Marine Investigation Report M93W0008

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.

Multiple Capsizings
Group of Chartered Sea Kayaks
Laskeek Bay, Queen Charlotte Islands,
British Columbia
30 July 1993

Summary

Nine sea-kayak charterers, led by two guides, were on passage to Vertical Point, Louise Island, B.C. On encountering adverse weather conditions near Heming Head, four kayaks were overwhelmed and capsized. Two members of the group were rescued immediately and two others were swept away by the waves. They were discovered in the water three hours later during a Search and Rescue mission. One was suffering from acute hypothermia. The other was later determined to have died from hypothermia and drowning.

The Board determined that the inexperienced group attempted a sea journey even though they were under-trained to safely handle their craft and to cope with emergencies, and were ill-prepared for the open water conditions which could be expected from the weather forecast. The fact that group discipline was not enforced and that the Search and Rescue mission was delayed because of initial confusion in the group and radio communications difficulties contributed to the death of one member of the group.

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1.0 Factual Information

1.1 Description and Particulars of the Kayaks

Three different types of kayaks, all owned by the Kayak Institute in Canmore, Alberta, were in use for the voyage (see photographs at Appendix A).

Type A is a single-seat sea kayak, 4.88 m in length and 0.61 m in breadth. It is moulded in fibreglass with two transverse watertight bulkheads dividing the kayak into three compartments. The bow and stern compartments contain foam buoyancy material in their forward and after extremities. The rest of each compartment is used for the storage of equipment. Access to the compartments is through waterproof hatches in the deck. The cockpit at the centre of the kayak is protected against water ingress by means of a skirt which fits around the kayaker's waist and the cockpit coaming. To reduce the volume of the cockpit and to minimize downflooding in the event of a capsizing, it is possible to use an insert known as a sea-sock. The sea-sock fits into the cockpit and is firmly secured around the cockpit coaming.

Type B is a double-seat sea kayak, 6.6 m in length and 0.76 m in breadth. It is built of moulded fibreglass with four transverse watertight bulkheads. There are two cockpits, a centre compartment, and bow and stern

compartments. The end compartments have buoyancy foam in the extremities and are used for storage. The centre compartment is also used for storage. Access to all three storage compartments is through waterproof hatches on the deck. Sea-socks can be used in both cockpits on double kayaks.

Type C is a single-seat sea kayak, 5.0 m in length and 0.603 m in breadth. It is made of cross-linked polyethylene. The one-piece hull is constructed in a heated mould. In this particular design, bulkheads are replaced by a permanently installed rigid sea-sock or pod. Such an installation reduces the size of the cockpit. There is a pumping arrangement for the pod but not for the hull compartment.

1.2 History of the Voyage

Nine charterers, four men and five women, met their two guides at Hotspring Island, B.C., on 26 July 1993 (see sketch of the area at Appendix B). Three type A, one type B and six type C kayaks were to be used for the trip. This gave a ratio of four or five charterers per guide, which is within the norm for the industry.

For the first two mornings, the charterers in the group participated in training periods, exercising capsizing and re-entry into a kayak, paddling techniques, chart reading and compass work. Not all of the charterers capsized a kayak or tried re-entry during training. Rafting together for added stability during rescues or stops on the water was described but not practised by the group.

Also discussed was the use of the "buddy system", whereby two kayaks would pre-arrange to travel in close company each day. Different kayaks could "buddy", but the arrangement to do so had to be made before setting out.

No voyage plan was filed with a Coast Guard Radio Station (CGRS)<1>.

During the first few days, there was some switching of kayaks between the group members to decide which was the best for their needs. One man used a fibreglass single-seat (type A) kayak throughout the trip because it was best adapted to his size.

On 30 July 1993, the guides checked the 0545<2> weather forecast for the area. At 0830, the group departed their overnight campground on the north-east tip of Lyell Island, B.C., and proceeded unhurriedly to an abandoned native village on Tanu Island, B.C., a distance of approximately five miles.

During lunch break at the village of Tanu, the head guide listened to the 1145 weather forecast for the area. He interpreted the weather forecast to indicate diminishing wind and waves and an improvement in conditions.

Before departure, the head guide told the group to wear warm clothing as they would be in for a long, cold passage. The women all remember hearing the advice and acted upon it. One dressed in all the outer clothing she had. She wore a sweatshirt, fleece jacket, rainsuit jacket and pants, wet suit boots, canvas hat and a lifejacket. Some of the men did not hear or did not take the advice and were dressed in minimal clothing below the waist, where they expected to be protected from the elements by the cockpit skirts.

At approximately 1530, they all set out for the intended overnight campsite at Vertical Point on Louise Island, a journey of about nine miles. In two groups, they paddled north-westerly in the relatively calm water in the lee of Kunga and Lyell Islands.

