Report 08-204, 6-metre workboat *Shikari,* collision with moored vessel, Waikawa Bay, Queen Charlotte Sound, 20 June 2008

The Transport Accident Investigation Commission is an independent Crown entity established to determine the circumstances and causes of accidents and incidents with a view to avoiding similar occurrences in the future. Accordingly it is inappropriate that reports should be used to assign fault or blame or determine liability, since neither the investigation nor the reporting process has been undertaken for that purpose.

The Commission may make recommendations to improve transport safety. The cost of implementing any recommendation must always be balanced against its benefits. Such analysis is a matter for the regulator and the industry.

Report 08-204

6-metre workboat *Shikari*

collision with moored vessel

Waikawa Bay, Queen Charlotte Sound

20 June 2008

The *Shikari*

The *Flightless* moored in Waikawa Bay

Executive Summary

Distraction by cellphone and excessive speed within a speed restricted area were the major factors contributing to the fatal collision on 20 June 2008 in Waikawa Bay, Queen Charlotte Sound, of the 6 metre aluminium workboat *Shikari* with the stern of the moored *Flightless*, a 27 metre private vessel.

The *Shikari's* skipper and one passenger died, 3 passengers received serious injuries, and the remaining passenger suffered minor injury. Nobody was aboard the *Flightless*.

At the time of the accident the *Shikari* was estimated to be doing 29 knots when, under Marlborough District Council Navigation Safety Bylaws 2002, it should have been doing 5 knots. Seconds before the collision the skipper finished using a cellphone, immediately after which he spotted the *Flightless* but too late to avoid collision successfully.

The route was a common one for the skipper, and the *Flightless* had been anchored or moored at the accident site for about 15 months. Mechanical, weather, and visibility factors were all discounted.

The skipper's employer did not have safety policies relating to cellphone use, which would have provided a further passive defence to the accident, nor did it have a written policy on adherence to speed limits imposed by local harbour bylaws.

The skipper's local launch operator's certificate had recently expired and did not name the *Shikari*, his most regular command. The skipper's longstanding command of the boat was outside the employer's crewing policy. The *Shikari's* certification had also recently expired. These safety factors did not contribute to the accident.

(Note: this executive summary condenses content to highlight key points to readers and does so in simpler English and with less technical precision than the remainder of the report to ensure its accessibility to a non-expert reader. Expert readers should refer to and rely on the body of the full report.)

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Abbreviations

°	degree(s)
’	minute(s) (angular measure of one 60th of a degree)
”	second(s) (angular measure of one 60th of a minute)
ILM	inshore launch master
kW	kilowatt(s)
LLO	local launch operator
m	metres
mm	millimetres
Maritime NZ	Maritime New Zealand
MEC 5	marine engineer class 5
MEC 6	marine engineer class 6
NZ King Salmon	New Zealand King Salmon Company
Police	New Zealand Police
s	second(s)
SSM	safe ship management
t	tonne(s)
T	true (usually used in angular compass direction to differentiate from magnetic (M))
UTC	co-ordinated universal time
VHF	very high frequency

Glossary

knot(s)	nautical miles per hour
port	left-hand side when facing forward
starboard	right-hand side when facing forward
SOLAS	International Convention for the Safety of Life at Sea, 1974 as amended

Data Summary

Vessel particulars:

Name:	*Shikari*
Type:	planing launch
Class:	non-passenger
Limits:	enclosed water limits – Havelock and Picton
Length:	5.8 metres (m)
Breadth:	2.35 m
Built:	1988, Wanganui Boats
Propulsion:	Yamaha 225 4-stroke outboard engine
Service speed:	29 knots
Owner/operator:	New Zealand King Salmon
Crew:	one

Date and time:		20 June 2008 at about 1555[1]
Location:		Waikawa Bay, Queen Charlotte Sound
Persons on board:	crew:	one
	passengers:	5
Injuries:	crew:	one fatality
	passengers:	one fatality, 3 serious, 1 minor
Damage:		*Shikari* – considerable to hull and internal fittings *Flightless* – hole in transom stern above the waterline
Investigator-in-charge:		Captain Iain Hill

[1] Times in this report are New Zealand Standard Time (UTC + 12 hours) and are expressed in the 24-hour mode.

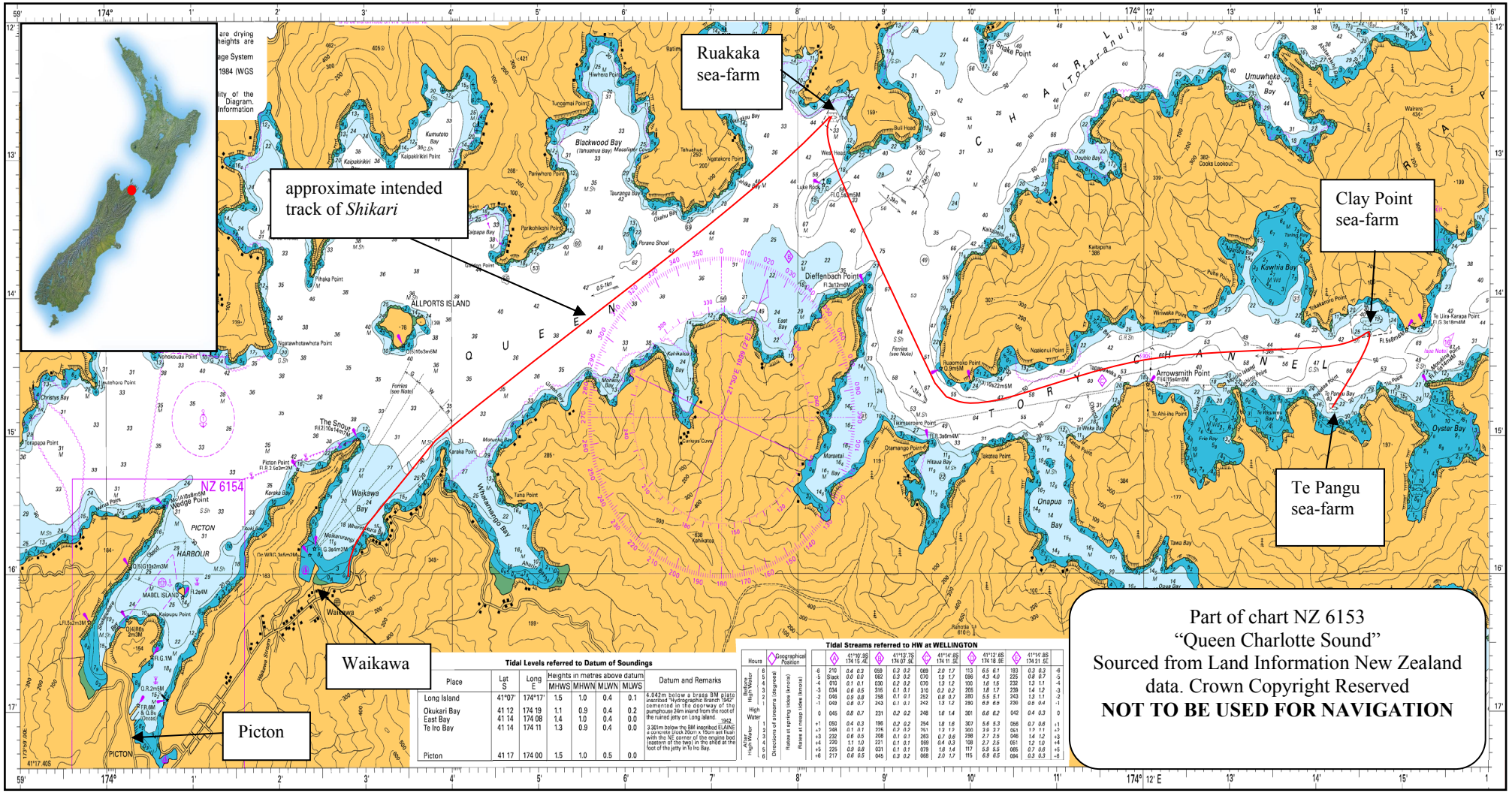


Figure 1
General area of the incident

1 Factual Information

1.1 Narrative

1.1.1 At about 0700 on Friday 20 June 2008, the skipper of the *Shikari,* having readied the boat for the day's work departed Waikawa Marina for Te Pangu sea-farm in the Tory Channel. Also on board were 2 fish health assessors (Pax 1 and 2) who he was to drop off at Clay Point sea-farm, also in the Tory Channel (see Figure 1).

1.1.2 At about 0730, the *Shikari* arrived at Te Pangu. The skipper was the on-site farm manager at Te Pangu, and worked at his normal procedures throughout the day. The *Shikari* was scheduled to leave Te Pangu at 1530, but the skipper brought this forward to 1515 to allow him to trailer the boat for maintenance and meet relations on the arriving passenger ferry in Picton.

1.1.3 At about 1515, the *Shikari* with the skipper and 2 aquaculture technicians (Pax 3 and 4), left Te Pangu sea-farm. A number of compressed air cylinders for diving (dive bottles) were lashed across the transom. The skipper then drove the boat to Clay Point sea-farm, arriving at about 1525, and picked up Pax 1 and 2 who he had dropped off earlier in the day along with their equipment that included 2 compressed oxygen cylinders. The skipper then drove the *Shikari* towards Ruakaka sea-farm. While on passage to Ruakaka sea-farm the skipper made a cellphone call to NZ King Salmon base advising the maintenance department that the *Shikari* should be back at Waikawa Marina by 1600 and requesting them to have the trailer ready for retrieving the boat.

1.1.4 At about 1540, the *Shikari* arrived at Ruakaka sea-farm where another aquaculture technician (Pax 5) was waiting for transport back to Waikawa.

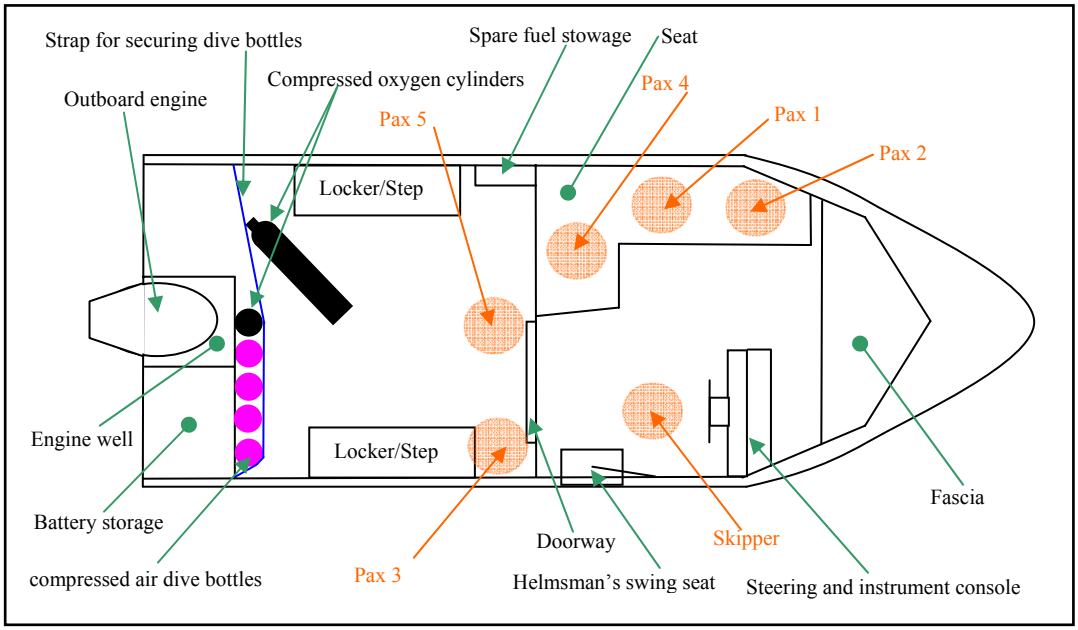


Figure 2
Plan of the *Shikari* showing approximate positions of the skipper and passengers

1.1.5 As the skipper drove the *Shikari* away from Ruakaka sea-farm and towards Waikawa, 3 of the Pax asked to be landed at Waikawa community wharf where their cars were parked. The skipper agreed to this request.

