KEEPING AN EYE ON CANADA'S OCEANS

Airborne Maritime Surveillance

By Blair Watson

Bordered by oceans on the east, west, and north, Canada has more coastline than any other country. This nation has the world's second largest area of continental shelf and territorial waters: 6.55 million square kilometres, almost six times the area of Ontario. The sum of our Atlantic and Pacific coastlines is more than twice the Earth's circumference.

Canada's vast ocean areas present significant monitoring challenges to federal departments responsible for sovereignty protection, the environment, law enforcement, transportation and commercial fishing. Immigrant smuggling, illicit drug operations, and dumping harmful chemicals into Canadian waters are some of the reasons why the federal government has spent tens of millions of dollars during the past two decades on airborne maritime surveillance.

For many years, keeping an eye on Canada's oceanic areas from the air was the exclusive province of the military. During World War II, Royal Canadian Air Force squadrons on the east coast flew patrols to find German submarines waiting to attack Allied convoys departing from Halifax. West of British Columbia, RCAF patrols searched for Japanese Navy vessels, and even balloons launched by Imperial Japan that were laden with incendiaries and small bombs. Coastal Command performed air-sea rescues, photographic reconnaissance and meteorological flights. Land airplanes such as the Blenheim, Mosquito, and Wellington were used, and RCAF sea aircraft included the amphibious Canso, Catalina and Sunderland flying boats.

After the war, the military flew maritime patrols with aircraft such as the CP-121 Tracker, SA-16 Albatross, and CP-107 Argus. In February 1968, RCAF aircraft used for maritime surveillance became part of the new Canadian Forces. The Argus was replaced by the CP-140 Aurora in the early 1980s, and all Tracker aircraft were retired by 1990. Three CP-140A aircraft – Auroras without antisubmarine-warfare systems – were ordered in 1991 to carry out Arctic sovereignty patrols and reconnaissance of surface vessels, and to assist with search-and-rescue operations.

During the 1980s, the federal government became increasingly aware of a serious problem east of the Atlantic provinces, particularly Newfoundland: marine pollution. Hundreds of thousands of seabirds were dying each year because of bilge water dumped from ships in Canadian waters and outside of this country's 200-nm maritime boundary. Bilge water contains oil, solvents, and other chemicals deadly to seabirds and other marine species.

Years of bilge water dumping resulted in the ocean area southeast of Newfoundland becoming one of the world's most polluted marine environments. Thousands of vessels transited the waters of Atlantic Canada annually, so closing the shipping lanes was not feasible. A solution to the maritime pollution problem was badly needed, and airborne surveillance of ships became an integral part of the remedial action.

In the early 1980s, an enterprising company, Atlantic Airways, started maritime ice reconnaissance services to the east coast oil exploration industry. Ice formations posed a risk to offshore exploration and production units, and companies needed to know and predict their location. In 1986, the company became the world's first private operator of digital X-band radar, which had been developed for anti-submarine warfare applications. In 1990, Atlantic Airways became Provincial Aerospace, and since then it has had four long-term contracts with the federal government through the Fisheries and Oceans Air Surveillance Program.

Provincial Aerospace has maritime surveillance aircraft

CONTINUED ON PAGE 37

CONTINUED FROM PAGE 24

based in St. John's, Halifax, and Comox, B.C. The company's primary domestic client is the Department of Fisheries and Oceans (DFO), but other government departments such as Transport Canada use the data and direct aircraft use for other maritime surveillance missions. Provincial Aerospace also has customers in other countries. The aircraft used for maritime surveillance in the Canadian program are modified King Air 200s, and the fleet is uniformly configured, which makes maintaining the airplanes and their surveillance systems easier.

There are four crew members on each maritime surveillance flight: two pilots and two sensor operators. One operator is responsible for the X-band digital radar, Forward-Looking Infrared System (FLIR) and the video and audio recording equipment, while the other handles the Airborne Data Acquisition and Management (ADAM) system. Aircrew, who have civilian and military backgrounds, are supported by managers, maintenance technicians and other personnel. Provincial Aerospace uses computer-based and in-flight training, as well as underwater egress training (provided by another company). In more than a decade and a half of maritime surveillance operations, including at night and in bad weather, the company has never had a mishap.

The King Airs are equipped with specialized systems, some of which, like the FLIR/video and ADAM units, have been developed by Provincial Aerospace. The radar system detects ('paints') targets on the ocean and the FLIR system picks up heat signatures. The video and digital photographic equipment is used to collect visual evidence, such as a slick of oily bilge water trailing behind a ship. Successful prosecution of polluters requires the type of evidence that Provincial Aerospace's aircraft gather. VHF, HF, and SATCOM equipment keep the aircrew in touch with their base and federal agencies, and an onboard electronic data transfer system allows surveillance information to be transmitted from the patrol area to interested parties onshore in real time.

Transport Canada and the DFO establish the maritime surveillance flight schedules based on their requirements. For example, monitoring commercial vessel activity is a high priority during fishing season. Bilge water dumping usually occurs at night, and ships from countries that do not regard marine polluting as seriously as Canada and/or have a record of illegal dumping are monitored closely.

Patrol areas include sections of ocean in and outside of Canada's declared 200-nm limit. The program has succeeded in detecting illegal activities such as the approach of a ship loaded with Chinese migrants off the west coast in July 1999.