

MARINE OCCURRENCE REPORT

STRIKING A ROCK AND GROUNDING
IN RAYMOND PASSAGE, CAMPBELL ISLAND, B.C.

OF THE FAST RESCUE CRAFT "G.R.1" ON A SAR
MISSION DISPATCHED FROM
THE CCGS "GORDON REID"
WITH SUBSEQUENT INJURIES SUSTAINED
BY THREE CREW MEMBERS

29 MARCH 1997

REPORT NUMBER M97W0048

The Transportation Safety Board of Canada (TSB) investigated this occurrence for the purpose of advancing transportation safety. It is not the function of the Board to assign fault or determine civil or criminal liability.

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Summary

The Fast Rescue Craft (FRC) "G.R.1", dispatched from the "GORDON REID" on 29 March 1997 in response to an urgent SAR (Search and Rescue) call, struck a rock at about 0140¹ at a speed of approximately 30 knots. All three occupants were thrown from the boat and projected over the rock, landing in the water on the opposite side. The boat, carried by momentum, flew through the air some 18m and came to rest at the water's edge also on the other side. The three persons, with various injuries, were rescued by other boats and taken to hospital. The badly damaged FRC was removed from the rock and transported to the CCG yard in Victoria, B.C. where it was declared a total loss.

¹ All times are PST.

Other Factual Information

Particulars of the vessels

Name:	"GORDON REID"	"G.R.1"
Official Number:	813735	14K37615
Port of Registry:	Ottawa, Ontario	Victoria, B.C.
Flag:	Canadian	Canadian
Type:	SAR vessel	Zodiac 733
Gross tonnage:	863.32	Not applicable
Length:	49m	7m
Built:	1990, Victoria	1995
Propulsion:	Diesel, 4,732 HP	Two outboard motors, Each 150 HP
Owners:	DFO, CCG	DFO, CCG

The Zodiac Hurricane 733 Rigid Hull Inflatable Boat is an open boat with two inflated tubes forming its sides and a bottom made of fibreglass and aluminum. The propulsion is provided by two outboard motors capable of attaining a speed of approximately 50 knots at full throttle.

A number of these boats are owned by the Canadian Coast Guard and designated as Fast Rescue Craft (FRC). They are adapted and allocated to the CCG patrol vessels and commonly referred to by using the vessel's initials.

The "G.R.1" was allocated to the "GORDON REID", a CCG patrol vessel plying the waters of the British Columbia coast. It was secured on a specially designed stern ramp and launched and manned when necessary by the crew of the mother ship.

It was fitted with three seats, two side by side at the stern and one in front of them. The occupants would straddle the seats which, along with hand rails, gave them good protection against accidentally falling overboard.

No safety belts were affixed to the seats. Reportedly, the seat belts are not suitable for these craft and would restrict the occupants in their ability to balance their bodies when the boat is rolling and pitching.

The instruments on the "G.R.1", the magnetic compass, radar, GPS, sounder and VHF radiotelephone, were installed on the consoles in front of the seats.

The front seat, designed for the wheelsman, had the steering wheel, throttles, various gauges and switches and the magnetic compass in a small dome. The R10X radar and the VHF, each in a watertight casing, were located in front of the starboard and port side seats, respectively.

The radar on the "G.R.1", a Raytheon R10X model, would operate in the 'Head-Up' mode only. That is, when the boat turned, the heading marker remained motionless while the targets, including the land, would slew in the direction opposite to the boat's turning direction. It was capable of operating on the ranges, 0.125, 0.25, 0.5, 0.75, 1.5, 3, 6, 12, 16 and 24 miles.

A kill-switch lanyard was attached to the controls column just below the ignition switch. The other end of the lanyard was to be attached to the wheelsman. When pulled, it would shut the engines down electronically, causing the boat to stop within a short distance.

On 28 March 1997, at 1055, the SAR and Fishery Patrol vessel "GORDON REID" anchored in Norman Morrison Bay, Campbell Island, in a position 52°11.8'N., 128°11.6'W.

Another vessel, the "TANU", performing the same task, anchored in the same bay approximately 3 cables east of the "GORDON REID". Both vessels were standing-by in the general area of a subsequent herring opening and were waiting for a fleet of fishing boats to arrive.