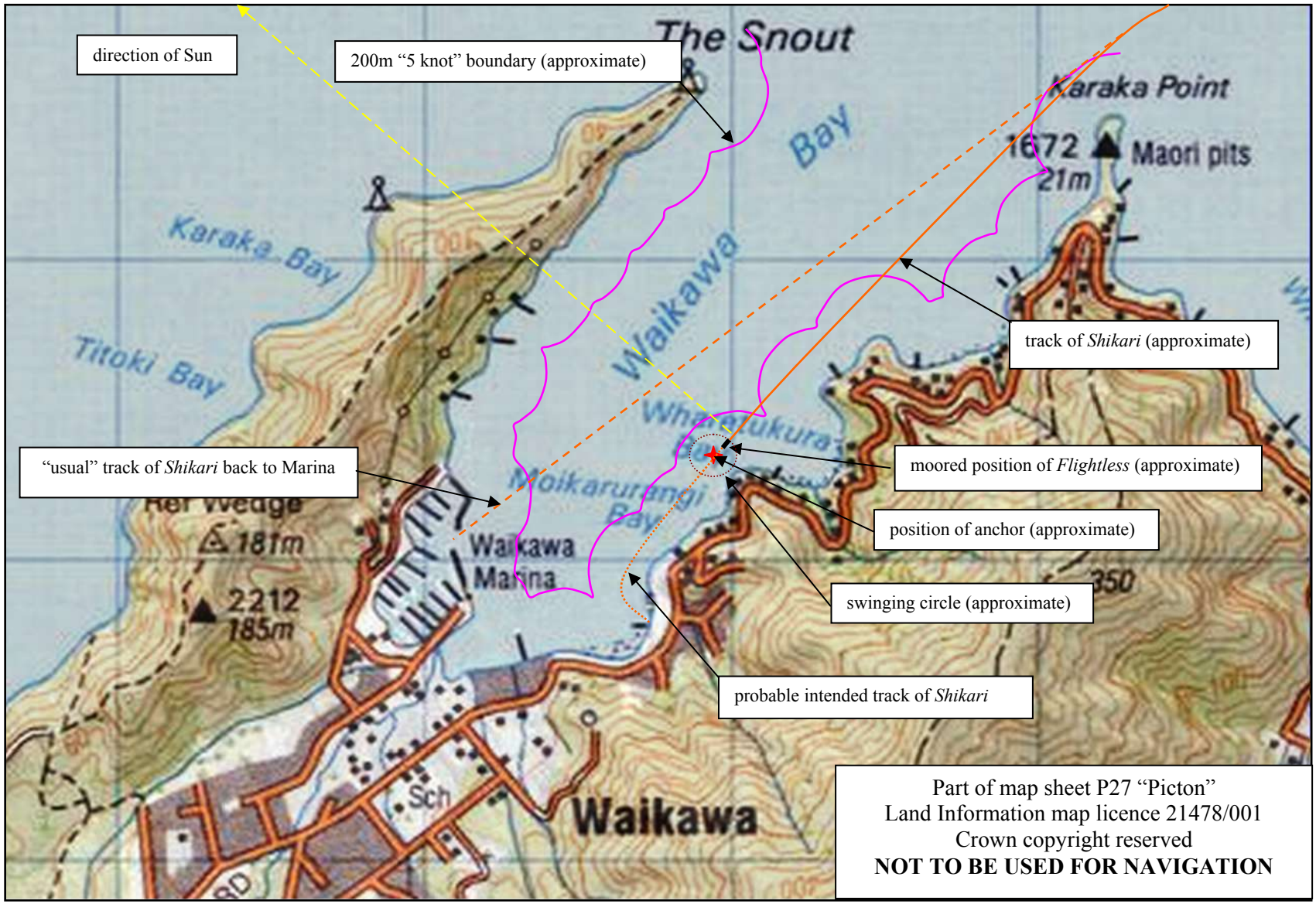


Figure 3
Waikawa Bay

1.1.6 On the journey to Waikawa, Pax 3 and 5 were standing in the cockpit of the *Shikari* (see Figure 2). The skipper was standing at the helm station on the starboard side of the boat inside the cabin. Pax 4 was sitting in the aft port corner of the cabin conversing with Pax 1 who was sitting on the port side middle. Pax 2 was sitting in the port forward corner of the cabin facing aft. All were wearing life-jackets in accordance with company procedures. The dive bottles and oxygen cylinders were strapped across the transom, but one oxygen cylinder was lying on the cockpit deck.

1.1.7 The *Shikari* followed a course into Waikawa Bay that Pax 5 estimated took the vessel about 200 m off Karaka Point (see Figure 3), then headed towards the west side of the bay where the community wharf was situated. After the incident Pax 5 commented that by looking through the cabin door they could clearly see through the forward windows.

1.1.8 From cellphone records it was established that at about 1555 the skipper made a voice call on his cellphone that lasted about 2 minutes finishing at about 1557. Pax 5 saw that as the *Shikari* was crossing Waikawa Bay the skipper was glancing at his cellphone and then slipped it into his pocket. Pax 5 then turned and was about to continue the conversation with Pax 3 when the skipper was heard to exclaim an expletive. Pax 5 then turned back and noticed the skipper turning the steering wheel quickly to the left.

1.1.9 At about 1558, when the skipper was heard to exclaim, Pax 4 looked up from his seated position at the rear of the cabin and saw a grey shape very close to the front of the boat. Seconds later the *Shikari* impacted with the stern of the *Flightless*. From data downloaded from the engine management system it was established that at the time of the accident the engine of the *Shikari* was operating at about 4700 revolutions per minute, the normal operating revolutions, which gave a speed through the water of about 55 kilometres per hour [29 knots] depending on the trim of the motor. The impact was sufficient to force the *Flightless* forward on its mooring and to rotate about its mooring, under the power of the outboard motor that was still operating at high speed. The dive bottles broke free from their lashing, some of them being catapulted overboard.

1.1.10 Pax 4 remarked after the accident that the grey shape was so large that he thought it was one of the Cook Strait ferries. Pax 4 stated that he started to brace himself just before the impact and tried to make himself smaller by curling up with his hands over his head.

1.1.11 Pax 4 was the first to recover after the impact having received only minor injuries. At about 1602, Pax 4 retrieved his cellphone and called the emergency services. However, when connected to the operator the operator had difficulty understanding him owing to his foreign accent. Pax 4 passed his cellphone to Pax 1 and asked him to speak to the operator. This call was the first to be received by the emergency services.

1.1.12 Pax 1 had come to after the impact and had heard the motor running at high revolutions. He reached over and pulled the emergency "kill-switch" on the engine. Pax 4 continued to help the others on the boat until outside assistance arrived.

1.1.13 Several people on the shore heard the sound of the collision but none of them witnessed it, on hearing the sound they made their way to vantage points to see what had caused the noise. Some people thought it was an accident on the road so initially focused their attention on the road, only then looking out into the bay. Several of the people who saw the aftermath of the collision rang the emergency services or Port Marlborough security to advise them of the accident. One of the witnesses on the shore saw what he described as "water spurts like a whale does, about a metre high, individual spurts but close [to the *Shikari*]". These were later attributed to some of the dive bottles that had been catapulted overboard and had their valve assemblies damaged in the impact of the accident.

1.1.14 At about 1604, one of the duty New Zealand Police (Police) officers in Picton received a priority 1 call from the Police southern communications centre. He immediately made his way to Waikawa Marina where he met a member of Port Marlborough security staff who had also been advised of the accident. The Police officer hailed a boat entering the Marina and requested to be transported to the small aluminium boat that appeared to be drifting in the bay. The boat owner obliged and the Police officer and the port security officer were soon onboard the *Shikari*.

1.1.15 The Police officer commenced assessing the injured and relaying the information to the Police southern communications centre. As he was relaying the information to the communications centre he was joined by another Police officer and a paramedic who had been transported to the *Shikari* by another boat. The *Shikari* was then taken in tow by one of the rescue boats and towed back to the Marina. Once at the Marina the *Shikari* was boarded by further paramedics who worked to stabilise the skipper and the other injured Pax. Pax 1 and 2 were then transported by rescue helicopter to Wellington Hospital and Pax 4 and 5 were transported by ambulance to Blenheim Hospital. Pax 3 died at the scene and the skipper succumbed to his injuries and died before he could be moved from the vessel.

