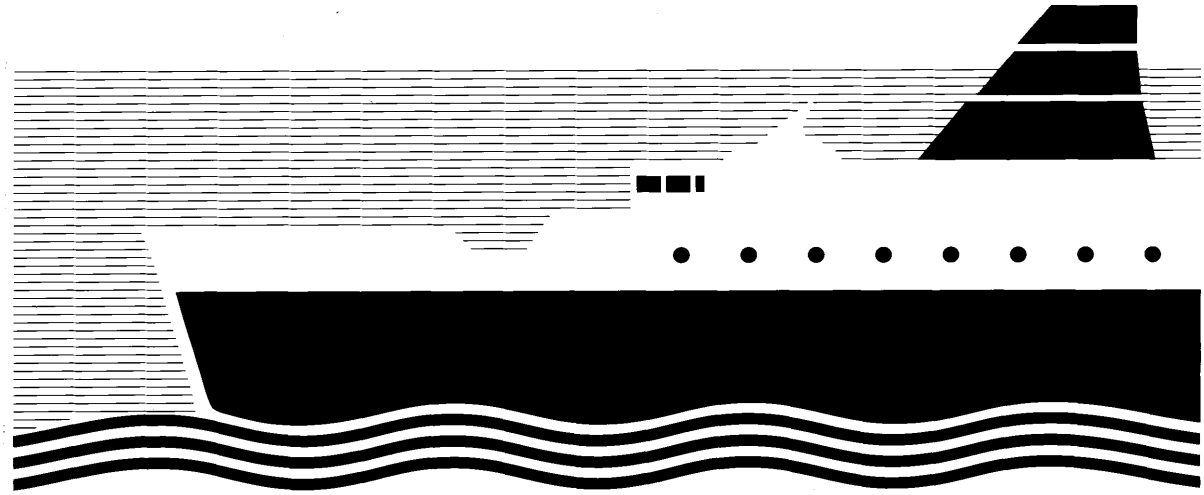
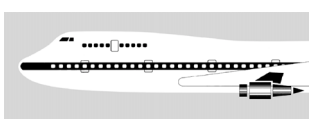
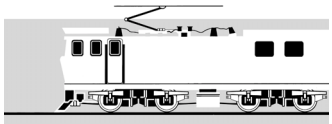


MARINE OCCURRENCE REPORT

05-207 **freight and passenger ferry *Santa Regina* and private launch *Timeless*, collision, off Picton Point, Queen Charlotte Sound** **2 May 2005**


TRANSPORT ACCIDENT INVESTIGATION COMMISSION
NEW ZEALAND

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 05-207

freight and passenger ferry *Santa Regina*

and

private launch *Timeless*

collision

off Picton Point, Queen Charlotte Sound

2 May 2005

Abstract

On Monday 2 May 2005 shortly after 1911, the ferry *Santa Regina* outbound from Picton collided with the inbound private launch *Timeless* in the vicinity of Picton Point, Queen Charlotte Sound. The ship had a Master, 31 crew and 71 passengers on board and the *Timeless* had 2 persons on board.

The bow of the ship struck the starboard side of the launch abaft mid-length, cutting the smaller boat in two. One person on the launch managed to escape from the cabin and climb onto a piece of wreckage to await rescue. The body of the other person on the launch was found about 30 minutes later.

Safety issues identified during the investigation included:

- adherence to the collision regulations
- adherence to the local bylaws
- bridge resource management and the ergonomics of the bridge of the *Santa Regina*.

Safety recommendations were made to the Director of Maritime New Zealand and the Managing Director of Strait Shipping Limited to address these issues.

photograph courtesy of Strait Shipping Limited

The *Santa Regina*

The *Timeless*

Contents

Figures

Abbreviations

°	degrees
AB	able seaman
AIS	automatic identification system
ARPA	automatic radar plotting aid
BRM	bridge resource management
Colregs	International Regulations for Preventing Collision at Sea, 1972 (as amended)
CPP	controllable pitch propeller
ENC	electronic navigational chart
GMDSS	global maritime distress and safety system
GPS	global positioning system
hp	horsepower
IMO	International Maritime Organization
ISM	international safety management
kW	kilowatt(s)
m	metre(s)
mm	millimetre(s)
nm	nautical mile(s)
NMEA	National Marine Electronics Association
POB	persons on board
STCW-95	the International Convention on Standards of Training, Certification and Watchkeeping, 1978 as amended in 1995
T	true (usually used as °T: degrees true)
TR	trip report
VHF	very high frequency

Glossary

abaft	behind or aft of; on the after side of; towards the stern relative to some other object or position
ARPA	automated system to plot and monitor targets on radar. Used by a watchkeeper to assist in collision prevention
athwartships	transversely across a ship
autopilot	a device that automatically controls the steering of a ship on a selected course
bollard pull	a measure of the static pull a vessel can exert
bow thruster	a small athwartships propeller mounted in a tunnel at the forward part of a ship, used to manoeuvre a ship at slow speeds
con (conduct)	direct the course and speed of a ship
course	direction steered by a ship
crosstrees	horizontal spar or platform set midway up a mast, historically to enable a better spread of the shrouds that support the mast
Doppler log	a device that uses the Doppler effect to measure a ship's speed
freeboard	distance from the waterline to the deck edge
gross tonnage	a measure of the internal capacity of a ship; enclosed spaces are measured in cubic metres and the tonnage derived by formula
heading	direction in which a ship is pointing at any moment
helm	the amount of angle that the rudder is turned to port or starboard to steer the ship
ISM Code	International Management Code for the Safe Operation of Ships and for Pollution Prevention adopted by IMO by resolution A.741(18), as amended from time to time
knot	one nautical mile per hour
neap tide	tidal undulation that has the highest low water, and lowest high water, in a series
parallel indexing	the use of a line, drawn either manually or electronically on the screen of a radar, through a fixed target and parallel to the intended track of the vessel at a distance equal to the planned passing distance. Any displacement of the fixed target from the index line indicates that the ship is off track
psychosomatic	relating to the interaction of mind and body

Data Summary

Vessel particulars:

Name:	*Santa Regina*	*Timeless*
Type:	passenger and freight ferry	private launch
Limits:	unlimited	not assigned
Classification:	Lloyds Register of Shipping	none
Length:	129.6 m	10.06 m
Breadth:	22.52 m	2.44 m
Draught	6.06 m	0.6 m
Gross tonnage:	14 588	3.5
Built:	France in 1985	2002
Propulsion:	2 x SEMT Pielstick PC 2.6, 9 L 400 in-line non-reversible diesel engines driving 2 controllable-pitch propellers through clutches and reduction gearboxes	Lombardini, 4-cylinder, 50 hp diesel engine
Service speed:	19 knots	7 knots
Owner/operator:	Strait Shipping Limited	private
Port of registry:	Wellington	Picton
Crew:	32	2

Date and time:	2 May 2005 at about 1911[1]		
Location:	off Picton Point, Queen Charlotte Sound		
Persons on board:	crew:	32	2
	passengers:	71	
Injuries:	crew:	nil	one fatal, one minor
	passengers:	nil	
Damage:	minor scratches to the bow		total loss
Investigator-in-charge:	Captain Doug Monks		

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

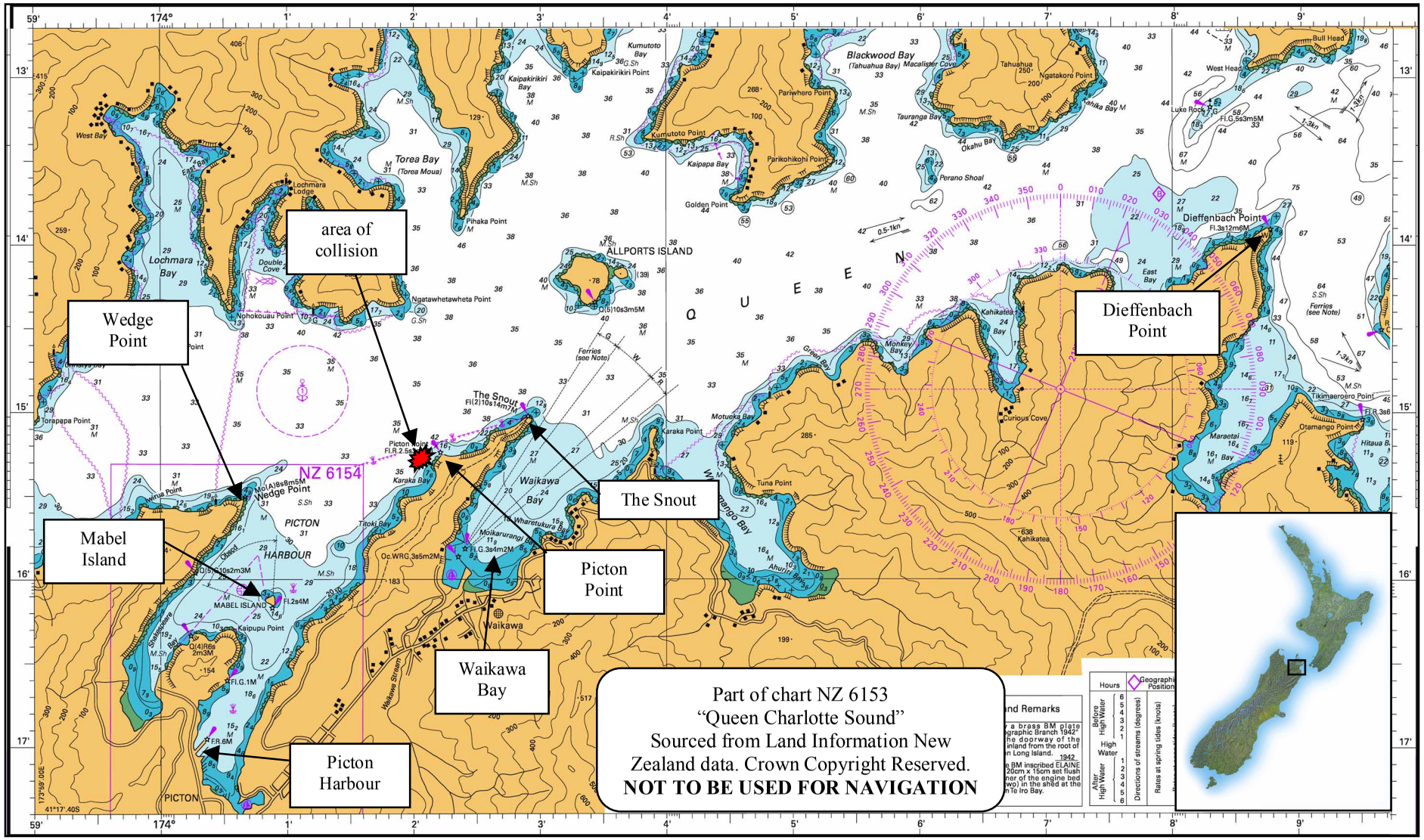


Figure 1
General chart of the area

1 Factual Information

1.1 Narrative

Note The times used in the bridge logbook of the *Santa Regina*, those recorded by the onboard computer for the electronic navigational chart (ENC) system, and those derived from the global positioning system (GPS) were each different. There was no recording of times on the *Timeless*. The actual times involved in the collision sequence were less important to the accident than the chronological order of events. The most reliable record of the order of events was the playback of the ENC log files, consequently this report uses the times from that system. The ENC computer was about one minute slow compared with the times recorded in the logbook, and 2 minutes 4 seconds slow compared with those from the GPS.

