



No. 95-206

White Water Rafting

Shotover River, Queenstown

25 July 1995

Abstract

On Tuesday, 25 July 1995 an accident occurred during a winter white water rafting trip down the Shotover River, Queenstown. The raft failed to follow the intended passage down the Cascade Rapid and was drawn sideways into a rapid/waterfall known as The Toaster. One of the passengers fell from the raft, became entrapped underwater and drowned. Safety issues identified included levels and methods of training for rafting guides. The Safety issues identified are being addressed by the Maritime Safety Authority by way of the Draft Code of Practice for Raft Operators.

Transport Accident Investigation Commission

Marine Accident 95-206

Vessel Particulars:

| | |
|-------------|-----------------------|
| Type: | Inflatable raft |
| Make: | Incept (self bailing) |
| Length: | 4.6 m |
| Width: | 2.1 m |
| Capacity: | 8 person |
| Buoyancy: | 7 compartments |
| Propulsion: | Paddles |
| Owner: | The Helicopter Line |
| Operator: | Danes Shotover Rafts |

Location: Queenstown, Shotover River, The Toaster Rapid

Date and time: 25 July 1995 1600 hours *

Persons on board: Crew 2
Passengers 5

Injuries: Passengers 1 fatal

Information sources: Transport Accident Investigation Commission field investigation.

Maritime Safety Authority Commercial White water Rafting Advisory Group: Review of Commercial White Water Rafting Safety Standards, Final Draft Report, June 1995

Investigator in Charge: T M Burfoot

* All times in NZST (UTC + 12 hours)

1. Factual Information

1.1 History of the trip

1.1.1 At about 1000 hours on Tuesday, 25 July 1995 eight tourists gathered at The Station booking office in Queenstown. They had booked and were about to embark on a multi-adventure sporting expedition known as “The Awesome Foursome”. This consisted of a helicopter flight to Deep Creek (Shotover River), followed by a jet boat ride up river to Skippers Bridge, a bungy jump off Skippers Bridge, return helicopter flight to Sutherlands Beach, and a 5.6 km white water rafting trip down river finishing at the Rafters Barn, Arthurs Point (See Figure 1).

1.1.2 The group consisted of two couples from the United States, who were holidaying together, and four Japanese tourists. None of the four Japanese tourists could speak fluent English.

1.1.3 The group was issued with tickets which showed the terms and conditions of the trip on the back and on the front, bottom right, was a warning that stated:

Passengers travel at their own risk, no claims accepted for injury, property losses or other expenses. Please read extended terms and conditions on reverse.

1.1.4 On the reverse was listed the extended terms and conditions which began as follows:

A We appreciate your custom and aspire to provide a friendly, exciting and safe experience.

B We advise that all activities do carry a degree of risk and that by participating in the activity provided by the operator, you are expressly assuming those risks personally and are releasing the operator and its officers and employees from any liability, claims, losses, damages or expenses caused by any event including but not limited to;

- Personal injury or death
- Property loss or damage
- Acts which may be construed as negligent or accidental
- Any other loss, damage, suffering, emotional or nervous disorder

1.1.5 The conditions continued to address several issues and then concluded with item six as follows:

6 Refunds - are entirely at the discretion of the operator. In general, no refund can be given for cancellation received less than one hour from departure time.

1.1.6 The passengers’ attention was not drawn to the warning or extended terms and conditions shown on the ticket before the accident.

1.1.7 At 1045 hours the group was met by the rafting Trip Leader who was to accompany them for the three pre-rafting activities. The group were transported by van from Queenstown to the Rafters Barn at Arthurs Point where they were each fitted with a full length, seven millimetre neoprene wetsuit, a five millimetre neoprene jacket, and neoprene boots and gloves. A splash jacket was provided to be worn over the top of the wetsuit. Neoprene booty liners and extra splash jackets were available for those who were still feeling the cold.

1.1.8 At 1145 hours the group was flown by helicopter to Deep Creek where they were taken on the jet boat ride. One of the American couples, Mark and Carol, watched the rest of the group complete their bungy jump and then the group waited for about one hour near the Skippers Bridge inside a shed which was heated by a wood-burning stove.

