



CANADA'S SUBMARINE ASSETS

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Submarines have been operated in Canada since 1914 when British Columbia acquired two small boats from an American shipyard because of local fears about German raiders as the First World War began. Responsibility and operation of the boats (and note that submarines are referred to as *boats*, not ships) was quickly transferred to the navy. In the decades that followed, the submarine service was small and the Royal Canadian Navy (RCN) commissioned only four boats, two captured German U-boats and two British H-class vessels.

In the years following the Second World War, Canadians maintained the skills necessary to operate submarines primarily with boats loaned to the RCN by Britain. Cold War requirements brought Canada back into the submarine game and, in 1962, approval was received for the acquisition of the *Oberon*-class attack submarines, the last of which was retired in 2000.

Canada's current submarine fleet is comprised of four *Victoria*-class diesel-electric attack submarines (SSKs), which replaced the *Oberon*-class. Divided between the Atlantic and Pacific fleets, the *Victoria*-class is made up of: HMCS *Victoria* (876); HMCS *Windsor* (877); HMCS *Corner Brook* (878); and HMCS *Chicoutimi* (879).

These vessels are renovated British ships of the *Upholder*-class (Type 2400s). Built for the Royal Navy in the late 1980s and early 1990s, the boats were purchased second-hand by Canada in 1998. After significant work to integrate them into RCN technology and equipment ('Canadianization'), they were delivered to the RCN between 2002 and 2004. Crewed by approximately 50 officers and sailors and displacing 2,475 tonnes (submerged), the *Victorias* are capable of speeds of up to 20 knots and an impressive range of roughly 8,000 nautical miles (at 8 knots). They are larger than most modern diesel-electric submarines, though only half the size and speed of their larger nuclear counterparts.

The *Victoria*-class has several missions and functions. They were built as anti-submarine warfare (ASW) platforms to locate and destroy Soviet submarines during the Cold War. Because hunting enemy submarines is done primarily by acoustic detection – the ability to listen in silence, while moving in and out of the ocean's different thermal layers – the best platform to detect and destroy an enemy boat has long been one of your own.

Despite considerable difficulty integrating them into the RCN – and the long period of update and initial renovations – they are highly capable assets. Armed with the US-made Mark 48 torpedoes and advanced sensor systems, the *Victorias* have become excellent tools for surveillance, defence and deterrence along Canada's coasts, as well as routine fisheries patrols and support to law enforcement. Sometimes described as a strategic asset, these boats have become a 'special force' component of the RCN due to their ability to control space through their very existence. Because they cannot be easily detected, the presence (or assumed presence) of an attack submarine serves as a deterrent to potential adversaries, altering that opponent's decision-making across an entire maritime theatre.

These vessels operate on both the East and West Coasts and have been deployed abroad alone and in partnership with Canada's allies. They are not capable of operating in the Arctic and have made only symbolic journeys north. Because a diesel submarine operates underwater on batteries, those batteries rely on a diesel engine to recharge and that recharging can only take

place on the surface, where diesel exhaust can be vented. As such, Canada's submarines have a limited submerged range. While this is suitable for the vessels' tactical employment in combat and surveillance, it makes under-ice operations dangerous and the *Victorias* do not deploy under ice in the Arctic.

In times of conflict, these submarines are Canada's most effective means of countering enemy submarines or surface craft to ensure the safety of Canada's coasts. They are also the best platforms for operating in dangerous environments where surface combatants would be at risk from air- or ground-based missile attack. Their combat capability is augmented by highly sensitive acoustic, electro-optic and electromagnetic sensors, as well as an advanced bow sonar. As a result, they can monitor large undersea areas for other submarines and detect and track surface vessels at great distances. Compared to the larger nuclear submarines operated by many of Canada's allies, the smaller size of the diesel-electric boats also makes them ideal vessels for operating close to shore – an increasingly important task in modern military operations.