1.2 Vessel information

The *Shikari*

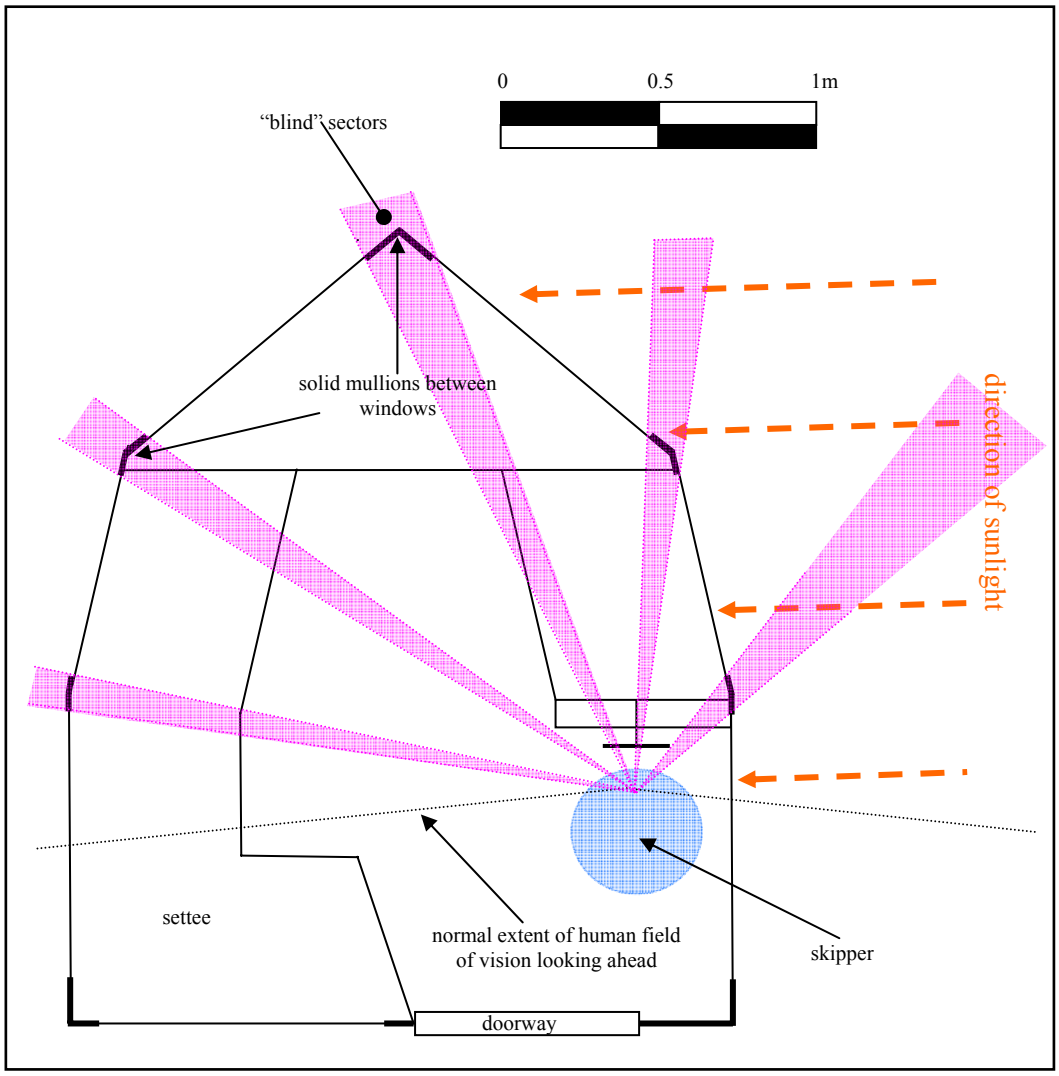


Figure 4
Layout of the *Shikari*'s cabin showing lines of sight

1.2.1 The *Shikari* had an overall length of 5.8 m and a breadth of 2.35 m. The vessel was powered by a 225 Horsepower petrol outboard motor that gave a maximum allowable speed of about 29 knots. The *Shikari* was fitted with a magnetic compass, radar and VHF (very high frequency) transceiver and an echo sounder.

1.2.2 The *Shikari* was built by Wanganui Boats in 1988 for use as a paua gathering dive tender in and around the Marlborough Sounds and Cook Strait. It was purchased by NZ King Salmon in 2000 for use in servicing sea-farms in the Marlborough Sounds.

1.2.3 NZ King Salmon placed the *Shikari* into safe ship management (SSM) with M&I, the predecessor of SGS M&I. The vessel was issued with a fit for purpose certificate as a non-passenger ship for the Picton and Havelock enclosed waters areas and subsequently an SSM certificate was issued. The most recent SSM certificate had been issued on 30 July 2004 and was valid until 14 June 2008, six days before the accident occurred.

1.2.4 Under SSM one of the requirements to operate the *Shikari* was that the vessel be operated as a salmon farm tender vessel by "appropriately qualified staff and contractors of NZ King Salmon Co. Ltd only" under Part 31B of the Maritime Rules. The SSM manual also stated that the vessel was to operate during daylight hours only on voyages limited to fine weather conditions.

1.2.5 The *Shikari*'s cabin was constructed with windows along the sides and to the front of the cabin (see Figure 4) the top of these windows was at a height of about 1.82 m. The after-side windows were parallel to the side of the vessel and the 2 forward-side windows angled in towards the bow about 350 millimetres (mm) at an angle of about 23 degrees ° to the fore and aft line of the vessel. The 2 forward-facing windows were angled at about 60° to the fore and aft line of the vessel. The windows were separated from each other by solid mullions; the mullion between the 2 front windows was about 210 mm wide and the mullion between the front windows and the side windows was about 140 mm wide. The centre of the steering wheel, behind which the helmsman would have stood was about 400 mm from the side of the vessel.

The *Flightless*

1.2.6 The *Flightless* was built by the Whangarei Engineering and Construction Company for the Royal New Zealand Navy and was first commissioned in 1983 as the *Moa*. The vessel was decommissioned in January 2007 then sold to a private buyer.

1.2.7 The *Flightless* had an overall length of 26.8 m and a breadth of 6.1 m and was of steel hull construction, the majority of which was of 6 mm steel; areas of increased stress were increased to 10 mm thickness. The vessel's hull was painted in light "admiralty" grey with the superstructure in white.

1.2.8 In March 2007, after the owner of the *Flightless* had purchased the vessel, he moved the vessel to Waikawa Bay where it was originally anchored until 27 October 2007 when the vessel was transferred to a mooring in the same position.

1.2.9 The *Flightless* was transferred to a mooring, in position 41° 15' 44".024 S 174°02' 59".390 E, after discussion with the harbour master's department, because owing to the direction in which it was lying at anchor, the vessel at times impinged on the track into the Marina as designated by the Marina's leading lights.

1.2.10 At the time of the accident the *Flightless* was lying generally in a 220° true (T) direction, parallel to the side of the bay with its bow pointing towards the head of the bay and its stern towards the main part of Queen Charlotte Sound.

1.3 Personnel information

1.3.1 The skipper of the *Shikari* had worked for NZ King Salmon since 1992 in several different jobs until he became a sea-farm manager. As part of his job as a sea-farm manager he was assigned the position of responsible person for the *Shikari*.

1.3.2 The skipper of the *Shikari* held a local launch operator's (LLO) certificate of competency which had been issued on 13 June 2003, and was valid until 12 June 2008, which meant it expired 8 days before the accident. The certificate was valid for the vessels *Shinook, Te Ika,* and *Forsyth Punt* in the Marlborough Sounds enclosed waters area.

1.3.3 The skipper of the *Shikari* was 1.72 m tall, a non-smoker and in apparent good health. He wore clear glass spectacles without anti-reflective coating, which he had been prescribed about 2 years earlier, to correct for defective distance vision. He was seen to be wearing these spectacles at the time of the accident.

1.3.4 The skipper of the *Shikari* had recently been engaged in extra-mural study for a professional qualification. He had completed the study and had taken an examination on the day preceding the accident. He had been out to celebrate the end of the study with some work colleagues and his wife had noted that he had returned home in the early evening and was "upbeat" about the end of the course and the exam.

1.3.5 Of the remainder of the passengers on board the *Shikari,* 3 held Royal New Zealand Coastguard issued Marine VHF radio user certificate of competency. None held any other boating qualification.

1.3.6 The *Flightless* was unmanned at the time of the incident.

1.4 Climatic and environmental conditions

1.4.1 The accident happened in the Cook coastal waters forecast area. The New Zealand Meteorological Service (MetService) issued coastal waters forecasts at regular times. The coastal waters' forecasts were valid within 60 nautical miles of the New Zealand coastline and described in a general sense the weather conditions expected. However, over small parts of the forecast area, for example off a particular headland or in a sheltered bay, weather conditions could be significantly different from those forecast.

1.4.2 The coastal waters' forecast issued at 1538 New Zealand Standard Time on 20 June 2008, for the Cook coastal area was:

> Forecast: Northerly 25 knots, sea rough, southerly swell 1 metre, easing
> Outlook: following 3 days; northerly rise Sunday 40 knots, change Monday morning southwest 30 knots becoming Monday evening Northwest 20 knots.

1.4.3 The weather in Waikawa Bay at the time of the incident was described as being sunny with few clouds, very little wind to calm, and no swell.

1.4.4 The New Zealand Nautical Almanac did not include either a standard or a secondary port tidal prediction for Waikawa Bay; the nearest standard port included in the New Zealand Nautical Almanac was Picton in the next bay to the west of Waikawa Bay. The National Institute of Water and Atmospheric Research (NIWA) provided an online service to determine the tidal height at any position around the New Zealand coast. This service was used to determine the times of high and low water for the actual occurrence location. The calculated times for high and low water for Picton and Waikawa Bay on 20 June 2008 were:

Port	Date	Low water	High water	Low water	High water
Picton	20 June 2008	0319 0.1m	1002 1.2m	1553 0.2m	2229 1.4m
Waikawa Bay	20 June 2008	0359 -0.57m	1002 0.49m	1602 -0.55m	2216 0.65m

At the time of the occurrence the tide had just reached low water and was about to flood. The *Flightless* was lying to the remnants of the ebb tide.

1.4.5 The altitude and azimuth of the sun was calculated, using an online service provided by the Astronomical department of the United States Naval Observatory, for the geographical position and approximate time of the occurrence. The results obtained were:

20 June 2008		
Time	**Altitude (degrees)**	**Azimuth (degrees, 360 notation)**
1555	9.2	312.6
1600	8.5	311.7
1605	7.8	310.8

1.5 Damage

The *Shikari*

1.5.1 The *Shikari* sustained significant impact damage to the bow section the bow was foreshortened by about 300 mm to 400 mm (see Figure 5). The helm station, associated hydraulic steering equipment and electronic instrumentation attached to the helm station were also significantly damaged.

1.5.2 The bulkhead between the rear of the cabin and the cockpit had been set forward about 45 mm and the aluminium bulkhead showed a distinct impact mark consistent with the shape of a compressed oxygen cylinder.

Photographs courtesy of New Zealand Police

Figure 5
Damage to the *Shikari*'s bow

The *Flightless*

1.5.3 The *Flightless* sustained a hole in the transom of the vessel approximately 1.4 m above the waterline (see Figure 6).

Figure 6
Damage to the stern of the *Flightless*

1.6 Organisational and management information

1.6.1 NZ King Salmon operated a range of vessels that were used by its employees for transportation of materials and personnel to and from the sea-farms, between the sea-farms and in and around the sea-farms.

1.6.2 NZ King Salmon had developed a policy for the use of these vessels with the intention of ensuring that the vessels were operated in a safe and responsible manner and to minimise risk to personnel, property and the environment.

1.6.3 NZ King Salmon's vessel operation policy included:

- a description of the 3 types of vessel employed by NZ King Salmon, namely farm tenders, water taxis, and large work vessels
- each vessel was assigned a responsible person
- the engineering supervisor was responsible for overseeing all the SSM requirements for each vessel
- only personnel who had undertaken certain training were allowed to operate vessels
- the training for a vessel operator varied according to the type of vessel
- specific instructions with regard to fuelling, accident repairs and maintenance reporting procedures
- specific operating parameters for each vessel
- specific instructions on the use and wearing of lifejackets on board the company's vessels.

1.6.4 NZ King Salmon classed the *Shikari* as a water taxi and stated that:

> To ensure our vessels are operated in a safe and responsible manner only people who have undertaken certain training are permitted to operate vessels. The training will vary according to the vessel type and the area the person is required to operate within.
>
> For our water taxis an operator:
>
> - Is required to complete a formal Maritime NZ qualification. As a minimum an operator shall hold a Coast Guard certificate or any other NZKS approved formal training which may include a Local Launchmaster's Certificate with our vessels and operating areas on the endorsements. A copy of the certification is to be stored on their personal files in Nelson
> - Must demonstrate they are competent in handling a vessel with the Seafarms Manager (or the responsible personnel)
> - Must operate a vessel under direct supervision of the of the Seafarms Manager (or the responsible personnel) for not less than 6 hours as recorded in the vessel logbooks
> - Is appointed (in writing) by the Seafarms Manager as able to operate the vessel by themselves.