The deck crew on the "GORDON REID" performed their normal duties. They stood two 12-hour deck watches, each watch including a deck officer and two deck-hands. The master did not keep regular watches but was called to the wheel-house whenever necessary.

Shortly before midnight, the chief mate and two deck-hands took over the watch. It was a dark night, overcast with rain and a strong south-easterly wind gusting up to 35 knots. The sea state was described as a heavy chop and the visibility was reduced in the rain.

At approximately 0125 on 29 March, an urgency call, "PAN PAN", from a water taxi off Bella Bella, having problems with the propulsion, was intercepted on the "GORDON REID". The call was addressed to and was responded to by MCTS Prince Rupert. However, the OOW on the "GORDON REID", aware of the nature of the call and the area it came from, ordered his watch to prepare the FRC "G.R.1" for launching.

At 0131 the "GORDON REID" was tasked by the Rescue Coordination Centre(RCC) Victoria to attend to the occurrence, which was some seven miles from Norman Morrison Bay.

The master was called to the wheel-house and the "G.R.1" was launched with three persons on board, that is, the entire deck watch. They all wore floater suits, caps, goggles, boots and gloves. They did not wear safety helmets.

The boat's equipment was checked and found in good working order. However, the previous crew of the "GORDON REID" indicated that the heading marker on the boat's radar was observed to be misaligned. Bearing this information in mind, the mate decided to test the radar before final departure.

At 0136, upon leaving the vessel's ramp, the mate ordered the wheelsman to take the boat approximately 1 cable away, turn around and steady the boat's head onto the "GORDON REID". The SAR vessel would still be visible from the boat. At the same time the mate compared the radar picture with the visual sighting. No error was found. The heading marker was lined up with the boat's bow and with the "GORDON REID'S" target on the radar PPI-screen. Satisfied with the result, the mate then told the wheelsman to turn the boat

away from the "GORDON REID".

The mate was familiar with the area and also had a chart on board. He knew that to depart from the bay he would have to proceed at first in a general northerly direction. He would then pass between Kintail Point on Campbell Island and Hose Point on Horsfall Island, leaving the latter on the port side.

The wheelsman was turning the FRC towards the starboard side, away from the "GORDON REID", and increasing the speed. The radar, operating on low ranges between 0.25 and 0.5 mile, was the only aid they used to navigate the boat. The available spotlight was not used. The mate was aware that the rain, reflected in the beam of light, would impair their visibility. This effect rendered the spotlight useless during the mission.

A few seconds later the mate noticed that an echo of a land-mass had appeared dead ahead and near the edge of the PPI. Assuming that it was the point on Horsfall Island, he ordered the wheelsman to steer more to starboard. As the echo of the land was getting wider and still dead ahead, and the distance was decreasing, the mate gave orders to bring the boat a further 20° to starboard. He also tried to adjust the controls of the radar.

The wheelsman reported that when he heard this order he observed that the compass heading was approximately 050°. He turned his head towards the mate when the boat, already travelling at a speed of approximately 30 knots, struck a hard object, flew through the air and all three occupants were ejected from their seats when the boat subsequently landed on the rock.

As it became known after the accident, the "G.R.1" had struck a rock in a position 52°11.8'N, 128°10.3'W, approximately 9 cables southeast from Kintail Point and 8 cables east of the "GORDON REID".

The point of initial contact was marked by shattered rocks and by pieces of orange fibreglass and aluminum debris, indicating that the boat was moving approximately in a southeast direction when it struck the rock. The next point of contact, with skid marks and debris, was some 18m further on. It was approximately one metre astern of the damaged boat, which was found resting on its starboard side, supported by the stem forward and the engines' legs aft.

The occupants were thrown over the rock and landed in the water on the other side. One of them probably hit the rock before landing in the water. They all managed to swim or crawl towards the grounded FRC and, then, helping each other, climbed into it.

The "G.R.1" had travelled approximately 7 cables before hitting a drying, rocky portion of the land. At the time of the occurrence the rock extended only about 2m above the surface due to the height of the water level, and was approximately 20m wide. The boat came to a final stop on the opposite side, partially submerged.