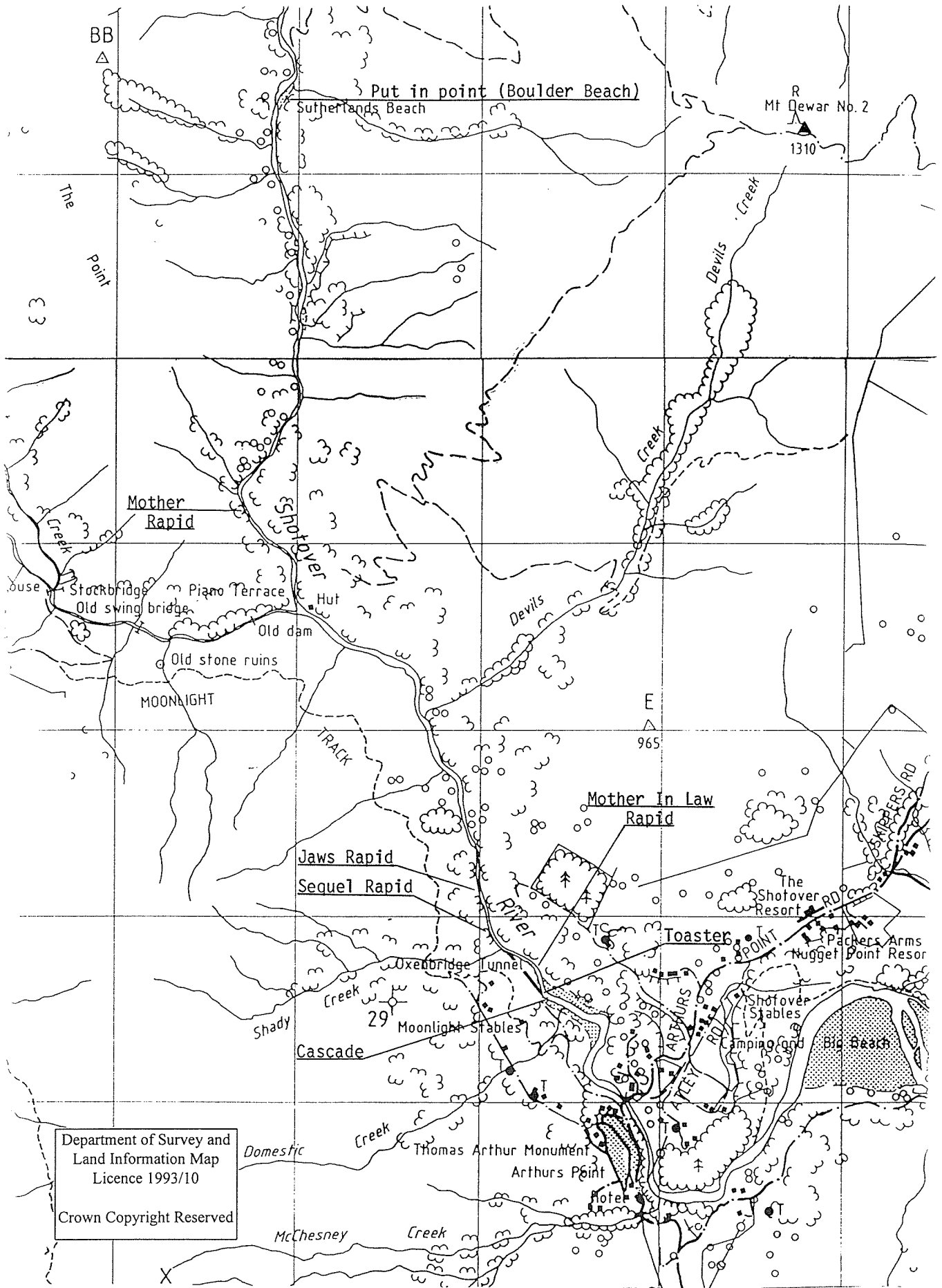


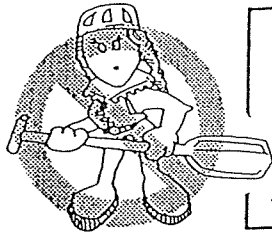
Figure 1

- 1.1.9 At about 1430 hours the helicopter returned and flew the group down river to Sutherlands Beach where the rafting section of the trip began. Another guide (Boatman) and two trainee guides were already waiting with two rafts inflated ready to start. Three other tourists arrived from Queenstown to join the rafting trip. One of the Japanese tourists opted out of the rafting and returned to Queenstown in the helicopter leaving a total of ten tourists, one trip leader, one qualified and two trainee guides.
- 1.1.10 The group was divided into two crews. Mark and Carol, together with their travelling companions Leon and Elaine, and one Japanese tourist (nick-named Toko) were assigned to the sweep raft (the last raft in the convoy) under the guidance of the qualified guide and one of the trainees. The remainder of the group were assigned to the lead raft under the guidance of the Trip Leader and the other trainee.
- 1.1.11 The Trip Leader and guides assisted their passengers in donning their lifejackets and safety helmets and checked that they were securely fastened.
- 1.1.12 Both crews were then gathered between the two rafts on the beach and given a safety talk by the trip leader. The safety talk began with the following statement:
- “You are about to go white water rafting on the Shotover River. This is a serious adventure activity which includes an element of risk. In the event of falling out of the raft, being separated from the raft or the raft flipping, there will be considerable physical demands placed on you. It is important that you listen to this safety talk so we can minimise the inherent risks in white water rafting.”
- 1.1.13 Following the introduction the safety talk included the following points:
- How to sit in the raft
 - How to hold the paddle
 - How to paddle forwards and backwards
 - How to hang on when the order was given
 - What to do if the raft capsizes
 - What to do if you fall in the water
 - What to do if you find yourself under the raft
 - The correct position to assume if floating in the water
 - The purpose of the throw line
 - How to haul someone back into the raft
 - Not to stand up in running water deeper than your knees.
- 1.1.14 The Trip Leader also explained that they would be “running safety” at Anvil Rock Rapid (stopping and surveying the rapid from below) and portaging (walking) around Toilet Rapid and that this would involve having to walk past the rapid over snow and ice covered rocks.
- 1.1.15 The safety talk was conveyed in a serious tone that left the American couples in no doubt as to the importance of what had been said. Mark and Elaine were left feeling apprehensive about the coming trip having been under the impression that they would just be along for the ride, but their partners felt confident. Elaine said she was not aware until that time how much their participation would be required to guide the raft safely down river.
- 1.1.16 The Guides told the group that because it was winter the river was running low and was therefore relatively safe. This helped to ease Mark and Elaine’s apprehension.
- 1.1.17 The Trip Leader then asked if anyone had any physical or medical condition that he should know about. Nobody replied in the affirmative.