The first group consisted of the head guide, in a single kayak, with five charterers also in single kayaks. This group set course toward Helmet Island, B.C., to observe sea lions. The head guide had intended to use a beach on the south side of Porter Head on the Tangil Peninsula as a resting place before going on to Helmet Island. Upon reaching the area, he realized that the sea was too rough to make a comfortable landing. He decided to continue on to a second rest area on Talunkwan Island, B.C., on the south side of Heming Head.

The second group consisted of the assistant guide in a single kayak, a husband and wife team in the double kayak and two other charterers in single kayaks. This group was fishing for food and set out at a slower pace with the assistant guide and one charterer trolling as they went. Very soon after leaving Tanu, the husband and wife team decided not to fish with the second group, left it and caught up with the first group. The guides had not enforced the "buddy system" in previous days so this departure from the system passed without comment.

The assistant guide and one charterer drew ahead of the other single kayak in group two, leaving a distance of about two cables between them. The assistant guide and the accompanying charterer reached the vicinity of Helmet Island and stopped to watch sea lions. The assistant guide kept the leading group in view to ensure that the two groups did not become completely separated.

Meanwhile, the person who was fishing experienced problems with her fishing gear, and called out for assistance. The assistant guide returned to help her, leaving the other person alone watching the sea lions. When this person saw the first group pulling away, she decided to set out after them rather than wait for the assistant guide and the straggler to catch up to her. She joined the first group and positioned herself immediately astern of the head guide.

After clearing his and the charterer's fishing gear, the assistant guide resumed paddling in company with the charterer. It had started to rain and he last sighted the first group as it neared Heming Head.

At this point, the head guide had eight charterers with him, the assistant guide had one.

As the first group approached Heming Head and came out of the lee of Kunga Island, B.C., the wind and wave heights increased. The head guide found that the second rest area was also unusable because of the heavy waves breaking on the beach. He then decided to try to land on the north-west side of Heming Head.

By the time the first group reached Heming Head, several of the charterers were feeling anxious about their ability to handle a kayak in the prevailing conditions. The wind was increasing to about 20 knots and the waves were up to 3 m in height, with breaking crests. Both wind and waves were from the south-east. The waves were higher in the shoal area close by Heming Head.

To keep clear of the inshore waves, the head guide chose a course from the vicinity of Helmet Island to keep the waves at 45· on the starboard quarter of the kayaks, the best angle of approach for inexperienced kayakers to ride the waves and stay upright. Abeam of Heming Head, the head guide saw that, to round the headland, they would have to steer a course which would bring the seas astern. The guide felt that some of the kayakers would not be able to manage stern seas, so he decided to continue on to the planned overnight campsite at Vertical Point.

He turned his kayak round to tell the group his plan and to organize the strung out group into a tighter unit. Up to this point, most of the group were unaware of the detailed intentions of the head guide. In the pre-departure briefing, only general guidelines for the passage were given.

The member of the group who had been immediately astern of the head guide was uncomfortable in not having the guide ahead of her and with being in the lead. She stopped paddling, lost her balance and capsized, losing her back support cushion in the process.

The group quickly assisted her back into the kayak. The water was pumped out from the cockpit pod but, due to the loss of the cushion, she was unable to reach the foot-steering pedals. She panicked and, calling for others to follow, set off toward the rocky beaches at Nelson Point, which are not normally used by kayakers. Followed by a more experienced kayaker, she made a rough landing among the rocks, cutting her cheek badly. The more experienced kayaker managed to calm her down. The two women changed clothing, started a fire and set up camp.

During this first rescue operation, a second member of the group capsized. After being assisted back into his cockpit by the remaining members of his group, he started to pump out the pod. It soon became evident to the head guide that water had entered the main body of the kayak and that it was sinking. The kayak capsized a second time. The head guide told its occupant to climb on the deck of the double kayak between the two cockpits in accordance with the standard rescue procedures with this type of craft.

While this second rescue was in progress, the three other kayakers paddled to retain their position and stability. After the head guide had called for one of these kayakers to assist, a large wave broadsided one of the kayaks and carried it away from the group. As the kayak was being swept away, its occupant shouted for help but the others did not hear her. After unsuccessfully attempting to rejoin the group and losing sight of it, she saw a rocky island and tried to head for it. Within a few minutes, at about 1745, the kayak capsized.

She attempted a self rescue, as she had been taught but had not practised earlier in the trip. She boarded

the overturned kayak and righted it, but was unable to empty the pod because she could not get the pump to work.

