



## RCN CAPABILITIES

*Updated August 2022*

The Royal Canadian Navy (RCN) is a versatile and balanced blue-water (i.e., ocean going) fleet with a wide range of capabilities, which can be adapted to various missions. The fleet is capable of naval combat with major warships and is armed and crewed for sustained high-intensity operations. Although the ships of the RCN have war-fighting as their fundamental mission, Canada has not been at war for many years. This means that RCN warships can and do contribute to operations other than naval warfare, ranging from peace operations, constabulary action, regulatory enforcement and surveillance.

The RCN is a navy that can be deployed around the world, with ships and submarines capable of independent ocean crossing, but enabled by support ships. This Briefing Note provides a basic understanding of the capabilities of the RCN ships.<sup>1</sup>

### Communication and Propulsion

At the most basic level, all warships must have the capability to float, move and fight. Before operations can begin – whether during war or peacetime – the ship has to travel to the theatre of operation (float and move). This means a ship has to have effective propulsion and navigation systems as primary capabilities. Canada does not have nuclear-powered ships/boats, all are diesel-electric.

To maintain situational awareness on the way to operations, and while there, the ships need surveillance and communication capabilities. To enhance operations, the RCN is able to operate seamlessly (i.e., the navy is ‘interoperable’) with Canada’s allies and defence partners. (See Briefing Note #36 for a discussion of naval interoperability.) To coordinate effort within a task group it uses the Global Command and Control System, and to exchange information with allies, the RCN ships use multi-link and coalition networks.

Because Canada is not at war, the most frequently used capabilities of Canadian naval ships concern the following capabilities:

- Propulsion: how far and how fast can the ship get to its destination, how long can it stay at sea without replenishment?
- Navigation: safe travel at sea is supported by, for example, navigation radars, Automatic Identification System (AIS), Global Positioning System (GPS) and electronic charts
- Communication: naval ships need secure communication channels between ships and aircraft as well as with facilities onshore. The communication needs to be short and long distance and effective in all weather

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<sup>1</sup> For more information, on the assets and capabilities discussed here, you should take a look at more detailed discussions in the following Briefing Notes: BN#5 Submarines; BN#6 the National Shipbuilding Strategy; BN#9 Canadian Surface Combatant; BN#10 Assets and Platforms; BN#11 MV Asterix; BN#13 Halifax-class frigates; BN#14 Arctic and Offshore Patrol Ships; BN#23 Kingston-class Maritime Coastal Defence Vessels; BN#26 Joint Support Ships.

- Data networks: naval ships need secure data exchange, both within the ship and with other ships and aircraft, and need to be fully engaged in the cyber domain.

## Ships of the RCN

If you have read Briefing Note #10 (Assets and Platforms), you will know that Canada currently has three main classes of ships, and one interim support ship. It has 12 frigates – the *Halifax*-class – which are the workhorses of the RCN. These ships have a crew of around 240 people and are versatile ships. Canada also has four submarines – the *Victoria*-class – which have been used in recent years for a variety of missions. As well, the RCN has 12 Maritime Coastal Defence Vessels (MCDVs) – the *Kingston*-class – which are smaller ships that have a crew of about 40-50 people and generally stay close to home, although in recent years they have been deployed to West Africa and the Caribbean/Eastern Pacific. The RCN also has an interim support ship – MV *Asterix* – which provides fuel and supplies to the fleet.

The National Shipbuilding Strategy (NSS) has begun to deliver a fourth class of ships to RCN capabilities and assets. As of 2022, the RCN has two Arctic and Offshore Patrol Ships (AOPS) – HMCS *Harry DeWolf* and HMCS *Margaret Brooke* – and the third AOPS, the future HMCS *Max Bernays*, was launched in January 2022. The RCN will receive six ships of this class through the NSS. In addition to the rest of the AOPS, the RCN will receive two replenishment ships (Joint Support Ships) and up to 15 new surface combatants (Canadian Surface Combatants).

## Surface and Sub-surface Operations

One of the principal tasks of any navy is sea *control*, namely control of your own ocean areas, and sea *denial*, denying non-friendly forces the military use and control of your own ocean areas. In practice this requires the ability to deter and/or sink enemy warships. This capability is resident in the RCN's two primary war-fighting assets: the frigates; and the submarines.

A crucial aspect of naval warfare is detecting the presence of other ships and any incoming threats. In addition to the Automatic Identification System (AIS) which provides information on all ships, the *Halifax*-class frigates have medium- and long-range air search radars, and a system that can identify unknown objects (Interrogator Friend-or-Foe (IFF)).

As well, the frigates have an updated Combat Management System, a warfighting computer network. The ships are also equipped with systems to use in electronic warfare, such as communication intercepts, enemy emitter identifiers, infra-red detectors and Optronic surveillance (digital night and day vision device providing fusion of information for threat and target detection).

The RCN's air-defence capabilities reside in the frigates. These ships are designed to operate in high-risk combat zones and possess a layered anti-air defence to protect them from enemy aircraft, drones and missiles. In addition to the surveillance and detection capability, and updated Combat Management Systems, mentioned earlier, the frigates' capabilities include the Rim-162 evolved Sea Sparrow missile to engage targets out to 50 kilometres, a 57 mm Mark 3 naval gun which can fire burst munition at targets within 12,000 metres, and a Phalanx Mark 15 close-in weapon system, which can fire 3,000-4,500 rounds a minute at incoming missiles or drones. Each frigate also carries an advanced system of electronic countermeasures which can divert incoming missiles before they can strike a ship.