WELCOME • KŪA ORA

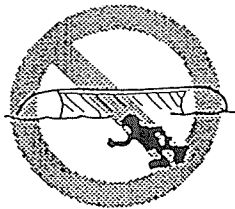
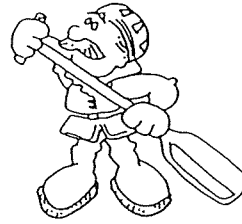
RAFT SAFETY

You are about to go whitewater rafting. This is a serious adventure activity which includes an element of risk. All the equipment you will be wearing is designed for your protection and safety. Your guide is a fully trained and certified professional with your safety being paramount.



THIS IS THE MOST EFFECTIVE WAY OF HANDLING THE PADDLE

Danes



RAFTS DON'T SINK. IF UNDER THE RAFT TAKE A BREATH & COME UP & HOLD GRABLINE ON OUTSIDE

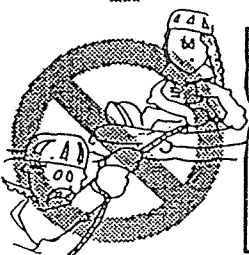


LINE RUNS AROUND OUTSIDE OF ALL RAFTS, USE IT IF YOU FALL OUT

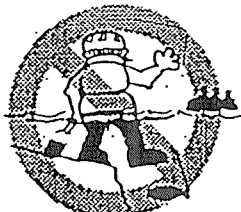
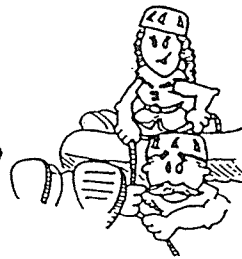
Danes



ALWAYS LIFT FEET OUT OF WATER, FLOAT LOOKING DOWNSTREAM ON YOUR BACK



NEVER WRAP ROPE AROUND WRIST. ENSURE ROPE IS OVER-SHOULDER, LIE ON BACK & LOOK DOWNSTREAM



NEVER STAND UP IN WATER ANY MORE THAN KNEE DEPTH. STAY WHERE YOU ARE STAFF WILL ARRIVE TO ASSIST



NICHE DESIGN

©

Figure 2
Danes Safety Card

- 1.1.18 According to several passengers the Trip Leader then told the group that if there was anyone who did not want to go white water rafting they could be flown back by the helicopter and their money for that part of the trip would be refunded. While Leon and Mark were adamant they were not offered this option one Japanese tourist did choose not to participate.
- 1.1.19 At the end of the safety talk the Trip Leader asked if there were any questions. He asked the Japanese tourists if they understood what he had just said. Toko indicated by sign language that he understood “a little”. The Trip Leader asked him to convey what he had said to the other two Japanese. According to others in the group he did not do this and they had the impression that he did not understand the Trip Leader’s request.
- 1.1.20 The raft operators, Danes have produced a raft safety pamphlet which, with the aid of pictures, summarises the main points of the safety talk and contains a risk warning similar to that given to the group at the start of the safety talk. The pamphlet is repeated in several different languages to assist the Trip Leader in conveying the safety message to non-English speaking passengers. The Trip Leader had memorised the safety talk and did not use the card. The cards were kept in the vans and were said to have been shown to the passengers during the trip from Queenstown to the Rafters Barn (See figure 2). Mark however stated that he did not see the cards used.
- 1.1.21 The group then separated into their respective raft crews. The guide in charge of Mark and Carol’s raft (the sweep raft) introduced the trainee guide to them and informed them that the trainee would be guiding the raft for the trip down river. They were told to follow the trainee’s instructions unless otherwise countered by him.
- 1.1.22 The trainee guide gave a “paddle talk” which was a repeat explanation of how to paddle forward and backpaddle and included a dry run at paddling on the beach before the raft was launched. Before launching each member of the crew was assigned a seat position in the raft. Mark and Leon were in front with Carol and Elaine directly behind their respective partners. Toko was seated directly in front of the two guides who were guiding from the back.
- 1.1.23 At about 1515 hours the two rafts were launched. For the first 15 minutes the river flow was relatively slow and this opportunity was taken to practise paddling technique and the various safety manoeuvres that would be required when passing through the white water sections of the trip.
- 1.1.24 Both the guide and his trainee commented that the passengers worked well together and they considered their overall performance as “above average”.
- 1.1.25 Mark and Leon, in the front of the raft, had difficulty hearing the commands made by the trainee and started to feel apprehensive. Carol and Elaine began to relay the commands to them of their own accord. After about 10 minutes the trainee asked Mark and Leon if they were having trouble hearing his commands. They replied “Yes” but no improvement was evident and they still found it difficult to hear his commands. According to the other passengers Toko was having trouble with his paddle technique and had to be corrected several times by the trainee guide.
- 1.1.26 At approximately 1530 hours the lead raft entered Mother Rapid with the sweep raft about 20 metres behind. Mother rapid consists of a series of six rapids or obstacles, Sharks Fin, Germans Drop, Anvil, Toilet, Oh Shit and Pinball.
- 1.1.27 Both rafts negotiated Sharks Fin and Germans Drop without any major incident. The sweep raft bounced off the side walls of the canyon several times which concerned Mark but did not worry the other occupants unduly. As planned “safety” was run on Anvil. This consisted of both rafts eddying out (using an eddy to beach the raft) above Anvil.