She managed to get her left thigh into the cockpit and her torso laid across the deck with her right leg trailing in the water. She was wearing all the outer clothing she had brought with her. Some time later, the kayak was carried into a kelp bed. Her leg became entangled in the kelp and she was pulled from the kayak. She tried to anchor herself and the kayak in the kelp bed but could not hold on against the waves. The waves carried her and the kayak toward the island she had set out for, but the current took her round it. Later, she heard surf and realized that she was approaching the shore which was a rugged rock face. She was preparing herself for the consequences of a rough landing when she saw the searchlight from a rescue helicopter.

Meanwhile, the rescue of the man from the capsized kayak continued. After rafting the double kayak and one of the single kayaks together for additional stability, the head guide took them in tow. They eventually beached through heavy breakers on the north side of Heming Head. At some point, the man in the other kayak became separated from the group. The survivor from the capsized kayak was treated for hypothermia. Camp was set up.

The assistant guide, in company with one woman kayaker, approached Heming Head at approximately 1630. He did not see the first party due to poor visibility and wave height. At 1700, the assistant guide called the head guide on channel 68 on his handheld very high frequency radiotelephone (VHF R/T), but there was no reply. Believing that the main group had headed for Thurston Harbour, he made for the same area.

On arrival, the assistant guide and the charterer accompanying him discovered that an American yacht at anchor was the only other vessel there. After setting up camp on the beach, the assistant guide made another VHF call to the head guide at 1800. As there was no reply, he made a call to any vessels in the area to try to contact the head guide by VHF channel 68.

At 1805, the assistant guide requested CGRS Prince Rupert to contact the head guide before his next scheduled call at 1900. The radio station advised that it could call on Channels 16 or 22A only. When the assistant guide could not contact the head guide at 1900, he again requested help from the radio station. The CGRS tried to make contact, but without success.

The CGRS requested the assistant guide to call again if he was unable to contact the head guide at 2000, the time of his next scheduled radio call. At 1956, the head guide used his VHF to ask vessels in the area to help retrieve the capsized, drifting kayak from which the second person to capsize had been rescued. Initially, no vessel in the area responded to this PAN request.

The head guide was unaware of the difficulties being experienced by other members of his group. When CGRS Prince Rupert asked him if he required Canadian Coast Guard (CCG) Search and Rescue (SAR) assistance, he declined.

The assistant guide overheard the head guide talking to the radio station and he broke into the conversation. It became evident that four of the group were missing and that a search was required.

It was arranged that the assistant guide would borrow the American yacht's inflatable boat and outboard engine, pick up the head guide from the north side of Heming Head and that both would search for the missing kayakers. About 35 minutes later, while on the way out of Thurston Harbour, the assistant guide asked the inbound yacht "OCEAN LIGHT" to join in the search.

Both the CCGC "GORDON REID" and CGRS Prince Rupert reported the incident to the Rescue Co-ordination Centre (RCC) in Victoria. The RCC declared a MAYDAY at 2025 and the SAR operation commenced. The "GORDON REID", the fishing vessel "KING II", the "OCEAN LIGHT" and the workboat "GORDONDALE II" were tasked. A commercial helicopter was also tasked to search the shoreline around Vertical Point.

The head guide told the assistant guide by radio that the helicopter was under way for the area. The idea of picking up the head guide to help with the search was abandoned.

Radio reception was confused with so many stations involved; the assistant guide undertook to relay messages.

One of the search vessels located the woman who had been with the assistant guide in Thurston Harbour and, after talking to her, the operator reported to the radio station that all the kayakers were safe. The assistant guide, overhearing this, queried the vessel's operator about his location and was able to clarify with whom the vessel had been in contact. The assistant guide then informed CGRS Prince Rupert and the other searchers that there were still people missing. The search continued.

At 2144, the helicopter crew found the two women on the beach at Nelson Point. After touching down and talking to them, the helicopter crew resumed the search in Breaker Bay. At 2154, the helicopter crew advised CGRS Prince Rupert that one kayak, with a man wearing glasses, had been sighted in the water nearby. The man appeared to be lifeless. A minute later, the helicopter spotted the second missing kayak about 150 m away from the first. It was about 15 m off the shore of Haswell Island and was occupied by a woman kicking away at the water.

The helicopter kept both kayaks illuminated with a searchlight until the "OCEAN LIGHT" recovered the woman and the "GORDONDALE II" recovered the body of the man who was pulled from the water wearing only light clothing and a lifejacket.

Both these persons were transported to Thurston Harbour for transfer to the helicopter. On the way to Thurston Harbour, the woman, who had been in the water for some three hours, was treated by the crew of the "OCEAN LIGHT" for acute hypothermia. The crew of the "GORDONDALE II" was unable to resuscitate the man.

