



# RCN CAPABILITIES

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. Ships of the RCN can also contribute to operations other than naval warfare, ranging from peace operations, constabulary action, naval diplomacy, regulatory enforcement and surveillance. The RCN is able to operate seamlessly (i.e., the navy is ‘interoperable’) with Canada’s allies and defence partners. It 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 these capabilities.

## **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 frigates – 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. Finally, the RCN now has an interim support ship – MV *Asterix* – which provides fuel and supplies to the fleet, and which is run by Federal Fleet Services with a mix of civilian and RCN personnel. (See Briefing Note #11 on *Asterix*).

Besides core naval assets, Canada also has six Patrol Craft Training vessels (*Orca*-class). While not specifically assigned operational roles, these vessels patrol coastal waters (mainly on the West Coast) reporting suspicious activity, pollution infractions, fishing violations, and helping with search and rescue as needed.

In coming years, the National Shipbuilding Strategy (see Briefing Note #6) will lead to an increase in the navy’s ship assets. The RCN will receive six Arctic and Offshore Patrol Ships in the coming years, with the first ship – HMCS *Harry DeWolf* – handed over to the RCN in the summer of 2020. The navy will also receive replenishment ships (Joint Support Ships) and new surface combatants (Canadian Surface Combatants).

## **Anti-Ship Combat 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 *Halifax*-class frigates; and the *Victoria*-class submarines. Canada’s frigates accomplish this task with their primary armament, the RGM-84 Block II Harpoon missile. The Harpoon is a sub-sonic (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 up to 130 kilometres away.

A more powerful anti-ship weapon is the Mark 48 heavyweight torpedoes, carried by Canada's diesel-electric submarines. 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 to an enemy vessel.

## Anti-Submarine Warfare

Some of the RCN's most intense combat 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 from German U-boats. 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 remains an important part of the RCN's combat capabilities today. The navy's principal ASW asset is the *Halifax*-class frigate. The frigates are equipped with a hull-mounted Sonar (HMS SQS-510) that actively seeks underwater threats, and a passive acoustic array of hydrophones called the Canadian Towed Array System (CANTASS). CANTASS is designed to be towed up to two kilometres behind a frigate to detect and track submarines by placing the sonar away from ship-generated noise.

However, maritime helicopters are the major element of the modern hunt for submarines. The frigates served as platforms for the now-retired CH-124 Sea King helicopters and now serve as platforms for the new 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 anti-ship 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. A defensive system is NIXIE SLQ 25 – an anti-torpedo towed acoustic decoy. The NIXIE attempts to defeat a torpedo's passive sonar by emitting simulated ship noise, such as propeller and engine noise, which is more attractive than the ship to the torpedo's sensors.

## Air Defence

The RCN's air-defence capabilities reside in its 12 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. This system includes the Rim-162 evolved Sea Sparrow missile to engage targets out to 50 kilometres, and the BOFORS 57 mm Mark 3 naval gun which can fire burst munition at targets within 12,000 metres, supported by two fire control radars (CEROS 200).

Long-range air search capability is provided by the SMART-S phased array 3D radar which can locate and track air contacts at the range of 130 nautical miles (240 km). The air search is supplemented by the Identification Friend or Foe (IFF) system. The last line of defence against incoming air and surface threats is the Phalanx Mark 15 Block 1B close-in weapon system (CIWS), which can fire 3,000-4,500 rounds per minute at an incoming threat, and can operate in full-auto independently of the rest of ship's Combat Suite.

### **Electronic Warfare**

Each *Halifax*-class frigate carries an advanced system of electronic countermeasures, including those that are designed to divert incoming missiles before they can strike a ship (RAMSES). The Electronic Warfare (EW) Suite fitted on frigates enables the ships to intercept electronic communications, find an enemy's radar emissions, track by infra-red heat signature, and decoy incoming missiles with the Multi-Ammunition Softkill System (MASS).

### **Land Attack**

Unlike some navies, the RCN possesses a limited ability to strike targets on land. In 2016 the RCN received of its first Harpoon Block II missiles, a system which adds some land attack capability. With the new Harpoons, the RCN has the ability to support ground operations by conducting tactical strikes, an important consideration in a contested battlespace where air strikes 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.

### **Combat Management System**

The *Halifax*-class Combat Management System (CMS 330) was added during the *Halifax*-class Modernization/Frigate Life Extension (HCM/FELEX) program which was closed out in 2018. The CMS 330 is a computer network that integrates all shipboard weapons, sensors, surveillance and intelligence, and provides a real-time battle picture to maximize combat capabilities. It enables an operator to make timely decisions and choose the best weapon to engage the target based on selected battle doctrine. Operators control CMS 330 from multi-function workstations located in the Operations Room. The system has manual, semi-automatic and fully automatic modes, simultaneous and cooperative engagements, ensuring defence of the ship under the extreme tempo of a modern combat. Remarkably, the tactical picture that an operator sees on the workstation screen is compiled both from the contacts detected by the ship's own sensors, and received from other vessels in the task group via multi-link external communication systems. Thus, each vessel contributes to the Global Command and Control System (GCCS) which can also interface with CMS 330.

## Surveillance

Canada's premier surveillance assets are its four *Victoria*-class submarines. Diesel-electric boats are the stealthiest naval vessels in the world, able to monitor suspicious or hostile maritime activity undetected. Details on the roles and duties of submarines usually remain classified, however they have been deployed off the coast of North Korea to monitor maritime traffic and they have conducted constabulary missions closer to home, such as fisheries patrols and support to maritime law enforcement.

The RCN also employs its frigates and *Kingston*-class patrol vessels to monitor activity along Canada's coasts and in global hotspots as part, for example, of UN or NATO missions. Information from patrols on Canada's coasts is fed back to 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 Peace Operations and Disaster Relief

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. While not normally directly engaged in peace operations, the RCN provides indirect support through surveillance and intelligence reporting, and direct support in moving forces and equipment and evacuating civilians.

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. (See Briefing Note #30 for more information on naval humanitarian assistance/disaster relief operations.)

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.