# TWENTY-FIVE YEARS OF CANADIAN COAST GUARD HOVERCRAFTING

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On an occasion such as this, I feel that there is room for less formal and perhaps more personal contributions than are normally found at learned gatherings. What follows is therefore an informal review of the operational side of Canadian Coast Guard hovercraft activities, which may stimulate some reminiscing of forgotten trivia.

CCGHU formed in 1968 and took delivery of SRN-5 021 at Vancouver in June of that year. In those early years, hovercraft in CCG was virtually a retired Fleet Air Arm club. The Director of Fleet Operations, responsible for equipment and operation of CCG ships, was Admiral Tony Storrs, whose foresight led to CCGHU. To command and operate the Unit, he recruited a retired RCN test pilot, Bert Mead, who had operated the SRN-6's at Montreal Expo in 1967. On the regulatory side, a retired RCN air engineer Captain, John Doherty, picked up the threads in Ottawa in 1968 and in 1969, I joined him. For maintenance of 021, Bert Mead captured Reg Hogg, the RN Chief Air Artificer who had occupied the engineer's seat in SRN-3 at Lee for several years as well as maintaining our N-5's at I.H.T.U.

Vancouver Airport was selected as the home for CCGHU, since it is on an island with tidal mud flats at one end of the main runway, heavy logging traffic on the river boundaries, and very dense and diversified marine traffic in the Straits of Georgia. The original tasking of the Unit was purely evaluation of the SAR role in daylight. However, they soon proved their worth when they pulled off a dramatic night rescue of 5 persons from an expensive pleasure cruiser aground on rocks in a storm, with air temperature of -13°C and the sea was 50% pan ice. That was still in their training phase, as they were not declared fully operational until 1 April 1969. By today's standards, their equipment, while very effective, was primitive. A Decca 202 radar, Doppler, a couple of radios and an ADF was the nav/comm fit, while for airfield fire fighting the craft could carry a large spherical 'bomb' full of 'Purple K' dry chemical. Up to 1977, 021 performed valiant and increasing SAR missions, ranging from towing floatplanes off the mud-flats in fog, to replenishing 4 metre runabouts with 10 litres of fuel. By 1977, nearly 600 rescue missions per year were being carried out. In March 1975, disaster struck when a fierce gale developed in the late evening out of nowhere and by 2 in the morning, the Straits of Georgia was full of ships running for shelter or in distress. Responding to a call to attend to 2 fishing vessels at 0230, 021

hit an unlit dismasted trimaran at 20 knots, tearing her port bow and puncturing main buoyancy. She managed to stay afloat, and was towed back in the morning; repairs and opportunistic up dating of electronics by the Unit took 7 months.

By this time, CCGHU was performing other CCG roles - servicing navigation buoys and fixed beacons; fishery and environmental patrols, pollution control and occasional ice-breaking to assist the fishing fleets, and 021 was becoming overloaded. Twice, plans to move the Unit for work in other areas had to be abandoned due to public pressure, although the craft was deployed for 6 weeks to Prince Rupert, some 800 km. north of Vancouver. In 1977, she was joined by SRN-6 039, an ancient but unused craft, from BHC, she was immediately fitted out with a comprehensive nav/comm package and relieved the pressure. By now, equipment also included side-decks, twin Nite-Sun searchlights, and a permanently rigged towing hawser - in her last 2 years 'solo', 021 performed 148 rescue tows, about 12% of all her SAR missions.

By a quirk of fate, Bert Mead had left CCG in 1973 to operate 2 SRN-6's for Northern Transportation Company in the Beaufort Sea, but by 1978 this operation had ceased, and Bert then negotiated the sale of SRN-6 030 and 031, plus a comprehensive spares package, to CCGHU. Ostensibly for spares, these craft were stored at Vancouver but the very entrepreneurial C.O., John McGrath, quietly cajoled his maintenance staff to commence re-furbishing them, and they finally entered CCG service in the mid-80's, coded as 045 and 086. On completion of the first, John proudly sent me a message "with lack of ceremony and quiet pride, SRN-6 successfully completed her first CCG mission". To which the congratulatory reply included "While 045 may have operated with lack of ceremony, she also did so with lack of a Flight Permit. Please advise".