Upon arrival in Thurston Harbour, both victims were transported by helicopter to Queen Charlotte City Hospital, where they arrived shortly after 2300.

Meanwhile, the "KING II" had launched her inflatable boat and unsuccessfully tried to recover the two women camped at Nelson Point. When it was confirmed that the women had shelter, arrangements were made to take them off the beach in the morning. The following morning, the "GORDON REID" evacuated the people and kayaks from all three camp sites.

1.3 Injuries to Persons

	Guides	Charterers	Total
Fatal	-	1	1
Missing	-	-	-
Serious	-	1	1
Minor	-	2	2
None	2	5	7
Total	2	9	11

The coroner's report indicated that the death was due to hypothermia and drowning.

1.4 Damage to the Kayaks

The polyethylene single-seat kayak which sank was later recovered. As the forward and after watertight hatch covers were still intact, it appeared that downflooding had occurred through the pod seal. There was no damage to the other kayaks.

1.5 Certification

1.5.1 Vessel

Being small craft under 15 tons, these vessels do not require certification.

1.5.2 Personnel

There is no requirement for certification of persons operating or chartering kayaks.

Similarly, there is no requirement for certification of persons acting as guides or instructors for sea kayakers.

1.6 Personnel History

1.6.1 Head Guide

The head guide, co-owner of the Kayak Institute, had 18 years' experience in both white-water and sea kayaking. He had 10 years' experience as a commercial sea-kayaking guide in British Columbia in the summer and Baja California, Mexico, in the winter, and he teaches a 10-day Sea Kayak Guides Course as part of an Adventure Guides Program. He is experienced in outdoor survival techniques and holds an Advanced Wilderness First Aid Certificate. He also holds a Radiotelephone Operator's Restricted Certificate (Marine).

1.6.2 Assistant Guide

The assistant guide is a professional commercial airline pilot. He also holds a Radiotelephone Operator's Restricted Certificate (Marine). For several years, he had acted as a guide on canoe trips in Ontario. He had been white-water kayaking for six years and sea kayaking for four. Since starting sea kayaking, he had acted as an instructor and guide on the West Coast, using polyethylene and fibreglass kayaks.

1.6.3 Guides' Work Schedules

Since mid-June, the head guide had completed three previous 10-day sea-kayak trips with little or no time between each. As the owner of the charter company and the kayaks used on all four trips, he had the responsibility of maintaining the kayaks both during and between trips. As head guide, he had the responsibility for the safety of all the charterers.

The assistant guide was on his second 10-day sea-kayak trip since returning from a pleasure cruise sailing on his yacht "CARPE DIEM" from Vancouver Island, B.C., to Alaska. The kayak trips were to be a break in his sailing schedule and were part of his summer cruise schedule.

1.6.4 Charterers

Of the nine persons in the charter party, only one had previous experience in a sea kayak, three had limited experience in river kayaks and five had no experience at all.

1.7 Environmental Information

1.7.1 Weather Forecasts

The weather forecast for the northern waters, issued by Environment Canada at 1145, 30 July 1993, for the period ending at 1200, 31 July 1993, indicated south-easterly winds to 25 knots, veering to the south and south-west and diminishing to 10 to 15 knots. Wave heights were forecast to be between 1 m and 2 m.

1.7.2 Weather as Recorded by the Vessels

At Heming Head, winds were forecast to reach 25 knots from the south-east. Wave heights were estimated to have reached 3 m with breaking crests. The visibility was reduced due to rain and waves.

Records from the two closest weather stations support these observations.

1.7.3 Tides and Currents

Low water at Pacofi Bay, seven miles upstream in Selwyn Inlet, was predicted for 1822, 30 July, and the

succeeding high water at 0020, 31 July. Tides generally flow in and out of the inlet at approximately two knots. The average seawater temperature in the Hecate Strait area for July is 13·C to 14·C.

1.7.4 Sunset and Twilight

The times of sunset and civil twilight were 1958 and 2041 respectively.

1.8 Navigation Equipment

Each of the two guides carried a magnetic compass, and all 10 kayaks had plasticized charts and tide and current tables for the area.

1.9 Radio Communications

The two guides were equipped with handheld, battery-operated VHF radio sets. Channel 68 was the exclusive working channel, switching to other channels for weather forecasts or contact with CGRS. Because of the absence of battery recharging facilities, continuous radio watches were not maintained. Communications were made on the hour.

None of the kayaks had names or call signs for radio communication. The head guide used "S.S.PUFFIN" as his designator and the assistant guide used "CARPE DIEM".