- 1.1.28 The Trip Leader walked over the rocks past Anvil rapid and surveyed it from the bottom. Having confirmed that there were no unusual hidden dangers in the rapid which were not visible from above, he signalled the sweep raft to come through, which it did without incident and eddied out below it. The sweep raft then waited while the Trip Leader climbed back up to the lead raft and guided this raft through without incident.
- 1.1.29 At low river levels approximately 90 percent of the water in Toilet Rapid flows under an exposed rock ledge. A raft, or person having fallen out of a raft, would be in danger of becoming permanently trapped under the ledge. For this reason the Queenstown Lakes District Council (QLDC) Harbourmaster had placed a restriction on rafting Toilet Rapid. This was imposed under Section 60(J) of the Lakes District Waterways Authority Control By-laws 1989.
- 1.1.30 For this reason the passengers were asked to leave the rafts and walk down (portage), unaccompanied, past Toilet Rapid over ice and snow covered rocks while the guides floated the empty rafts down through the rapids using guide-lines from the water's edge. At times the passengers lost sight of the guides below. After approximately 10 minutes walking they reboarded their rafts and continued their passage down river with the lead raft again in front.
- 1.1.31 The lead raft went through Jaws Rapid without incident and pulled over to observe the sweep raft coming through. As the sweep raft entered the rapid it began to skew and the front of the raft became stuck on rocks. At that stage the qualified guide took control and gave an order for everyone to move to the left of the raft. This action freed the raft from the boulders and it continued down the rapid backwards in what the passengers thought was an out of control fashion. Order was restored in the smooth waters below Jaws Rapid and the trip continued.
- 1.1.32 The near capsizing of the raft in Jaws rapid had left Mark shaken and apprehensive again. He was requiring constant consoling by Carol, Elaine and Leon. They had noted that the lead raft appeared to be under better control than their raft, always straight and in the middle of the channel, where their raft regularly bounced off side walls and rocks.
- 1.1.33 Above Arthurs Point the river divides with the right fork passing through an old mine shaft known as the Oxenbridge Tunnel. At the bottom end of the tunnel the river divides again either side of a large rock, the left side falling away into a narrow chute known as The Toaster Rapid, which is more like a small waterfall. The right fork continues down as the Cascade Rapid which is the route the rafts normally follow as they exit the tunnel. A photographer stationed on the river bank takes photos of the rafts as they run Cascade Rapid.
- 1.1.34 As the rafts neared the entrance to the Oxenbridge Tunnel, the passengers were reminded of the special tunnel positions they had practised earlier in the trip. This involved most of the passengers crouching down in the raft with their paddles inboard to avoid contact with the tunnel walls and roof. The raft was controlled by the guide from the back who was assisted by a passenger leaning over paddling in a sweeping motion across the front of the raft when instructed by the guide. The trainee guide chose Mark for this position.
- 1.1.35 Before entering the tunnel the sweep raft qualified guide told the passengers that if anything happened in the tunnel they were to listen to his instructions instead of the trainee's. The passengers had not been told what to expect at the other end of the tunnel.
- 1.1.36 The lead raft entered the tunnel at about 1620 hours with the sweep raft approximately 20 metres behind. Mark was still having difficulty hearing the commands made by the trainee so Carol had to relay the instructions to him.

- 1.1.37 As the Sweep raft neared the end of the tunnel Mark noticed that the river divided at the exit. The left side appeared to drop away through a narrow gap between the tunnel wall and a small island in the centre of the flow (Toaster). He observed the lead raft moving across to the right and down the Cascade rapid while their raft appeared to be pulling over to the left hand side.
- 1.1.38 The trainee guide, seeing that the raft was moving towards the left, issued a series of commands to Mark in the front to adjust the “ferry angle” of the raft to the right. The action was too late and the front of the raft was drawn further to the left towards The Toaster. The qualified guide, on seeing this, ordered everyone to sit up again and start back paddling. By this time the raft was in an unrecoverable situation and was drawn down into The Toaster.
- 1.1.39 The raft rode up on the middle island and was tilted over on its side by the current as it forced it through the narrow gap. The guide tried to leap off the back of the raft on to the small island, but he slipped on the ice covered rocks and ended up in the water clinging to the rocks. The trainee guide and the passengers went over the Toaster Rapid with the raft, Carol falling from the raft as it went over.
- 1.1.40 The water flowing over Toaster falls under a rock ledge. The raft dropped under the ledge on its side and was caught in the turbulent waters for about 10 seconds before being ejected back up and out through the chute at the bottom. This phenomenon where the raft falls in on its side and is ejected back out again, like a piece of toast, and the likelihood that the occupants of the raft will “get toasted” in the process, is the reason why the rapid was named The Toaster. The Toaster is normally avoided at all costs.
- 1.1.41 The guide leapt from the raft to avoid being trapped in The Toaster with the passengers, where he would be unable to render assistance if it was required.
- 1.1.42 The raft came out of The Toaster upright with the trainee guide and four passengers inside. The Trainee guide made a head count and realised that Carol was missing. He brought the raft into the beach below the island and started to call and search for Carol. The remaining passengers were cold and shaken but unharmed.
- 1.1.43 The Trip Leader from the lead raft, having been told by the photographer what had happened, climbed to the top of the Island where he was joined by the sweep raft guide who had managed to pull himself from the water onto the island. They looked down at the raft as its occupants were gathering themselves and realising that one passenger was missing began searching up and down river. They found no sign of the missing passenger so the guide ran down to the raft and used the portable radio that is carried on the sweep raft to call for help.
- 1.1.44 As there was no sign of the missing passenger it was assumed that she was trapped under water in The Toaster. The trainee guide took the rest of the passengers down to the take-out point where they were taken away to change. The remaining guides began to set up a system of ropes across Toaster Rapid. The rescue team arrived some 15 minutes after being summoned and assisted with rigging the ropes. The Trip Leader attached himself to the ropes, entered the water and began searching under the rapid with his feet. He located what he thought was Carol, but was unable to dislodge her from a log caught in the bottom of the rapid. Shortly after this Carol’s lifejacket surfaced confirming she was trapped under the rapid.
- 1.1.45 Hampered by the cold and onset of darkness, attempts to free her body were unsuccessful. A watch was posted overnight and next day, aided by a mechanical digger which was used to reduce the flow of water over The Toaster, rescuers recovered her body.