The boat had never left the bay. Instead, after the radar test was completed, it made a turn to starboard and advanced eastward into the bay. The officer in charge reported that when giving the wheelsman the orders to steer, he used the radar picture and his mental depiction of the area but did not refer to the compass which was not readily visible from his seat. He interpreted the land that appeared ahead on the PPI as Horsfall Island, which was to be passed to the port side and, consequently, he ordered the boat turned to starboard.

At 0141 the mate called the "GORDON REID" on his portable VHF radio advising the master about the accident and launched one flare. Following this call, two rescue boats were launched, one from the "GORDON REID" with a paramedic and one from the "TANU".

The crews of the rescue boats administered first aid, removed the survivors from the rock and, at approximately 0225, brought them back to the "GORDON REID". Due to the severity of some injuries, it was decided to transport all three persons to the nearest hospital in Bella Bella.

At 0253 the "GORDON REID" left the anchorage in Norman Morrison Bay for Bella Bella where she arrived and berthed at 0335. At 0402 all three survivors were taken by ambulance to the hospital.

One deck-hand with a broken leg, fractured wrist, severe bruising and laceration was flown to a Vancouver hospital, where surgery was performed. The other deck-hand, who suffered bruises and sore muscles, was given a 6-day off-duty leave-period and sent home to recuperate. The mate, who did not sustain any physical injury, was released and returned to the vessel immediately after a doctor had examined him.

The operation of the FRCs is governed by a Canadian Coast Guard Fleet Order (CGFO) regulating such items as operators' qualifications, safety gear, maintenance and responsibilities. These regulations are further expanded on by a CCG publication concerning the personal protection system for Fast Rescue Craft operators.

Reportedly, the requirements of the above orders, except for wearing safety helmets, were fulfilled on the "GORDON REID". The personnel had undergone the mandatory training and the "G.R.1" had been maintained and checked as required.

The chief officer, in charge of the "G.R.1" at the time of the accident, was a holder of the certificates pertinent to his employment. These certificates included Ocean Navigator Class 2, Simulated Electronic Navigation Levels 1 and 2 and Automatic Radar Plotting Aids, all issued in 1991. He had accumulated approximately 19 years of sea time on board CCG ships, including the "GORDON REID". Of this time, he had served approximately eight years as a deck officer.

The wheelsman, employed on the "GORDON REID" as a deck-hand when the accident took place, held a Watch keeping Mate certificate of competency issued in 1985. He had also sailed on this ship as second mate in the past.

Both the chief officer and the wheelsman had completed the Rigid Hull Inflatable Operator Training (RHIOT) course.

The third person on board the "G.R.1" graduated from the Efficient Deck-Hand course in 1995. He was making his first trip to sea on the "GORDON REID" when the accident happened. He had some experience in

scuba-diving and boating on the lakes.

The FRCs are not subject to periodical inspection by the Marine Safety Branch of Transport Canada. However, the on-board regular daily checks by the crew of the "GORDON REID" and periodical overhauls by the CCG maintenance yard ensured that the "G.R.1" and the instruments were in good condition. The last overhaul of the "G.R.1" before the occurrence was conducted in November 1996 at the CCG maintenance yard in Victoria.

Analysis

At 0140 on 29 March the tide was nearing High Water, flooding the lower drying ground and isolating some portions of the land.

The FRC "G.R.1" veered off course and struck the rock in spite of the fact that it was operated by qualified personnel and its equipment was in good working order. The injuries to the three persons were lessened by the rising tide, which had flooded the lower ground on the other side of the rock and softened their landing.

The mate commanding the boat decided to make sure that the radar was operating properly before departure, yet he subsequently navigated the boat without the same thoroughness. He did not use all available means to ensure that the boat was proceeding safely in the proper direction, and neither of the two crew members verified his orders.

The reason for the accident may have been a momentary lapse, an error in making use of the instruments, an obstructed access to the equipment, a lack of team work, or an adverse environmental condition. Probably each of these factors played some role in causing the occurrence.