Due to pressure from fishing boat incidents at the Northern end of their operating area, and with 3 craft available, one was deployed permanently to a sub-base at Parkesville, about 100 Km N.W. of the main base, on Vancouver Island. Once 086 was operational, 021 was gracefully retired as the sole remaining operational SRN-5 in April 1986, and the Unit had 3 SRN-6's with modern equipment; probably for their size, the most comprehensive nav/comm fit in any ship. New state of the art radars, with computerized navigational electronic chart inputs, track plotter, LORAN, GPS, VHF and UHF coverage of air and marine bands, cellular telephone, and CB radio, they can contact virtually anyone, and at the same time know and record their exact position, which can be vital in incidents where legal evidence may be required. In 1991, as a result of many factors, the Parkesville sub-base was closed; one of the factors was the deterioration of craft structures with the attendant increase in

cost. As a result of surveys, it was decided to scrap 030 and carry out major refits on 039 and 031; it is not certain that they could continue to operate without restrictions beyond the end of 1995.

Jumping back in time, the Canadian Government in 1971 funded the development of the Bell Voyageur as an Arctic transport vehicle which could traverse the delicate Arctic tundra while carrying 20 tonne payloads in support of the then frantic oil explorations in the Beaufort Sea. In the event, by the time the development was complete, Voyageur was too late and only 4 were built; the design was, of course, developed to the LACV-30 for the US Army. During the development, CCG conducted trials in the Mackenzie River and Mackenzie Delta - I had the unique experience of hiking along the ice road and thumbing a ride from a passing Voyageur, driven so far as I remember by Tony Smith. As a result of all this, CCG acquired Voyageur 002 and commenced evaluation in Coast Guard roles at Parry Sound in Ontario. At that time - 1972 - the ACT-100 had demonstrated the use of heavy ACV platforms to break ice at Yellowknife, and in the Spring of 1973 we decided to investigate whether Voyageur could be used in the same way - operating over ice at low speed (3 - 5 knots), with ice thickness roughly the same as the cushion pressure head - about 25 cms. A suitable area of ice was found about 10 Km. out from the base at Parry Sound but obviously we were not going to transit at 5 knots. It was during a trip out to the ice patch that one of the crew looked astern and to everyone's amazement, the wake of the craft was covered with broken ice while travelling at about 20 knots. Measurement of the ice thickness showed it to be 50 - 60 cms. - well in excess of expectations at 5 knots. All further thoughts of low-speed testing were abandoned while we examined this "new' phenomenon. Thus, high-speed ACV ice-breaking was born - the rest is history. To be fair, similar ice-breaking had, we discovered, been noted during the BH-7 trials in the Baltic and during Hovercat trials in Sweden some years previously, but the significance had not been recognized.

Voyageur 002 was subsequently moved to Montreal and since the winter of 1973-74, high-speed ice-breaking in water depths down to ice thickness have been a regular and very productive winter pastime. Millions of dollars of damage and repair have been saved each winter by the ice-breaking and flood control operations of Voyageur and subsequently Waban Aki on the St. Lawrence and numerous tributaries between Montreal and Quebec City. Optimum ice-breaking occurs at or around open-water hump speed and during pirouettes, with attendant heavy spray and rapid craft icing. One very useful by-product of the ice-breaking, therefore, was the development as a joint venture between Transport Canada and Hoverlift Systems, of the Spray Suppression Apron (S.S.A.), or Anti-Spray Skirt (A.S.S.). Versions of this

are now a regular feature on a number of hovercraft.

Mention of Hoverlift Systems conjures up memories of other UK hovercraft expertise in Canada - Roley Hunt, Ray Dyke, Geoff Parkhouse and Graham Westerling-Norris, the team that were responsible for the ACIB, ice-breaking bow attachment built to CCG specifications and developed and tested in the early 1980's. It was over-complicated, became a political football and was scrapped without being given a fair chance.

