FROM THE DEPTHS

GETTING THE VICTORIA-CLASS SUBMARINE REPLACEMENT RIGHT

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About the Author

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The opinions and recommendations in this report, and any errors, and do not necessarily reflect the views of the publisher.

Abbreviations

AIP – Air Independent Propulsion
CPSP- Canadian Patrol Submarine Project
DWF – Distant-Water Fishing
GMD - Ground-Based Midcourse Defence
HMCS – His Majesty's Canadian Ship
ICBM – Intercontinental Ballistic Missile
IRB – Industrial Regional Benefit
ISS – In-service Support
ITB – Industrial Technological Benefits
MOTS – Military Off the Shelf
NSR – Northern Sea Route
OEM – Original Equipment Manufacturer
RCN – Royal Canadian Navy
ROKN – Republic of Korea Navy
SSBK – Diesel Electric Submarine
SSBN - Nuclear-Powered Ballistic Missile Submarine

Cover Photo: "Her Majesty's Canadian Ship (HMCS) VICTORIA", LS Zachariah Stopa, MARPAC Imaging Services, ET2015-0051-01, CombatCamera.Forces.gc.ca

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Introduction

For multiple governments, the Victoria-class submarine fleet has been a procurement curse to reckon with. The subs have been on land more than they have spent at sea, undergoing extensive refits and numerous upgrades to bring them into operation. The Victoria-class was procured in an eleventh-hour deal from the British and has been one of those buyer-beware lessons for Canada.

Canada's defence procurements have faced a history of delays, cost overruns, ill-suited equipment due to over-Canadianization, and overall, a history of controversies. If there is ever a procurement project that needs to be efficiently executed and exorcise the procurement ghosts of the past, it would be the replacement of the Victoria-class submarine with the Canadian Patrol Submarine Project (CPSP).

That saga is coming to an end, as the Liberal government has announced plans to procure up to 12 new submarines from abroad within the past year. Recently, the Carney government narrowed the competition down to two designs and companies. This follows the Carney government's announcement that it would increase defence spending and revitalize the Canadian Armed Forces (CAF).

This paper will examine the two options and the geopolitical landscape that Canada must navigate. Submarines are the extension of the RCN and, because of that, are an extension of Canada's foreign policy goals. The world stage has undergone significant changes even within the past five years, and challenges lie ahead due to climate change and other factors. The successor to the Victoria-class will be essential, given how the Royal Canadian Navy (RCN) and the government will handle those challenges as a responsible middle power.

Victoria-class Submarine

In the 1990s, Canada faced a pressing need for a new submarine procurement due to the dire state of the Oberon-class. The RCN faced a capability gap, and a rushed procurement of four second-hand diesel-electric British Upholder-class submarines was pursued. It was not just the availability of the submarines, but also the price, as the Chretien government, at the time, was facing a fiscal crisis and could not turn down the offer. Thankfully, there will be no second-hand submarines this time.

It soon became apparent that the ships had design and engineering flaws. Even before the submarines entered service in Canada, issues arose with the soon-to-be HMCS Corner Brook, HMCS Victoria, and, of course, the fire that occurred in HMCS Chicoutimi, resulting in one death and numerous injuries.[1] HMCS Corner Brook conducted one patrol in 2017, but then spent seven years undergoing various refits and repairs. It was not until just recently that the Corner Brooke conducted another patrol. [2]

There have been various issues with the Victoria-class submarines, leading to them spending more time on land than at sea.[3] The aim was for each submarine to spend 270 days at sea per year. In 2023, the Canadian government reappraised the operational goal, and it was adjusted to be a cumulative 270 days at sea for the fleet.[4] Moving the operational goalposts highlights the dire condition of the submarines and the complexity of the upgrades and refit operations. The submarine fleet remains in dire straits and has not been adequately operational after twenty years of service.

The original price tag for the four submarines was $750 million, comprising $610 million for the submarines and an additional $140 million for related expenses. The first Victoria Class In-Service Support (ISS) Contract was awarded in 2008 by the Harper government for $1.5 billion. The Victoria-class Modernization is estimated to cost between $500 million and $1 billion.[5] The second ISS contract for the Victoria class is estimated to be between $1 billion and $4.99 billion, starting in 2026.[6] This does not include the various other costs incurred by the Canadian government, such as retrofitting American torpedoes in Canadian stock, retrofitting substandard electrical parts, or acquiring intellectual property rights for various parts.[7] In 2020, it was reported that the maintenance fees for the four submarines were $325 million as all submarines underwent further repairs and maintenance.[8] The operational costs of the Victoria-class submarine continue to rise – unlike the submarines, as they remain mostly in drydock.

"The Canadian government needs to act swiftly to secure a replacement for the Victoria-class, which, realistically, should have been replaced years ago."

By 2036-2042, the Victoria-class submarines will be 50 years old and in need of decommissioning.[9] The Royal Canadian Navy will need a replacement by then or risk losing the capability it has strived for since 1998. The Canadian government needs to act swiftly to secure a replacement for the Victoria-class, which, realistically, should have been replaced years ago.