1.2 Weather and river conditions

- 1.2.1 The weather on 25 July was fine with clear sky. There had been an over night frost. The QLDC Harbourmaster recorded the air and water temperatures at the Arthurs Point Jetty as:

| | | |
|------------|-------------------|--------------|
| 0815 hours | Air temperature - | -7 ° Celsius |
| | Water temperature | -2 ° Celsius |

| | | |
|------------|-------------------|--------------|
| 1600 hours | Air temperature | +3 ° Celsius |
| | Water temperature | +1° Celsius |

- 1.2.2 The river level was low with National Institute of Water and Atmospheric Research (NIWA) levels recorded on the same day as follows:

| | |
|------------|--------------------------|
| 1400 hours | 16,309 litres per second |
| 1600 hours | 17,000 litres per second |

1.3 Crew information

- 1.3.1 The Trip Leader had approximately three and a half years' rafting experience, all of which had been spent in Queenstown on the Shotover and Kawarau Rivers. During this period he had completed approximately 700 commercial trips down the Shotover River. He held a current first aid certificate.
- 1.3.2 The qualified guide had attended an outdoors centre 16 week course in Motueka. The last seven weeks of that course focused on training as a white water rafting guide on the Buller River which included the completion of a swift water rescue course. On completion of the course he worked as a guide on the Buller River for approximately three months. In December 1994 he moved to Queenstown and commenced training on the Shotover River. After approximately 25 trips down the Shotover River he became registered with the QLDC as a boatman. After a further 15 trips he started working for Danes Rafting and had completed approximately 85 commercial trips down the Shotover River prior to the accident. He also held a current first aid certificate.
- 1.3.3 The trainee guide on the sweep raft had completed four months of training as a guide. He had done a total of 37 commercial trips, 25 down the Shotover, under the guidance of a qualified guide. Prior to this his experience was limited to rafting as a passenger.
- 1.3.4 To be registered with the QLDC as boatman, trainee guides must have completed a minimum of 25 trips on the river for which they seek to be registered. In addition they must have completed a white water rescue course and hold a current first aid certificate. This then allowed them to take charge of a commercially operated raft.
- 1.3.5 Boatmen with Danes Rafting must complete 40 to 60 trips and undergo assessment by senior guides within the company before being allowed to be in charge of a raft with passengers on board.
- 1.3.6 To be registered with the QLDC as a trip leader an applicant must have been registered as boatman for a minimum of 12 months and have done at least 50 trips or 100 hours on the river. The Trip Leader is responsible for the co ordination and safety of all rafts in the convoy.
- 1.3.7 Danes Rafting criteria for employing Trip Leaders are not specified but have been stated as being far in excess of the QLDC standards. Their requirements are based on time served and in-house assessment.

1.4 Raft information

- 1.4.1 The type of rafts used on the day of the accident were Incept W46S self-bailing squareback inflatables constructed in Du Pont reinforced synthetic rubber with neoprene armouring to protect against abrasion.
- 1.4.2 The raft is divided into seven independent airtight compartments so that in the event of one compartment becoming punctured the rest will remain inflated and the raft can still support its maximum complement.
- 1.4.3 A total of 19 D-rings are attached at various locations on the raft for running grab lines and securing equipment needed to perform rescues, and recovery of the raft.
- 1.4.4 A minimum of two rafts is assigned to each convoy. This allows for “safety” to be run where needed. The Trip Leader usually guides the lead raft. Emergency equipment is carried in the sweep raft and includes the following;
- Low frequency radio
 - FM radio
 - First aid kit
 - Puncture repair kit
 - Air pump
 - Rescue lines and equipment
- 1.4.5 If a problem is encountered with any of the rafts ahead (down river), then the sweep raft with the emergency equipment on board will eventually arrive on the scene.

1.5 River information

- 1.5.1 A river can take on many forms which are determined by a combination of the surrounding topography and the amount of water flowing past it. The river form can range from calm pools and flat water to waves, swirling currents and rock gardens.
- 1.5.2 Rapids vary in size and shape. Some are short abrupt drops while others may continue for several hundred metres. A rapid may broaden to filter down through boulder gardens or constrict to rush between cliffs. The channels of rapids may be straight, or twist to send the current crashing into rock walls. Some have a moderate fall and can be surveyed from upstream, others fall so steeply they appear as a horizon line across the river when approached from upstream. The latter would normally require to be surveyed from below before they can be run safely.
- 1.5.3 There are three main factors contributing to the formation of a rapid:
- | | |
|----------------------|--------------------------------------------------------------------|
| Gradient: | Downward slope and shape of the riverbed |
| Constriction: | Narrowing of the riverbed |
| Volume: | The amount of water flowing down a river (cubic metres per second) |
- 1.5.4 The water level in a river is constantly changing and the above factors change with it. For this reason it is not practicable for a river guide to memorise a rapid. They must learn to read and analyse the river as they go. This skill is gained by time and experience on rivers.
- 1.5.5 The main components of a rapid are:
- 1.5.5.1 **Tongue** - At the beginning of many rapids is a smooth “V” shaped tongue of fast water that marks the path of the main current.

