



CANADA'S SUBMARINE ASSETS

Canada has operated submarines since the First World War when British Columbia acquired two small boats from an American shipyard to quell local fears of German raiders. In the five 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, which were operated until 2000.

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

These vessels are renovated British ships of the *Upholder*-class (Type 2400s). Built by the Royal Navy in the late 1980s and early 1990s, the vessels were purchased second-hand by Canada in 1998. After significant and, sometimes unexpected, 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 electrics, 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 to hide and seek, the best platform to 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 were and remain 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.

These vessels operate on both the East and West Coasts and deploy regularly 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 operations under ice impossibly dangerous, since surfacing in the Arctic often requires waiting for the right conditions.

Sometimes described as a strategic asset, these boats have become a 'special force' component of the Canadian navy 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.

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 prevalent task in modern military operations.

Canada does not have nuclear submarines. Nuclear submarines are a commonly misunderstood weapons platform. Often associated with nuclear missile-carrying ballistic missile submarines (SSBN), a nuclear submarine is actually defined by its use of a nuclear power plant to provide propulsion. Canada considered acquiring nuclear attack submarines (SSN) in the late 1950s/early 1960s and again, far more seriously, in the late 1980s. These vessels were nuclear-powered but not nuclear-armed – meaning that they would use conventional torpedoes and 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.

Conventional diesel-electric attack submarines, like the *Victoria*-class, have certain advantages over larger nuclear-powered vessels. Their electric propulsion system makes them extraordinarily quiet, providing a decisive advantage in certain scenarios, especially operations in shallow waters and strategic choke points. This stealth and strategic area defence makes them a valuable strategic asset 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 of its own, 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 be beyond its reach.

Canada's *Victoria*-class submarine fleet has been active at sea since 2003. In that time, these boats have undertaken a diverse set of missions spanning the security and defence spectrum. 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, and in 2018, a Canadian submarine visited Japan for the first time in many years.

Following the return of HMCS *Windsor* from a Mediterranean deployment in 2018, 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. HMCS *Victoria* returned to sea for trials in September 2020 after time in dry dock on the West Coast where it underwent routine maintenance, repairs and upgrades, including a new sonar and new battery 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 after sea trials will return to operational status, and HMCS *Windsor* finished a maintenance period in March 2021 and returned to sea, most recently participating in Exercise Cutlass Fury in September 2021.

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 of Canada objectives across the security and defence spectrum.