Canadian Patrol Submarine Program

On 10 July 2024, the Canadian government announced that it would investigate replacing the Victoria-class. Later, then Defence Minister Bill Blair announced that Canada intends to procure up to 12 diesel-electric powered, under-ice capable submarines as part of its commitment to implementing the government's defence plans outlined in "Our North, Strong and Free".[10] The purpose of the CPSP is to enable the RCN to "covertly detect and deter maritime threats, control our maritime approaches, project power and striking capability further from our shores, and project a persistent deterrent on all three coasts."[11]

There were five bidders for the program – Germany's TKMS Group with the 212CD, Spain's Navantia with the S80, Sweden's Saab with its C71, France's Naval Group with likely a model of its Barracuda family of submarine, and South Korea's Hanwha Ocean with KSS-III. Hanwha Ocean's pitch was made as an unsolicited bid with the option of procuring other land systems through Korea's defence industrial complex.[12]

The Carney government dedicated itself to replacing the Victoria-class with some expediency to ensure a smooth transition and not to risk losing the RCN's submarine capacity. The Carney

government has stated that it is committed to revitalizing the CAF and has made steps, including the establishment of the Defence Investment Agency. On 26 August 2025, during Prime Minister Carney's engagement trip to Europe, the Canadian government announced that it had narrowed the CPSP competition down to TKMS Group and Hanwha Ocean. Not two weeks earlier, the commander of the Royal Canadian Navy, Vice-Admiral Angus Topshee, had voiced his concerns that he wanted a submarine chosen by the end of the year.[13] This does seem like a distinct possibility.

The previous Trudeau government seemed not to have a plan to replace the Victoria-class submarines, but did express an immediate intention to do so. This timeline was not feasible for maintaining Canada's submarine capability. Choosing a design is far from having a submarine constructed, commissioned, and in service with the RCN, complete with a trained crew and maintenance support staff. Canada's submarine replacement has been pushed back by both the Trudeau and Harper governments, as announced in the National Shipbuilding Procurement Strategy.

The Carney government appears to be eager to move quickly on procurement, which has the benefit of reducing inflationary costs. Delays to procurement projects do equate to an erosion of the budget due to the higher inflationary costs associated with defence procurement projects. This has been seen with the possible F-35 procurement and with the River-class destroyers that will replace Canada's Halifax-class fleet.

To secure submarine orders in time for construction, it is best to do so as early as possible. It is not just the construction of the submarine. The RCN is facing the 2036 deadline for the CPSP. There is also a significant amount of supporting infrastructure that requires consideration. Training simulators need to be ordered and requisitioned, as well as the training of submariners to operate such a complex boat that requires teamwork and efficiency. Shipyard and ISS technicians and engineers also need training and other support, including the development of the necessary infrastructure for the ISS. Additionally, the RCN faces a 2036 deadline, and it will take time to build and deliver complex submarines. Construction schedules at the shipyards need to be revised and rescheduled to accommodate their other naval clients.

"Canadianization" – A Necessity, but Dangerous

Canadianization refers to the part of the design process that ensures equipment, such as a vehicle or a ship, is capable of being operated in Canada. Canadianization can also be a threat to the cost, delivery and effectiveness of the equipment. With either submarine bid, there is a need for a Military Off the Shelf (MOTS) solution; however, a degree of "Canadianization" will be required. This can range from ensuring that it can withstand the weather conditions of a Canadian summer/winter, to verifying that the electrical systems and plugs are to North American specifications, rather than European or Asian. Suppose there are substantial modifications to be made to meet the RCN's operational requirements. In that case, this can result in additional strain on Original Equipment Manufacturers (OEMs) to fulfill some of those needs. Equipment would need to be re-designed and possible re-engineered from the original design and specifications. It is something that requires close monitoring.

General Rick Hillier provided an excellent example of the hazards of Canadianization with the acquisition of the Leopard 1.[14] Canada decided to install a Canadian fire control system and opted out of the original German one. The substitution was unique to Canada and worked well in cold weather; however, in hot weather, it was ineffective. For three years, the Canadian Forces attributed misses to gunnery error, rather than the fire control system. It was not until the crews realized that they could "fix" the problem by placing wet sandbags on the turret that the fire control system could function. This is due to a thin piece of metal that would buckle in hot weather, causing the targeting sights to become misaligned. An issue that would not have been if the originally designed German targeting system had been installed. Hillier ruminated in his book that if the Cold War had escalated into a shooting war, Canadian armoured personnel would have been required to dunk sandbags in the Danube River to remain combat-effective for a short while until the sandbags dried out and became warm.

"Adding and removing systems can derail the procurement project."

There have also been incidents where "Canadianization" has led to the ineffectiveness and inefficiency of procured equipment. There is another term associated with Canadianization, and that is "requirements creep", where a project experiences uncontrolled expansion due to new parameters or evolving requirements that were not initially designed for. This is where the RCN and the Canadian government need to be aware of when seeking to Canadianize a foreign design. Adding and removing systems can derail the procurement project.

A prime example of requirements creep would be the CH-148 Cyclone helicopter. Extra equipment was added to the design, and Sikorsky had to upgrade the GE CT7-8A engine that the helicopter was originally designed for. This meant that more time and money had to be spent re-designing and re-engineering the helicopter to meet the new requirements and new equipment that the DND had instructed to be installed.[15]

There are other instances where Canadianization has gone awry, and it is a lesson that needs to be applied to the CPSP. The CPSP will face various challenges due to its location of operation. There has been much attention to the prospect of submarines operating under the Arctic Sea ice, but it is also likely that Canadian submarines will also face the warm waters of the Caribbean to assist in drug interdiction operations. It will have to operate in both extremes of cold and hot temperatures.

Having a design that is not already fully suited for Arctic and cold-water operations could lead to a level of Canadianization that could put the project's timeliness in jeopardy. There are internal heating considerations, as well as considerations for hull survivability, since the submarine will be operating under dense glacial ice. For a diesel-electric submarine operating in Arctic conditions, providing heating for the ship and its crew will pose unique energy challenges, as it must be supplied by both battery and other critical systems, including propulsion.