- 1.5.5.2 **Channels** - The downstream current usually follows one or more channels of varying size and difficulty.
 - 1.5.5.3 **Standing waves** - A series of waves caused by the convergence of main channel currents, underwater obstacles, or increasing river speed/gradient.
 - 1.5.5.4 **Eddies** - An eddy is a place where the current swirls around and stops, or flows upstream, due to obstacles in midstream, projections from the shore, or a sharp river bend.
 - 1.5.5.5 **River bend** - Due to centrifugal force the main body of water carries to the outside of a river bend. For this reason the current is strongest and the river is deeper here. The inside of the curve is shallower where the current is not so strong and on sharp bends eddies may form there.
 - 1.5.5.6 **Reversal** - This is where the river flows upward in a wave and breaks back on itself, creating a turbulent upstream current. This is considered to be one of the most dangerous features in a rapid.
- 1.5.6 Rivers are graded on an international scale of one to six, one being the easiest and six being the most difficult to raft. A grade six river is not rafted commercially. The Shotover river usually runs at grade three which is described as follows:

Normally these rivers have a current force that would prevent you from standing up in the river. More formidable and tricky rapids and fast rock-dodges requiring deliberate guiding of the raft down the chosen route. Higher irregular waves of up to a metre in height. Falls of up to one metre. The course of the river should be passable but current speed will have removed weed and growth from the banks and bed.

Rivers change and can develop hidden dangers regardless of their grading.

1.6 History of white water rafting

- 1.6.1 White water rafting began in New Zealand as a recreational activity, becoming popular with the availability of army surplus dinghies following World War 2. As these dinghies wore out, rafting declined in the 1950s until early 1970s when technology and new materials enabled rafts to be marketed at a reasonable price again.
- 1.6.2 By 1980 a dozen rafting companies had begun operating commercially in both North Island and South Island. From then on the sport of rafting made a rapid transition from a purely recreational activity to a highly commercial industry.
- 1.6.3 By 1983 the number of rafting companies had increased to over 50. Competition had become intense and the industry saw its first fatalities. The larger companies, aware of the negative influence that accidents had on business, formed the New Zealand Professional Rafting Association (NZPRA) in 1982 with the intention of drawing up a safety code.
- 1.6.4 Policing the safety code in an environment of intense competition proved to be beyond the capabilities of the NZPRA so in 1984, the Marine Division of the Ministry of Transport assumed the responsibility for supervision of the activity under the Shipping and Seaman Act 1952

- 1.6.5 Subsequently it became apparent that the limitations the Act imposed on the Marine Division rendered the Division ineffective in ensuring rafting safety. As a result, in 1991, the role was transferred back to the industry on the understanding that the industry was in a better position to ensure the safety of rafting operations.
- 1.6.6 The River Guides Association had been formed by rafting guides in the late 1980s to oversee guide training. The Association made changes to the Ministry of Transport Code and published it as a voluntary code of practice for the industry.
- 1.6.7 During this time the QLDC had established by-laws that governed rafting (1989) after consultation with local rafting operators. The safety standards were monitored and enforced through a contracted Harbour Master. Queenstown remained the only territorial authority to regulate rafting until 1994 when the Rotorua District Council initiated a process for a similar system for one local river using a Heritage Protection Order.
- 1.6.8 In 1993 the Maritime Safety Authority (MSA) became the crown entity with the responsibility for promoting marine safety. The legislation that the authority was created to administer and enforce, the Maritime Transport Act 1994, became law in February 1995. The new Act applies to rafting where it applies to craft of any length irrespective of their motive power or the waters they ply within New Zealand.

1.7 White water rafting today

- 1.7.1 The Shotover River has a higher volume of rafting numbers than any other river in New Zealand. Approximately 40,000 passengers are carried by the four commercial rafting operators each year.
- 1.7.2 Following the death of an Australian visitor on a Queenstown rafting trip in January 1994, and in response to industry concerns, the MSA made an investigation into safety within the industry. The lack of basic statistical information about the industry, reports of unsafe practice and issues with the voluntary code of practice confirmed to MSA that a review was required.
- 1.7.3 Between November 1994 and May 1995 a comprehensive review of safety standards within the New Zealand commercial white water rafting industry was carried out by an industry advisory group under the auspices of the MSA.
- 1.7.4 The review involved a programme of information gathering including surveys of: rafting operators, guides, local and regional government bodies, overseas practices and rafting passengers. This was followed by consultation with the industry and organisations that may have future roles in safety standards within the rafting industry.
- 1.7.5 A draft final report on the review was circulated to interested parties in June 1995 approximately one month before the accident.

1.8 Toaster Rapid

- 1.8.1 Ever since white water rafting began on the Shotover River, some 15 years ago, there has been concern amongst the rafting operators and guides over the danger Toaster Rapid posed to them and their passengers. Depending on the river level, approximately 50 percent of the water flowing out of the Oxenbridge tunnel dropped into Toaster Rapid. Guides misjudging their exit from the tunnel and succumbing to the Toaster Rapid was a regular occurrence. Most guides, including those with substantial experience, had at some time been carried over Toaster Rapid unintentionally.