1.6.5 The vessel operation policy stated that the responsible person was responsible for:

- key contact point for organising transport for that vessel
- key contact should you require taking and operating that vessel
- maintaining a tidy, rubbish-free vessel
- ensuring and co-ordinating repairs and maintenance for the vessel such that it is maintained in a safe working standard as required by our Safe Ship Management Program.

1.6.6 The vessel operation policy stated that the engineering supervisor was responsible for:

- maintenance and replacement (if required) of pyrotechnics and other safety equipment
- maintenance of the vessel's power system
- maintenance of all Safe Ship Management System paperwork and requirements.

1.6.7 The engineering supervisor for NZ King Salmon had noted that the *Shikari* was due for its SMS certificate survey and had informed the responsible person (the skipper). He was waiting for the skipper to contact him to schedule a suitable date for the survey.

1.6.8 Aquaculture technicians and other workers who were contracted to work on the sea-farms for periods of a week, or longer if overtime was worked, were transported to and from the farms on a Wednesday by a water taxi contracted for that specific purpose. As there was no parking available for the worker's cars in the Marina area where the *Shikari* and other boats berthed, workers parked in the available parking close to the community wharf and were embarked and disembarked from the water taxi at the community wharf.

1.7 Legislation

1.7.1 On 1 February 1998, Maritime Rules Part 22 came into force. Maritime Rules Part 22 gave effect to the Convention on the International Regulations for Preventing Collisions at Sea, 1972, to which New Zealand was party. The Part provided the steering and sailing rules for vessels. The Rules of Part 22 applied to all New Zealand vessels, including pleasure craft, wherever they were, and foreign vessels, including pleasure craft, in New Zealand waters (see Appendix 1 for applicable Rules).

1.7.2 Maritime Rules Part 22 was divided into sections and subsections. Section 1 contained the steering and sailing rules (see Appendix 1) and consisted of the following subsections:

- subsection 1, Rules 22.4 to 22.10, covered the conduct of vessels in any condition of visibility
- subsection 2, Rules 22.11 to 22.18, covered the conduct of vessels in sight of one another
- subsection 3, Rule 22.19, covered the conduct of vessels in restricted visibility, and applied to vessels not in sight of one another when navigating in or near an area of restricted visibility.

1.7.3 The Marlborough District Council's regional jurisdiction extended to the waters detailed in schedule 1 of the bylaws and encompassed the Marlborough Sounds. The Council had developed the Marlborough District Council Navigation bylaws 2002, which applied to all waters within the District excluding rivers and lakes, to ensure the safe use of the harbours and coastal waters. The Council Navigation Bylaws were supplemental to the relevant Maritime Rules (see Appendix 2).

1.7.4 On 1 February 2001, Maritime Rules Part 31B, Crewing and Watchkeeping, Offshore, Coastal and Restricted (Non-Fishing Vessels) came into force. Maritime Rules Part 31B prescribed the minimum crew numbers and the crew qualifications required for New Zealand ships, other than fishing vessels, when operating within specified sea limits (see Appendix 3).

1.7.5 On 22 October 1999, Maritime Rules Part 32, Ships' Personnel – Qualifications came into force. Maritime Rules Part 32 contained the requirements that needed to be fulfilled by seafarers to obtain certificates of competency (see Appendix 4).

1.7.6 On 21 October 1999, Maritime Rules Part 35 Training and Examinations came into force. Section 2 of Part 35 permits industry specific training leading to the issue of certificates of competency by organisations running specified operations. The intent of section 2 is to require an organisation to address the risks likely to be encountered by the operator of a specific vessel and to design a framework to train an operator to avoid or minimise those risks (see Appendix 5).

2 Analysis

2.1 The *Shikari* was on a routine trip that was usually undertaken daily. There was nothing untoward about the purpose of the trip, nor the manner in which the trip was made. There are a number of factors to consider when determining why the *Shikari* collided at high speed with the moored vessel *Flightless*; these include:

- the environment
- the course of the *Shikari*
- the speed of the *Shikari*
- the distraction of a cellphone
- the limitations of human performance

Environment

2.2 The weather conditions were fine and clear, with good visibility. The sea conditions were calm with little reported wind. These conditions alone should not have affected the skipper's ability to see-and-avoid the moored vessel or any other object or vessel in the water. One consideration is that benign conditions such as these could lead a skipper into a reduced state of vigilance for the task or in human factors terminology, a low state of arousal. Driving a small craft in a rough sea where visibility might be affected by sea spray, for example, would typically result in a high state of arousal because the driver of a small planing craft such as the *Shikari* might constantly have to make steering and/or speed adjustments to maintain the desired track and level of comfort. Similarly, if visibility were impaired by sea spray or rain for example, the driver would typically be more vigilant in looking for other craft or objects in the water.

2.3 Once trimmed and at a steady speed, the inputs required to maintain the *Shikari* on its desired track would have been minimal in the conditions on the day of the accident. The visibility was good and the calm sea conditions would have made detection of other craft easy. The skipper was clearly not asleep as he was standing up, he had been making occasional course adjustments as the boat entered Waikawa Bay, and he was seen using[2] his cellphone just before the collision. The decision to use the cellphone may have been influenced by the benign weather conditions. The effects on driver performance of talking on a cellphone are considered later in this analysis.

2.4 Following the accident there was some speculation that sun strike might have been a factor in the accident. Being at low elevation the sun would have entered the cabin through the right hand side windows, but at the time of the accident the sun was calculated to be at 88° from the direction of travel, on that side. The land in the direction of the sun was between 100 m and 120 m high and would have cast a shadow of about 736 m from the ridgeline; this would have limited the area of water in the bay for the sun to reflect off and thus reduced the likelihood of reflected sun strike off the water.

2.5 It is possible for sun shining at an oblique angle on a windscreen to impair visibility owing to refraction on the windows surface through any surface debris such as salt crystals. The windscreen was fitted with wipers, which from post accident inspection of the boat had been used at some time to clear a visible arc on the screen limiting the amount of salt build up on the window. Also, one of the passengers said that when they looked forward through the driver-side window shortly before the collision, they had a clear view ahead. For these reasons, sun strike is not considered to have been a factor contributing to the collision.

Course

2.6 The route taken by the skipper of the *Shikari* on its way from Ruakaka sea-farm to Waikawa Bay was the most direct route possible and likely the route that was always taken in good weather. The route then deviated from the direct course to the Marina entrance to one closer to the eastern side of the bay and on to the community wharf. Although this was a deviation from the skipper's planned route it was not an unusual deviation as the "water taxi" vessels were often required to drop workers off at the community wharf.

2.7 As shown in Figure 3 the deviation to the community wharf would have taken the *Shikari* inside the 200m 5-knot zone before it reached the *Flightless*, and the *Flightless* was moored inside that zone. The course also took the *Shikari* within 50m of several other moored craft, all of which required *Shikari* to reduce speed to no more than 5 knots.

[2] Using a cellphone could mean anything to do with cellphone use such as sending or receiving text messages, responding to an alarm, checking the time, checking for voice or text messages or making and receiving calls.

Speed

2.8 An advantage of travelling at a slower speed is that a skipper has more time to recognise and react to any source of danger. The international collision regulations enacted by Maritime Rule Part 22 refer to the requirement of all vessels to proceed at a safe speed. A number of factors are listed in the Rule that a skipper must take into account when determining a safe speed. Two factors relevant to this accident were the requirements to consider:

- the traffic density, including concentrations of fishing vessels or any other vessels, and
- the state of the wind, sea, and current, and the proximity of navigational hazards.

2.9 The Marlborough District Council Navigation Bylaws' requirement to reduce speed to at least 5 knots within 200m of the shore or structure, or within 50m of another ship, floating structure or person in the water, can be considered a refinement of the collision regulations, and was made for good reason. The zone close to the shore line is typically occupied for recreational water activities, swimming, kayaking and dingy sailing to name a few. The Bylaws were mirrored by all other district and regional councils throughout New Zealand, so were not peculiar to the Marlborough Sounds.

2.10 Anecdotal evidence and opinion from residents and other water users suggested that speeding within the inshore zone was a problem faced by water users in the area. Some comments from the harbourmaster are worth repeating:

> Speeding near-shore is something that we target as much as we can during our patrol season. Over this last season, there have not been many infringement notices issued, although patrol staff did log speaking to quite a number of mainly recreational craft relating to speed within 200 metres … Behaviour is good when the patrol is about, but as soon as they go, they revert back to bad habits. ...
> This attitude [to exceeding the speed limit] also prevails amongst the small commercial operators and quite often it is time-table driven.
> This is an area we will be targeting intensively during the next summer season with the intention of issuing infringements …
> From my own experience in my private boat, I am aware that many small craft race to the marina entrance and often pass close to other vessels. Again, when the patrol is about, this does not happen.

2.11 The *Flightless* had been anchored or moored in the same position for about 15 months and was a well known conspicuous object in the harbour. The skipper would have been aware of its position as he passed it most days on his way to and from the sea-farms.

2.12 There were many other moored craft that the *Shikari* was approaching. Most were closer in shore, although in some cases, only marginally. The whole inshore zone in which the *Flightless* was moored was peppered with moored boats. Again, the skipper would have been aware of this as he either passed through or adjacent to this area each working day.

2.13 It was clear from the evidence that the *Shikari* was exceeding the 5 knot speed limit by some 20 to 24 knots. NZ King Salmon in its submission contended that the excessive speed was due to normalisation through the repetitive nature of the daily trip. However, the Commission contends that it could not be established why the *Shikari* was exceeding the speed limit for the area. It could not be established whether this was a routine violation, or peculiar to this trip only.

2.14 The skipper had departed the sea farm early and arranged an early retrieval of the boat by the maintenance crew and possibly wished to facilitate a rendezvous with family arriving on a Cook Strait ferry. The deviation to the community wharf may have placed some pressure on him to achieve his plan on time, which could have motivated him to maintain his cruise speed longer than usual, or he could simply have been distracted by using the cellphone, and not appreciated that he should have reduced speed earlier.

Cellphones

2.15 Much research into the effect of mobile telephone usage on safety in relation to road users and driving has been carried out worldwide. Although driving a small planing water craft might appear a totally different activity from driving a car on the road, there are similarities. Just as the driver of a car is constantly scanning for vehicles and other threats then reacting to them, so too does the driver of a small high-speed planing boat operating close to a shoreline in a busy or crowded waterway. As a driver of a car has to scan the road and constantly adjust speed and direction, so too does the driver of the boat need to adjust speed and direction in response to waves on the sea.

2.16 Research carried out by the psychology department of Aston University in the United Kingdom on behalf of the Royal Society for the Prevention of Accidents in 1999 indicated that using a mobile telephone while driving greatly increased the risk of having an accident. It also confirmed that the danger remained in the minutes after a telephone call was terminated. The research was the first to test motorists under all combinations of hand-held and hands-free telephones and manual and automatic transmission cars. No matter what the combination, the drivers were shown to be less responsive to road and traffic conditions when on the telephone. They "tailgated" other vehicles, greatly increasing the probability of a collision. Heart rates increased during telephone conversations, indicating an increase in stress levels. Psychologists established that drivers under stress were more likely to have an accident.