1.1.1 Around lunchtime on Monday 2 May 2005, the owner of the private launch *Timeless* and his partner left Picton Marina to go fishing. They anchored near Dieffenbach Point (see Figure 1), where they remained for the whole afternoon. At about 1800, when the weather started to deteriorate, they decided to return to Picton. The owner was conning the boat by eye as they made their way along Queen Charlotte Sound at a cruising speed of about 7 knots.

1.1.2 The roll on – roll off passenger and freight ferry *Santa Regina* had arrived at Picton from Wellington at 1604 that day. It disembarked its passengers and discharged its cargo before loading for the return trip. At about 1850, all the cargo had been loaded and the passengers embarked ready to depart for Wellington.

1.1.3 At 1851, the Mate/Master, who had assumed command of the ship at 1800, tested the bridge equipment in preparation for sailing and gave the duty engineer 10 minutes' notice of sailing. The Second Mate, who was the duty officer, together with the Deck Officer Trainee had been supervising the loading of the ship. Once all the cargo and passengers were onboard, the Bosun and crew lifted the stern ramps and closed the stern doors. The Deck Officer Trainee made his way to the bridge at about this time. The Second Mate called the Mate/Master on the bridge, using an ultra high frequency intraship radio, to inform him that the stern doors were closed; the Mate/Master confirmed that the stern door indicator lights on the bridge showed that the doors were securely closed. The Second Mate made his way from the vehicle deck to the bridge.

1.1.4 At 1901 the Mate/Master took control of the engines and ordered the forward and aft mooring parties to let go the ship's lines. The Deck Officer Trainee was on the bridge by this time. By 1902 all the mooring lines were clear and the Mate/Master started to move the ship out of its berth. At about this time the Second Mate arrived on the bridge. The Second Engineer was also present on the bridge but was making a personal cellphone call and did not play any part in the operation of the ship.

1.1.5 The Mate/Master engaged the autopilot and was manoeuvring the ship from the forward conning position. Within 2 minutes, the ship had reached 10 knots and was coming around onto its planned course of 032°(T). A small boat showing a red sidelight passed close down the ship's port side at speed. This boat was later identified as the water taxi *Cougar 1*.

1.1.6 By the time the ship was abeam Mabel Island at shortly after 1907, the heading was 030°(T) and the speed 16.5 knots. At about this time, the Mate/Master said he saw ahead a red light at an estimated distance of between one mile and one and a half miles. This light was later identified as the private launch *Timeless*. The Mate/Master asked the Deck Officer Trainee if he could see a target on the JRC radar. Soon afterwards the Deck Officer Trainee identified a faint echo just under a mile ahead, possibly slightly to starboard. The Deck Officer Trainee also looked out of the window, and saw a red light fine to starboard; soon, however, the light appeared to move across to be fine on the port bow but still showing a red light. On hearing the conversation between the Mate/Master and the Deck Officer Trainee, the Second Mate went to the JRC radar to oversee the Deck Officer Trainee, who continued to watch and report on the approaching target. The Deck Officer Trainee was not aware whether the apparent movement of the light from the starboard to the port bow was due to the movement of the *Timeless* or the result of an alteration of the course of the *Santa Regina* by the Mate/Master.

1.1.7 When the *Timeless* was about 0.8 miles ahead, the Deck Officer Trainee saw both its red and green sidelights. Soon afterwards the Deck Officer Trainee told the Mate/Master that the target was 0.6 miles ahead, and the Mate/Master turned the control wheel on the autopilot to alter the ship's course by between 5 and 10 degrees to starboard to around 040°(T). At about this time the Mate/Master sounded 5 short blasts on the ship's whistle. To the bridge team of the *Santa Regina* it seemed that soon after the whistle signal, the *Timeless* altered course to port in front of the ship that was still turning to starboard. The Mate/Master realised that a collision was imminent and adjusted the control wheel on the autopilot further to starboard; the autopilot applied its pre-set maximum helm of 15° to starboard. At about the same time he put the engine controls to full astern, changed the helm over to manual steering and used the steering control on the wandering lead to apply hard to starboard and requested the Second Mate to sound the ship's whistle, which he did with a long blast.

1.1.8 The bridge team lost sight of the launch under the *Santa Regina*'s bow and although they did not hear or feel the impact, they realised, when wreckage was seen off the starboard side of the ship, that the 2 vessels had collided. The impact had cut the launch in two and appeared to have pushed it under the water. The Skipper's partner, who had been standing on the port side at the front of the cockpit next to the Skipper, found herself underwater, but was able to feel her way around the windows until she found the centre forward one, which was open, through which she was able to escape the boat. She managed to clamber onto some flotsam to await rescue and while waiting she repeatedly called out for her partner, without getting any reply.

Figure 2
A boat similar to the *Timeless* showing the window through which the partner escaped

1.1.9 The *Santa Regina* continued to turn to starboard as its speed degraded until at about 1913, when the ship stopped and started to make sternway. The bow of the ship came to within about 125 m of the shore (see Figure 6).

1.1.10 Following the collision, the Mate/Master of the *Santa Regina* had the Second Mate make radio calls to Picton Harbour Radio and Picton Maritime Radio to inform them. The crew launched the ship's lifeboat and started to search the debris off the starboard side of the ship. From her calls for help, it was apparent that there was a female survivor, but before they picked her up they checked the immediate area to see if they could find anyone else in the water, without success. When they picked up the survivor, she told them that there had been 2 people on the launch, and that the other was her partner who had been the Skipper and owner of the launch.

1.1.11 A number of other vessels, including the water taxis *Cougar 1* and *Westbay*, the dive tender *First Light*, the coastguard vessel *Interisland Rescue*, the tug *Nautilus* and the barge *Rongawai*, were requested to assist in the search and rescue operation. The survivor, although coherent when rescued, soon started to show signs of shock and hypothermia, and was transferred onto one of the water taxis and taken to Picton from where an ambulance took her to hospital. The search for the Skipper continued, and at about 1945 one of the lookouts on the bridge of the *Santa Regina* sighted the Skipper's body floating close to the starboard side of the ship. The body was recovered by one of the searching water taxis and taken to Picton where an ambulance was waiting.

1.1.12 The ship's lifeboat was recovered and the ferry returned to Picton and disembarked its passengers and cargo. The ship remained in Picton while investigations into the collision were started.

1.1.13 During the night the barge *Rongawai* managed to recover most of the wreckage of the *Timeless*, which was taken to a secure site for inspection.

1.2 Actions onboard the *Timeless*

1.2.1 During the trip back to Picton, the Skipper was conning the vessel from behind the steering wheel, situated on the starboard side at the front of the cabin. Although there was light rain a centre forward window was clamped open to allow air into the boat.

1.2.2 The sidelights and the all-round white light at the masthead had been turned on for the trip back to Picton. The partner said all the cabin lights were off during the trip back, remembering this clearly because she had needed a torch to use the compact disc player.

1.2.3 On the trip back, the Skipper had been pointing out various navigation lights to his partner, including The Snout and Picton Point. In between times she had been tidying the cabin. Although not paying particular attention to the navigation of the boat, she did remember that as they rounded The Snout she could see the lights of Picton Harbour and the *Santa Regina* just leaving its berth.

1.2.4 The partner said that she thought the *Santa Regina* was further to the west than was normal and that the ship appeared to alter course towards them when they were 4 or 5 ship lengths away (about 520 to 650 m, or 0.3 to 0.35 nm). She was also of the impression that the *Timeless* was nearer Wedge Point on the western side of the entrance to Picton Harbour rather than Picton Point on the eastern side.

1.2.5 The partner said that she heard a single long blast from the *Santa Regina*'s whistle when it was 4 or 5 ship lengths away and it was at that point the Skipper realised they were in immediate peril and said "what are they doing, they can't see us, they are coming straight for us". She said that he increased engine speed and turned to port and that he said he realised he was turning the wrong way, but thought that it would give them the best chance of avoiding the ship. About 10 or 15 seconds later the vessels collided, with the bow of the *Santa Regina* slicing into the *Timeless* abaft its starboard beam.

1.3 Topography and local traffic

1.3.1 Picton Harbour lies on the south side of Queen Charlotte Sound, and is guarded at its entrance by Wedge Point to the west and The Snout to the east. The port and town lie at the head of the Harbour, about 1.7 nm from the entrance. The Harbour is divided into 2 natural bays, Picton Harbour to the east and Shakespeare Bay to the west. A small island, Mabel Island, is located midway between the bays and about 1 nm from the port.

1.3.2 Admiralty Sailing Directions NP 51, the New Zealand Pilot, carried the caution that at night, due to background lighting, it is difficult to distinguish vessels moving in the port area.

1.3.3 In May 2005, there were 5 ferries operating between Wellington and Picton, each completing 2 or 3 round trips per day. In addition, deep-sea cargo vessels called at Picton and Shakespeare Bay, and numerous fishing boats, charter vessels and water taxis operated throughout the Marlborough Sounds. As well as the commercial shipping, there was a very strong presence of many types of privately owned recreational boats in the area, including self-drive launch and yacht charters. Marinas were situated in Picton and Waikawa, the next bay to the east, with many more moorings throughout the Sounds. Inevitably there was conflict between the different operations, particularly the ferries and the private boats.

1.3.4 The busy waterways of Tory Channel and Queen Charlotte Sound gave rise to many close-quarter situations and near misses. Consequently in 2002, the new Marlborough District Council Navigation Bylaws specifically addressed the issue by decreeing that vessels under 500 gross tonnes should not impede the progress of any ship of 500 gross tonnes or more while navigating within harbour limits.

1.3.5 Even with legislation in place, close-quarter situations continued to occur frequently. In the 9 months from the beginning of the year to 30 September 2005, there were 13 reported close-quarter situations, predominantly between ferries and private vessels. Anecdotally, ferry masters say close-quarter situations occur frequently, but are often not reported as they are seen as "part of the job".

1.3.6 In many of the reported close-quarter situations, the identity of the smaller vessel could not be established. But even if the name of such a vessel was determined, the contact details of its owner or skipper usually remained unknown.

1.3.7 The collision between the *Santa Regina* and the *Timeless* has focused the ferry masters' attention and 11 of the 13 reported close-quarter situations had been reported after this collision occurred.

1.4 Vessel information

The *Santa Regina*

1.4.1 The *Santa Regina* was a passenger and freight ferry operated by Bluebridge, a division of Strait Shipping. The *Santa Regina* was built in 1985 in France. Strait Shipping purchased the vessel in 2002. The ship was certificated to carry a total of 367 passengers and vehicular cargo. The ship was in class with Lloyds Register of Shipping. The ship traded on a scheduled service between Wellington and Picton with a service speed of 19 knots.

1.4.2 The *Santa Regina* was powered by 2 SEMT Pielstick diesel engines producing 11 322 kW power driving 2 controllable-pitch propellers (CPP). Two rudders provided steering, one aft of each propeller. The *Santa Regina* also had 2 bow thrusters, each with a maximum power rating of 500 kW, giving a combined bollard pull of about 13.5 tonnes.

1.4.3 The manoeuvring data for the *Santa Regina* gave the following information for the ship when it was travelling at full service speed of 19 knots:

- full ahead to stopped in the water — 0.358 nm or 663 m or 5.1 ship lengths
- time to stop — 2 minutes and 37 seconds
- turn to starboard — diameter of turn 0.32 nm or 593 m

The *Santa Regina* was travelling at about 17 knots, slower than the full service speed, and the autopilot restricted the maximum helm to 15°, until manual steering was engaged. Consequently the actual manoeuvring characteristic of the ship on the night of the accident would have differed from the data quoted.