The KSS-III is unproven in the Arctic, whereas the Type 212CD was explicitly designed for German Baltic Sea and Norwegian Arctic patrols. Having an Air Independent Propulsion (AIP) system that allows a submarine to operate underwater for weeks is only part of what makes

Arctic water operations possible. Without a submarine equipped with an AIP system, Canada will not be able to patrol under the sea ice for an extended period, nor will it have year-round access. The current Arctic Offshore Patrol Ship is not capable of operating in the Arctic year-round. This is why there is a need for an AIP, so that a submarine can operate under sea ice for up to three weeks. It may incur some "Canadianization"; however, it will result in overall improvement for the 212CD's operability for both the German and Norwegian navies.

Both the 212CD and the KSS-III can operate underwater for weeks with their AIP systems; however, it is unclear whether any additional design requirements will likely be necessary for the KSS-III to support Arctic operations, as it was primarily designed with South Korean waters in mind. For example, cold weather can have adverse effects on battery life, which in turn affects the operation of on-board equipment underwater. The 212CD has been designed with Arctic operations in mind as it is being constructed for both the German and Norwegian navies, who operate in a similar cold environment.

Changing Security Environment

The geopolitical landscape and security environment have undergone significant evolution since the 1990s. Russia has become increasingly adversarial towards the West, and China is emerging as a global competitor. Russia annexed Crimea and launched an offensive in the Donetsk and Donbas regions of Ukraine in 2014. Russia then launched a full-scale invasion of Ukraine in 2022.

There has been much discussion and speculation around China's ambitions with the possible annexation of Taiwan and its global aspirations. The Chinese military has undergone extensive modernization, and over the past 40 years, a naval strategy has been implemented to project power throughout the Pacific through the Island China initiative. The Chinese Navy has developed an aircraft carrier capability in recent years and is expanding its carrier fleet. China has not been an outright threat, but it is a potential threat that the West is, to an extent, planning for in the future.

Violent Non-State Actors have increasingly become a problem with terrorist groups in the Middle East, Africa and Asia. Drug trafficking has become an international issue – one that the US Navy has deployed ships to South America and the Caribbean. South American cartels are also smuggling drugs into Africa to serve as a launching point into Europe. Canada has previously contributed to these drug interdiction operations alongside the United States, but there may be an opportunity for Canada to also assist our European allies. There has never been a time when having a viable submarine fleet is more critical to Canada's safety.

The world appears to be in greater flux, lacking a stable geopolitical landscape. Canada has a unique role to play as a middle power if a Canadian government wishes to explore its global responsibilities. However, the security situation regarding existential threats on our borders necessitates action now, which in turn requires a Canadian submarine force.

The choice of submarine can, and will, have implications for Canada's foreign policy in the defence and military sphere, given that a submarine can be seen as a force projector, especially

with sea-to-land missiles on board. This is something that the Canadian government does not have the policy stomach to back up, which is concerning.

Arctic

There is increasing competition in the Arctic as climate change is making the region more accessible to naval assets with the reduction of sea ice. This has been the selling point for the new submarines as they will have to operate under Arctic ice for weeks without resurfacing.

Russian activity in the Arctic is increasing as Russia has revitalized old Cold War bases and created new ones. Russia also has plans to develop its Northern Sea Route (NSR) as an economically viable trade route between Europe and East Asia. The NSR has also been militarized with an array of new bases, as well as a renewed Northern Fleet focused on Arctic operations.

The Russian Northern Fleet is expanding its capabilities of operating within the Arctic with more ice-capable ships. This year, the Ivan Papanin, an 8,500-ton, 114-meter-long vessel with an Arc7 ice class, finished trials.[16] Russia will continue to build the ice-capabilities of the Northern Fleet for Arctic operations. Russia is also revitalizing and expanding Arctic air bases for interceptors and bombers, and has created a drone base on its eastern flank in recent years. If Canada does not counter Russian capabilities, it will be placed in a position where its sovereignty is at risk.

Russian Arctic bases not only include expeditionary forces or those tasked with protecting its borders. It also includes nuclear weapons testing facilities for so-called super weapons such as nuclear-armed and nuclear-powered Burvestnik missile and the nuclear-armed and nuclear-capable Poseidon torpedo.[17] Russia touts that both will have indefinite ranges due to nuclear-powered propulsion, but it has not been proven in reality.

China – Nuclear and Sovereignty Threat

Chinese activity has also increased, with joint naval patrols with Russia.[18] The possibility of Russian or Chinese submarines entering Canadian Arctic waters is a foreseeable and likely threat. China has been cooperating with Russia in its Arctic ambitions with the development of the NSR and has benefited from Russian sponsorship when it comes to Chinese Arctic research endeavours, which has given China a claim as a "near-Arctic" state.

There is a new nuclear arms race as China is expanding and improving its intercontinental ballistic missile (ICBM) capabilities, Russia has withdrawn from the START II, and the United States is beginning to modernize its Minuteman III ICBM inventory. Negotiating a new START will be more challenging as a trilateral agreement among China, Russia, and the United States, primarily due to the increasing strategic threat faced by some actors. For example, China will be less willing to negotiate with the United States while it has to deter Indian nuclear capabilities.

A nuclear arms agreement becomes significantly more challenging when other external actors are involved. The United States would wish to increase its nuclear arsenal as China wants to meet the US and Indian threat. Then, of course, Russia would like to expand its capabilities to match those of the US.

One of the concerns stems from the Cold War, specifically the presence of foreign submarines operating in Canada's Arctic under the sea ice. Access to Canada's Arctic via Russia's Arctic backyard allows for a Chinese Nuclear-Powered Ballistic Missile Submarine (SSBN) to operate in Canadian waters to get a better vantage point for its missiles against North America. Currently, the American missile shield is in Alaska and California to deter a North Korean missile with the Ground-Based Midcourse Defence. A Russian or Chinese SSBN located in Canada's Arctic will give it a better vantage point, in terms of distance, against North American targets. A Canadian submarine presence in the Arctic also contributes to ballistic missile defence, which has been a long-standing American-Canadian policy issue for decades. A Canadian submarine in the Arctic provides some deterrence of Chinese and Russian submarines in the region, but also acts as our eyes and ears if one were to enter our sovereign territory.