2.17 A report in 2005, by the SWOV Institute for Road Safety Research in Leidscheendam, The Netherlands[3] found in conclusion:

> In general, conclusions of behavioural studies are that the use of mobile phone negatively affects different aspects of a driver's performance. Reactions to traffic signals are slower, braking reactions are slower with shorter stopping distances, drivers miss more important traffic signals, they are inclined to riskier behaviour like accepting shorter gaps or making fewer speed adjustments or adjustments to dangerous road conditions.
>
> These negative effects on driving performance are caused by physical, visual, auditory and cognitive distraction as a result of mobile phone use. Although the physical distraction could be reduced or even limited by various 'technical' aids like hands-free phones, speed dialling, voice activation, etc., the cognitive distraction remains the main problem involved in concurrent mobile phone use. This is why hands-free mobile phones do not have significant safety advantages over handheld mobile phones. The extent of the negative effects of mobile phone use while driving depends on the complexity of both mobile phone conversations and of the momentary driving situation. The more difficult and complex the conversation, the stronger its effects on driving performance. Similarly, phone use during undemanding driving periods might appear easy but with the increasing complexity and difficulty of the driving situation, the effects of mobile phone conversation become more pronounced.
>
> In terms of crash risk, there is increasing agreement that drivers who use mobile phones in their vehicle have a four-times higher risk of having a road crash than drivers who do not.

2.18 A report for Land Transport New Zealand[4] into the distractive effects of cellphone use found:

> One of the most consistent findings is that drivers' use of cellphones increases their reaction times to vehicles braking ahead although other adverse changes in driver behaviour have been reported as well, including: impaired gap judgements; an increased number of traffic violations; failure to maintain appropriate headway distances; higher curve speeds; impaired eye scanning;

[3] R-2005-12, Use of mobile phones while driving – effects on road safety, A literature review, Nina Dragutinovic and Divera Twisk.
[4] Research report 349, Distractive effects of cellphone use, July 2008, Samuel G. Charlton, TERNZ Ltd., Auckland and University of Waikato, Hamilton.

> reduced checking of rear view mirrors ; striking pedestrians; impairment of vehicle control actions; and poor speed management …
>
> The results clearly indicated that driving while talking to an in-car passenger was appreciably different from conversing over a cellphone. Drivers talking on a cellphone often failed to take any action to reduce their speed as they approached hazards, resulting in the highest crash rates obtained. Similarly, many of these drivers also failed to manage the overtaking scenario by increasing their speeds when appropriate. Drivers with passengers were more likely to anticipate hazards and reduce their speeds, performing nearly as well as the no-conversation group.

2.19 The Australian Transport Safety Bureau aviation research investigation B2004/0324, dangerous distraction, which was an examination of accidents and incidents involving pilot distraction in Australia between 1997 and 2004, noted that:

> Although the specific impact that mobile phone distractions have on the cognitive and physiological performance of pilots remains unclear, research on driver distraction has identified a number of adverse effects. According to driver simulator studies, mobile phones can significantly impair a driver's visual search patterns, reaction times, decision-making processes and the ability to maintain speed, throttle control and lateral position on the road (Young, Regan, & Hammer, 2003). Similarly, it is possible that pilots may also be vulnerable to a decrease in cognitive functioning, slower reaction times, and limited biomechanical performance due to one or no hands on the controls.

2.20 There are 2 occurrences in New Zealand that the Transport Accident Investigation Commission (the Commission) investigated where use of cellphones was considered contributory. On 5 January 2005, a collision occurred between a passenger ferry and a fishing charter boat (marine occurrence report 05-201) where the use of a cellphone by the skipper of the fishing charter vessel was noted as a distraction for the skipper. On 10 November 2007, an aircraft engaged in top dressing descended into trees in a small gully close to the area being top dressed (aviation occurrence report 07-012). At the time of the accident the pilot was engaged in a lengthy telephone conversation on a cellphone and that distraction was considered a contributing factor in the accident.

Human performance – vision

2.21 For some reason the skipper did not see the *Flightless* until the last second, or had seen it then later lost awareness of where it was in relation to his own boats position.

2.22 "See and avoid" is a term commonly used in aviation for aircraft flying visually without the electronic aids to avoid colliding. It is also the primary means by which mariners maintain a safe operating distance from other vessels and hazards when they are navigating by eye without other navigational aids. The person driving the vessel must of course first see the potentially conflicting object in sufficient time to take avoiding action. Numerous articles[5], mainly in the aviation industry, have been written on the limitations of see and avoid.

2.23 For see and avoid to work requires an effective visual scan to be maintained outside the boat. This allows the skipper to build a mental picture of their surroundings and maintain good situational awareness. The amount of time spent looking outside the boat will depend upon workload at the time

[5]FAA Advisory Circular 90-48C, Pilots' Role in Collision Avoidance, 18 March 1983.
ATSB Research Report, Limitations of the See-and Avoid Principle, 1 April 1991.
Aviation, Space, and Environmental Medicine Vol 75, No 4, Midair Collisions: Limitations of the See-and-Avoid Concept in Civil Aviation, April 2005.
ISASI Forum, The Physical Limitations of the "See and Avoid" Concept for Separation of Air Traffic, Captain Peter T. Popp U.S Air Force, September 1995.

2.24 A human's field of vision is about 190°, but this starts to contract after about age 35. The quality of vision varies across the visual field and is best in the centre, covering an arc of about 2°, hence the need for a person driving a vessel to scan across the horizon to increase detection probability. However, when scanning for an object, the eye jumps from one focal point to another in a series of fixations called saccades. This can cause gaps in the visual field, particularly at longer distances.

2.25 Another gap in the visual field is the "blind spot". An object can be hidden behind obstructions, for example window mullions on the skipper's own boat or the bow of the vessel at certain attitudes of trim. The skipper therefore has to move their head around as much as possible to increase the field of view and look past any obstructions. A second type of blind spot is where the optic nerve exits the eyeball and is generally compensated for by binocular vision – the use of 2 eyes. If however, the field of vision of one eye is obstructed by some means, such as a window mullion, any small object can remain hidden from view in the other eye's blind spot. As shown in Figure 4, the *Shikari*'s wheel-house had 5 mullions between windows, one of which was almost directly ahead of the driving position.

2.26 As a skipper scans the horizon trying to locate another vessel, without a visual cue the eye will automatically focus at a relatively short distance, about 56 cm. The effect is called "empty field myopia" and reduces the chances of identifying a distant object. This can be compounded by a dirty windscreen, where a skipper's focus may automatically drop to an insect or a streak of salt residue on the windscreen and a vessel in the distance becomes blurred or in some cases invisible.

2.27 An object can also be too small to be seen if it is below the eye's visual acuity level. Studies involving aircraft identification determined that an object must cover about 12 minutes of arc, 0.2º, to be reasonably recognised as another aircraft.[6] The *Flightless* had a beam of 6.1 m, so when viewed from end on, as it would have presented to the skipper as the *Shikari* entered Waikawa Bay, it would become visible at about 1.75 kilometres or a little under one nautical mile. It should therefore have been possible to distinguish as an object before the *Shikari* passed Karaka Point near the entrance to Waikawa Bay.

2.28 Another factor affecting the detection of an object is its general conspicuity; that is, its contrast with the environment or background. A vessel's colour contrast with the background and atmospheric effects, for example haze, broken light or shadows, can act like camouflage under some conditions. In this case the *Flightless* was moored in bright sunshine. It is possible that its light grey hull and white superstructure blended in with the sea and buildings on the foreshore, or other boats moored around and behind it.

2.29 The human eye is better at detecting contrast and movement. A vessel that is on a steady collision course will maintain a constant relative bearing and therefore not appear to move in the person's field of vision. Although getting progressively bigger, the lack of relative movement of a closing vessel can fail to attract a skipper's attention sufficiently early for the skipper to initiate a response, particularly when approaching it at high speed.

2.30 Once an object has been detected, a person needs to identify the object, determine if it is a threat and initiate avoiding action if required. Research has determined that the time required for a human to recognise a threat and take evasive action is 10.5 seconds. The time starts once an object has been detected and is broken down as follows:

Action	Specific time	Cumulative time
See object	0.1 s	0.1 s
Recognise object	1.0 s	1.1 s
Recognise collision likely	5.0 s	6.1 s
Determine action	4.0 s	10.1 s
Muscular reaction	0.4 s	10.5 s

[6] NTSB 1993.

2.31 If recognition of an object is late and it is large, such as seeing the *Flightless* at close range ahead, the time to recognise that a collision is likely could be reduced. This time does not allow for the time that the vessel will take to react to the helm.

2.32 Given the circumstances described the cellphone conversation the skipper was having shortly before the collision and his observed preoccupation with the cellphone immediately before the collision are considered to be one of the main contributing factors. From phone records it was established that the skipper had been talking on the cellphone for about 2 minutes, and from the evidence provided by Pax 5, the skipper was looking at his cellphone and put the cellphone in his pocket moments before the collision. At a boat speed of about 55 kilometres per hour the *Shikari* would have travelled about 1.8 kilometres while the skipper was talking on the cellphone, during which time the moored vessel the *Flightless* should have become visible as the *Shikari* rounded Karaka Point and entered Waikawa Bay.

2.33 There was an estimated one minute between the time the skipper ended his cellphone call and when he was observed glancing at it and putting it in his pocket immediately before the collision. It could not be established if during that time he was using the cellphone for other tasks such as responding to an alarm, checking the time, or checking for voice or text messages.

2.34 If the distraction of using the cellphone reduced the quality of the skipper's scanning outside the boat, the *Flightless* could simply have been obscured behind a window mullion, and only come into view seconds before the collision, the skipper having finished using the cellphone, placed it in his pocket and resumed his scan outside the boat. The skipper exclaiming and winding the steering wheel rapidly to the left as the *Shikari* struck the *Flightless* supports this conclusion.

Organisational factors

2.35 Under health and safety law and Maritime Rules, employers must have an effective method of systematically identifying hazards and risks involved in their employees' work and take all practicable measures to manage these risks. There were a number of shortcomings in NZ King Salmon's safety system that resulted in non-compliance with various rules.

2.36 The skipper of the *Shikari* held the correct grade of certificate and endorsements to operate a vessel in the Marlborough Sounds' enclosed waters area; however, it was not endorsed with the *Shikari*. The certificate had a validity of 5 years and could easily have been re-validated by someone who was using the specified vessels regularly; however, the skipper's certificate had expired 8 days before the accident.

2.37 The engineering supervisor had noted that the vessel was due for survey and re-certification, but was waiting for the responsible person to contact him for a suitable date. As the contact between the engineering supervisor and the responsible person was by word of mouth, it is possible that the need for the survey had slipped the mind of the responsible person. The responsible person had arranged for maintenance on the engine to be undertaken but not for the survey work.