1.4.4 The navigating bridge of the *Santa Regina* was equipped with:

- a Decca S2690 B/T Bridgemaster radar with automatic radar plotting aid (ARPA) function
- a JRC JMA 7000 radar
- 2 GPS, one Racal, one Leica
- an Anschutz Compilot 8 autopilot
- a C Plath LMP HSC autopilot
- an ENC system running Endeavour 5 software
- a Sailor global maritime distress and safety system (GMDSS)
- a Sailor KDU 1905 automatic identification system (AIS)
- 2 Simrad echo sounders
- a Sailor RT 5022 very high frequency (VHF) radio transceiver
- a Navtex receiver
- a Doppler log
- portable searchlights.

The bridge was also equipped with the controls for:

- CPPs
- main engines and generators
- steering gears
- whistles
- navigation lights
- car deck fans
- watertight doors
- fire detection and pumping arrangements.

1.4.5 The design of the navigating bridge (see Figure 3) had the major controls for the CPPs, engines, bow thrusters etc. located on a console situated at the bridge front, to starboard of the centreline. The two radars were located at the front of the bridge, but to port of the centreline. The main helm station was on the centreline midway between the front and back of the bridge. Another console with switches and indicators for fans and lights was situated to starboard of the helm station. The chart table, which had the echo sounder and one of the GPS units, was to port of the helm station. The stability computer was next to the chart table.

1.4.6 One of the ship's whistles was situated on the foremast, and the other under the crosstrees of the radar mast situated above the bridge (see Figure 4). The horns of each of the whistles faced forward, concentrating the sound in that direction. The controls for the whistles were located on the starboard side of the console about 6 m from the helm stations on the centreline. The control allowed selection of the forward, aft or both whistles, an all-round white light that flashed in synchronisation with the whistle, and a selector for the automatic fog signal. A manual whistle button and a button to start the automatic fog signal were incorporated into the control panel. Immediately above the control panel there were independent operating buttons for each of the whistles. In addition, there were whistle-operating levers on each bridge wing. There was a mechanically operated wire and handle extending from the deckhead above and behind the helmsman station that was directly connected to the aft whistle, but this was inoperable.

1.4.7 The passenger lounge on the upper deck was situated about 70 m and 40 m abaft the forward and aft whistles respectively.

1.4.8 A conning station had retrospectively been fitted on the centreline at the bridge front forward of the main helm station. At this conning station were the ENC monitor, the C Plath autopilot, the AIS, and the Leica GPS receiver that was interfaced with the other 3 pieces of equipment.

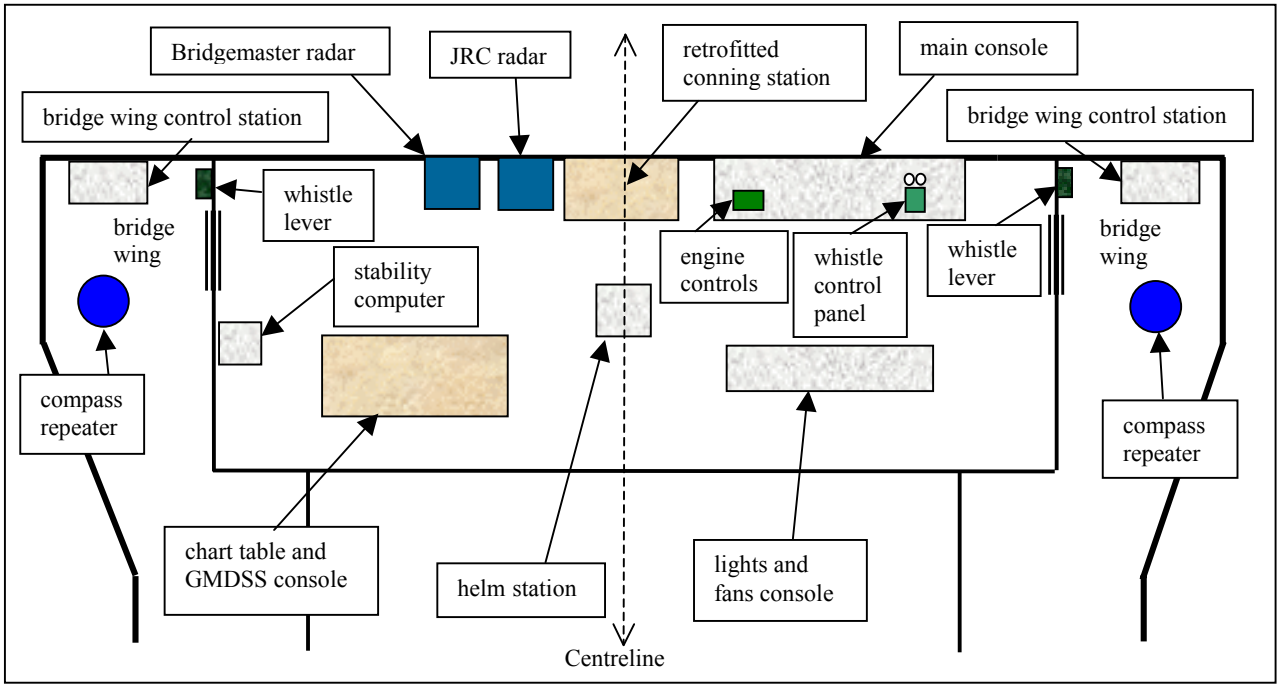


Figure 3
Bridge layout of the *Santa Regina* (not to scale)

1.4.9 The 2 autopilots operated independently, but the C Plath was switched through the Anschutz at the main helm position. The Anschutz autopilot was a traditional type with an analogue display where turning a knob in the centre of the compass display set the desired course. Conversely, the C Plath was more modern with a digital display, the desired course being "dialled up" on a small wheel. The C Plath had more functionality; being able to accomplish radius turns, and being interfaced with the GPS and the ENC it could automatically follow a route, but it was not being used in the route-following mode during the accident. On each autopilot different parameters could be selected for sensitivity of the automatic systems, including the maximum helm to be used, routinely set at 15°.

1.4.10 The ENC system used the GPS data to provide accurate positional information so that the ship's position could be displayed on the appropriate chart. The data from the GPS included positional information, date, time, speed and heading. The ENC stored the data in log files that could be readily downloaded. After the accident, the log files for the period leading up to and after the collision were downloaded. The manufacturer of the ENC display program produced a video playback of the *Santa Regina*'s track from those log files.

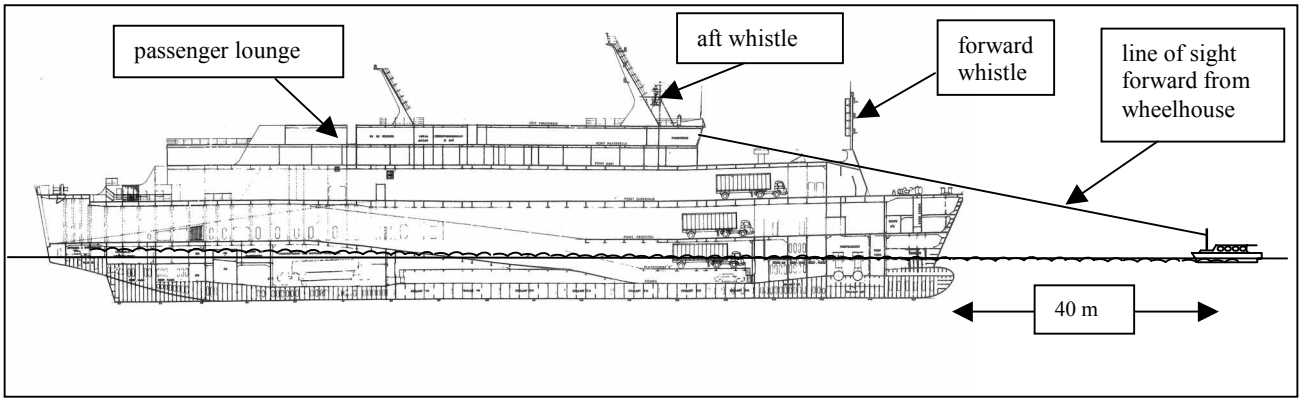


Figure 4
Profile of the *Santa Regina* showing the position of the whistles and the ahead visibility from the bridge (approximately to scale)

1.4.11 At the time of the collision Maritime Radio in Avalon, Lower Hutt, was trialling an AIS tracking system for the Cook Strait area using software similar to that used in the ENC system on the *Santa Regina*. Downloads and screen prints from the AIS system were comparable with the information gathered from the ship's ENC. There was a large time discrepancy (7 hours 50 minutes) in the Maritime Radio AIS system, probably through an inaccurate computer clock, but the track of the *Santa Regina* could be clearly distinguished.

1.4.12 The *Santa Regina* complied with the International Safety Management Code and had the appropriate documentation. Part of that documentation was a Navigational Route Guide that contained the company's approved passage plans. The company had provided a copy of the passage plans to the Marlborough District Council Harbourmaster as required by the Marlborough District Council Navigation Bylaws. To accompany the Route Guide, a set of parallel index check cards had been provided. A minor discrepancy existed in the Picton to Wellington passage plan, where the bearing and distance off when abeam Picton Point on a course of 032°(T) was specified as 122°(T) at 0.25 nm, but the remarks column indicated that the parallel index should be set to 0.28 nm, which was the distance prescribed in the Marlborough District Council Navigation Bylaws. The parallel index chart for the course out of Picton Harbour used 0.17 nm off Titoki Bay as the reference and not Picton Point as implied by the route guide. The actual course made good by the *Santa Regina* on the night of the collision resulted in Titoki Point being passed at 0.18 nm, which would, had the ship not deviated from its course, have resulted in it passing Picton Point at about 0.28 nm, the same as that prescribed in the Bylaws.

The *Timeless*

1.4.13 The *Timeless* was built by Logan Classic Boats as a replica of a 1912 vintage motor launch. The boat builder took moulds from an original launch, and produced replica hulls using fibreglass resin. The builder offered various options when he supplied the hulls; purchasers could buy the hull alone or any combination through to a complete boat.

1.4.14 In 1998, the original owner of the *Timeless* had bought the hull, complete with front deck and front cabin already fitted. He had spent the following 4 years finishing and outfitting the boat. Apart from the fibreglass construction of the hull and superstructure, the majority of other large structures were made of wood.

1.4.15 The *Timeless* had a 4-cylinder Lombardini diesel engine, developing 50 hp, which drove a 3-bladed fixed-pitch propeller through a reversing gearbox. The engine control was via a single lever situated on the forward bulkhead, to port of the steering wheel; the lever was pushed up to go ahead and pulled down to go astern. The wreckage of the *Timeless* was returned to Picton on a barge; the main part of the hull was carried inverted on the deck of the barge. When the wreckage was brought ashore the control lever was found to be level with the top of the cabin front, close to the neutral position.

1.4.16 The *Timeless* was fitted with a 12-volt direct current electrical system running off 2 lead acid batteries, which were charged by an alternator attached to the main engine. The electrics were controlled from a switchboard on the after bulkhead of the forward cabin (see Figure 5). There were switches and fuses for 6 circuits: the refrigerator, fresh water pump, cabin lights, radios, navigation lights and anchor light. The cabin lights were individually switched locally in the cabin. In addition, there were switches at the helm station for wiper, autopilot, winch and blower.