After leaving Tanu, the hourly system was to be used only after 1800 or if the guides became separated. By 1700, the head guide was involved with the first capsizing and rescue and did not have his radio switched on. At 1800, the head guide was towing the rafted kayaks to land and again did not have his radio on when the assistant guide tried to make contact.

1.10 Emergency Equipment

1.10.1 Life-saving Equipment

Every kayaker wore a lifejacket, with whistle attached, at all times when they were on the water. There were neither lights nor reflective tape on the lifejackets.

Stirrup slings were attached to each kayak for self rescue re-entry into the cockpit of the kayak, should it capsize. There was no reflective tape on the undersides of the kayaks.

1.10.2 Emergency and Safety Equipment

The kayaks had a standard set of emergency/safety equipment:

- inflatable paddle float, carried deflated to save space;
- spare paddle;
- inflatable sea wing sponsons (side floats used to help the kayaker reboard after a capsizing and to stabilize the kayak) also carried deflated to save space; and
- a bailing pump.

In addition, the kayaks used by the guides carried sea anchors.

1.11 Search and Rescue

The "GORDON REID" gave an estimated time of arrival (ETA) on scene of five hours. Consequently, the SAR was carried out by fishing vessels and workboats in the vicinity together with a commercial helicopter equipped with a searchlight but no retrieval gear.

1.12 Stability

In heavy weather, the stability of a kayak can be improved by paddling continuously. The kayaks were equipped with inflatable paddles and sponson floats which can be fitted to assist the kayaker reboard after a

capsizing and to increase stability. However, to do so, the kayaker must stop paddling. The use of the floats to increase stability before the multiple capsizings was not considered. The floats were not used.

1.13 Pre-conditions and Requirements for Charterers

1.13.1 Information Supplied by the Kayak Institute

In all the advertising and information brochures sent to prospective clients, the Kayak Institute states that:

No previous paddling experience is required to enjoy any of our programs, although we do ask that you have spent sufficient time tent camping in backcountry settings to prepare you for travel through remote wilderness areas.

The brochures also state that "prices for all our programs include instruction, tour leading & **specialized kayaking gear**."

1.13.2 Requirements for Charterers

The Kayak Institute brochures state that:

Participants are responsible for providing their own CAMPING GEAR & FOOD. A detailed equipment list, food planning & menu guide, & information on how to pack our kayaks will be sent to you upon your registration in any of our programs.

The brochures and the equipment checklist both mention wet suits in the clothing list but leave it as an option for the client to decide. The additional information sheet states that "wet suits are not absolutely required for paddling in - unless you are the type that gets cold easily." Also mentioned under snorkeling is the fact that "the water is really cold, but offers excellent diving."

There is no requirement for the clients to provide medical proof that they are able to exercise to the extent required by these trips. Instead, it is taken as a given that anyone who has participated in backcountry camping is able to make the trip and, incidentally, is not too large to fit into a kayak. This criterion is also used by other kayak charter companies and is not unusual in the industry.

1.14 Owner's Manual

The manufacturer of the type C kayaks supplies an owner's manual with every kayak. The comprehensive manual gives advice on different aspects of sea kayaking under various headings.

The manual was not on board any of the type C kayaks.

The manual states, in part:

Words To The Wise On Seamanship

Without wishing to alarm anyone, we want to make it clear that sea kayaking is an activity that demands sound judgement and caution. This is always the case, no matter how experienced you are. Not surprisingly, your most vulnerable time is when you have most to learn, as a beginner. Here are some basic cautions and precautions to help you through the early stages:

- the greatest single danger to sea kayakers is *hypothermia*. *Cold water kills*. *Wear your wetsuit*. Learn about *hypothermia*.
- start gradually, in moderate weather, close to shore, with an experienced companion. Experiment with strong winds only when they are blowing towards shore.
- thoroughly familiarize yourself with your boat. Capsize it and discover how easily you can exit and how difficult it can be to re-enter.
- let someone know where you are going and when you are planning to return.

General Hazards

Most accidents occur when people misjudge conditions of weather, current and topography. So take particular note of the following:

Wind:

Avoid paddling when whitecaps are visible until you thoroughly appreciate their effect.

Wind can:

- upset a kayak.
- make it difficult to turn.
- create unmanageable waves.
- prevent you from holding a course.
- slow you down.

2.0 Analysis

2.1 Introduction

The aims of the trip were educational and recreational. The completion of this trip was supposed to give the charterers the necessary skills to plan and execute a sea-kayak trip. Because the guides relied on individuals to feel comfortable with their own capabilities and experience, not all the charterers were forced to complete all the training given. Given the level of expertise of the majority of the charterers, the training given to them before setting out was not sufficient to ensure the survival of all the participants when bad weather was encountered.