The threat is also not limited to submarines and the use of nuclear weapons. The Arctic Ocean is the last ocean that has not been commercially fished. There is a potential for Chinese fishing fleets to enter Canadian waters and overfish. Over the past two decades, China has constructed a massive Distant-Water Fishing (DWF) Fleet of over 3,000 ships that operate worldwide. The decline in global fish stocks and the untapped resources of the Arctic Ocean present a lucrative opportunity for exploration and exploitation.

China is a signatory to the Central Arctic Ocean Fisheries Agreement, which prohibits fishing in the central Arctic Ocean unless a scientific program is in place to ensure that the fishing stocks are viable and sustainable.[19] There has been an influx of Chinese research ships in the Arctic, as well as Chinese research delegations operating within Russian territory. This could signal an increased interest in building research to support Chinese claims concerning fishing rights and limitations.

Canada learned a lesson thirty years ago about sovereignty, fishing stocks and the protection of the Canadian fishing industry and the ecosystem. Fishing stocks can be lucrative enough to lead to violations of international agreements. The Turbot War in the 1990s was a conflict between the Canadian government and Spanish fishermen who were conducting illegal fishing off the Grand Banks. The RCN and the Canadian Coast Guard had to intervene to dissuade Spanish trawlers, resulting in multiple arrests. Imagine Canada having to order a Chinese DWF fleet, comprising dozens of vessels, if not a hundred, to stand down its fishing operations and withdraw from Arctic waters. Canadian Coast Guard assets, in collaboration with the RCN, would need to demonstrate a robust show of force, and a whole-of-government approach would be required due to the diplomatic repercussions, which would include tariffs or the halt of agricultural imports from Canada.

Can Canada stand up to the Chinese DWF fleet backed by enormous scientific data to support their illegal fishing in the Arctic? Or does the RCN have the ability to force a Chinese DWF fleet from Canadian Arctic Waters? A viable submarine capable of Arctic patrols can monitor a Chinese DWF fleet and report its findings that can support an international response to potential illegal overfishing.

North America

Drug interdiction from South America and the Caribbean has become a priority for the Trump administration. Drug interdiction off the coast of the US and in international waters has been a policy undertaken by US administrations in the past, but not with this level of fervour. Submarines can be vital intelligence-gathering assets. The United States Coast Guard and Navy have conducted illicit drug interdiction operations close to its territory, and now the US Navy has been deployed to the Caribbean and South America. The RCN has deployed naval units to assist with drug interdiction in the Caribbean in the past. Canadian submarines will play a vital role in intelligence and surveillance in future missions.

Drug trafficking routes have diversified as has the drug cartel's supply chain. Drug cartels are looking to expand routes to Africa and then export drugs into Europe.[20] There have been advancements in narco-submarines which attempt to avoid detection.[21] Another operation that fully-submersed submarines can assist with detection, observation and arrest of a global drug cartel operation.

Both Competitors Promise Expediency

The Victoria-class submarines needed to be replaced decades ago, and one could argue that they needed replacement from the day Canada received them. Hanwha Ocean promises that the first four submarines will come before 2035.[22] It does sound like an attractive proposal, but if one were to stand back and examine what is needed for training and ISS.

Currently, only the South Korean Navy (ROKN) operates the KSS-III, with two commissioned ships, Batch One, and one scheduled for launch. Batch 2 of the KSS-III is expected to be completed in 2026, 2028 and 2031.[23] There is a significant difference between Batch One and Batch Two. Batch two is an upgrade, but an untested variant of the KSS-III.

Batch 1 is less capable, smaller, and less advanced than Batch 2. Batch 2 features a higher number of vertical launch system cells (10 vs. 6), a larger displacement, and lithium-ion batteries, as opposed to the lead-acid batteries in Batch 1. The Batch 2 AIP system is designed to be more advanced and capable than the Batch 1 submarines, featuring enhanced sonar and combat management systems. In short, the Batch 1 submarines are more traditional in design, and the Batch 2 will undertake an advanced technological makeover. The Batch 1 has not proven itself under combat conditions, and the Batch 2 appears to be upgraded on paper but has not been tested by any other navy, including the ROKN. The Batch 2 submarines will be larger than the Batch 1 submarines both in length and in tonnage. The first Batch 2 submarine, the ROKS Lee Bong-chang, is slated for commissioning in 2026.[24] The ROKN had a ceremony for the launching of the first KSS-III submarine, the ROKN Jan Yeong-sill, at Hanwha Ocean's Geoje shipyard on 22 October 2025.[25]

Construction for the three Batch 1 submarines was laid down in 2023 and 2024. With no other international buyers, the ROKN is the sole purchaser, acquiring six KSS-III submarines, with

half of them in Batch 1 and the other half in Batch 2. This will put Canada at risk of being the only international buyer, and only two countries will face any upgrades or technical issues.

Hanwha Ocean can provide an expedited delivery date as it has no international orders for the submarines. However, it does not matter if other orders have already been made as deliveries can be reprioritized among allies.

It is not uncommon for ship deliveries to be rescheduled among allies. For instance, Norway announced that it will procure five Type 26 frigates from BAE Systems, which will be built in Glasgow.[26] The UK Royal Navy pushed for a delayed delivery of a Type 26 frigate, which was suspected to be commissioned as the new HMS Belfast, to prioritize delivery to the Norwegian Navy.[27] It is not uncommon for agreed-upon deliveries of warships to be delayed due to a new customer; in fact, that added customer tends to add dependability and better ISS with the unique conditions they face.