Figure 5
Switchboard located in the forward cabin and helm station switches

1.4.17 When the wreckage was recovered the police noted the position of each of the switches and also determined the condition of each of the fuses. Later, relevant bulbs and electrical items were checked. Table 1 details the switch positions and the state of the fuses and bulb filaments.

Item	Switch position	Fuse	Operation of item/ state of bulb filament
master battery isolating switches (2)	both on	n/a	
individual battery isolating switches	both on	n/a	
refrigerator	off	intact	
fresh water pump	off	intact	
cabin lights	on	intact	individual light switches off. Partner confirmed cabin lights were off. Filaments from 5 lights from the forward and main cabin examined and all found intact
AM/FM radio (stereo)	on	intact	not known but CD in player
VHF radio			switched off
navigation lights	on	blown	starboard sidelight filament intact. Both sidelights seen during the time before the collision
anchor light (also used as an all-around white masthead light)	on	intact	filament intact. Light noted by rescuers to be working after the collision
wiper	off		
autopilot	off		
winch	not known		
blower	not known		
ignition switch	off		may have been turned off during recovery of the wreckage.
engine revolution indicator			jammed at 1800 RPM
bilge pump	on/automatic	blown	
GPS/chart plotter			partner confirmed this not operational
engine control	n/a		in forward gear, just above neutral

Table 1
Position of electrical and control equipment of the *Timeless* when it was recovered

1.5 Log files' video playback information

1.5.1 The log files and the video representation of those log files showed the *Santa Regina*'s position, heading, track and speed from the time it left Picton until after the collision. Also available on the log files were AIS signals from other ships. It was possible to record radar data in the log files, but this function was not operating at the time of the collision, so the radar track of the *Timeless* was not recorded.

1.5.2 There was a little over 2 minutes' discrepancy between the log file times sourced from the ENC computer's internal clock and the time from the GPS data stream in the log file. The time from the GPS is continually updated and would be accurate, whereas computer clocks are more likely to be inaccurate. The manufacturer of the ENC system said that the computer running the ENC system was not dedicated solely to the ENC but was used for other computer programs. Consequently, if the GPS time was used to update the computer time, other programs on the computer might have been compromised. As previously stated, for consistency this report uses the times from the log files, which varied from those in the logbook and those from the GPS.

1.5.3 After the *Santa Regina* cleared the berth at Picton the Mate/Master steadied the ship on a heading of about 030°(T) and increased speed (see Figure 6 and Table 2). By the time the ship was abeam Mabel Island it had attained a speed of 16.5 knots. At 190931(hours minutes seconds) the ship started to alter course slowly to starboard and within a minute the ship's head had come round to 039°(T). At 191048 the speed of the ship started to reduce and continued to do so over the next 2 minutes until the ship had stopped and started to pick up sternway. Also over the same period, the ship's head had continued to turn to starboard until the sternway negated the rudders and the ship steadied on a heading of about 130°(T).

1.5.4 The playback information and the evidence of the bridge team placed the *Timeless* off Picton Point when the *Santa Regina* first altered course to starboard at a distance of a little over 0.6 nm between the vessels. The speed of the *Santa Regina* did not start to reduce for another minute and 18 seconds.

1.5.5 When the *Santa Regina* stopped making headway, the GPS aerial was about 165 m from the shore just south of Picton Point. The bow was about 40 m from the bridge approximately where the GPS aerial was mounted, so the bow of the ship came to within about 125 m of the shore.

1.6 Legislation and bylaws

1.6.1 The Marlborough District Council Navigation Bylaws 2002, Part 3 Ships, Masters and Pilots gave directions for navigation within Queen Charlotte Sound. Section 3.2 stated:

> (i) In addition to the radio calling requirements as set out in clause 3.3 '**Tory Channel**' the following shall apply:
>
> (a) The master of every commercial ship shall, prior to entering Queen Charlotte Sound limits, call 'Picton Harbour Radio' on marine VHF Channel 19 and report the intention of the ship to enter harbour limits. Such ships shall maintain a listening watch on marine VHF Channel 19 whilst within harbour limits.
>
> (b) The master of every commercial ship when making the call to Picton Harbour Radio as required in (i) (a) of this clause, will advise Picton Harbour Radio whether the ship is carrying dangerous goods.
>
> (c) For the purposes of these Bylaws, that part of Queen Charlotte Sound forming Tory Channel, from Dieffenbach Point to East Head, shall be deemed to be a narrow channel in accordance with Maritime Rules Part 22.9 – Collision Prevention, Narrow Channels and the provisions of that Rule shall apply.
>
> (d) The Master of every ship shall keep as far to the sides of navigable channels as is practicable.
>
> (e) The Master of every ship which is less than 500 gross tonnes shall not impede the progress of any ship of 500 gross tonnes or more while navigating within harbour limits.

1.6.2 The harbour limits were defined in Schedule 1 of the Bylaws, but generally they encompassed the entire waters of Marlborough within a line that extended from Cape Soucis in the west, around Stephens Island to the north and down to Willawa Point in the east. They included Tory Channel, Queen Charlotte Sound and Picton Harbour.

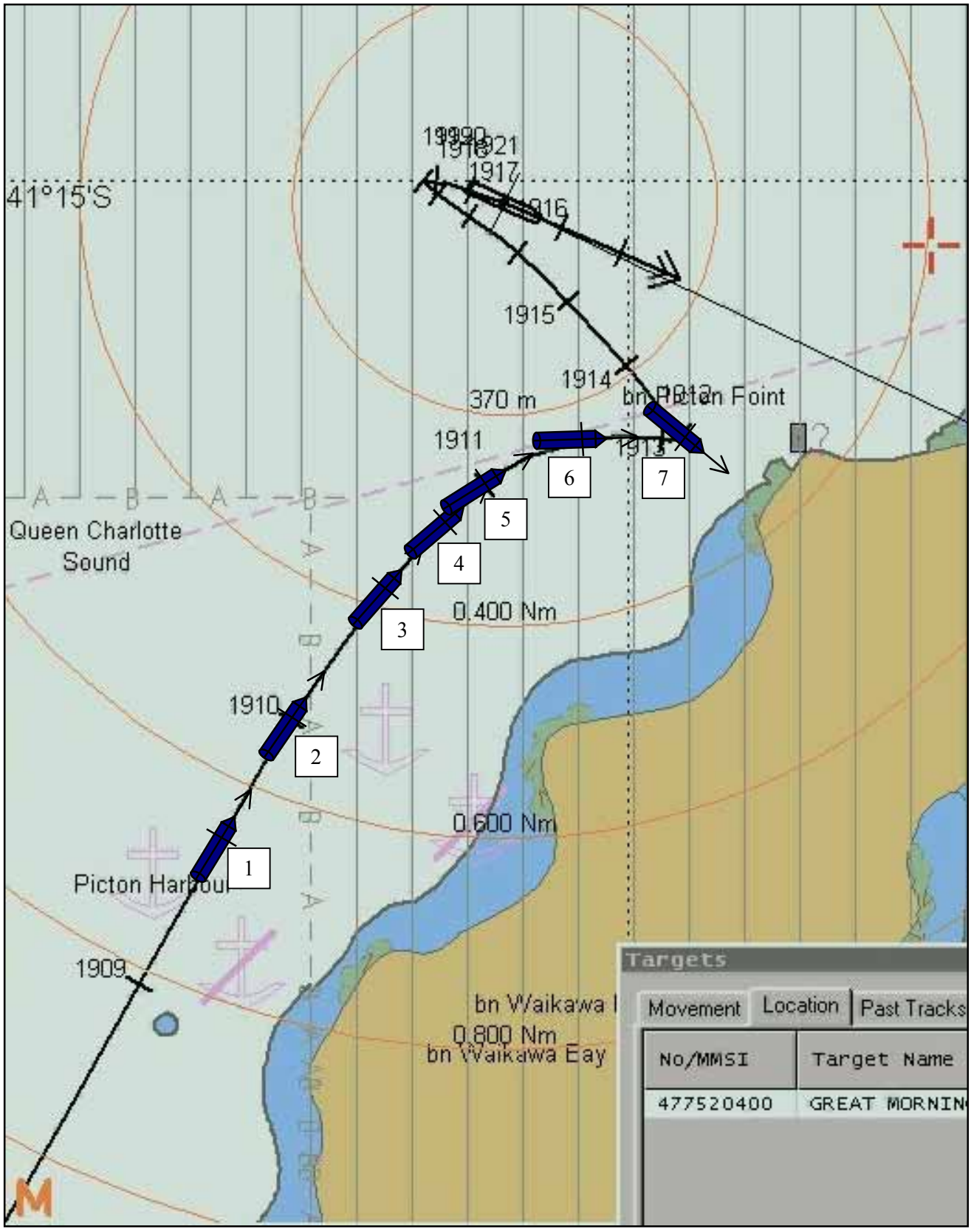


Figure 6
A screen capture from the video playback of the ENC data, showing the track of the *Santa Regina* up to and immediately after the collision

Note: The vessel positions are those for notable events and the periods between them are unequal and not intended to indicate vessel speeds.

Position number	Time from computer (hhmmss)	Latitude ° ' S	Longitude ° ' E	Heading °(T)	Course over ground °(T)	Course made good °(T)	Speed over ground knots	Speed made good knots	Comments
	190155	41 17.00	174 00.35	043	116	129	0.1	0.0	The *Santa Regina* leaving the berth
	190300	41 16.96	174 00.41	045	047	047	5.3	4.8	The *Santa Regina* clearing the long arm
	190715	41 16.19	174 10.07	030	029	029	16.5	16.5	The *Santa Regina* abeam Mabel Island
1	190931	41 15.63	174 01.48	031	029	029	17.3	17.3	The *Santa Regina* starting to alter course to starboard to avoid the *Timeless,* which was probably passing Picton Point about 0.6 nm ahead
2	191000	41 15.51	174 01.57	035	032	031	17.4	17.4	
3	191030	41 15.39	174 01.69	039	037	036	17.4	17.4	
4	191048	41 15.33	174 01.76	047	042	039	17.3	17.4	The *Santa Regina* speed reducing
5	191100	41 15.29	174 10.81	057	046	045	17.1	17.2	The *Santa Regina* rate-of-turn increasing and speed slowly reducing. Collision occurred soon after this time
6	191130	41 15.24	174 01.96	088	076	071	11.9	13.2	Picton Point bearing 095°(T) at 350 m
7	191241	41 15.25	174 02.07	130	005	066	0.6	1.1	The *Santa Regina* stopped and starting to make sternway. Bow approximately 125 m from shore ahead
	191500	41 15.11	174 01.93	132	318	318	4.4	4.5	The *Santa Regina* sternway easing

Table 2
Key to notations on Figure 6

1.6.3 Part 3.4 (i) of the Bylaws specified distances off salient points. Of relevance to this investigation were:

Bearing and distance from:	Minimum	Maximum
Mabel Island Light	090°(T) x 0.1 nm	090°(T) x 0.16 nm
Picton Point Light	344°(T) x 0.28 nm	323°(T) x 0.52 nm

Part 3.4 (iv) required:

(iv) The pilot or master (if pilot exempt) of every ship of 500 gross tonnes or more must navigate his ship at a proper speed not exceeding 12 knots in Picton Harbour when south of 41° 16'.16 south.