2.38 The *Shikari* was certified as a workboat although the certification had expired 6 days previously. According to the Maritime Transport Act and the Maritime Rules, the vessel was functioning as a passenger vessel at the time of the accident. It should therefore have been certified and equipped as an enclosed waters passenger vessel. A "passenger" under the Maritime Rules is defined as:

> **"Passenger[7]"** means any person carried on a vessel, other than –
> (a) the master and members of the crew, and any other person employed or engaged in any capacity on board the vessel on the business of the vessel; or
> (b) a person on board the vessel either in pursuance of an obligation laid upon the master to carry shipwrecked, distressed, or other persons, or by reason of any circumstance that neither the master nor the owner nor the charterer (if any) could have prevented or forestalled; or
> (c) a child under the age of 1 year:

[7] Also as defined in the Maritime Transport Act

The persons that the *Shikari* picked up on its way back to Waikawa were not members of the crew of the vessel or engaged in any capacity on board the vessel on the business of the vessel; they were therefore "passengers". The skipper's LLO certificate would have been sufficient to operate the vessel as a passenger vessel; however, NZ King Salmon's in-house training, even if approved by the Director of Maritime New Zealand (Maritime NZ), would not have complied with the rules if the *Shikari* had been designated a passenger vessel. If it is accepted that the vessel had operated for at least 4 years as a passenger vessel the lack of correct certification during this period showed failures in the survey and audit programme of the SSM provider and the regulator. There have been previous similar failures of the SSM system which resulted in safety recommendations[8] (see section 5 Previous Safety Recommendations).

2.39 Maritime NZ recognise that the definition of a passenger is a grey area and that there are other organisations such as Police, the New Zealand Customs Service and the Department of Conservation who use their vessels to transport employees and contractors. Maritime NZ is in the process of reviewing the definition of passenger as applied to non-SOLAS vessels.

2.40 The NZ King Salmon vessel operation policy stated that the operator of a water taxi could hold "a coast guard certificate or any other NZKS approved formal training, which may include a Local Launchmaster's certificate". NZ King Salmon had not applied to the Director of Maritime NZ for recognition of their training syllabus nor did Maritime NZ consider the coastguard certificate of competency as boatmaster as being of a suitable equivalent standard to that of an LLO certificate. Thus an operator with either a coastguard or a NZ King Salmon training certificate could have been operating the "water taxi" in contravention of the Maritime Rules.

2.41 At the time of the accident, one of the witnesses on shore noticed what he described as water spurts around the boat. These "spurts" were likely to have been splashes caused by some of the dive bottles that were ejected over the side from their stowage position. Another unsecured cylinder of compressed oxygen impacted with the cabin's rear bulkhead, setting it forward about 45 mm. The dive bottles and oxygen cylinders were not safely secured. Any gas kept in a compressed form could be considered a hazard through either the inadvertent release of the gas through a damaged valve assembly or an explosive risk. Together with the danger the bottles posed as projectiles during collision, they posed a significant risk to those on board.

2.42 While none of the points raised above had any direct bearing on this accident, they were indicative of a safety system that could do with some improvement. Operating relatively high speed work boats in and around the Marlborough Sounds is not without risk, as demonstrated in this accident. It can at times be a busy waterway with environmental challenges. A thorough review of the hazards, and thus risks, associated with this type of operation would have been warranted. Compliance with the various Maritime Rules and harbour bylaws should have been considered a minimum.

2.43 It could be argued that if the *Shikari* was travelling at no more than 5 knots in the vicinity of the shore and other vessels, this collision probably would not have occurred, or at least the consequences of the collision would have been much less severe. Keeping a good lookout is applicable at all times when on the water. There is just as much risk of colliding with other craft travelling at speed or with small craft in open waters. Anything that detracts from keeping a good lookout should be avoided.

2.44 It might be reasonable to think that having provided cellphones to skippers of its boats, NZ King Salmon should have implemented some policy on when they could be used. Most of the public focus on cellphones however, has been on using them while driving cars on the road and this had not yet been prohibited in New Zealand at the time of this accident. The use of cellphones in aircraft has been prohibited, but for different reasons (fear that flight systems might be affected)

[8] TAIC marine occurrence report 05-212, restricted limit passenger vessel, Milford Sovereign, loss of directional control, Milford Sound, 20 November 2005, (incorporating Occurrence 06-206)

2.45 This accident and others the Commission has investigated, as well as much research internationally, demonstrates that cellphone use can be a distraction that can lead to serious accidents. This issue therefore goes far wider than lack of instructions from NZ King Salmon to its skippers regarding phone use; it is a safety issue for the maritime industry to address collectively.

2.46 There is possibly enough written into current maritime and occupational, safety and health rules to require commercial operators to consider and mitigate the risk cellphone use poses to their operations, but an awareness campaign might be required to have the safety issue addressed. Such a campaign could be aimed at recreational boat users as well.

3 Findings

Findings are listed in order of development, not in order of priority

3.1 The *Shikari* collided at high speed with the stationary moored vessel the *Flightless* when the skipper became distracted while using a cellphone.

3.2 The *Shikari* was travelling at about 29 knots when it entered the 5-knot speed zone within which the *Flightless* was moored. It could not be established whether the excessive speed was due to distraction from using a cellphone, or was a routine violation of the speed limit.

3.3 There were 5 non-compliances (paragraphs 2.34, 2.35 and 2.36) with Maritime Rules within NZ King Salmon's operation. None of these was considered to have directly contributed to the collision.

3.4 Regulatory oversight did not detect deficiencies in the design and operation of the applicable SMS.

4 Safety Actions

4.1 In August 2009, Maritime NZ issued Safety Bulletin No. 20 which was directed at masters and skippers of commercial and pleasure vessels, ship operators and management, and SSM companies. This Safety Bulletin alerted the New Zealand maritime community to the safety risk of using mobile phones while a vessel is underway (see Appendix 6).

4.2 After the accident Maritime NZ sent its technical trainer to ensure that NZ King Salmon was aware of its responsibility to develop an effective health and safety system to identify and manage risks and to ensure that an effective safety management system was put in place to ensure survey, crew certification and training requirements were met.

4.3 After the accident NZ King Salmon revised its vessel operating procedures to require that all trained and approved skippers had their competency re-assessed every 5 years. This re-assessment included observation of their driving practices and ensuring their knowledge of the relevant navigation by-laws.

4.4 After the accident NZ King Salmon reviewed its internal procedures to reinforce the need to comply with all Maritime Rules, and limited the use of cell phones by skippers operating its vessels.

5 Previous Safety Recommendations

5.1 On 2 April 2007, a safety recommendation was made to the Director of Maritime Safety in marine occurrence report 05-212, to:

> undertake a full review of the Safe Ship Management system and make changes to ensure the system promotes and effectively regulates a safe and sustainable maritime industry consistently throughout New Zealand.

On 24 July 2007, the Director of Maritime NZ replied:

> MNZ constantly monitors the SSM system, which has been formally reviewed three times since its introduction in 1998. Each review, by independent bodies external to MNZ, found that the philosophy behind the system was sound, and since the system was introduced safety statistics in all commercial maritime sectors have improved. While feedback from the industry indicates solid support for the intent of the system MNZ considers that there is still room for improvement in how the system is implemented and delivered by MNZ and SSM companies.
>
> In line with our continuous improvement policy, a review of the SSM system has been identified as the key strategic priority for MNZ in its 2007-2010 Statement of Intent. MNZ has commenced a programme of work to enhance the sustainability and effectiveness of the SSM system by:
>
> 1 Ensuring that the regulatory framework supporting SSM is robust and appropriate by reviewing the maritime rules that govern its operation. A draft discussion document summarising proposed changes to Maritime Rules Part 21 (Safety Management Systems) and Part 46 (Surveys, Certification and Maintenance) is due for public release in late 2007;
>
> 2 Complementing existing guidance material (Health and Safety: A Guide; FishSAFE Health and Safety Guidelines; various leaflets) with additional material including a comprehensive resource to support owners in the development of their SSM systems, specific fatigue management material, and health and safety guidelines for passenger and non-passenger operations. This additional material is being progressively released through until December 2007 in association with targeted training material;
>
> 3 Increasing the amount and quality of formal and informal training and education that is available to all those working in the system, including MNZ and SSM Company staff, surveyors, owners and operators. This training will be supported by the development of a mentor network utilising experienced industry participants to provide support and advice to their peers;
>
> 4 Reviewing the current capacity and quality of service delivery by both MNZ and SSM Companies in the area of SSM and comparing this with requirements in order to identify and address necessary areas for improvement;
>
> 5 Allocating additional resources to the SSM team within MNZ to allow for more responsive contact with industry and other stakeholders, along with the provision of personalised assistance where required to owners and operators; and
>
> 6 Structured auditing by MNZ of SSM service providers.
>
> This work is being actively progressed and monitored within MNZ. It is also intended to establish an external consultative group to ensure that all industry and other stakeholders remain fully involved with, and aware of, the programme as it is developed and implemented.

Approved on 17 September 2009 for publication

W P Jeffries
Chief Commissioner

Appendix 1

Relevant Rules from Maritime Rules Part 22

Section 1 - Steering and Sailing

SUBSECTION 1 - CONDUCT OF VESSELS IN ANY CONDITION OF VISIBILITY

22.4 Application of Subsection 1

Rules in this subsection apply in any condition of visibility.

22.5 Look-out

Every vessel must at all times maintain a proper look-out by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions, so as to make a full appraisal of the situation and the risk of collision.

22.6 Safe speed

Every vessel must at all times proceed at a safe speed so that proper and effective action to avoid a collision can be taken and the vessel can be stopped within a distance appropriate to the prevailing circumstances and conditions.

In determining a safe speed, the following factors must be among those taken into account -

1) For all vessels -
   a) the state of visibility:
   b) the traffic density, including concentrations of fishing vessels or any other vessels:
   c) the manoeuvrability of the vessel, with special reference to stopping distance and turning ability in the prevailing conditions:
   d) at night, the presence of background light such as from shore lights or from the back scatter of the vessel's own lights:
   e) the state of wind, sea, and current, and the proximity of navigational hazards:
   f) the draught in relation to the available depth of water.

2) Additionally, for vessels with operational radar -
   a) the characteristics, efficiency, and limitations of the radar equipment:
   b) any constraints imposed by the radar range scale in use:
   c) the effect on radar detection of the sea state, weather, and other sources of interference:
   d) the possibility that small vessels, ice, and other floating objects may not be detected by radar at an adequate range:
   e) the number, location, and movement of vessels detected by radar:
   f) the more exact assessment of the visibility that may be possible when radar is used to determine the range of vessels or other objects in the vicinity.

22.7 Risk of Collision

(1) Every vessel must use all available means appropriate to the prevailing circumstances and conditions to determine if the risk of collision exists. If there is any doubt, such risk must be considered to exist.

(2) Proper use must be made of radar equipment, if fitted and operational, including long-range scanning to obtain early warning of the risk of collision and radar plotting or equivalent systematic observation of detected objects.

(3) Assumptions must not be made on the basis of scanty information, especially scanty radar information.

(4) In determining if the risk of collision exists, the following considerations must be among those taken into account -

(a) such risk must be considered to exist if the compass bearing of an approaching vessel does not appreciably change; and

(b) such risk may sometimes exist even when an appreciable bearing change is evident, particularly when approaching a very large vessel or a tow or when approaching a vessel at close range.

22.8 Action to avoid collision

(1) Any action to avoid collision must, if the circumstances of the case allow, be positive, made in ample time and with due regard to the observance of good seafaring practice.

(2) Any alteration of course or speed or both to avoid collision must, if the circumstances of the case allow, be large enough to be readily apparent to another vessel observing visually or by radar. A succession of small alterations of course or speed or both should be avoided.

