: Liveright, 2017, 112 pages, ISBN 978-1-63149-342-3

Reviewed by Brian Bertosa

Battleship Yamato is not a title I normally expect to see staring up at me from a display right beside the cash register of a major bookstore – or any bookstore, for that matter. (Well, maybe a nautical bookstore, but how many of those are left?) Small enough, or almost, to serve as a stocking stuffer, loss prevention may in fact be the reason why the copies of this very slim hardcover book were kept

where they were. With the subtitle *Of War, Beauty and Irony*, it was by no means clear to me exactly what kind of book this was. With only enough time to flip through it – I was, after all, there to pay for my other purchases – it was obvious that the only way to learn more was going to be to take a chance and buy it.

Essentially, what the eminent British author, historian and travel writer Jan Morris gives us here is a reflection on the nature of war expressed through the prism of the final, suicidal mission of the Imperial Japanese Navy's battleship *Yamato* in April 1945. As the narrative unfolds, contemplative digressions touch on such themes as apprehension, duty, stoicism, sacrifice and reconciliation, among others. As the subtitle indicates, beauty receives considerable attention, given that *Yamato*, along with her sister ship *Musashi*, were arguably the most beautiful warships ever built. And for Morris, irony is to be found in precisely the juxtaposition of beauty and lethality embodied in these vessels.

As if to give pride of place to the theme of beauty, the book is oriented landscape style, the better to accommodate double-page spreads of a long, graceful ship. Many of the illustrations do, in fact, take up two full pages, without margins, characteristic of many picture books. All of the better-known images of *Yamato* are here, as well as a number I have not seen before, such as those of a wooden builder's model of the ship. Chosen to illustrate, at least loosely, some of the broader themes discussed in the book are classic works of Japanese and Western art, reproduced in colour, by artists such as Kuniyoshi, Picasso and Velázquez. There are also photos of senior commanders on both the Japanese and American sides, as well as maps tracing the course of the ship over its final two days.

Morris' essay is not lengthy; exclusive of a three-page chronology of *Yamato*'s final action, it runs to no more than 44 (short) pages. I can perhaps be forgiven, then, for not being able to decide if this book is a brief text interspersed with large-format illustrations or a picture book interspersed with text. As if in recognition of its unusual nature, the book opens with something I have never seen before, a five-page section, titled "Explanatory," that, among other things, serves as a justification of the book's *raison d'être*. This is telling.

The work contains no notes, no index, and the author provides only three sources for her text, all monographs. (Picture credits, on the other hand, are numerous and detailed, no doubt a legal requirement.) In fairness, however, no one is likely to mistake this book, scarcely a half inch in thickness including boards, for a scholarly work of any capacity. As for its character as a picture book, the illustrations are not – with the possible exception of an excellent line drawing of the entire ship in elevation – likely to be of the type that ship modellers are going to be able to use to 'prove' what the anti-aircraft fitment of the ship might have been on a given date, for example. That type of thing is simply not what the photos were chosen for, or what this book is about.

My impulse purchase turned out to be neither fish nor fowl, and I suspect that the readers of a journal such as *Canadian Naval Review* are not likely to be foremost among those with enthusiasm for the approach taken here. But other people might. Thus fans of Jan Morris and younger readers with an interest in things nautical might find the book very enjoyable, and the book might make a suitable presentation to a deserving senior cadet at a Sea Cadet annual inspection, for example. Readers of any age who have not already tackled more serious material in this field might have a keen appreciation for this handsomely produced volume.

J. Brent Wilson, *A Family of Brothers: Soldiers of the 26th New Brunswick Battalion in the Great War*, Fredericton, NB: Goose Lane Editions, 2018, 290 pages, Appendix, notes, bibliography and index, illustrated, maps, ISBN 978-0-86492-923-5

Reviewed by Robert Dienesch

For most of us the First World War is summed up in very specific ways. On the one hand. it is about horror, destruction and high casualties. Certain battles have come to define this. The battles of the Somme or Passchendaele epitomize the slaughter and sacrifice and have become examples of the horrors of industrialized war. On the other hand, it is seen as history. As such, it is sanitized and shaped through the construction of the history that we commemorate. Remembrance Day, the Week of Remembrance on the History Channel and the documentaries that are shown in schools present a specific memory of the war. As Tim Cook has demonstrated with his book *Vimy*, memory is elastic, shaped by the people who write about it and consume it. And that memory of course can be changed. Yet the actual experience of conflict, the life experience of those who fought in the trenches, not that of the general officer, remains in most ways elusive and missing. So when an author is able to break down some of that experience, it presents an incredible point of reference for the war. J. Brent Wilson's book, *A Family of Brothers: Soldiers of the 26th New Brunswick Battalion in the Great War*, does exactly that and in the process produces a unique

history of New Brunswick at the same time.