1.6.4 Part 3.5 General Requirements of the Bylaws required in part that:

(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.

(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.

1.6.5 Part 3.8 Collision Prevention of the Bylaws stated:

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

1.6.6 There was no requirement in any New Zealand legislation requiring a person in command of a private boat to be qualified, or to have had any training, or for the boat itself to be registered. The Marlborough District Council Navigation Bylaws 2002 sections 5.1(i) and 5.3(i) did require that a person operating a powered boat capable of a proper speed of 10 knots be over 15 years of age.

Maritime Rules

1.6.7 The International Regulations for Preventing Collision at Sea, 1972 (Colregs) apply to all vessels upon the high seas and in all waters connected therewith navigable by seagoing vessels. In New Zealand, Maritime Rules Part 22 gives effect to the Colregs. Part 22 provides the steering and sailing rules for ships, as well as standards for the installation, performance and use of lights for collision avoidance and the sound and light signals used for communication of safety information. There were minor editorial changes between the Colregs and Part 22, but the changes did not alter the meaning of the rules relevant to this occurrence.

1.6.8 The sections of the Maritime Rules Part 22 Collision Prevention relevant to this investigation were:

> **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 backscatter 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.

22.9 Narrow channels

(1) A vessel proceeding along the course of a narrow channel or fairway must keep as near to the outer limit of the channel or fairway which lies on its starboard side as is safe and practicable.

(2) A vessel of less than 20 metres in length or a sailing vessel must not impede the passage of a vessel which can safely navigate only within a narrow channel or fairway.

22.14 Head-on situation

(1) When two power-driven vessels are meeting on reciprocal or nearly reciprocal courses so as to involve risk of collision, each must alter its course to starboard so that each passes on the port side of the other.

(2) Such a situation will be considered to exist when a vessel sees the other ahead or nearly ahead and -

(a) by night, the masthead lights of the other vessel are in line or nearly in line and/or both sidelights are visible; or

(b) by day, the corresponding aspect of the other vessel is observed.

(3) When a vessel is in any doubt as to whether such a situation exists, it must assume that it does and act accordingly.

22.16 Action by give-way vessel

Every vessel which is directed to keep out of the way of another vessel must, so far as possible, take early and substantial action to keep well clear.

22.17 Action by stand-on vessel

(1) If one of two vessels is to keep out of the way, the other must keep its course and speed.

(2) As soon as it becomes apparent to the stand-on vessel that the vessel required to give way is not taking appropriate action in compliance with this Part -

(a) it may take action to avoid collision by its manoeuvre alone; and

(b) if it is a power-driven vessel in a crossing situation, if the circumstances of the case allow, it must not alter course to port for a vessel on its own port side.

(3) When, from any cause, the stand-on vessel finds itself so close that collision cannot be avoided by the action of the give-way vessel alone, it must take whatever action will best avoid collision.

(4) This rule does not relieve the give-way vessel of its obligation to keep out of the way.

22.34 Manoeuvring and warning signals

(1) When vessels are in sight of one another, a power-driven vessel underway, manoeuvring as authorised or required by this Part, must indicate that manoeuvre by the following signals on its whistle -

(a) one short blast to mean “I am altering my course to starboard”:

(b) two short blasts to mean “I am altering my course to port”:

(c) three short blasts to mean “I am operating astern propulsion”.

(4) When vessels in sight of one another are approaching each other and for any reason either fails to understand the intentions or actions of the other, OR is in any doubt whether sufficient action is being taken by the other to avoid collision, the vessel in doubt must immediately indicate such doubt by sounding the following signal on its whistle -

at least five short and rapid blasts.

This signal may be supplemented by a light signal of at least 5 short and rapid flashes.

(6) If whistles are fitted on a vessel at a distance apart of more than 100 metres, one whistle only must be used for giving manoeuvring and warning signals.

22.40 Responsibility

(1) Nothing in this Part will exonerate any vessel, its owner, master, or crew, from the consequences of any neglect to comply with this Part, or of the neglect of any precaution which may be required by the ordinary practice of seafarers, or the special circumstances of the case.

(2) In interpreting and complying with these rules, due regard must be given to all dangers of navigation, collision, and any special circumstances, including the limitations of the vessels involved, that may make a departure from the rules of this Part necessary to avoid immediate danger.

1.6.9 The International Convention on Standards of Training, Certification and Watchkeeping, 1978 as amended in 1995 (STCW-95) contained requirements (amongst others) for the basic principles, guidelines and responsibilities for navigational watchkeeping. Maritime Rules Part 31A, Amendment 1 Crewing and Watchkeeping Unlimited, Offshore and Coastal (Non-Fishing Vessels) implemented New Zealand's obligations under STCW-95 for these principles, guidelines and responsibilities.

1.6.10 The paragraphs of Maritime Rules Part 31A, Amendment 1 relevant to this investigation are:

31A.20 Duty of Master

(1) The master of a ship must ensure that the voyage is planned observing the following requirements:

(a) the intended voyage must be planned in advance, taking into consideration all pertinent information, and any course laid down must be checked before the passage commences.

(c) prior to each voyage, the master of every ship must ensure that the intended route from the port of departure to the first port of call is planned using adequate and appropriate charts and other nautical publications, that contain accurate, complete and up-to-date information regarding those navigational limitations and hazards which are of a permanent or predictable nature and which are relevant to the safe navigation of the ship on the intended voyage.

(d) prior to each passage, the master must verify the planned route taking into consideration all pertinent information:

(e) the verified planned route must be displayed clearly on appropriate charts and must be available continuously to the officer in charge of the watch.

31A.21 Duty of Officer in Charge of a Navigational Watch

An officer in charge of a navigational watch on a ship must -

(a) verify each course to be followed before using it; and

(b) carry out his or her navigational watchkeeping duties in accordance with the directions of the master; and

(c) in carrying out watchkeeping duties -

(i) when the ship is at sea, have regard to the requirements and operational guidelines for navigational watchkeeping set out in Appendix 1; and...

Appendix 1 - Navigational Watchkeeping at Sea

(1) The master of every ship must ensure that watchkeeping arrangements are adequate for maintaining a safe navigational watch. Under the master's general direction, the officers of the navigational watch are responsible for navigating the ship safely during their periods of duty, when they will be particularly concerned with avoiding collision and stranding.

(8) Performing the navigational watch

(b) The officer in charge of the navigational watch must, during the watch, check the course steered, position and speed at sufficiently frequent intervals, using any available navigational aids necessary, to ensure that the ship follows the planned course.

(c) The officer in charge of the navigational watch must have full knowledge of the location and operation of all safety and navigational equipment on board the ship and must be aware of and take account of the operating limitations of such equipment.

(e) Officers of the navigational watch must make the most effective use of all navigational equipment at their disposal.

(l) The officer in charge of the navigational watch must bear in mind the necessity to comply at all times with the steering gear requirements in Part 23. The officer of the navigational watch must take into account -

(i) the need to station a person to steer the ship and to put the steering into manual control in good time to allow any potentially hazardous situation to be dealt with safely; and

(ii) that with a ship under automatic steering it is highly dangerous to allow a situation to develop to the point where the officer in charge of the navigational watch is without assistance and has to break the continuity of the look-out in order to take emergency action.

1.7 Personnel information

1.7.1 The Mate/Master of the *Santa Regina* went to sea in 1963 as a deck cadet. He gained his master foreign going certificate in 1973. In 1979 he was appointed as a pilot and Deputy Harbourmaster of the Southland Harbour Board, being promoted to Harbour Master, Chief Pilot and Operations Manager in the next few years. In 2000, he joined Strait Shipping and after a period as Third and Second Mate was appointed Mate/Master. In December 2002, when the *Santa Regina* was brought into operation he was transferred to that vessel as Mate/Master. At the time of the collision the Mate/Master held pilot licences for Bluff and Fiordland and pilotage exemption certificates for Wellington and the Marlborough Sounds.

1.7.2 The Second Mate of the *Santa Regina* started work at an Outward Bound facility from 1996, where he operated a launch. From there he worked on the *Spirit of New Zealand* sail training ship as First Mate for 4 years. He gained local launchmaster, commercial launchmaster and New Zealand coastal master certificates before joining Strait Shipping as a Deck Officer Trainee in 2001. In 2003 he gained a Second Mate foreign going (Class 3 Deck Officer) certificate and had been serving as Second Mate since July 2003.

1.7.3 The Deck Officer Trainee joined the Royal New Zealand Navy in 1983, where he spent 2 years as a rating. After he left the Navy, he sailed on various vessels connected with the oil exploration industry as an able seaman (AB) and crane operator. In 2000, he worked as an AB on a fast catamaran ferry between Wellington and Picton. In July 2001 he joined Strait Shipping as an AB and later, when he started to study for a Second Mate foreign going certificate, he was designated a Deck Officer Trainee.

1.7.4 The owner and Skipper of the *Timeless* had, earlier in his life, been an engineer in the British Merchant Navy, but had left the sea many years ago. In the early 1990s, when he was living in Wellington, he had built his own 30-foot launch and had attended a New Zealand Coastguard boatmaster's course, but had not sat the examination. He had used that launch regularly around the Mana area until 2001 when he retired to Picton, bringing the boat to the Marlborough Sounds. His partner estimated that over the previous 4 years they had been on trips around the Sounds weekly, if not more often. About 6 weeks before the collision he had bought the *Timeless*, which was delivered to Mana by road transport, from where the owner, his partner and another friend sailed it to Picton. Since then, the Skipper and partner had been out 5 or 6 times in the launch.

1.8 Manning on the *Santa Regina*

1.8.1 The deck officer complement of the *Santa Regina* comprised a Master, a Mate/Master, a Second Mate and a Third Mate. Two watches were formed; one included the Master and Third Mate, and the other the Mate/Master and Second Mate. The navigational and cargo duties were divided between the 2 watches. They worked a roster of 4 hours on, 8 hours off, 8 hours on, 4 hours off. The changeover times were 1400, 1800, 0200 and 1000. At the time of this incident the Mate/Master and Second Mate were on duty. The officers worked a 2-week-on and 2-week-off work/leave roster.

1.8.2 The designation of Mate/Master allowed the incumbent to fulfil the role and obligations of Master when the assigned Master was on his rest period.

1.8.3 The complement of the *Santa Regina,* as prescribed in the Minimum Safe Crewing Document issued by the Maritime Safety Authority (the former name of Maritime New Zealand) on 4 June 2004, depended on the number of passengers carried. At the time of the accident there were 71 passengers so the minimum complement was 20. However, there were 32 crew on board at the time of the accident.

1.8.4 At the time of the collision, the bridge of the *Santa Regina* was manned by the Mate/Master, the Second Mate and a Deck Officer Trainee. The usual practice was for the masters of the *Santa Regina* to control the steering: manually as they were leaving the berth using a control box on a wandering lead, and when they were clear of the berth to switch to either the Anschutz or

C Plath autopilot. Consequently, they did not have a helmsman on the bridge, but had one of the crew on immediate standby in a mess room close by, should he be needed for manual steering. As an AB, the Deck Officer Trainee held a steering certificate and as such was available to take the helm should it have been necessary.

1.8.5 On this occasion, after they had cleared the wharf, the Mate/Master changed over to autopilot from the wandering lead. Initially he selected the Anschutz, but almost immediately changed to the C Plath autopilot, at his preferred forward conning position.