- 1.8.2 In 1992 the Queenstown rafting operators approached the Department of Conservation and requested consent to block off Toaster Rapid. After consultation, consent was given to block off a portion of Toaster Rapid. This was achieved by temporarily blocking off the entrance to the Oxenbridge Tunnel to divert the water flow and using cement to fill in the appropriate gap. Water could still flow down the Toaster but a greater proportion flowed on past it down the Cascade Rapid making it easier for a raft to follow that path as intended.
- 1.8.3 However, the soft rock and the cement did not bond well and in January 1994 flood waters in the Shotover Canyon washed an unknown quantity of the cement out of the Toaster which left it open, and once again rafts regularly succumbed to the Toaster Rapid.
- 1.8.4 For the ensuing 12 months senior guides in Queenstown endeavoured to have Toaster Rapid filled in permanently, but failed due to lack of Resource Management consent, and funds.
- 1.8.5 Rafting through the Oxenbridge Tunnel and down Cascade Rapid is considered to be one of the highlights of the trip down the Shotover River. This is reflected in some of the brochures advertising the trip
- 1.8.6 The Harbourmaster for the QLDC has the power to close down any part of the river that he deems unsafe. He was “well aware” of the safety issue of rafts laden with passengers being guided past a known potential danger (Toaster) but Commercial pressure from the rafting industry in Queenstown had overshadowed the need for safety action.

2. Analysis

- 2.1 Inherently white water rafting is a dangerous activity. Although the number of accidents and mishaps can be reduced through regulation of the rafting industry, they can never be eliminated.
- 2.2 To date the QLDC has been alone in attempting to regulate commercial rafting in its area of jurisdiction through local by-laws. While those by-laws provided a means for them to regulate the industry they did not monitor it effectively.
- 2.3 Any trainee guide was required to complete a minimum of 25 trips before becoming registered as a boatman with the QLDC. While this ensured some form of training before a guide could take control of a raft unsupervised, it was not sufficient to guarantee the level of expertise that is required to guide a raft using unskilled crew down a complex and changing river. While the basic skills can be taught, the finer art of river guiding can only be gained by experience. Some guides learn these skills faster than others. It is necessary therefore for a guide to undergo some form of high level assessment before being deemed qualified.
- 2.4 Danes recognised this and had formed their own set of standards that exceeded those required by the QLDC, and which included a system for internal assessment by senior guides. Each employee worked to an operational procedures plan. Unfortunately the operational procedures plan did not cover protocol for training the trainees.
- 2.5 The system allowed, in this case, a relatively inexperienced, but qualified, guide to supervise a trainee in control of a raft with passengers on board. The Trip Leader had been allocated two trainees for that trip so he was unable to avoid this when dividing the group up into raft crews. The training of guides should only be allocated to senior guides or Trip Leaders who have been made familiar with training techniques and whose ability to “read” the water should come as second nature thereby allowing them to devote more attention to monitoring and assisting the trainee.

- 2.6 At least two of the five passengers on board the sweep raft were feeling apprehensive about the trip before it began. Toko understood little English and had trouble understanding the trainee's commands. In the front of the raft Mark and Leon were having difficulty hearing the commands made by the soft spoken trainee guide. This problem was solved by their partners relaying the instructions to them. Although this system appeared to work on this occasion, it created the opportunity for an accident to occur through poor communication.
- 2.7 It was apparent to the passengers that the lead raft, under the guidance of the Trip Leader and his trainee, was under better control than the sweep raft throughout the trip. The sweep raft often entered the rapids off-line and regularly bounced off the side walls. This was not a reflection of the guide and his trainee's potential or ability, but of their combined experience when applied to a task for which neither was fully trained.
- 2.8 The Harbourmaster considered Toilet Rapid to be dangerous at the existing low river levels and had placed a restriction on rafting that rapid, yet rafting past Toaster Rapid was allowed to continue for 12 months in spite of the known danger it posed to rafts, guides and their passengers.
- 2.9 The restriction placed on Toilet Rapid did not affect the nature of the trip, apart from causing an inconvenience to passengers having to walk over ice and snow covered rocks; however if safety had prevailed and rafting past Toaster Rapid had been stopped, by either the Harbourmaster or the raft operators, this would have taken away a portion of the trip (the Oxenbridge Tunnel) which had been used as a main marketing tool.
- 2.10 Due to commercial pressures in the competitive environment that exists on the Shotover River, the safety of passengers, who were already exposed to the inherent risks involved in white water rafting, was compromised.
- 2.11 The extended terms and conditions on the back of each passenger's ticket for the trip included a "risk warning" although this was not conveyed to the passengers verbally. If the passengers read the extended terms and conditions on the back of the ticket at the time of purchase they would know that there was an element of risk involved, and they would be under the impression that once embarked on the adventure there would be no refund and no turning back.
- 2.12 Not until hearing the safety talk on the beach were the passengers made aware of, their expected involvement in the safety and control of the raft. If the option to pull out and have their money refunded was explained, they were by this time on the beach, fully outfitted, and in a position where bravado, peer pressure, and reluctance to inconvenience the group could have affected their decision.
- 2.13 After the safety talk on the beach prior to commencing the trip, Mark was feeling apprehensive about the trip and "just wanted to get the trip over with". Elaine was concerned that so much of the safety of the raft appeared to ride on their (the passenger's) participation. Carol and Leon were not overly concerned.
- 2.14 In spite of this the guides considered, once on the river, the passengers performed "above average" in response to the trainee's commands.

3. Findings

- 3.1 White water rafting will always have an element of inherent risk, regardless of the level of regulation.

