Canadian Maritime Aviation: Missions and Capabilities

If you have read Briefing Note #20, you'll know about the history and development of Canadian naval maritime aviation capability. In this Briefing Note, we'll discuss what maritime aviation assets contribute to the navy, what the Royal Canadian Navy (RCN) does that requires air capabilities, and what capabilities the RCN has.

There are a variety of maritime aviation operations and capabilities. The capabilities can be classified as either fixed-wing assets (airplanes) or rotary-wing assets (helicopters). And aside from the technical differences, in Canada this relates to the location from which the asset is operated – i.e., there are maritime aviation operations that are conducted from shore and operations that are conducted from aboard ships. Because the RCN no longer operates aircraft carriers that are able to launch and recover fixed-wing aircraft like fighter jets, Canada operates fixed-wing aircraft from shore. Canada has Maritime Patrol Aircraft, in particular the Aurora long-range patrol aircraft. These aircraft are able to cover great distances at high speed. They are useful for maritime search and rescue, monitoring Canada's coastlines for vessels of interest, and conducting surveillance over the Arctic. These assets are operated by the Royal Canadian Air Force, not the navy. (See Briefing Note #20 for details on the history of maritime aviation in Canada.)

The beauty of maritime aviation capabilities, and why they are such an asset to naval forces, is that when aviation assets are joined to a warship, they allow it to see beyond the horizon. If you send a helicopter out from the ship, it can conduct reconnaissance far beyond what the ship itself can see. (It should be noted that this works both ways – i.e., the helicopter increases the range of the ship, but the ship is a moving airfield which increases the range of embarked helicopters.)

As well, a helicopter, and even more so an airplane, can cover more area than a ship, at a much faster speed. This is extremely useful when trying to find out if enemy forces – or perhaps criminal forces if you are conducting counter-piracy or counter-narcotic operations – are in the vicinity. Plus, air assets are extremely useful in search-and-rescue operations at sea. The ability to conduct surveillance and reconnaissance became even more useful when helicopters gained the technological capability to transmit real-time information directly back to the ship.

So helicopters can extend the ship's vision over the horizon, but what else? One of the main assignments for the RCN during the Cold War was anti-submarine warfare (ASW). What, you're wondering, can a helicopter do about a submarine? Helicopters are very useful in detecting submarines. The helicopters are equipped with sonar buoys (acoustic receivers and radio transmitters mounted in a buoy that can be dropped from a helicopter) or a 'dipping sonar' (a

long cable with a transducer that goes into the water and detects objects via sound pulses, i.e., transmits and listens for underwater electronic signals). With the dipping sonar, the helicopter hovers over the surface of the ocean and lowers the cable into the water and the transducer sends information to the helicopter that tells it if there are any submarines in the area. This information is transmitted back to the ship.

As well as sending information about submarines back to the ship, a helicopter can also deal with a submarine itself. The helicopters can be armed with missiles that could strike a submarine that has been located – the Cyclones can be armed with two MK-46 torpedoes. The Cyclones are also equipped for self-defence with flares and jammers, and can be armed with a door-mounted general-purpose machine gun.

What else are ship-borne helicopters used for? They are extremely useful assets for transporting material ashore if the ship itself cannot dock because facilities do not exist, or they are not secure. For example, in 1992 when the Canadian Navy was sent to Somalia in support of what was originally a United Nations mission there, the RCN ships were not able to dock in Mogadishu because the port was not secure. The helicopters thus transported supplies ashore for the Canadian Army units that were stationed in Somalia. In another example, when RCN ships arrived in the aftermath of the earthquake in Haiti in 2010, the port facilities were insufficient and/or destroyed, so supplies, water, personnel and the Disaster Assistance Relief Team were often transported by helicopter. As well, helicopters can transport divers to a scene, undertake medical evacuation (medevac) operations, and provide support to other Canadian government departments (aid to the civil power) if necessary.

Maritime aviation is thus a real asset for the navy. But what capabilities does the RCN have? As noted above, the Royal Canadian Air Force (RCAF) has used the Aurora (CP-140) maritime long-range patrol aircraft extensively to monitor the ocean approaches to Canada.

The helicopter asset that the RCN utilized – for more than 50 years – was the Sea King (CH-124).[1] The Sea Kings came into service in 1963 and over the past five decades played multiple roles for the RCN. After a long and arduous procurement process, the Sea Kings have now been retired. The new RCN helicopter is the CH-148 Cyclone. The Cyclone successfully completed its first operational deployment with the RCN in 2018 and the helicopters will continue to be received by the RCAF (which operates them for the navy) over the next few years until full operational capability is reached in 2025.

While some of the kinks are still being worked out, not surprisingly the Cyclones add new capabilities that the Sea Kings did not possess. For one thing, although there continue to be 'pilots' on board, the helicopters are flown by computer, what is referred to as 'fly-by-wire.' They have much better communication systems, in some ways better than the ships on which they're located. In addition to the ability to conduct both day and night operations in poor weather, they have infra-red capability and auto-tracking. The Cyclones have the ability to conduct over-the-horizon targeting. As well, they have a long-range radar that can get a full picture of a contact up to a range of 200 miles ahead of a ship, and the resulting signals are far better resolution – not just a blip. While they use the same principles for detecting submarines as the Sea Kings, the Cyclones can detect submarines at much longer range.

Changing technology is a huge factor in the improvements to maritime aviation. The Auroras have been updated to provide better sensor technology in order to collect information and transmit video and pictures, in real-time back to the home base. As well both the Auroras and Cyclones have upgraded abilities to conduct operations at night. The new Cyclone helicopters are equipped with technology that the original Sea King pilots could only have dreamed of.

As technology continues to improve, unmanned aerial vessels (UAVs) (and unmanned surface and sub-surface vessels) will increasingly be used by the RCN. The RCN has been using UAVs for years, currently the CU-170 Heron, but this will only increase. As technology evolves navies will have the option to use a broad spectrum of UAVs – which already exist in sizes ranging from the size of a small bird to as big as a glider – for a huge variety of missions. And advances in autonomous technology will increase the maritime aviation options even more. (See Briefing Note #17 for a discussion of the RCN and Unmanned Technology.)

Notes

1. For a discussion of the Sea King, see John Orr, "Perseverance: Some Reflections on 50 Years of the Canadian Sea King," *Canadian Naval Review*, Vol. 9, No. 2 (2013), pp. 11-16; and Jeff Tasseron, "Sailing to Byzantium: A Eulogy to the Sea King," *Canadian Naval Review*, Vol. 15, No. 1 (2013)