The mate had a good knowledge of the area and probably did not need a chart to navigate the boat. He knew the direction the boat should follow but did not use the compass when giving steering orders. Instead, he relied solely on the radar picture. If he had seen the compass or asked for the compass course he would have realized that the boat was proceeding in the wrong direction. Unlike the compass, the un-stabilized radar picture with a motionless heading marker could not yield any information as to the boat's course with reference to North.

The radar was set to a low range, which produced a picture of limited radius and did not yield enough information to navigate the boat safely. The mate could navigate the boat safely between the two islands using radar alone. However the radar, used on a low range, did not allow him to compare the screen with the chart depiction of the area.

The echo of the nearest land on the perimeter of the PPI gave the mate the information that he was heading directly toward it. However, he took it as Horsfall Island to be passed to port. Had he switched the radar to a longer range he would have seen that the land ahead was actually Campbell Island to be passed on the starboard side.

The wheelsman manoeuvred the boat according to the mate's orders. However, he did not give the mate the feed-back information that was available to him on the boat's course. He remembered that the compass reading

was 050° when, after testing the radar, the mate gave him an order to turn to starboard. He turned the boat as he was told and increased the speed. Had the wheelsman passed the compass reading immediately to the mate, the latter would have noticed his own mistake and changed the course accordingly.

The speed of the boat was increased by the wheelsman to approximately 30 knots after the radar test was completed. The speed of the boat did not allow the mate time to scan the area with various radar range-scales in order to verify the direction of the boat. In addition, the speed increased the severity with which the boat struck the boat.

The environmental conditions hampered the crew in their ability to observe, communicate and compare. The pitch-dark night did not allow them to see even the slightest signs of land. The rain and gusting wind further impeded their vision by cluttering their goggles and forcing them to turn their heads away from the pounding rain drops. The rain also made the spotlight unusable.

Contrary to the CCG standing orders, nobody on board the "G.R.1" wore a safety helmet. Had helmets been worn, at least some of the injuries could have been less severe.

The crews of the "GORDON REID" and the "TANU" reacted promptly by dispatching their boats and rendering immediate assistance to the injured persons.

Findings

1. The propulsion and navigational equipment on the FRC were tested and found in good working order.
2. The mate navigated the boat by radar alone.
3. The radar was set to a low range, which produced a picture of limited radius and did not yield enough information to navigate the boat safely.
4. The mate misinterpreted the radar picture and turned the boat in the wrong direction.
5. The speed of the boat was increased without a full assessment of the path ahead.
6. The speed of the boat was excessive in the circumstances.
7. All three occupants were thrown from the boat and projected over the rock, landing in the water on the other side.
8. Two occupants sustained serious injuries.
9. The boat was seriously damaged and declared a total loss.
10. One compass on board the "G.R.1" was located in front of the wheelsman and was not easily visible from the officer-in-charge's seat.

11. Contrary to the standing orders the persons in the FRC did not wear safety helmets.
12. The action by the two SAR vessels after the occurrence was efficient and appropriate in the circumstances.

Causes and Contributing Factors

The FRC "G.R.1" struck the rock because it was navigated in the wrong direction at very high speed. The navigation of the boat by radar alone, set to a short range; the reduced visibility; the obstructed access to the equipment; and a lack of teamwork contributed to this accident. Its occupants were injured as a result of being ejected from the FRC by its sudden deceleration on striking.

Action Taken

Following this incident and as part of its ongoing review, the Canadian Coast Guard, Pacific Region conducted their own internal investigation and is planning to introduce several preventive measures in the near future. The crews of the CCG patrol ships using similar FRCs will be reminded to use the mandatory safety equipment (helmets) and to apply the principles of the Bridge Resource Management when navigating the boats. The latter procedure is to include pre-deployment briefings, communication between the FRC crew, cross-checking of intentions.

Regional orders will be introduced to amplify the existing FRC standard operating procedures and restrictions regarding weather conditions and crew experience. The ships' commanding officers (masters) will be instructed to include specific or local operating instructions in standing orders. All FRC operators will be reminded of obligations imposed by the normal practice of mariners and, whenever possible, given refresher training in blind pilotage.

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board, consisting of Chairperson Benoît Bouchard, and members Maurice Harquail, Charles Simpson and W.A. Tadros, authorized the release of this report on 04 February 1998.