Given the previous defence deals between South Korea and Poland, Hanwha Ocean is willing to provide a financing deal to Poland for the KSS-III.[28] Poland is currently seeking three diesel-electric submarines as part of its "Orka" submarine procurement program. Hanwha Ocean is also offering one of its Batch 1 submarines to Poland for training purposes as soon as 2028. There have been no public reports of Hanwha Ocean providing financial support or a submarine for training purposes to the RCN. There is limited understanding of Poland's stance. Still, it appears that Hanwha Ocean is more aggressive in the Canadian procurement process for upwards of 12 submarines than in markets where it has previously achieved success. This does make sense, as there is a potential that the CPSP will be upwards of four times the Polish bid.

If Canada were to choose the KSS-III, it would be the first international buyer of this model. It would have to face the growing pains and design and equipment upgrades required to operate in our unique environment, comprising three very different ocean theatres. To reflect on the warning of the Cyclone helicopter, if Canada were to sign onto the KSS-III before Poland chooses a winner, then it would place Canada in a vulnerable position as the only international purchaser of the KSS-III, with a potential lack of spare parts and in-service solutions for problems that arise with such a complex ship.

Hanwha Ocean

South Korea's ambition is to become the fourth-largest defence exporter by 2027.[29] According to 2024 statistics, South Korea is ranked 10th by the Stockholm International Peace Research Institute.[30] The KSS-III export to Canada is one of the gems that will make that defence export jewel for its crown. The Hanwha Ocean bid to provide mobile rocket and artillery systems to Canada is part of that overall global aspiration.

The KSS program was designed to build on its gradual technological advancement, with South Korea building 27 attack submarines between 1994 and 2029.[31] The KSS-III is the final phase of that larger program. The KSS program began with the KSS-I, which was an export version of the German Type 209.[32] The KSS-II was also purportedly derived from technology based on the German Type 214 submarine.[33]

The ROKN also has nine Type 214 submarines in its inventory, designated as the Son Won-Il class. The Type 214 is the export version of the Type 212A, which is designed from the 212CD. The Type 212 was designed in conjunction with the German and Italian navies and has demonstrated the ability to remain submerged for up to three weeks without snorkelling. India recently announced that it chose the Type 214 for six submarines over Navantia's S-80 design in the face of the Pakistani and Chinese navies.[34]

Vertical Launch Missile Systems (VLS)

The RCN states that both the 212CD and the KSS-III meet their operational requirements, but they are two very different submarines. Interestingly, the government has portrayed both in very similar terms to the public, stating that the RCN has approved both designs without offering any explanation.

One of the key features of the KSS-III (Batch 2) is its inclusion of 10 vertical launch systems (VLS). The KSS-III will house submarine-launched ballistic missiles (SLBMs) that are capable of carrying a heavy conventional payload or cruise missiles. Canada would have to buy into domestically built South Korean missiles, the Hyunmoo-4 SLBM. Currently, Canada does not operate any cruise missiles, let alone heavy sea-to-land missiles.

It is unclear whether the VLS can operate Western cruise missiles, such as the Tomahawk, not currently in Canada's inventory, but in the inventories of our allies. No other member has purchased the KSS-III submarine, so there is no proof of an easy technological transition. Regardless, an additional procurement file will likely need to be opened to buy these missiles.

This makes the KSS-III VLS more vulnerable to "Canadianization" due to its interoperability with NATO allies, and our future cruise missile capability is in question. Does Canada need that capability for its foreign operations? Regardless, it appears that a separate procurement project would need to be established to procure missiles for the submarines, as well as a level of Canadianization of the VLS to launch missiles similar to those of our NATO allies, for interoperability reasons. The range of a Tomahawk cruise missile is 1,600 to 2,500 kilometres. The Hyunmoo-4 has an estimated range of 500km.[35] Whether the RCN wants a VLS capability has not been openly discussed. It would also fundamentally change how those submarines will be deployed internationally and how it will affect our foreign policy.

The first assumption is that Canada wants a VLS capability. If so, the VLS capability would be limited to international operations, and Canada would have to assume a larger role in these operations. To have a submerged cruise missile capability means that Canada believes it will be part of a coalition that will need this capability to offset the capability gap of its allies. Therefore, Canada's own foreign policy would have to become more nuanced during conflicts.

For Canada, however, purchasing 12 KSS-III submarines and having a VLS of 120 conventionally armed SLBMs makes no sense. Canada, for decades, has been seen as a responsible middle power or as a peacekeeping nation. The inclusion of sea-to-land cruise missiles, that are conventionally armed, will have to be at the forefront of international interventions, like the British and the Americans who have utilized their VLS capability in international conflicts.

Canada would have a conventional first-strike capability in international operations. Having conventionally armed cruise missiles would be seen more as a first-strike capability and not as a second-strike deterrent, unlike nuclear-armed cruise missiles, because they are more surgical in nature and pose less of a deterrent due to their lower explosive yield. Conventionally armed cruise missiles are to designed to take out specific targets and not provide the level of deterrence that eliminating an entire nuclear facility or city. NATO's intervention in Libya is a prime example where submersed Tomahawk cruise missiles were utilized to take out Gaddifi's air defence systems.

Canada operates within a coalition for international operations. This means that there would be a varied arsenal, which would encompass longer-range cruise missiles that could be launched from ground, air, and sea. There have been instances where there has been a limited number of cruise missiles launched from submarines, such as during NATO's initial operation in Libya. Again, our European allies were closer to the operational theatre – so it made sense that British submarines fired cruise missiles. When will Canadian submarines be in the initial operational vicinity to carry out such a launch?