(3) If there is sufficient sea-room, alteration of course alone may be the most effective action to avoid a close-quarters situation provided that -

(a) it is made in good time;

(b) it is substantial; and

(c) it does not result in another close-quarters situation.

(4) Action taken to avoid collision with another vessel must be such as to result in passing at a safe distance. The effectiveness of the action must be carefully checked until the other vessel is finally past and clear.

(5) If necessary, to avoid collision or to allow more time to assess the situation, a vessel must slacken its speed or take all way off by stopping or reversing its means of propulsion.

(6) (a) A vessel that, by any rules in this Part, is obliged not to impede the passage or safe passage of another vessel must, when required, take early action to allow sufficient sea-room for the safe passage of the other vessel.

(b) A vessel that is required not to impede the passage or safe passage of another vessel is not relieved of this obligation if approaching the other vessel so as to involve risk of collision. It must, when taking action, have full regard to the action which may be required of itself and the other vessel by this section of Part 22.

(c) A vessel the passage of which is not to be impeded remains fully obliged to comply with this section of Part 22 when the two vessels are approaching one another so as to involve risk of collision.

Appendix 2

Relevant Rules from Marlborough District Council Navigation Bylaws 2002

3.5 General Requirements

(i) The master of every commercial ship shall ensure, when navigating within harbour limits, that:

(a) automatic steering 'pilot' devices, if fitted, are not to be used, unless a helmsman is standing by, to take over manual steering immediately on this being required, in the immediate vicinity of the helm or wheel.

(b) the main engines are to be immediately available for reducing speed, stopping or going astern at all times without delay.

(c) anchors are immediately available for letting go in an emergency and capable of being used without power.

(d) all aids to navigation, including but not limited to radar and depth recording devices, if fitted are to be in continuous operation and fully utilised.

(ii) Every licensed pilot:

(a) is required to lodge the following current documents with the Harbourmaster:
A copy of the Pilotage Passage Plan
A copy of the information exchange card for every act of pilotage performed

(b) must ensure that any permanent changes to his or her pilotage passage plan is communicated to the Harbourmaster in writing, prior to implementation.

(iii) The master of every ship which is pilot exempt:

(a) is required to lodge a current passage plan for the whole of the voyage which occurs within defined pilotage limits

(b) must ensure that any permanent changes to the passage plan referred to in 3.5 (iii) (a) of this clause are communicated to the Harbourmaster in writing prior to implementation.

(iv) The master of every commercial ship while navigating within harbour limits shall ensure that sufficient trained personnel are tasked with monitoring the ship's progress and implementation of the agreed on passage plan.

(v) No person shall navigate a ship (including a ship towing some object) at a proper speed exceeding 5 knots when:

(a) within 50 metres of any other ship, floating structure or person in the water;

(b) within either 200 metres of the shore or any structure; or

(c) within 200 metres of any ship or floating structure that is flying Flag A

(vi) No person shall navigate a powered ship at a speed exceeding that as is displayed on any official notice board erected by Council

3.8 Collision Prevention

(i) No person may operate any ship in breach of Maritime Rule Part 22 – Collision Prevention – made under the Maritime Transport Act 1994.

(ii) Every person commits an offence against this clause who, on being required by the Harbourmaster or Enforcement Officer to comply with the Maritime Rule referred to in 3.8(i)

Appendix 3

Relevant Rules from Maritime Rules Part 31B

31B.10 Enclosed Area

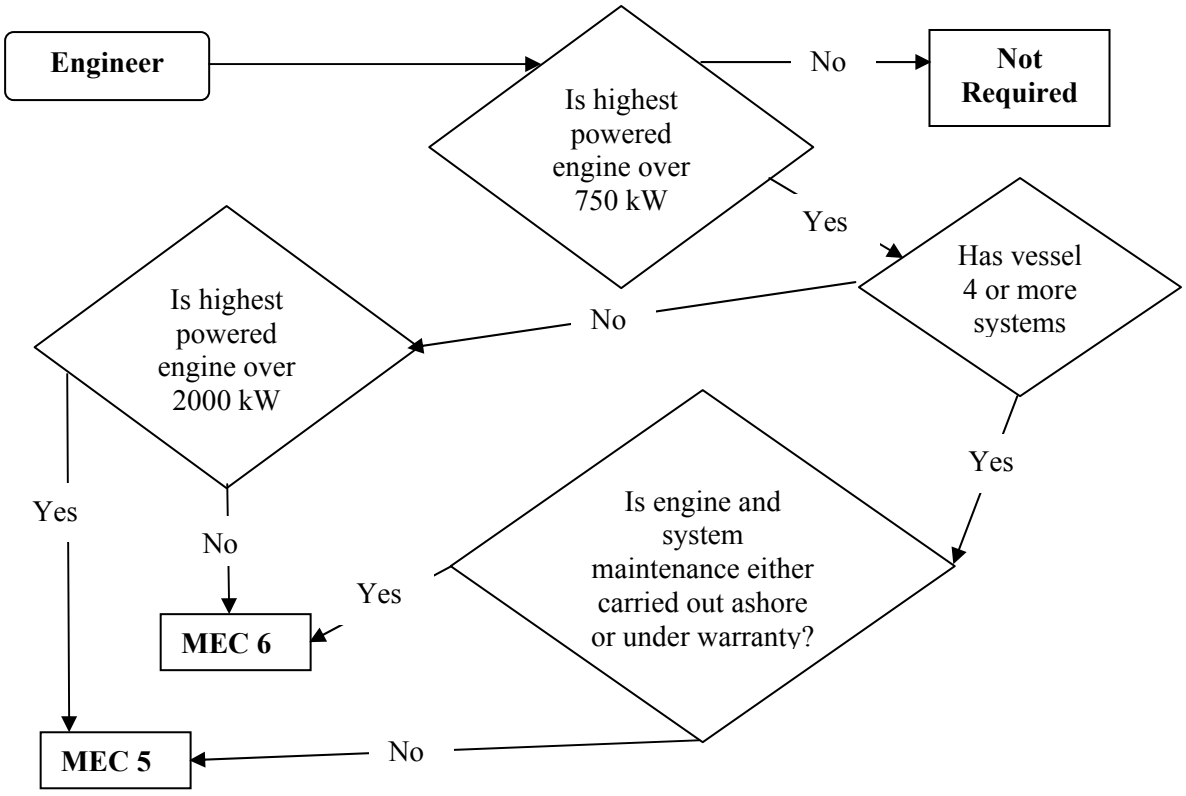
Except as provided by rule 31B.6(1)(b), passenger vessels operating in the enclosed area must carry at least–

(a) seafarers holding the minimum required qualifications specified in Table 3 and in the accompanying flow-chart; and

(b) the minimum crew specified in Table 3.

Table 3

Vessel length overall	Passenger on board	Minimum Required Qualifications	Minimum Crew
20 m or more	50 to 99 Less than 50	Master – ILM Engineer – in accordance with the flow chart and may be the master	2
Less than 20 m	50 to 99 Less than 50	Master – LLO endorsed for the area Engineer – in accordance with the flow chart and may be the master	1

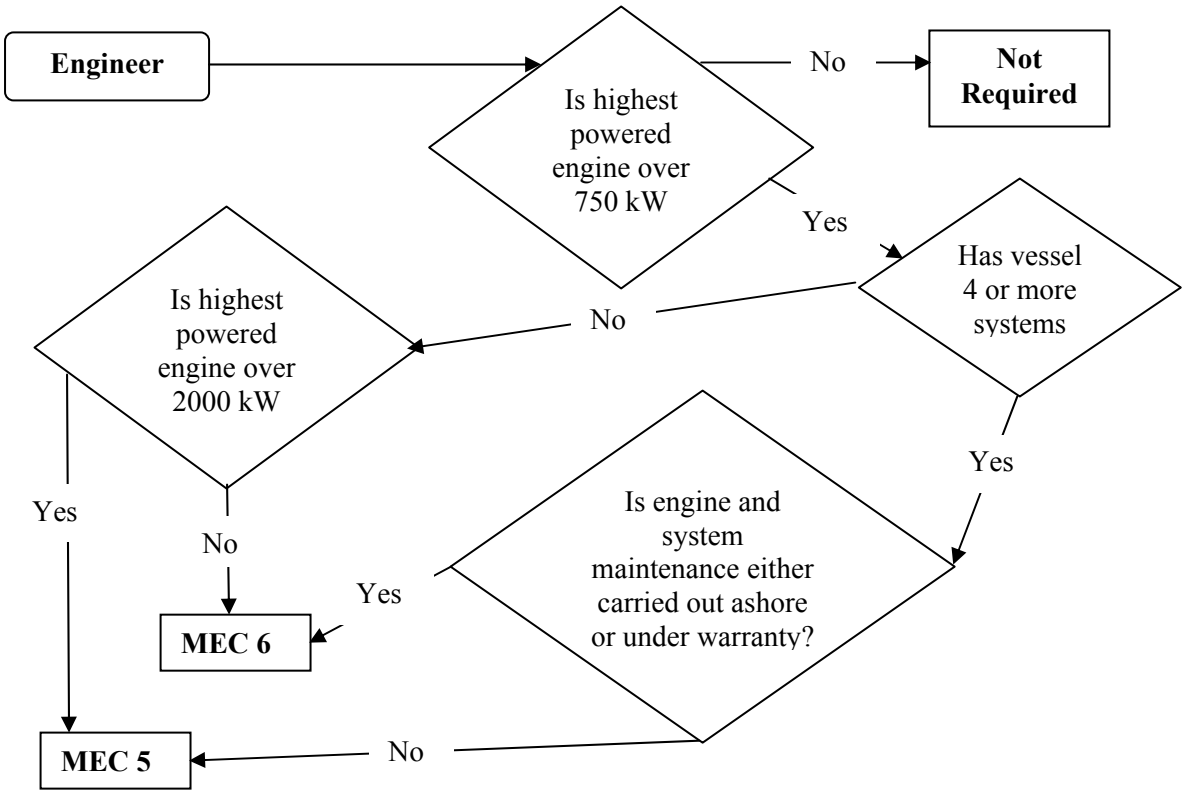


31B.15 Enclosed Area

Except as provided by rule 31B.6(l)(b), non-passenger vessels operating in the enclosed area must carry at least
(a) seafarers holding the minimum required qualifications specified in Table 8 and in the accompanying flow-chart; and
(b) the minimum crew specified in Table 8.