2.2 Pre-Trip Training for Emergencies

Although she had assisted other members of the group in kayak-righting exercises, the woman in the kayak which became separated from group one had not practised righting a kayak during the period of instruction given by the guides. In spite of this, she was able to right the kayak and at least partially get out of the cold water.

Because no one saw the man who died of hypothermia and drowning after he became separated from the main group, it is not known how he came to be in the water beside his kayak. Similarly, it could not be determined if he had performed righting exercises during training.

2.3 Interpretation of Weather Forecasts

As the head guide had interpreted the weather forecast to mean that winds were diminishing, the trip for the day was continued. Although familiar with the area, the head guide did not fully anticipate the effect of large seas on the group of inexperienced people he was leading.

2.4 Clothing

Although the owner of the kayaks was aware of the benefits of wearing a wet suit which provides good protection against hypothermia, charterers were left to decide whether to wear one or not. The owner was also well aware of the temperature of the water because he warns prospective customers in the KayakInstitute brochures that "the water gets really cold...."

The language of the brochure did not reflect the more emphatic instruction in the kayak owner's manual which warns that "the greatest single danger to sea kayakers is *hypothermia*. *Cold water kills*. *Wear your wetsuit*. Learn about *hypothermia*."

Because the woman in the kayak which became separated from group one had heeded the advice of the guide to dress warmly, she increased her chances of survival. Although she developed hypothermia after her kayak capsized, her layered clothing reduced its severity and ensured her survival.

The chances of survival of the man who died would have been greater had he been warmly dressed.

Prospective charterers were not given sufficient information in the brochure upon which to make an informed decision concerning the wearing of a wet suit. It is probable that neither person would have developed severe hypothermia had the wearing of a wet suit been mandatory during the trip.

2.5 Group Discipline

The importance of group discipline on such an excursion was not emphasized by its leaders during training. This had a causal and contributory effect on the crises which developed.

Because the charterers did not fully understand the importance of the "buddy system", they ignored it. Although the guides tried to impose the "buddy system", kayakers formed themselves into the groupings they wished. This resulted in a situation where the head guide, who was preoccupied with rescue efforts, was in charge of eight charterers while the assistant guide was in charge of one. The kayaking industry requires that the voluntary norm for the ratio of guides to charterers be of one to four. This norm which had been respected at the outset of the day's trip was exceeded.

It is likely that the head guide did not realize that there were this number of charterers in his group. While the weather was the primary reason the two kayakers became separated from group one, the fact is that the head guide was not in a position to help them because he was already engaged in two rescues.

2.6 Use of Radio Equipment

Because of battery life considerations, it was practicable to use the radios only "on the hour" when the two groups were out of sight of each other.

The system failed in that the head guide was heavily occupied in rescue or towing efforts at 1800 and 1900. Had the guides been able to make contact at these times, SAR efforts could have been commenced much earlier than was the case.

2.7 Search and Rescue

The reason for the delay in starting up the SAR operation was that the head guide did not realize at first that two kayakers were missing from his group. Because of this, he initially declined the assistance offered to him.

Because the assistant guide had expertise in radio communications, the SAR operation was, in the main, successful. In the beginning, the search was scattered because of a lack of hard information and the dispersion of the kayaks. By relaying messages and correcting misunderstandings, the assistant guide was able to clarify the initial confusion.

2.8 Emergency and Safety Equipment

The side sponsons and/or paddle floats were not inflated and installed ahead of time to assist the kayaker to reboard after a possible capsizing or to increase the stability of the kayaks. Consequently, when the kayakers entered an area of rough seas, they had to keep paddling to keep their kayaks upright. Each kayak was equipped with these floats. The secondary use of the sponsons, i.e. to increase the stability of the kayaks, was not foreseen before the kayaks encountered severe weather.

2.9 Kayak Design Considerations

The capsizing and downflooding of the second kayak are probably attributable to the fact that the U-shaped outer pod seal had been pulled off the coaming probably as the occupant exited the pod when the kayak capsized. It could not be determined if the inner seal was defective because the owner later replaced both seals. These replacements cured the leak but it is unknown which replacement cured the problem.

Because pumping arrangements are confined to the pod, there is no arrangement to pump out the hull if it becomes flooded. Removal of water from the hull requires that the kayak be inverted with the watertight deck hatches removed. It was for this reason that the kayak's occupant was rescued and the kayak

abandoned.

As a result of the back support cushion in another kayak not being secured, the woman using the kayak was unable to reach the foot pedals used to steer the rudder. This lack of control of the kayak caused its occupant to panic, quit the group and contributed to the confusion during the SAR operation. In the circumstances, it was fortuitous that this person was able to make a landing although she was injured in the process.