Written as part of the New Brunswick Military Heritage Project, Wilson's book on the 26th New Brunswick Battalion presents a unique vantage point into both the war itself and the history of New Brunswick. The 26th was a battalion that seems to have been pretty much everywhere. While it missed the second battle of Ypres, the unit was present at every major battle that followed. By examining one battalion and following it through the war, Wilson provides the reader with a solid understanding of the wartime experience of the men who made up the unit. The author traces the creation of the regiment and its initial recruitment, training and equipping, as well as its movement and deployment to France. The result is a history of the Canadians at war from the perspective of the individuals who did the fighting.

One of the greatest strengths of Wilson's book is the interrelationship between the men and the experiences. Each chapter examines a period of the unit's history chronologically. As such, it combines the everyday mundane experiences in the trenches with the more tense moments of combat. The value of this is clear. In the second chapter dealing with the period from September 1915 to August 1916, we see how the unit was prepared for its first trip forward and its experiences there as the members adjusted to the bewildering world of the western front. It also follows the 26th as it experienced its first fighting in the crater battles of 1915 and at St. Eloi in 1916. Here the dichotomy of the war is clear. While casualties are inevitable at the front, there is a pronounced difference between the period of simply holding the line and taking the offensive whether in the form of a major battle or trench raiding. Particularly interesting is the description of the winter and relations between the Canadians and Germans.

The perspective that Wilson presents adds to the value of the text. Since the unit was involved in most of the key battles of the war, it provides the reader with a battalion-level experience for most of the war. For example, the discussion in chapter four of the Somme and Vimy provides an interesting window into the experience in these battles; the organization, planning and of course operations. More importantly it demonstrates how the Canadian conception of fighting the war evolved over time adjusting to acquired experience and new technology. When combined with the rest of the text, it demonstrates that the Canadian Army was evolving and becoming more effective. The army was not composed of lions led by donkeys. Rather the truth is that the Canadian doctrine adapted and evolved over time producing an effective and capable army that was watched by the Germans very carefully.

Wilson's *A Family of Brothers* is also a very human history. Brought out through the merging of individual experiences with the history of the unit, the human experience is profound. This is reinforced in a couple of ways. The inclusion of individual service numbers and details of lives back in New Brunswick produces a connection between the reader and these individuals. Sadly this can be a negative experience as in many cases the individuals are killed during operations. The inclusion of details on medical and discipline issues only reinforces the human aspect here.

Overall Wilson's *A Family of Brothers* is an excellent addition to anyone's library. By focusing on one battalion, the book provides the reader with a truly unique perspective. Written in an easy-to-read format, it successfully conveys what the author wanted the readers to see – that the bond among these men, these brothers, was forged in a unique and difficult set of conditions but in the process it became stronger because of that. Brought together to fight a war, the men of the 26th earned an excellent reputation at the front and became a family. I highly recommend this text for anyone interested in the Great War or New Brunswick history. It is a valuable addition to anyone's library.

Credit: Corporal David Veldman, Canadian Armed Forces Photo

*The US Coast Guard cutter **Tahoma** (right) and Danish patrol ship **Triton** (left), traverse Eternity Fjord in Greenland ahead of HMCS **Glace Bay** (not pictured) during **Operation Nanook** on 15 August 2020.*

HMCS *Regina*, sporting a commemorative camouflage paint scheme, fires a rare salvo of two Harpoon anti-ship missiles against the decommissioned amphibious cargo ship ex-USS *Durham* (LKA 114) during RIMPAC 2020 off the Hawaiian coast.

Credit: MS Dan Bard, Canadian Forces Combat Camera