Table 8

Vessel length overall or type	Minimum Required Qualifications	Minimum Crew
20 m or more	Master – ILM Engineer – in accordance with the flow chart	2
6 m or more and less than 20 m	Master – LLO Engineer – in accordance with the flow chart and may be the master	1
Less than 6 m; or operating within a marine farm	Master – LLO or Industry specific training qualification issued under Part 35	



Appendix 4

Relevant Rules from Maritime Rules Part 32

Combined skipper/engineer certificates

31.9 Enclosed Area

(1) A candidate for the issue of a local launch operator certificate must —

(a) be at least 18 years of age; and

(b) provide evidence of having completed, in the last ten years, not less than 6 months sea experience in a deck capacity which must include —

(i) not less than one months experience on the type of vessel which is to be endorsed on the certificate; and

(ii) not less than one months experience in the area of operation for which the certificate is required, completed within the 12 months immediately preceding the date of the candidate's application for examination; and

(iii) ether not less then one month sea service on a commercial vessel or not less then one month as skipper on a pleasure craft; and

(c) provide evidence of having passed an oral and a written examination that test knowledge of a syllabus approved for this qualification by the Director; and

(d) provide evidence of being the holder of a first aid certificate that is acceptable to the Director; and

(e) if over 65 years of age, provide evidence of medical fitness to the satisfaction of the Director; and

(f) provide evidence of, within the last 12 months —

(i) having passed the reduced eyesight test prescribed in the Appendix; and

(ii) taking the alternative colour vision test prescribed in the Appendix[9]; and

(g) specify

(i) the name of the vessel or vessels she or he intends to serve on; and

(ii) the intended area of operation, being —

(aa) an enclosed limit; or

(bb) a nominated safe haven in the inshore limit.

(2) If the Director issues a local launch operator's certificate, the Director must endorse the certificate with —

(a) the name of the vessel or names of vessels to be used, or in the case of a vessel of six metres or less, the name or design[10] of the vessel; and

(b) the intended area of operation.

(3) The Director may endorse a local launch operator's certificate issued under Part 32, or an existing local launchman's licence, with up to 5 additional vessels or up to 5 additional areas of intended operation, or any combination of additional vessels and additional areas provided the combined maximum total does not exceed 6, if the candidate or certificate holder —

(a) for an additional vessel that is substantially different to any vessel nominated on the certificate or licence, passes any additional written or practical examination required by the Director; and

[9] A candidate that fails the colour vision test will be able to operate during daylight only.

[10] The design is acceptable in ships of 6 metres or as an alternative to specified ships in recognition of the similar handling characteristics of ships of the same design

(b) for an additional area, provides evidence of having completed not less than one months experience in the area for which the certificate is required within the 12 months immediately preceding the date of the candidate's application for examination or the certificate holder's application for endorsement.

(4) A candidate for the issue of a certificate of service as a local launch operator[11] to operate a vessel of six metres or less in length or a marine farming vessel must —(a) provide evidence that he or she has completed 24 months sea service on commercial vessels, including —

(i) not less than six months experience on the type of vessel which is to be endorsed on the certificate; and

(ii) not less than six months experience in the area for which the certificate is required;

within the five years immediately preceding the date of the candidate's application for the certificate; and

(b) provide evidence of being the holder of a first aid certificate that is acceptable to the Director; and

(c) provide evidence of complying with medical and eyesight requirements for a local launch operator; and

(d) provide evidence of having a safe operating record that is satisfactory to the Director.

(5) A certificate of service as a local launch operator —

(a) may only be endorsed for —

(i) a maximum of six —

(aa) vessels of six metres or less; or

(bb) designs of vessel of six metres or less; or

(cc) marine farming vessels; and

(ii) the area operated by those vessels immediately prior to the entry into force of this Part; and

(b) must not be endorsed with additional vessels or areas after its initial issue.

(6) A local launch operator certificate and a certificate of service as a local launch operator —

(a) shall be valid for five years from the date of issue; and

(b) may be renewed prior to expiry upon the applicant providing evidence of —

(i) having completed six months sea service as skipper on a vessel or vessels endorsed on the certificate since the issue or most recent renewal of the certificate; and

(ii) if the applicant is over 65 years of age, medical fitness to the satisfaction of the Director; and

(iii) within the last 12 months —

(aa) having passed the reduced eyesight test prescribed in the Appendix; and

(bb) having taken the alternative colour vision test prescribed in the Appendix.

[11] The certificate of service as a local launch operator is for existing operators of under 6 metre vessels. It is granted to applicants that have at least two years sea service in the last five years and have safe operating records. The certificate will be endorsed for one vessel only, and the area of operation the applicant has experience in. The holder of a certificate of service as a local launch operator will need to sit for a local launch operator certificate or higher certificate if they wish to operate another vessel or in another area.

Appendix 5

Relevant Rules from Maritime Rules Part 35

Section 2 — Training Framework and Approved Organisations for Industry Specific Training

35.10 Approval of organisations

(1) The Director may, having regard to the risk to maritime safety existing in an organisation's maritime operation, approve that organisation to issue certificates of competency for the operation of —

(a) craft of six metres or less in length overall; or

(b) non-passenger boats which are not fishing boats, of 15 metres or less in length overall, and which operate only within restricted limits; if the Director has approved, in accordance with rule 35.11, a training framework developed by the organisation for the certificates of competency that the organisation intends to issue.

(2) Every approval made under rule 35.10(1) —

(a) must be in writing; and

(b) must prescribe the type of certificate or certificates that the organisation may issue; and

(c) must prescribe the class of applicants to whom the organisation may issue certificates; and

(d) is subject to any conditions that the Director considers, on reasonable grounds, are appropriate for the approval.

(3) An approved organisation may only issue a certificate of competency if —

(a) that certificate —

(i) has been issued while the organisation has an approved training framework for the certificate; and

(ii) has been issued in accordance with an approved training framework; and

(iii) has been issued to a person who falls within the class of applicants prescribed in the approval; and

(b) the organisation has complied with every condition of their approval.

35.11 Training framework

(1) The Director may approve a training framework for a certificate of competency if the Director is satisfied that the training framework —

(a) identifies the duties to be performed by the holder of the certificate and the training to be provided to enable the holder to undertake the duties; and

(b) identifies the risks, including health and safety and environmental risks, involved in the operation of any ship to which the certificate relates; and

(c) identifies the training that will be given to enable applicants to recognise and avoid or respond to each risk identified under rule 35.11(l)(b); and

(d) identifies the skill level of persons providing training for applicants, including nautical, instruction, and assessment experience; and

(e) identifies how the training will be given to applicants, including —

(i) which parts of the training will be classroom based and which parts will be carried out on board a vessel; and

(ii) the length of time for the delivery of each lesson, including, if relevant, whether training will be undertaken in darkness; and

(iii) how applicants will be assessed; and

(f) outlines the training schedule; and

(g) outlines the minimum number of hours of boating experience required for the granting of the certificate; and

(h) identifies the medical and eyesight standards that will be required of the holder of the certificate; and

(i) identifies the requirements that existing operators must fulfil to be issued with the certificate; and

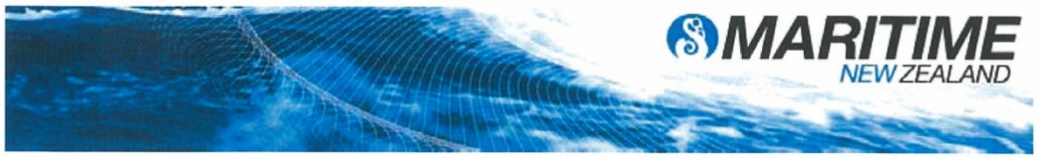
(j) outlines how continued proficiency of certificate holders will be maintained; and

(k) outlines how continued proficiency of persons providing training will be maintained; and

(l) identifies how the fit and proper person requirements of section 41 of the Act will be satisfied.

(2) The organisation must ensure that the form of the certificate issued to a successful applicant has been approved by the Director.

Appendix 6
Safety Bulletin Issue 20 – August 2009



Maritime New Zealand Guidelines

SAFETY BULLETIN ISSUE 20 – AUGUST 2009

DANGEROUS USE OF MOBILE PHONES WHILE A VESSEL IS UNDERWAY

This safety bulletin is for:

- masters and skippers of commercial and pleasure vessels
- ship operators and management
- safe ship management companies.

Purpose of this bulletin

To alert the New Zealand maritime community to the safety risk of masters and skippers using mobile phones while a vessel is underway.

Use of mobile phones as a safety hazard

Three people have been killed in recent collisions as a result of skippers being distracted by their use of mobile phones. A number of serious injuries have also occurred.

It is important to note that mobile phones may serve a useful function as a back up means of emergency communication. However, it is clear that their use by skippers and masters to receive or make calls or text messages needs to be managed appropriately to the circumstances of each operation. This risk is heightened while a vessel is underway, with the likelihood and consequences of an accident being greater when vessels are operated:

- at speed
- in poor sea conditions
- in conditions of restricted visibility
- close to other vessels
- close to navigation hazards.

All New Zealand masters and skippers are reminded of their legal responsibility under Maritime Rule Part 22.5 to ensure their vessel maintains a proper lookout by sight and hearing as well as by all available means in the prevailing circumstances and conditions, so as to make a full appraisal of the situation and the risk of collision.

Because the risk profile of every operation is different, ship operators and management are also asked to ensure that any safety risk associated with mobile phone use is appropriately identified and managed. Risk management strategies will differ according to the circumstances, but may include prohibiting mobile phone use while a vessel is either underway or at critical stages of her passage.

Recommendations

It is recommended that:

- All New Zealand masters and skippers note their responsibility to ensure their vessel maintains a proper lookout at all times.

- Ship operators and management have procedures in place to identify and manage any safety risk that is associated with masters, skippers and other key personnel using mobile phones while a vessel is underway.

Further information

For further information please contact our Wellington office:
Phone: 0508 22 55 22 or (04) 473 0111
Fax: (04) 494 8901
Email: enquiries@maritimenz.govt.nz

Recent Marine Occurrence Reports published by the Transport Accident Investigation Commission (most recent at top of list)

08-202	coastal bulk carrier Anatoki and bulk carrier Lodestar Forest, collision, Tauranga Harbour roads, 28 April 2008
07-202	fishing vessel Walara-K, flooding and sinking, 195 nautical miles off Cape Egmont, 7 March 2007
07-207	Bulk carrier, Taharoa Express, Cargo shift and severe list 42 nautical miles southwest of Cape Egmont, 22 June 2007
08-201	Fishing charter vessel, *Pursuit*, grounding, Murimotu Island, North Cape (Otou), 13 April 2008
06-207	restricted limit passenger vessel, *Milford Sovereign,* engine failure and impact with rock wall, Milford Sound, 31 October 2006
07-206	Tug Nautilus III and barge Kimihia, barge capsize while under tow, Wellington Harbour entrance. 14 April 2007
06-204	fishing vessel "Kotuku", capsized, Foveaux Strait, 13 May 2006
07-201	charter catamaran, *Cruise Cat*, collision with navigational mark, Waikato River entrance, Lake Taupo, 22 February 2007
06-208	fishing vessel *Santa Maria II*, engine room fire, L'Esperance Rock, Kermadec Islands, 10 December 2006
05-212	restricted limit passenger vessel Milford Sovereign, loss of directional control, Milford IncorporatingSound, 20 November 2005 incorporating:
06-206	restricted limit passenger vessel Fiordland Navigator, heel due extreme wind gust in Milford Sound, 8 July 2006
06-201	passenger freight ferry *Aratere*, Heavy weather incident resulting in cargo shift, Cook Strait, 3 March 2006
06-205	fishing vessel, *Lady Luck*, collision and subsequent foundering, Motiti Island, Bay of Plenty, 23 June 2006
06-203	fishing vessel *Venture*, grounding, Tipi Bay, Tory Channel, 19 April 2006
05-211	container ship *Spirit of Resolution,* collision with bridge, Onehunga, 8 October 2005

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