3.0 Conclusions

3.1 Findings

1. The level of training and practical exercises given to the inexperienced charterers before setting out on the sea voyage was not sufficient to ensure the survival of all the participants when bad weather was encountered.
2. The charter company's brochure did not give prospective charterers sufficient information to make an informed decision concerning the wearing of a wet suit.
3. The voyage was continued after weather forecasts predicted conditions unsuitable for small craft such as kayaks.
4. Stabilizing equipment was not fitted to the kayaks before they entered an area of rough water.
5. The majority of the kayakers were not aware of the head guide's intended stop-over points or of the final destination.
6. No voyage plan was given to a Coast Guard Radio Station (CGRS).
7. Group discipline broke down when the guides did not enforce the "buddy system" or ensure that the number of kayakers in each group remained manageable.
8. Half of the group did not heed the head guide's advice to dress warmly for the passage.
9. The fact that the deceased was lightly clad probably caused the quick onset of hypothermia.
10. The head guide, preoccupied with rescue efforts, was unaware that four members of his group were missing and initially declined assistance offered by the CGRS Prince Rupert.
11. The assistant guide's expertise in radio communication ensured that a Search and Rescue mission was mounted and, because he relayed messages, initial misunderstandings and confusion were clarified.

3.2 Causes

The inexperienced group attempted a sea journey even though they were under-trained to safely handle their craft and to cope with emergencies, and were ill-prepared for the open water conditions which could be expected from the weather forecast. The fact that group discipline was not enforced and that the Search and Rescue mission was delayed because of initial confusion in the group and radio communications difficulties contributed to the death of one member of the group.

4.0 Safety Action

4.1 Action Taken

4.1.1 Charter Vessels

As a result of several occurrences, the TSB issued five marine safety recommendations in February 1994 with respect to charter vessels and the circumvention of safety regulations. The Board recommended that:

The Department of Transport conduct a formal safety evaluation of the Canadian charter boat industry to include the adequacy of vessel inspection and crew certification requirements as well as current operational practices;

(M94-01, issued February 1994)

The Department of Transport expedite its currently proposed amendment to the *Canada Shipping Act* with respect to the carriage of the fare-paying public as passengers on charter vessels;

(M94-02, issued February 1994)

The Department of Transport encourage all charter vessel operators to equip their vessels with life-saving and emergency communication and/or signalling equipment suitable for the type of operation;

(M94-03, issued February 1994)

The Department of Transport encourage charter boat operators to establish sailing plans and to conduct passenger safety briefings before getting under way; and

(M94-04, issued February 1994)

The Department of Transport initiate research and development into ways of ensuring the accessibility of all emergency equipment, including in a capsizing situation.

(M94-05, issued February 1994)

4.1.2 Working Group on Charter Operations

Following this occurrence, the Canadian Coast Guard (CCG) established an all-region working group consisting of representatives from CCG offices across the country with a view to produce a "policy document" on charter vessel operations and safety.

4.1.3 Safety Study on Charter Vessel Operations

In response to recommendation M94-01, the CCG engaged the Consulting and Audit Canada Group to conduct a formal safety study, "Review of Charter Vessel Safety (RCVS)". In June 1995, the consultants interviewed some 15 charter vessel operators, builders, architects, and insurance agencies in the western regions and participated in an all-region CCG working group on charter vessels. It is understood that the first draft of the report was completed in September 1995.

4.1.4 Sail Plan

In January 1995, the CCG issued Ship Safety Bulletin (SSB) No. 4/95 entitled *Recommended Safety Communications Measures for Small Craft*. The bulletin is directed to operators of all small craft including fishing and charter vessels. It covers issues such as Coast Guard Radio Stations sail plans processing and alerting service, cellular telephone marine emergency service, and safety briefings.

4.1.5 Boating Safety

In 1994, a federal/provincial joint working group was established to deal with three important areas of responsibility regarding boating safety: vessel licensing; operator proficiency and boating safety programs; and enforcement, waterways policing standards and emergency boater assistance.

In 1995, the newly restructured Department of Fisheries and Oceans (DFO) created an Office of Boating Safety (OBS). The OBS provides several services with respect to the safety of the recreational boating community. The OBS has also received funding from the National Search and Rescue Secretariat for the production of a video on Safe Kayaking, due in March 1996.

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board, consisting of Chairperson, John W. Stants, and members Zita Brunet and Maurice Harquail, authorized the release of this report on 22 November 1995.