The primary armament of Canada's frigates is the RGM-84 Harpoon missile. In 2016 the RCN took possession of its first Harpoon Block II missiles, a system which adds the ability to strike targets ashore. The Harpoon is a subsonic (i.e., slower than the speed of sound), over-the-horizon anti-ship missile capable of delivering 227 kilograms (500.5 pounds) of high explosive to an enemy target nearly 130 kilometres away.

Some of the RCN's most intense combat historically has been in the field of anti-submarine warfare (ASW). During the Second World War, in the company of other Allied countries, Canada was responsible for defending convoys in the Atlantic from German U-boats and this involved sinking them if possible. This ASW tasking remained the navy's core mission throughout the Cold War, as Soviet submarines could, as Germany had in WW II, try to close off the Atlantic Ocean to shipping in the event of war.

The ASW tradition continues to be an important part of the RCN's combat capabilities today. The navy's principal ASW assets are the frigates. For threats coming from the underwater arena, the frigates have hull-mounted sonar, and the Canadian Towed Array Sonar System (CANTASS) to detect the presence of submarines or submarine-launched weapons.

Canada's diesel-electric submarines are armed with Mark 48 heavyweight torpedoes, a powerful anti-ship weapon. These modern torpedoes can travel up to 100 kilometres at 55 knots to deliver 295 kilograms (650 pounds) of explosives to a target. Unlike earlier versions of torpedoes, for example many of the ones used in the Battle of the Atlantic, these weapons do not detonate against the hull of their target. Rather, they explode beneath an enemy ship causing a bubble to form under the hull, lifting the vessel out of the water and cracking it in two. While an anti-ship missile like the Harpoon will do serious damage, it is the heavy torpedo that presents a truly critical threat.

Maritime helicopters are also a major element of the modern hunt for submarines. The frigates serve as platforms for the CH-148 Cyclone maritime helicopters. These aircraft can range out to 400 kilometres, dropping sonar buoys in the water to detect the sound of submarines, allowing the frigate to stay well out of range of enemy weapons. Once located, an enemy submarine can be attacked by the helicopter's complement of two torpedoes. In addition to their Harpoon missiles, Canadian frigates carry Mark 46 lightweight torpedoes, which can be fired from aft tubes. These weapons are considered largely defensive, since surface ships prefer to engage submarines at long range using aircraft.

Unlike some of the navies of larger states, the RCN possesses a limited capability to strike objects on land. With the new Harpoons, the RCN has the ability to support ground operation by conducting tactical strikes, an important consideration in a contested battlespace where strikes from aircraft may be too dangerous. Warships operating in coastal (littoral) regions also contribute to the operations of land forces through surveillance and intelligence reporting that can be collected by embarked aircraft or unmanned systems. Warships, with their advanced communications suites and large storage spaces, also provide ideal command and control platforms and supply hubs for land forces ashore.

## Surveillance

In peacetime as in wartime, a state wants to know who is in its territory. Canada is in a fortunate geographic position with oceans on three of four borders. To protect Canada and the sovereignty of its territory – including the maritime elements – it is important to know what is happening in the ocean approaches. The RCN employs its frigates and *Kingston*-class patrol vessels to monitor

activity along Canada's coasts and in global hotspots. With the first AOPS coming into service, Canada has increased its ability to monitor and conduct surveillance in the Arctic. As noted, warships have excellent capabilities for collecting information on activity in the maritime arena.

Another surveillance asset is the RCN's submarines. Diesel-electric boats are quiet and stealthy naval vessels, able to monitor suspicious or hostile maritime activity undetected. Details on the roles and duties of submarines usually remain classified, however Canadian submarines were recently deployed, for example, off the coast of North Korea to monitor maritime traffic that is contravening UN sanctions against the country. The submarines have also conducted constabulary missions closer to home, such as fisheries patrols and support to maritime law enforcement and other governmental departments.

Information from all the RCN sources is fed back to Canada and assimilated by the Marine Security Operations Centres (MSOCs). (See Briefing Note #19 for more about the MSOCs.) This data is, in turn, disseminated to key government agencies and can be disseminated to allies as well.

### **Support for Disaster Relief and Good Order at Sea**

For more than 70 years, Canada has deployed forces abroad to support United Nations and international coalition missions to restore peace and security in areas of conflict. The navy plays an important, if often overlooked, role in these missions.

The RCN is one of the Canadian government's most effective tools in disaster response or humanitarian assistance. When hurricanes and natural disasters strike in coastal areas, naval vessels are often among the first responders. In situations such as these, navy ships can provide much-needed supplies, including food and water, as well as (limited) medical facilities, essential transport and aid, storage space, operational hubs and ship-based aircraft when they are needed most. Warships have large storage spaces so they can transport supplies much more cheaply than air transport. They provide effective command and control platforms and supply hubs – particularly in areas without established, or with damaged, facilities ashore. As well, because they can sustain themselves, naval ships can continue to provide assistance even if airports are damaged or are being used to capacity, without straining facilities on shore. In addition to the provision of disaster assistance ashore – such as in the operation after the devastating earthquake in Haiti in 2010 – the RCN also provides indirect support through surveillance and intelligence reporting, and direct support in moving forces and equipment and evacuating civilians.

As well, RCN vessels work with allied navies in global counter-terrorism and counter-narcotic operations by restricting the freedom of manoeuvre of terrorists and criminals in the maritime domain and intercepting merchant craft supporting such activities. Canada participates regularly in international maritime operations. Canada has taken leadership positions in a variety of maritime groups. For example, Commodore Darren Garnier was commanding officer of Combined Task Force 150 (CTF 150) for part of 2019, and Commodore Josée Kurtz commanded Standing NATO Maritime Group Two (SNMG2) in 2019.