Reverting to Voyageur, in the early years 1974-78, her ice-breaking operations were about the only permanent feature in the calendar and the crew had to beg for work during the summer. When she did find it, she was too successful. One summer, she was given the job of checking all the buoys and beacons on the Ottawa River between Montreal and Ottawa. This job was usually a leisurely summer cruise over 250 Km. of scenic river for 4 or 5 deck-hands on Barge 99, taking 4 or 5 weeks. With Voyageur, the summer cruise disappeared - the job was completed in 4 days! Barge 99 was returned to service in later years!

But, with a deck-mounted crane and her 15m x 10m working deck, she very successfully completed a number of significant construction jobs - installing a generating station on top of a lighthouse on a tidal island in the St. Lawrence, and numerous shore-line beacon towers, and gradually she was accepted. A major feature of the summer program became and still is, the twice-yearly re-supply of about 10 manned lighthouses in the St. Lawrence Estuary. This includes bulk re-supply of diesel fuel and water, carried in large deck-mounted tanks and pumped up from the craft. Some of the light houses are on islands or cliffs, but at least 2 are tower structures in the water, and the hovercraft has to remain on a tethered hover at the tower base.

By 1985 Voyageur was becoming more and more difficult and expensive to operate and CCG looked for a replacement. The result, of course, was Waban Aki (People of the Dawn), the Westland AP.1-88/200, which arrived in Montreal in September 1987. For 3 months, while Waban Aki worked-up, Voyageur continued to operate, but she was then retired and sold for scrap. Waban Aki immediately took over and early in her life showed that she was a much more powerful ice-breaker than Voyageur. This ice-breaking phenomena at what is essentially open-water hump speed has never been satisfactorily explained mathematically; several attempts have been made, but we still do not know what design parameters to use to improve the performance. All the parameters which can be expected to influence ice-breaking are very similar on Voyageur and Waban Aki - cushion area, weight, cushion volume flow, cushion aspect ratio, etc. - and yet Waban Aki breaks a path probably 20% wider than Voyageur in similar ice, typically about 50 m. wide in ice

of 60-70 cm. thickness at a speed of 15-16 knots.

Waban Aki has proved her worth, with greatly reduced operating costs compared with Voyageur, much greater comfort for the operating crew and the work crew which they frequently carry. On a recent deployment to New Brunswick, about 800 Km. distant, the Maritimes Region of CCG Fleet had their first exposure to ACV potential and were very enthusiastic. By 1991, less than 4 years after her arrival, her productivity and economy already had her Laurentian Region masters talking about a new and improved additional craft - a far cry from 15 years previously when Voyageur had to beg for work. Now in 1993, the Maritimes and Laurentian Regions are both wanting any new craft that may be purchased.

Although the popular conception may be that Waban Aki is based at Montreal, she is very rarely there, typically from November to February, for annual self-refit and the early ice-breaking around Montreal. For the major ice-breaking, she operates from unprepared sites at Trois Rivières, in the middle of the winter activity half-way between Montreal and Quebec City. Most of the rest of the year she operates out of a ramp in Quebec City or from a small sub-base at Cachouna, 100 Km. further downstream, for the light station resupply.

What of the future? CCG is firmly committed to continued use of hovercraft by at least the two existing operational units, but tasked as multi-role vessels rather than the original SAR-dedicated CCGHU. It is public knowledge that Westland's have been conducting design studies and definitions for a developed Waban Aki for some time. The negotiations have been protracted for many reasons, one of the biggest being to try to arrive at a solution which would meet the differing operational scenarios of Vancouver and the Laurentian and Maritimes Regions. As this is being written, at the end of September, the internal pressure is on to reach a rapid resolution; probably by mid-November, this will have been achieved and the way ahead will be clear. Will CCGHU still exist and be operating hovercraft on their Golden Jubilee in 2018?