Appendix A - Photographs

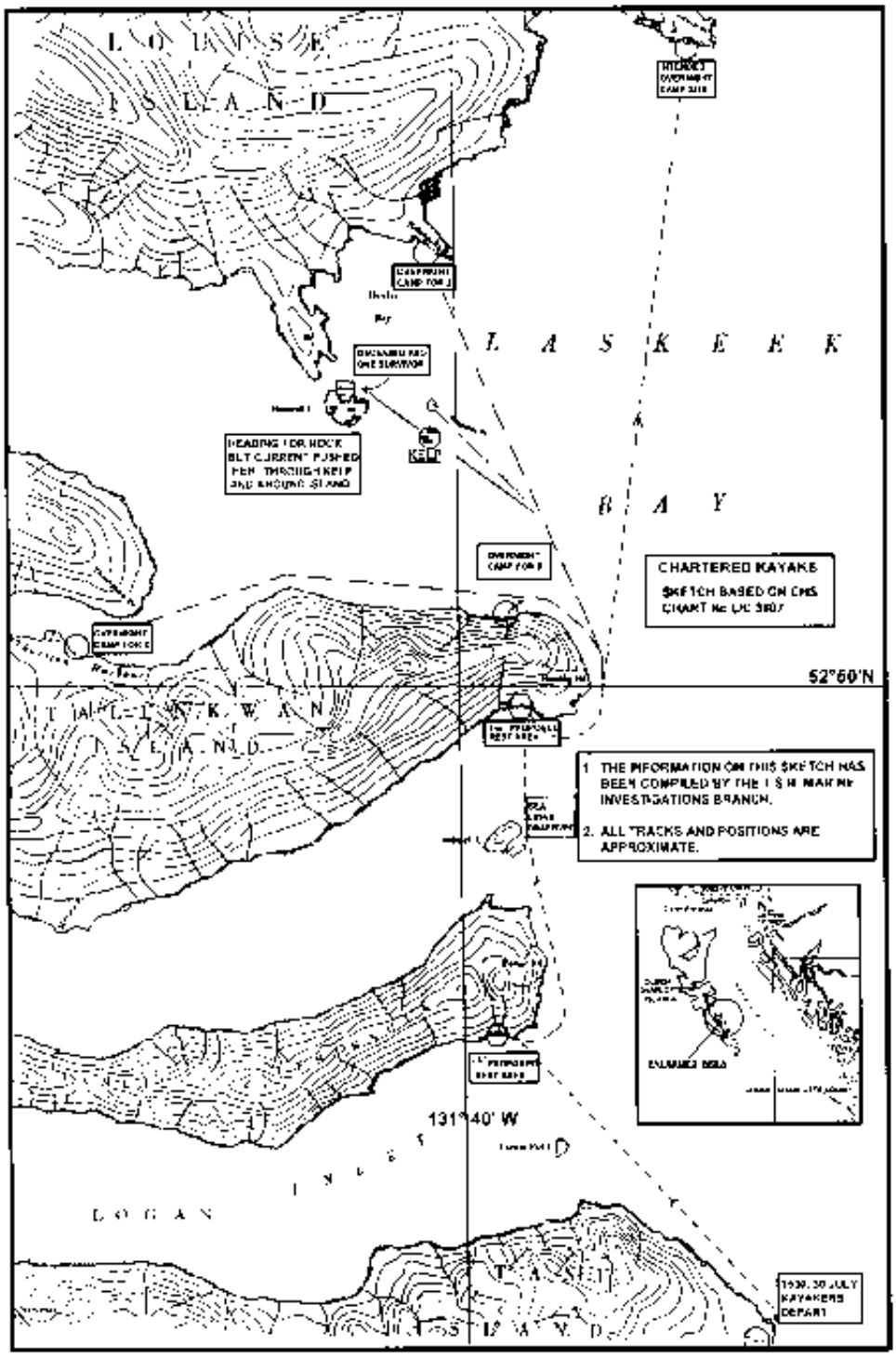
Type A Kayak

Type B Kayak

Cushion similar to the one lost when type C Kayak capsized.

Type C Kayak

Appendix B - Sketch of the Occurrence Area



Appendix C - Glossary

B.C. - British Columbia
CCG - Canadian Coast Guard
CCGC - Canadian Coast Guard Cutter
CGRS - Coast Guard Radio Station
DFO - Department of Fisheries and Oceans
ETA - estimated time of arrival
m - metre(s)
OBS - Office of Boating Safety

PAN - "Urgency" message
PDT - Pacific daylight time
RCC - Rescue Co-ordination Centre
R/T - radiotelephone
SAR - Search and Rescue
SSB - Ship Safety Bulletin
TSB - Transportation Safety Board of Canada
UTC - Coordinated Universal Time
VHF - very high frequency
· degree(s)

<1>See Glossary for all abbreviations and acronyms.
<2>All times are PDT (Coordinated Universal Time (UTC) minus seven hours) unless otherwise stated.

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