1.8.6 The Deck Officer Trainee had been assisting the Second Mate to load the cargo, and arrived on the bridge shortly before or as the ship was moving out of the berth. With the permission of the Mate/Master, the Deck Officer Trainee was using the JRC radar and was plotting the prescribed parallel index lines on the monitor to indicate the clearance of the ship from prominent points of land.

1.8.7 Once the cargo and passenger loading had been completed, the Second Mate supervised and assisted in lifting the ramps and closing the stern doors. When the doors were closed he checked with the bridge that the warning lights indicated that the doors were properly closed. During this time he checked the forward and aft draught remote sensors, the readouts of which were in the ballast room adjacent to the stern doors. He then went to the bridge where he arrived as the ship was clearing the berth. His initial duty, after removing his wet weather gear, was to record the passenger numbers and persons on board (POB) in the logbook. He then advised, using the VHF radio channel 19, Picton Harbour Radio that they had departed, the POB and the Master's name. He then called Maritime Radio, on VHF channel 16 giving them the trip report (TR) with POB and estimated arrival time at Wellington. He then went to the stability computer to calculate the mean draught and freeboard of the ship, and continued completing the post-departure paperwork, while keeping a partial lookout over the chart table island.

1.8.8 As they headed up the Harbour, the Mate/Master discussed with the Deck Officer Trainee whether he could identify a target, a mile to a mile and a half ahead, on the JRC radar. Eventually, after adjusting the sea and rain clutter controls, the Deck Officer Trainee identified an intermittent echo about one mile ahead.

1.9 Bridge resource management and human factors

1.9.1 Over recent years, it has been recognised that effective use of the personnel on the bridge of a ship is necessary to assist its safe navigation, particularly on ships that are frequently operating in confined waters. The system developed for ships, bridge resource management (BRM), is based on cockpit resource management, which was developed to improve the interaction between aeroplane pilots.

1.9.2 BRM requires a detailed plan of the intended passage to be developed, and for everyone involved in the execution of the plan to be briefed on it and to be aware of their expected part in the plan. During the passage, each of the participants is encouraged to challenge any departure, intentional or unintentional, from the plan. A closed-loop system of communications is advocated to minimise the risk of misinterpretation.

1.9.3 When used effectively, BRM can help to eliminate the potential for one-man error, improve the communication between members of the bridge team, and quickly identify where a departure from the intended passage plan has occurred and so prevent it developing into a major occurrence.

1.9.4 Effective BRM requires that all of the bridge team members share a common view of the intended passage plan. Each member needs to be aware of the more critical phases of the voyage and be able to concentrate on their primary function without distraction. Communications should be via a closed-loop system that ensures orders and information are heard and understood. BRM needs to be promoted throughout an organisation to enable it to be effective, and to encourage a culture where challenge and response are the accepted norm.

1.9.5 The Strait Shipping Bridge Operation Manual, dated 26 April 2005, addressed BRM in the following paragraph:

> 4.3.12.1 The vessel is to be operated within the Bridge Resource Management (BRM) system.
>
> (i) Officers are to take an active interest in pilotage waters, familiarising themselves with the main navigational beacons, buoys, marks, leads and landmarks used, and dangers to be expected in that pilotage. They are to assist with the sighting and identification of these marks and shall assist the Master in every way including the plotting of the vessel's position at frequent intervals. The time the vessel passes lighthouses, beacons and buoys shall be recorded.
>
> (ii) Communications between the Bridge Operations Team will be open, interactive, and within a closed-loop.
>
> (iii) Briefings will be made to develop a shared mental model with defined bottom lines and responsibilities, i.e. passage plan with limits.
>
> (iv) Debriefings will be held to look at positive and negative aspects of the team. Preventing repetition of errors, and to look for improvement.
>
> (v) An atmosphere should be created where challenges are expected, made and responded to.
>
> (vi) For problems arising which are not covered by Standard Operating Procedures resources should be pooled to reduce the risk of a one person error accident.
>
> (vii) High workload situations should be managed by delegation.
>
> (viii) Use planning and monitoring to improve situational awareness. Verify and check for missing information.

1.9.6 The Strait Shipping Navigational Route Guide further emphasised the BRM concept in the following paragraph:

> In enclosed waters the Bridge Team is to constantly monitor the actions (conning) and orders of whosoever is in control of the navigation of the vessel and are to question any action that they are unsure of.

1.9.7 Star Cruises, a passenger liner operator, had instigated a stringent BRM system on its ships, which had developed into it becoming a trainer of BRM techniques. Its BRM system had procedures and contingency plans in place for many eventualities, including a ship deviating from its intended track. The system required that at least 2 officers, and in confined waters 3 officers, continually monitor the vessel's track. The design of the bridges on the Star Cruises vessels was of the cockpit style with 2 conning positions, each having access to all major controls and indicators. Star Cruises promoted the use of an autopilot to steer the ship, stating that it generally maintained a course better than a helmsman and allowed controlled radius turns to be performed.

1.10 Climatic conditions

1.10.1 The weather on the night of the accident was overcast with drizzle and heavier rain showers. There was little wind in Picton Harbour.

1.10.2 The visibility of lights was reported moderate to good. The lights of Picton were clearly visible when the *Timeless* rounded The Snout.

1.10.3 The range of tide, as tabulated in the New Zealand Nautical Almanac for Picton, gave a spring range of 1.5 m and a neap range of 0.5 m. The predicted tide for Picton as detailed in the New Zealand Nautical Almanac for 2 May 2005, was:

Low Water		High Water	
1517	1.0 m	2048	0.4 m

1.10.4 The predicted range was 0.6 m, and therefore closer to a neap tide. There was little or no tidal flow in Picton Harbour.

1.10.5 Sunset for Picton on 2 May 2005 was at 1734. The moon set at 1433. Consequently, there was no natural light at the time of the collision.

1.11 Damage

1.11.1 The *Santa Regina* suffered negligible damage, with some paint transfer from the *Timeless* and scratches to the paintwork at the bow (see Figure 7). Lighter abrasions were noted along each side of the hull, but none could positively be attributed to this accident.

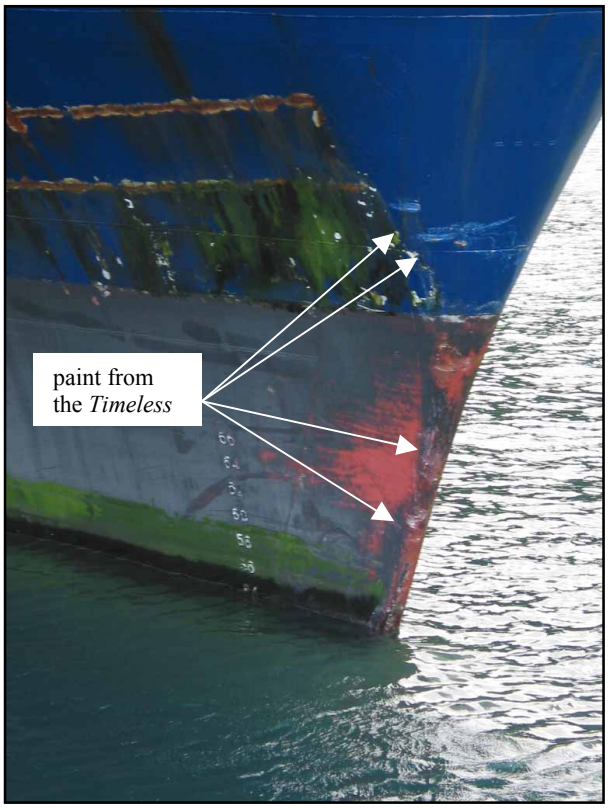


Figure 7
Bow of the *Santa Regina*

1.11.2 The *Timeless* was destroyed. The hull was split in two about two thirds of the length from forward (see Figure 8). The cabin roof was detached from the hull and separated into 2 parts at the rise of the roof, the windows were torn off and separated from the roof and hull, and the interior demolished. The propeller drive shaft that ran about three quarters of the boat's length from the engine compartment in the forward cabin to where it joined the tail end shaft, was bent nearly at right angles about 500 mm from its after end (see Figure 9). The rudder was completely missing. The hull had blue paint on it where it had come in contact with the *Santa Regina*'s hull.

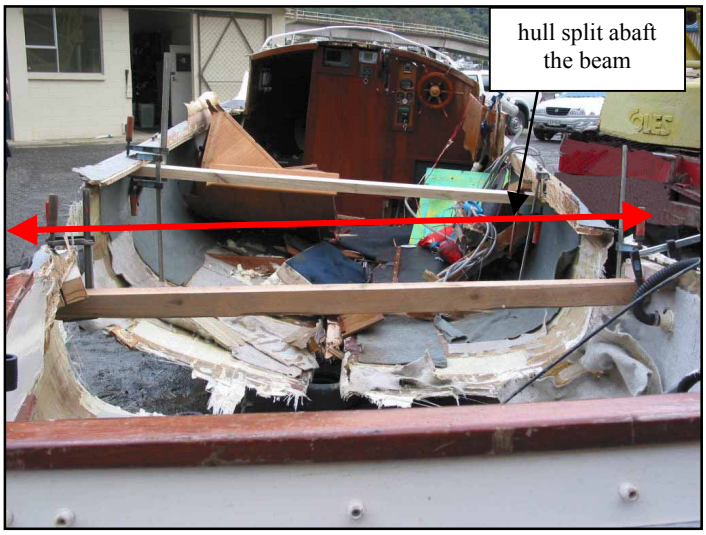


Figure 8
Hull of the *Timeless*

Figure 9
Propeller shaft from the *Timeless*

1.12 Medical, pathology and toxicology

1.12.1 About 2½ years before the collision, the Skipper of the *Timeless* had suffered a myocardial infarction and was taking prescribed medication to prevent a relapse. He also suffered from the early stages of glaucoma for which he took topical and systemic drugs.

1.12.2 The partner said that the Skipper's heart disease did not hamper him, neither was his glaucoma sufficiently advanced to detract from his distance vision. He used spectacles for reading only.

1.12.3 The post-mortem examination of the Skipper concluded that his death was due to drowning in salt water. Physical injuries were limited to grazes on the right hip and left knee, with a bruise on the left shoulder blade. Other than signs of the heart disease, there were no abnormalities.

1.12.4 Toxicology of the Skipper was performed with negative results for alcohol and cannabis.

1.12.5 The Mate/Master, the Second Mate and the Deck Officer Trainee of the *Santa Regina* voluntarily submitted to take breath-screening tests for alcohol; all returned negative results.

2 Analysis

2.1 The Marlborough District Council Navigation Bylaws of 2002 were quite clear that small vessels shall not impede the progress of large vessels. In addition, good seamanship would dictate that, where possible, a large and relatively unmanoeuvrable vessel should be given a wide berth by smaller, more manoeuvrable vessels. Consequently, the Mate/Master of the *Santa Regina* could reasonably have expected that the smaller private boat would not impede his progress.

2.2 Maritime Rules Part 22.9 Narrow Channels required that vessels of less than 20 m not impede the progress of vessels that can only navigate within a narrow channel or fairway. While there was no definition of what constitutes a narrow channel, the confined waters of Picton Harbour could well be considered narrow for vessels of the size of the *Santa Regina*.