Canada does not have nuclear submarines. Nuclear submarines are a commonly misunderstood platform. A nuclear submarine is defined by the use of a nuclear power plant to provide propulsion not, as most people seem to think, by carrying nuclear weapons (i.e., a nuclear missile-carrying ballistic missile submarine (SSBN)). Canada considered acquiring nuclear attack submarines (SSNs) in the late 1950s/early 1960s and again in the late 1980s. These vessels would have been nuclear-powered but not nuclear-armed – meaning that they would use conventional torpedoes not nuclear missiles. On both of these occasions, the extreme cost of the nuclear plant and the onshore support requirements dissuaded the government from making an acquisition, as did protests from the Canadian public.

Conventional diesel-electric attack submarines, like the *Victoria*-class, have certain advantages over larger nuclear-powered vessels. Their electric propulsion system makes them very quiet, providing a decisive advantage in certain scenarios, especially operations in shallow waters and strategic choke points. This stealth and ability to operate in shallow/strategic areas makes them valuable assets for Canada and a useful training tool for Canada's allies.

Canadian submarines are an important element of Canada's strategic relationship with the United States. Because the US Navy operates no diesel-electric submarines, the *Victoria*-class regularly trains with American ships to prepare for combined operations against an enemy possessing a similar capability. Canada also participates in a global 'water space management' regime, in which allied submarine operators share information about the movement of their submarines in order to prevent a collision. As a member of this exclusive 'sub club,' Canada gains privileged access to naval intelligence that would otherwise not be available to it.

The *Victoria*-class submarines have been active at sea since 2003. In that time, these boats have undertaken a diverse set of security and defence missions. They have participated in exercises at home and overseas, patrolled Canada's coastal areas – including the Arctic (although not under the ice) – and worked in partnership with Canada's allies in international operations such as *Operation Caribe*, a counter-drug operation in the Caribbean/eastern Pacific, and in 2018, as part of *Operation Projection – Asia-Pacific*, a Canadian submarine visited Japan for the first time in many years.

Canadian submarine operations experienced a pause in operations and were not active in 2019 and 2020. All four of the submarines spent time in various stages of maintenance or modernization. Because submarines are complex and operate in an unforgiving environment, they require regular maintenance, including preventive and corrective maintenance, engineering upgrades, and hull survey and remediation. HMCS *Victoria* returned to sea for trials in

September 2020 after routine maintenance, repairs and upgrades, including a new sonar, among other things. A new capability was tested in fall 2020 as *Victoria* worked with a helicopter hovering overhead to practice transferring equipment and personnel to the submarine. HMCS *Corner Brook* finished its extended docking work period in June 2021 and returned to operational status, HMCS *Windsor* finished a maintenance period in March 2021 and returned to sea, participating in Exercise Cutlass Fury in September 2021. HMCS *Chicoutimi* is scheduled to return to sea in 2023.

Canada is approaching the time when a decision will have to be made about replacing the *Victoria*-class submarines. As you will have seen if you've read Briefing Note #6 (National Shipbuilding Strategy), there was no provision included in the NSS to replace the submarines. The government announced that the operational life of the *Victoria*-class boats will be extended to permit them to operate into the 2030s, but there has been increasing discussion about replacing the submarines. In late 2022, the Canadian Patrol Submarine Project was initiated to examine the capabilities that would be required in a new generation of RCN submarines. In April 2023, it was revealed that the RCN is pushing for a submarine replacement program as part of the Defence Policy Update process.¹ This discussion is in the early stages and the outcome is as yet uncertain.

Submarines are an important part of what Canada's naval policy, *Leadmark 2050*, describes as a 'balanced' fleet. This means a fleet capable of deploying globally, controlling maritime space, surreptitiously collecting intelligence and supporting government security and defence objectives.

¹ See David Pugliese, "Royal Canadian Navy Pitches \$60 Billion Submarine Purchase, Say Defence and Industry Sources," *Ottawa Citizen*, 4 April 2023.