The KSS-III is better suited for the complex security situation in Northeast Asia due to its VLS capability, as South Korea seeks to establish a level of deterrence against North Korea and China. South Korea is planning to have three Batch 1 and three Batch 2 variants. This would mean that the ROKN would have a total 48 conventionally armed cruise missiles submerged*, waiting to strike at targets in North Korea and China. It may be enough to provide a pause for North Korea, but also a tactical advantage for South Korea if the situation on the peninsula were to come to war. Again, it would be a limited advantage as the yield of those conventional weapons would be able to target a facility or a specific military target, but it does not provide the same level of deterrence as a nuclear-armed missile would.

"...have 120 VLS tubes and missiles that will be lying dormant waiting for maintenance, upgrades and further costs."

Even if Canada were to enter a war with Russia, 120 submerged cruise missiles would not offer much of a tactical advantage to disable the Russian military industrial complex or enough military-related assets to make a difference. In reality, that is 120 missiles that need to be initially procured and maintained. The launch systems will also need to be maintained, and having 10 extra launch tubes per submarine hull also means increased ISS costs. Not only the maintenance of the missiles, but also the training and specialization of navy staff that will have to service those missiles at base or on board the submarine. We could potentially have 120 VLS tubes and missiles that will be lying dormant waiting for maintenance, upgrades and further costs. The easy way to get to the commitment of 2% of our GDP towards defence spending is to purchase equipment which will require a grossly inflated ISS and personnel-related costs.

The 212CD does not have a VLS capability. The 212CD is designed and constructed to serve as a submarine hunter-killer and an intelligence gathering asset, rather than as a covert missile strike platform for conventional missiles. This submarine will fulfill a similar operational role that our previous submarine fleets had in the past and currently.

* KSS-III Batch 1 has 6 VLS tubes; while Batch 2 have 10 tubes.

Even if Canada desired this capability, Tomahawk missiles can be fired horizontally from torpedo tubes. There have been limited instances where a submerged cruise missile has been fired, with the British Royal Navy being a recent example. The UK Royal Navy has fired Tomahawk missiles horizontally from its torpedo tubes from both the Vanguard- and Astute-class submarines.

A Submarine Horizontal Launch TACTOM Capsule (SHLTC) is used to protect the Tomahawk within the torpedo tube, and as the rocket engine ignites after leaving the submarine, the capsule is disposed of as it breaks free. Thus, relegating the KSS-III VLS is redundant. The VLS will be an additional capability that will require ISS, increase the life-cycle costs for the submarine class, and necessitate Canada to reassess its overall foreign affairs positioning for a capability that could be achieved through a horizontal torpedo tube if desired.

Then we need to take a look back at the future of air operations and how cruise missiles and drones will operate on the initial day of operations. Will submersible cruise missiles have the same effect on the first strike wave as they did in Libya or elsewhere?

The Russian-Ukrainian war demonstrates that drones are becoming increasingly crucial in 21st-century battlespace, with navies testing aerial drone operations, such as a mix of manned and unmanned aircraft on carriers.[36] The Royal Navy is considering VANQUISH, a jet-powered carrier-launched drone, and aims to conduct trials within the next two years.[37] The United States is looking at operating drones from aircraft carriers, and even South Korea is building a drone carrier fleet.[38] Although a submarine capable of firing cruise missiles underwater will provide an element of surprise, it may not have that initial critical importance of softening air defences or critical C5ISR infrastructure as technology continues to evolve and proliferate.

TKMS Group Bid - 212CD

The 212CD is a joint production between Germany and Norway. The design is based on the Type 212, but will be significantly larger. The Type 212A has an AIP system that incorporates a hydrogen fuel cell technology. The 212CD features a diamond hull design, which substantially reduces its radar and sonar signature by deflecting active sonar pings.

The hull of the 212A also has a low magnetic signature, as it is constructed from antimagnetic steel. There is an opportunity for Canada to participate in the production of low-magnetic-signal steel, which could be leveraged for other potential projects. There is an opportunity for technological development in this area for the Canadian industry. If economic stimulus and opportunities are what this government is focused on then this is something that should not be overlooked.

The initial 5.5 billion Euro contract was for six submarines to be shared between the German and Norwegian navies. The critical design review for the submarines was completed in 2024, and now construction of the ships can be intensified.[39] The 212CD project is on schedule, and at the end of 2024, Germany increased their order of 212CD submarines by another four.[40] Making the total of ten submarines compared to the three KSS-III Batch 2 that the ROKN has ordered. This should be remembered in the context of ISS supply chains and support.

The Canadian defence industry will reap the benefits of joint production with Germany and Norway, with Canadian businesses potentially producing machine parts for the submarines and the possibility of securing joint research and development contracts. For decades, the industrial benefits of joining the F-35 Joint Strike Fighter program have been a major selling point for the government.

The ROKN also has nine Type 214 submarines in its inventory. The Type 214 is the export version of the Type 212A, which the 212CD is designed from. For the 212A, there are 14 planned and 10 in service. The Type 212A was designed in conjunction with the German and Italian navies and has demonstrated the ability to remain submerged for up to three weeks without snorkelling.

The 214 has a traditional steel hull and is considered the export version of the 212A. There are currently 27 Type 214 in service across the Portuguese, Greek, South Korean, Singaporean and Turkish navies. TKMS has been chosen as a frontrunner to Indian to deliver six Type 214 submarines to India.[41] The Indian Ministry of Defence and the state-owned Mazagon Dockyards Limited have been given the authority to begin contract negotiations with TKMS. That permission was not given to the Indian MoD to discuss options with Navantia.