- 3.2 At the time of the accident the QLDC was the only New Zealand organisation to regulate the rafting industry.
- 3.3 The rafting by-laws made by the QLDC had improved rafting safety on the Shotover River, but not to a level where the only risk involved could be classed as inherent.
- 3.4 The QLDC by-laws specified a minimum number of trips to be made before a trainee guide could be registered as Boatman, but did not identify a sufficiently high level of supervision under which those trips were to be made.
- 3.5 Danes training requirements and procedures for trainee guides exceeded those specified by the QLDC by-laws in all areas except the level of supervision under which the guides should be trained.
- 3.6 When Toaster Rapid reverted to its near natural form during the 1994 floods it would have been prudent for the four rafting companies to stop rafting through the Oxenbridge Tunnel pending a permanent solution to the danger Toaster Rapid presented to rafters.
- 3.7 It would have been prudent for the Harbourmaster to stop rafting operations through the Oxenbridge Tunnel after the 1994 floods.
- 3.8 It would have been appropriate to give a safety talk at the Rafters Barn before departing on the Awesome Foursome in addition to the safety talk on the beach just before launching the rafts. This would give the passengers the opportunity to pull out from any part of the adventure without having the added pressure of inconveniencing the companies and the other passengers involved.
- 3.9 The trainee guide alone did not have adequate experience to guide the sweep raft safely down the Shotover River with passengers on board.
- 3.10 The qualified guide did not have adequate experience to monitor the raft's progress down the river at the same time as monitoring the performance of the trainee.
- 3.11 The safety actions taken by the QLDC and the Queenstown rafting operators in response to the MSA Commercial White Water Rafting Advisory Group's recommendations are considered by the Commission to have addressed the above safety concerns.

4. Safety Actions

- 4.1 The MSA set up a Commercial White Water Rafting Advisory Group to review safety standards within the commercial white water rafting industry.
- 4.2 A final report on the review was circulated to interested parties in June 1995. The report identified the level of regulation and monitoring required for the industry, and included a Draft Code of Practice for raft operators. The code addresses issues which include operational procedures, guide training and passenger safety.
- 4.3 Consultation with the rafting industry is continuing and the MSA hope to introduce regulation of the Commercial White Water Rafting Industry by legislation in 1996.
- 4.4 The QLDC and the four white water rafting operators in Queenstown have taken the initiative and drawn up an agreement incorporating the Commercial White Water Rafting Draft Code of

Practice compiled by the MSA Advisory Group. It is intended that the agreement will amend or replace the existing QLDC by-laws regulating white water rafting.

- 4.5 After the accident, senior guides made a decision to construct a permanent dam across Toaster Rapid using rocks from the surrounding area. After this dam had been completed most of the water from the Oxenbridge Tunnel flowed past Toaster and down the Cascade Rapid.
- 4.6 There was still some concern that when the river volume rises above the level of the rock dam, a “swimmer” (person fallen from a raft) could be swept over the dam on to the rocks below. In view of this it was agreed between the operators and the QLDC that Resource Management Consent would be sought to complete the work on Toaster to make it safe at all river levels. This would be done when the river level dropped sufficiently to allow the work to be completed; meanwhile if the river was flowing at such a height and volume over the Toaster Dam that a person “swimming” could be swept over it, then the Oxenbridge Tunnel would not be rafted by any operator.
- 4.7 In view of the competitive environment which exists, Queenstown rafting operators agreed that when conditions were marginal, their decision whether it was safe to raft the river would be made by a representative from each company intending to raft the river that day. If a unanimous decision could not be reached then no company would raft the river until conditions improved.

21 February 1996

M F Dunphy
Chief Commissioner

Glossary Of Marine Terms

| | |
|-------------|------------------------------------------------------------------------------------------------------------------------|
| AC | Alternating current |
| Aft | Rear of the vessel |
| Beam | Width of a vessel |
| Bilge | Space for the collection of surplus liquid |
| Bridge | Structure from where a vessel is navigated and directed |
| Bulkhead | Nautical term for wall |
| Bus | An arrangement of copper conductors (Bus bars) within a switchboard, from which the circuits are supplied |
| Cable | 0.1 of a nautical mile |
| Chart datum | Zero height referred to on a marine chart |
| Command | Take over-all responsibility for the vessel |
| Conduct | In control of the vessel |
| Conning | Another term for “has conduct” or “in control” |
| DC | Direct current |
| Deckhead | Nautical term for roof |
| Draft | Depth of the vessel in the water |
| EPIRB | Emergency Position Indicating Radio Beacon |
| Freeboard | Distance from the waterline to the deck edge |
| Freshet | Term used to describe an increase of water level in the river due to rain in the mountains |
| Focsle | Forecastle (raised structure on the bow of a vessel) |
| GM | Metacentric height (measure of a vessel’s statical stability) |
| GPS | Global Positioning System |
| Hove-to | When a vessel is slowed or stopped and lying at an angle to the sea which affords the safest and most comfortable ride |
| Hz | Hertz (cycles) |

| | |
|--------------------|-----------------------------------------------------------------|
| IMO | International Maritime Organisation |
| kW | Kilowatt |
| m | Metres |
| MSA | Maritime Safety Authority |
| SOLAS | Safety Of Life At Sea convention |
| Sounding | Measure of the depth of a liquid |
| SSB | Single-side-band radio |
| Statical stability | Measure of a vessel's stability in still water |
| Supernumerary | Non-fare-paying passenger |
| Telegraph | Device used to relay engine commands from bridge to engine room |
| V | Volts |
| VHF | Very high frequency radio |
| Windlass | Winch used to raise a vessels anchor |