2.3 The Marlborough District Council Navigation Bylaws' requirement that "an autopilot shall not be used unless there was a helmsman immediately available to take over manual steering immediately on this being required in the immediate vicinity of the helm or wheel" was quite specific. However, the Mate/Master of the *Santa Regina,* together with the other masters of that company, was of the opinion that a dedicated helmsman on standby in the mess room was sufficient to satisfy the requirement. A person in another area could not reasonably be considered to be in the immediate area. However, in this instance the Deck Officer Trainee was adequately qualified to be able to steer the ship and was available to take the helm immediately.

2.4 At the time of the collision, apart from when manoeuvring close to its berth, the ship was usually steered by autopilot. Consequently, even though most of the crew held steering certificates, they were unpractised at steering the ship, so putting them on the wheel in an emergency was unlikely to result in a smooth transition. Notwithstanding the above, the speed with which the 2 vessels approached one another made it unlikely that a change to hand steering would have prevented a collision.

2.5 Every ship must maintain a proper lookout. It is clear that each vessel did see the other vessel at a distance of more than one mile. The Mate/Master had seen a light in the distance but he and the Deck Officer Trainee had difficulty identifying a target on either of the radars. A vessel constructed from non-radar-reflective materials such as fibreglass and timber, as the *Timeless* was, gave a poor radar return and resulted in a poor or non-existent radar target. Vessels constructed of poor radar-reflective materials often carried a passive radar reflector, but the *Timeless* did not. On this occasion the poor radar return was probably exacerbated by the presence of rain and drizzle.

2.6 The lights of the *Timeless* might have been more difficult to identify in the prevailing conditions. While each of the bridge team could remember the red and green sidelights of the *Timeless,* none of them remembered the masthead light, which was surprising as the rescue teams made special mention that the masthead light was still illuminated when the wreckage was found.

2.7 The partner indicated that, despite the rain, she could easily see the lights of Picton and those of the ship, indicating the visibility was moderate. That does not preclude the possibility that the Skipper may have "lost" the *Santa Regina* against the town lights, between first seeing the ship as it left its berth and immediately before the collision.

2.8 The need to maintain a safe speed was a requirement of all vessels. The *Santa Regina* exceeded the 12-knot speed restriction in place for Picton Harbour south of Mabel Island, but was travelling at a legitimate speed immediately prior to the collision. Whether the speed of each of

the vessels was a contributing factor is difficult to determine. A collision occurs when 2 vessels are in the same place at the same time; if either vessel changes its speed or course before the point of collision they may not collide. Consequently, if the *Santa Regina* had maintained a speed of less than 12 knots while inside Mabel Island, the collision position would have been different and the collision may not have eventuated. However, being on, or nearly on, reciprocal courses the 2 vessels would still have been at risk of having a collision, but would have met a short time later. Certainly, if the *Timeless* had not impeded the ship, the speed would have been irrelevant, and if each vessel had taken the correct action to avoid a collision the speed would have been irrelevant.

2.9 Given the uncertainty that the Mate/Master felt over the actions of the approaching vessel, it might have been prudent for him to ease the ship's speed at the time the doubt became sufficiently strong for him to sound the whistle and make the initial alteration of course to starboard.

2.10 The combined speeds of the 2 vessels, the *Santa Regina* 17 knots and the *Timeless* 7 knots, gave a closing speed of 24 knots. To close the 0.6 nm between the vessels from the 190931 position would have taken 90 seconds. Consequently the collision would have occurred at or very shortly after 1911.

2.11 Neither vessel actually determined whether a risk of collision existed by taking relative bearings either visually or by radar. The *Santa Regina*'s radar did have an ARPA facility, but once the target of the *Timeless* was established there would not have been enough time to engage the ARPA and get any meaningful information from it. Had the ship's speed been reduced, there would have been slightly more time to better evaluate the situation and react accordingly.

2.12 The Skipper of the *Timeless* reacted to the warning whistle signals from the *Santa Regina* by increasing his vessel's engine control. However at that point in the collision sequence it is doubtful whether the increase in engine speed made any difference to the actual boat speed or its turning ability.

2.13 Maritime Rules Part 22.14 Head On Situations is one of the few collision regulations that actually specify the alteration of course to be made by each vessel. It required each vessel to alter course to starboard in order to pass to port of the other. The Mate/Master complied with this provision and turned to starboard, but in doing so he placed the *Santa Regina* in real danger of running aground. The closest approach was recorded at about 125 m from the rocks at the edge of the shore. However, alternative avoidance manoeuvres would have contravened Part 22.14. For the Mate/Master to alter course to port would fly in the face of all the training and intuition he had gathered throughout his career. Easing the speed of the ship, stopping or going astern, if undertaken in sufficient time, might have been the most effective course of action, particularly as the crash stop distance for the ship was less than 0.4 nm, but this would not have been in compliance with Part 22.14. However, Part 22.40 allowed a departure from the collision regulations in order to avoid immediate danger, such as that faced by the Mate/Master.

2.14 If the Skipper of the *Timeless* had altered course to starboard rather than port the collision might have been avoided. If a collision had still occurred it would probably have resulted in the bow of the *Timeless,* its strongest part, striking the hull of the ship, the damage from which may have been substantially less than that actually suffered in the collision.

2.15 The collision regulations required that vessels keep to the starboard side of a narrow channel or fairway. The video playback from the *Santa Regina*'s ENC showed that the ship was maintaining its planned track up the starboard or the eastern side of Picton Harbour. However, from the perspective of those on the *Timeless*, it might well have appeared to be in the centre, if not to the western side, of the Harbour. Similarly, the Skipper's partner was under the impression that the *Timeless* was to the western side of the Harbour, closer to Wedge Point than Picton Point. On a dark night, with nothing other than navigation aids and the lights of the town to guide them, it would have been easy for the Skipper of the *Timeless* to misjudge his position and think he was further off The Snout than he actually was. Steaming towards Picton using

only visual references to navigate, it was possible that the Skipper was unwittingly drawn towards the lights of Picton and initiated a slow turn to port.

2.16 Passing distances and tolerances in the confined waters of the Marlborough Sounds were often minimal, consequently any actions taken to avoid collisions needed to be taken early, comply with the collision regulations and be sufficiently large to remove any doubt of the intention of that action. The perception of any manoeuvre depended on the size of vessel that was being conned; what might be considered a safe distance or a clearing course for a small boat might be considerably less than that on a large vessel.

2.17 The ongoing conflict between the users of the Marlborough Sounds was demonstrated by the number of close-quarter situations that were recorded in the first 9 months of 2005. Most of these situations appeared to have been caused by a lack of understanding of the Bylaws and the collision regulations, or smaller vessel skippers being unaware of the limitations of the larger vessels, or an intentional violation of the rules and regulations as a form of protest against the ferries by the private vessels.

2.18 The number of close-quarter incidents that were reported in the 5 months after this collision, compared with those reported in the 4 months before, was disproportionate and possibly indicated that before this accident ferry masters did not consider the reporting of close-quarter incidents sufficiently important, or that the time spent on the administration of an incident report would have little chance of improving the situation. The anecdotal evidence was that many incidents were not reported and generally were considered to be an accepted part of operating in the Sounds. This indicated that the conflict between users might be more widespread than the statistical data suggested. The Mate/Master stated later that he had reported several close-quarter incidents before this collision but the authorities had not taken any action.

2.19 The ferries were sufficiently common and their schedules sufficiently regular for other users of the Sounds to be able to predict times and areas where they may be encountered. The *Santa Regina* departed Picton at, or about, 1900 every evening, so the Skipper of the *Timeless* either knew or should have known that he was likely to meet the ferry around the entrance to the Harbour about that time.

2.20 At the time of the accident, New Zealand had no requirement for private boats to be registered or their skippers to be trained or licensed. The only law pertaining to the operator of a private boat was contained in the Bylaws, which required a person in control of a boat that could exceed 10 knots to be over 15 years of age. Consequently, it was possible for an untrained person to be in charge of a private vessel of any size and power. Such a situation resulted in masters of large and generally less manoeuvrable vessels being unsure whether the skipper of a small boat knows the collision regulations and whether the appropriate action will be taken not to impede the larger vessel.

2.21 Having no registration or compulsory identification marking on private boats made administering the Bylaws and collision regulations difficult. The virtual anonymity of private boats also reinforced the belief by masters of larger ships that little improvement would be gained by reporting every close-quarter incident that occurred.

2.22 There was conflicting evidence as to what sound signals the *Santa Regina* made and at what stage during the collision sequence they were sounded. The bridge team of the *Santa Regina* said that the Mate/Master sounded 5 short and rapid blasts when the vessels were about 0.6 nm apart and then the Second Mate sounded a continuous blast immediately before the collision. The survivor of the *Timeless* could only recall hearing a single long blast on the whistle shortly before the collision. Of the *Santa Regina* passengers who were interviewed, none could remember hearing the ship's whistle, but that was not indicative that the signals were not made. The passenger lounges were sufficiently remote from the ship's whistles, and the horns of the whistles were directed forwards, concentrating the sound in that direction. The resultant sound in the passenger lounges would have been muffled and indistinct, and something that would probably not be noticed by someone who was unused to the ambient noise of the vessel.

2.23 The sounding of 5 short and rapid blasts as prescribed in Maritime Rules Part 22.34(iv) was to indicate one crew's uncertainty about the intention of an approaching vessel's crew. The signal conveyed a sense of urgency and when heard, particularly by an untrained person, could lead to an unpredictable reaction, possibly not that required by the collision regulations. This might have been the case for the Skipper of the *Timeless,* with the whistle causing him to react and alter course to port, without fully evaluating the situation.

2.24 The wreckage of the *Timeless* was brought ashore inverted on the deck of a barge. When turned upright the engine control lever was found to be close to the neutral position. However, this position approximately corresponded with the line of the deck on which the inverted hull was supported during the recovery, so was probably not the position the lever was in at the time of the collision. The partner said that the Skipper increased engine power as he altered course shortly before the collision, a more probable scenario than reducing engine speed as the position of the lever on the recovered hull suggested.

2.25 The ignition switch was found in the off position. Given that the partner said that the boat was still under power at the time of the collision, it is likely the switch was turned off when the wreckage was recovered.

2.26 Medical and witness reports show that the Skipper of the *Timeless* was medically well. Incapacitation or impairment from his heart illness or from the effects of the prescribed medications were excluded as causal factors. The prescribed medication would not have affected his perception of the approach and relative position of the ship, or the best course alteration he should take to avoid a collision. His perceptive, cognitive and psychosomatic performance would have been unaffected. The decision to alter course to port ahead of the ship in an attempt to avoid the collision was an unusual one. Despite being made in the knowledge that it was the wrong way there were no medical factors that predisposed the Skipper to such a critical lapse in his seamanship.

2.27 The bridge of the *Santa Regina* had been designed around a traditional concept where ergonomics was not the primary concern. The primary controls, onboard communications and engine indicators, steering positions, radars and alarms were spread across the bridge, requiring the operator to move between them. A prime example of this poor layout was the position of the only whistle-operating buttons in the wheelhouse, which were situated together on the far starboard side of the console, 6 m from the central steering positions. To sound the warning signal, the Mate/Master had to leave the conning position, move the 6 m to the starboard side of the wheelhouse, sound the signal and then return to the conning position, all of which would take at least 15 seconds, possibly longer. During that time the 2 vessels would have closed by about 0.1 nm, and the Mate/Master would have lost his perspective of the relative bearing of the other vessel, he would have had no indication of his vessel's course while away from the conning position (he had dialled up the initial alteration of course to starboard before he sounded the whistle), and he would have been removed from the electronic navigation aids.