Recently, TKMS Group CEO, Oliver Burkhard went as far to say that if Canada wanted to build the submarines in Canada that they can. However, it would not happened immediately as it would take some time to train the shipyard staff on the techniques of building a submarine and various other factors.[42] This does demonstrate the commitment that TKMS Group would have with Canada and has demonstrated with its international partners.

In-service Support

Complex and highly engineered equipment, such as a fighter jet, tank, or submarine, requires regular operating and maintenance activities to ensure the equipment is available and reliable enough to respond to changing circumstances and operational needs. ISS encompasses the maintenance and repair of equipment, a ready supply of spare parts, and training for the engineering and inspection necessary for maintenance.

Babcock signed a strategic partnership agreement with Hanwha Ocean regarding ISS for the KSS-III submarines.[43] This agreement with the UK defence company outlines their collaboration on Hanwha Ocean's submarine exports to Canada, Poland, and elsewhere. Both Hanwha Ocean and Babcock have taken a wider global approach to the KSS-III. What is lacking, though, are international orders.

However, Babcock does not have a shipyard in Victoria and would have to rely on Seaspan for the facilities. Babcock does have engineering and support offices in Victoria, B.C., and their services are integrated with the shipyard facilities.

In contrast, TKMS has been in discussions with all NSS yards regarding what the ISS would be like and what infrastructure is required to meet the needs of the 212CD. TKMS has had similar talks with shipyards around the world. Seaspan, which operates Victoria Shipyards in Esquimalt, has been providing maintenance and repair work for the Victoria-class submarines.

TKMS is willing to open up supply chain contracts to Canadian companies.

Moreover, according to CEO Oliver Burkhard, TKMS was willing to transfer technology and intellectual property if necessary.[44] Canada had an issue with the Victoria-class submarine, and not having access to readily available spare parts and the intellectual property to shift to a different supplier.[45]

Similar ISS bids have been made by Hanwha Ocean, including the transfer of technology and intellectual property rights, as well as an ISS package in Canada. But not much is known.

There may be a supply chain issue with the KSS-III, as currently, there are no export contracts in place. Spare parts may not be as readily available, as the ROKN has a smaller KSS-III fleet compared to the RCN and the Canadian government's proposed fleets. The situation will not be as dire as with the CH-148 Cyclone, but there is a lesson to be learned.

The Canadian government signed a contract for the CH-148 Cyclone helicopter to replace its legacy fleet of CH-128 Sea King helicopters. No other government purchased these helicopters, which were an unproven design at the time of purchase. There was an instance where the German Navy considered the CH-148 Cyclone as an option for their maritime helicopter, but rejected it due to a lack of international buyers. Since then, a litany of issues has arisen, including concerns about maintaining aging weapons systems on board and the grounding of all helicopters in May 2025 due to the use of spare parts beyond their service life and the limited available supply that Sikorsky will maintain in inventory for a fleet of 28 helicopters.[46] Signing onto a product that our allies have not procured exposes us to the risk of a lack of readily available spare parts. In-service solutions will place the RCN in a vulnerable position if anything were to go wrong.

"... the German Navy considered the CH-148 Cyclone as an option for their maritime helicopter, but rejected it due to a lack of international buyers."

Hanwha Ocean and TKMS Group are offering ISS within Canada, as it is the only feasible and viable option for Canada. The RCN cannot send its submarines for refit to South Korea or Germany, as this would impact not only the overall deployable days but also the notion that Canada can service these submarines domestically, as Canada has with the Victoria-class. It is a matter of national security that we can service our equipment without joining a queue at a foreign shipyard or aircraft maintenance facility.

The question is how either Hanwha Ocean or TKMS Group will adapt their bid to the new Defence Investment Agency. This is a multi-billion-dollar procurement, and the in-service contract will also be in the billions. Creating jobs and Canadian supply chains is more than just signing an in-service support contract with a company.

One or the Other – Not Both

Vice-Admiral Angus Topshee stated that Canada could acquire submarines from both Hanwha Ocean and TKMS Group, verifying a rumour that has been circulating in Ottawa.[47] There are

numerous reasons against such a decision — it ultimately boils down to choosing one supplier over the other.

By splitting the submarine fleet, which will be "up to twelve submarines", but probably realistically around eight submarines in total. It will mean that crews on the Pacific and Atlantic will have to be separately trained, as well as their in-service support and supply chains. Unique training and supply chains that will increase costs. There is a reason why Canada will not have a dual-fighter jet fleet due to the increased costs.

There is also a human cost associated with the idea of a dual submarine fleet, and that is the human cost. There would be little incentive for personnel to transfer from the West to the East and vice versa, as new training requirements would arise. This could limit the services and the support needs of the RCN personnel and their families. This was addressed in three different reports concerning compensation and workplace grievances from the Ombudsman for the Department of National Defence and the Canadian Armed Forces.[48]

The notion of economies of scale will be thrown out the window as our order will decrease. As our order decreases, so do any incentives for economic investments in Canada. Having two separate submarine fleets will unravel any initiatives the Carney government has planned for increasing economic growth, a functioning CAF and properly managed defence spending.

"...intentional loose lips sink bad policies."

Prime Minister Carney stated that Canada would not split the submarine contract into two different suppliers.[49] As this was a rumour that was abound in Ottawa, Vice-Admiral Topshee's comment to the press concerning how it was a possibility proves that sometimes, intentional loose lips sink bad policies.

Economic

It is increasingly becoming clear that the Canadian government will favour a pitch that benefits the Canadian economy and jobs, rather than a submarine design that meets the needs of the RCN or the legacy costs tied to ISS and the additional equipment and support required, such as vertical missile launch, for example.[50] These are dangerous waters to be in. Both South Korea and Germany are currently valuable trading partners. Canada runs the risk of ostracizing our economic relations with either of them if they are not chosen for the submarine deal.

Those deals would be the Canadian export of critical minerals and, potentially, LNG to South Korea. Between what Hanwha Ocean has promised the Canadian government in terms of incentives and what TKMS Group has done in previous German negotiations over LNG, as well as its recent discussions with Canadian critical minerals, there is no definitive difference.

Even on 5 October 2025, during an interview on CBC, Stephen Fuhr, Secretary of State for Defence Procurement, stated, "It will come down to economic benefits to Canada, and they are both playing ball pretty substantially."[51] The KSS-III has a VSL capability, and the 212CD does not. They are two different submarines with different operational roles and in-service costs.

Oddly, this government is not discussing those differences. As described earlier, the decision between these two submarines should be based on a broader strategy for Canada's international operations and participation in coalitions.

There is a precedent for incorporating economic and technological benefits into defence procurement through the Industrial and Technological Benefits (ITB) policy. This policy has been in place for decades in various forms. Still, the crux of the policy is that there needs to be a domestic economic benefit from defence procurement and an industrial benefit to the industry. It is often stated that there needs to be an ITB for the Canadian defence industry sector, rather than the overall economy. However, Canada lacks the capability and expertise to build a submarine fleet, and a contract would therefore have to be sourced outside of Canada. However, prioritizing economic benefit over capability or the suitability of a submarine seems ludicrous.

There is an element of foreign affairs involved in defence procurement. It is not part of the decision-making process, but it does have an impact through diplomatic channels. A major procurement deal could land political leverage for other economic relations between countries. There is a difference between leveraging that leverage during further economic negotiations and plastering it in the international media as a significant decision point for the CPSP.

Hanwha Ocean is attempting to "sweeten" its deal with "industrial-technological benefit collaborations that could involve investments in Canadian lithium-ion battery production, liquefied natural gas, aerospace, steel, critical minerals mining and sustainable energy."[52]

All things that Germany has been discussing with the Canadian government. There has been much discussion over the years of Canada's critical minerals and liquified natural gas (LNG) partnership with Germany. Germany took a significant blow when it came to its fossil fuel imports after the full-scale Russian invasion of Ukraine.

According to Global Affairs Canada, Germany is "Canada's sixth-largest merchandise trading partner and the largest among EU member states."[53] Additionally, we are our sixth-largest investor – holding a direct stock investment valued at $40.3 billion.[54] Canadian exports to Germany were valued at $6.8 billion in 2024.[55] Canada also has a strong relationship in science, technology and innovation with more than 1,500 joint research projects with Germany. Canadian exports to South Korea were valued at $7.6 billion in 2024.[56] Canada has had a Science, Technology and Innovation (STI) agreement with South Korea since 2017.

Both countries are attempting to increase trade imports from Canada in critical minerals and sustainable energy sources. Natural Resources Minister Tim Hodgson recently stated that German companies are interested in Canadian LNG, and the Carney government intends to meet that demand, which contrasts starkly with the previous Trudeau government.[57]

Germany is ranked as the third-largest economy in the world, and South Korea is ranked 13th. If there is an economic package to be had, then it seems that Germany would have the most leverage. However, it does seem that South Korea is willing to hint at increased economic and technical packages without much public knowledge.

We should be discussing operational capability, ISS and not just economic incentives. There are operational costs associated with these complex vessels, as well as new capabilities that are not being discussed.

Conclusion

The Type 212CD is based on the 212A design, which has been subject to multiple international export contracts under the Type 214 designation. The Type 212CD is the latest collaboration between Germany and Norway to meet the security challenges of the 21st century. The overall design has been exported worldwide, and the 212CD has been specifically designed to meet the requirements of the Arctic.

The KSS-III remains an unproven submarine in the international market. Canada would face the growing pains of design revisions, equipment upgrades, and might even fall into the operational spike trap of Canadianization. When operational requirements are added, the submarine may become less capable than the original design.

Hanwha Ocean is doing its very best to add mobile rocket and artillery systems to the arms package for Canada. Canadian defence procurement projects face a high risk of Canadianization being their downfall. Signing onto Hanwha Ocean carries its own developmental risks, as the KSS-III does not yet have an export customer.

TKMS Group has a history of working with local partners and providing ISS. The ISS for a submarine is more complex than for a surface ship. Canada's partnership with Germany and Norway would mean that potential developmental risks would be shared three ways. Additionally, given that the 212CD is based on the reliable 212A, which has been exported worldwide as the 214, there is considerably less risk.

The Canadian government has two options:

1) Choose Hanwha Ocean. The RCN would initially receive a few more submarines by accepting the Hanwha Ocean deal rather than the TKMS Group deal. However, the RCN runs the risk of adopting a submarine that is in development, which has not garnered any other export deals to date. This would mean that any design issue would be unique to Canada due to our distinct environmental conditions in the Pacific, Atlantic, and Arctic regions. The RCN would have a VLS capability, but one that will have to be paid for by further ISS and procurement contracts – and that is if it is a capability that the Canadian government can utilize on the international stage.

2) Choose TKMS Group. The RCN would only receive one submarine within the retirement deadline for the Victoria-class submarines. The 212CD design is based on a proven design in various navies, and any design issues with the 212CD will be shared by Germany and Norway, who will be operating in similar waters. It does not have the VLS capability, but other navies have fired cruise missiles horizontally.

The CPSP is a complex procurement, not only because of what the two competitors are offering. However, replacing the Victoria-class also comes with its own legacy – either this government

gets it right or suffers the political curse that has plagued many Canadian governments in the past over various procurement projects in Canada's history.

Getting this one right means more than just considering economic benefits; more importantly, it involves the operational role that these two different submarines will play in the CAF's operations and in Canada's foreign policy stance.

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