2.28 The retrofitted conning station in front of the helmsman's station had been an attempt to make a centralised control position, but with the main engine controls and onboard communication systems remaining on the starboard console the desired effect was not fully achieved.

2.29 Effective BRM would have minimised the negative impact of the traditional bridge layout; the Second Officer or the Deck Officer Trainee could have been better used to sound the whistle, adjust engine controls and carry out communications and assist in monitoring any other vessel's progress, leaving the Mate/Master to concentrate on his primary function of conning the ship.

2.30 The Deck Officer Trainee and the Second Mate arrived on the bridge just at, or after, the time that the *Santa Regina* left its berth. Consequently, there was no briefing of the bridge team. The Second Mate became engrossed in administrative tasks rather than concentrating on the navigation of the vessel. The Deck Officer Trainee, the least experienced of the bridge team, was exclusively operating the radar. Consequently, the Mate/Master was left operating in virtual isolation and vulnerable to one-man error.

2.31 The *Santa Regina* was on a regular ferry service between Wellington and Picton and as such the personnel forming the bridge team could become routinised, being used to the same voyage 2 or 3 times every day. Being on such a regular service, the bridge team would be aware of the general requirements of the voyage, so a pre-departure briefing would only need to highlight the details of that specific voyage. This accident does draw attention to the need for the bridge team to be on the bridge before departure, and for all administrative tasks to be completed before departure or for a person, other than one of the bridge team, to complete the administrative work away from the navigating area.

2.32 The Mate/Master preferred to use an autopilot rather than have a helmsman steering, stating that the machine steered a better course than the human. This was a common view held by most of the masters on the Cook Strait ferry services. Further, the use of an autopilot was the preferred method of steering on Star Cruises. However, the Star Cruises BRM system required that at least 2 officers, and in confined waters 3 officers, continually monitor the vessel's track and it had strict procedures and contingency plans in place. The Star Cruises ships had ergonomically designed bridges that allowed the persons conning the ship to reach the main controls from the centralised conning position, which made it possible to use an autopilot with confidence. Given the right circumstances, it may be preferable to use an autopilot rather than a helmsman, particularly a helmsman who is not practised at steering a specific vessel.

2.33 Because the VHF on the *Timeless* was not operating during the voyage to Picton, the Skipper was deprived from being reminded of other vessel movements, particularly those of the ferries. Had he been listening it would have reminded him that the *Santa Regina* was leaving Picton and heading towards Picton Point.

2.34 The video replay of the *Santa Regina*'s ENC data showed a continual alteration of course to starboard rather than 2 discrete alterations of course. At 090931 the ship started to turn slowly to starboard, and continued to do so until the rate of turn increased at 191030, which was probably the time when the Mate/Master applied maximum starboard helm. It was at about this time that the speed of the ship started to decrease, showing that the CPP was reversed at that time as well. From this it is clear that the collision sequence occurred rapidly and any avoidance action was reactionary rather than preventative.

2.35 The initial restriction of a maximum of 15° helm on the autopilot was unlikely to have contributed to the collision. Had full starboard helm been immediately available it was improbable that the increase in the rate of turn would have averted the collision or reduced its severity. It is not possible to be more definitive as the exact position and time of collision remains unknown, consequently the period for which the maximum helm could have been applied is also unknown.

2.36 It was unclear whether the first alteration of course to starboard at 090931 or the actual movement of the launch was responsible for the Deck Officer Trainee's impression that the *Timeless* moved from fine on the starboard bow to fine on the port bow. The Second Mate also remembered seeing the relative bearing of the launch move from fine to starboard to right ahead or slightly to port.

2.37 It might have been the initial alteration of course to starboard by the *Santa Regina* that the Skipper of the *Timeless* was referring to when he said to his partner "they are coming straight for us". He had possibly intended to stay close to the eastern shore and pass the ship starboard to starboard, without realising that he was presenting the Mate/Master with red and green sidelights, which would have indicated to those on board the *Santa Regina* that the 2 vessels were on or nearly on reciprocal courses. It is also possible that when the Skipper decided to alter course to port instead of starboard he thought he could avoid the collision by heading closer to the shore, an area where the ship would not normally go.

2.38 The presence of the Second Engineer on the bridge had the potential to distract the bridge team from their primary function, but it could not be determined if that was the case on this occasion.

3 Findings

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

3.1 The 2 vessels collided just south of Picton Point shortly after 1911, but the precise position and time could not be determined.

3.2 The Skipper of the *Timeless* did not suffer any major physical trauma in the accident, but drowned following the collision between the 2 vessels.

3.3 The *Timeless* impeded the progress of the *Santa Regina* in contradiction to the Marlborough District Council Navigation Bylaws and the collision regulations.

3.4 Prior to the collision the vessels were approaching each other on nearly reciprocal courses.

3.5 Why the Skipper of the *Timeless* chose to alter course to port, an alteration that he apparently knew did not comply with the collision regulations, could not be determined.

3.6 The medical condition of the Skipper and the prescribed medication he was taking was unlikely to have had any bearing on the collision or his decision to turn to port ahead of the ship.

3.7 The *Santa Regina* was on or very close to its intended track prior to the collision.

3.8 The *Santa Regina*'s proposed track met the requirements of the Marlborough District Council Navigation Bylaws.

3.9 Altering course to starboard with land close on that side carried the real risk of the *Santa Regina* grounding.

3.10 Even though the *Santa Regina* had earlier exceeded the 12-knot limit for Picton Harbour south of Mabel Island, immediately prior to the collision it was operating at a legitimate speed. However, it may have been prudent for the Mate/Master to have slackened the *Santa Regina*'s speed when he became concerned about the intentions of the other vessel.

3.11 The bridge of the *Santa Regina* was of a traditional design that necessitated the Mate/Master leaving the conning position to sound the whistle, thus removing him from the main information hub.

3.12 The superstructure of the *Timeless* had poor radar-reflective qualities and the launch did not have a radar reflector, making its detection by radar difficult.

3.13 The weather conditions did not significantly reduce the visibility, but may have attenuated the radar signal of the *Timeless*, exacerbating the launch's poor radar reflectivity.

3.14 There was no specific legislation requiring private boat operators to be trained or certified, or for their boats to be registered or certified seaworthy.

3.15 The high density of traffic in the waters of the Marlborough Sounds gave rise to frequent close-quarter situations. Although bylaws and collision regulations were in place, it was almost impossible to police such a large area effectively, particularly when private boats were unregistered and unlikely to be identifiable, thus reducing the likelihood of their being called to account for contraventions of the legislation.

3.16 Drugs and alcohol did not contribute to the collision.

3.17 More effective BRM on the *Santa Regina* might have allowed the bridge team to better evaluate and react to the situation. The duty officer ought to have been committed to the safe navigation of the vessel rather than completing administrative duties.

3.18 The Strait Shipping operations documentation promoted BRM within its fleet, but full acceptance and implementation did not appear to be routinely practised.

4 Previous Safety Recommendation

4.1 The following safety recommendation, which resulted from Marine Occurrence Report 01-216, a collision between a yacht and a tug and barge, was made to the Director of Maritime Safety on 14 February 2003:

> In line with the recommendations made by the Pleasure Boat Safety Advisory Group in 1999, continue to monitor for the five-year period to December 2004, the impact of education initiatives introduced in New Zealand against set safety targets. Further, that the systems of compulsory boating safety education in the Canadian and other jurisdictions, continue to be monitored for success through the same period, with a view to implementation of such a system in New Zealand. (057/02)

On 24 February 2003 the Director of Maritime Safety replied in part that:

> Recommendation 057/02 is a continuous action in support of other initiatives now in place to address accidents in the recreational sector.

Attention was again drawn to safety recommendation 057/02 in Marine Occurrence Report 03-203, a collision between a commercial jet boat and a private jet boat.

On 5 December 2005 the Manager of Recreational Boating, Maritime New Zealand informed the Commission that:

> We are reviewing the PBSAG [Pleasure Boat Safety Advisory Group] report at this time after 5 years in effect. The draft review is largely complete and will be considered at the Dec 13 meeting of the National Pleasure Boat Safety Forum. All recommendations in the PBSAG report have been examined and I would be happy to send you a copy. Once the draft has been looked at by the Forum and their collective input is included, decisions regarding where we go will be made next May when the Forum meets again. The Forum is an advisory body, chaired by the Director of Maritime New Zealand, and includes Harbourmasters, police, ACC, industry and all major recreational organisations such as coastguard. The purpose of the review is to look to the future and also to look at what has been done from the PBSAG recommendations and how effective this has been, especially in preventing fatalities.

Safety recommendation 057/02 is equally applicable to this accident and the Commission awaits the outcome of the PBSAG review and the initiatives made by the National Pleasure Boat Safety Forum. Consequently, no further recommendations have been made to address this issue at this time.

5 Final Safety Recommendations

Safety recommendations are listed in order of development, not in order of priority

5.1 On 26 January 2006 the Commission recommended to the Director of Maritime New Zealand that he:

003/06 Present this report to the National Pleasure Boat Safety Forum with a view that the Forum determine the feasibility of private boats being registered, marked accordingly and required to meet minimum standards of seaworthiness.

004/06 Promote through boating education and safety bulletins and boat notices, the fitment of passive radar-reflectors to smaller vessels, particularly those constructed of poor radar reflective materials.

5.2 On 23 February 2006, the Director of Maritime New Zealand replied:

> 003/06 This recommendation will be included as an agenda item for discussion at the next meeting of the National Pleasure Boat Safety Forum. The next scheduled meeting of the Forum is in May 2006.
>
> 004/06 Maritime NZ endorses this proposal to the extent that it is practical. Safety bulletins and boat notices are useful but are seen by relatively few recreational skippers and therefore have limited impact. Maritime New Zealand will therefore also include the recommendation for radar reflectors in the next edition of the booklet "Safe Boating, an Essential Guide" which is distributed very widely within the recreational maritime community. Maritime New Zealand will also ensure this advise is included where future DVD and boating safety videos are produced.
>
> We note, however, that the fitting of a radar reflector on many small boats that are most at risk of not being seen by watchkeepers on other craft is often impractical. No effective radar reflector has yet been produced where it is practical for fitment to vessels such as small dinghies or kayaks.

5.3 On 26 January 2006 the Commission recommended to the Managing Director of Strait Shipping Limited that she:

005/06 Put in place procedures to reinforce the need for effective bridge resource management on board the company's ships. This should include the requirement that the full bridge team are on the bridge before departure, and that administrative work is separated from the navigation function of the ships' officers.

5.4 On 22 February 2006 the Marine Manager of Strait Shipping Limited replied:

> BRM: the company has instituted a regime of BRM courses during which all watch keeping officers will be refreshed in BRM techniques the first of these was held in November the next scheduled for April 2006, hopefully courses permitting all watch keeping officers will have their BRM training refreshed by the end of 2006.
>
> The requirement that a full bridge team be in position before departure and that administrative work be separated from the navigational function of the ships officers was put in place via memo immediately after the incident.

Approved on 17 February 2006 for publication

Hon W P Jeffries
Chief Commissioner

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Transport Accident Investigation Commission
P O Box 10-323, Wellington, New Zealand
Phone: +64-4-473 3112 Fax: +64-4-499 1510
E-mail: reports@taic.org.nz Website: www.taic.org.nz

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