



Report 98-206

Ro Ro cargo vessel, *Spirit of Vision*

grounding

French Pass

30 April 1998

Abstract

On Thursday, 30 April 1998, at about 0250, the Ro Ro cargo vessel *Spirit of Vision* grounded in French Pass. The vessel had been on passage from Nelson to Lyttelton with eleven persons on board. There were no injuries. Attempts to refloat the vessel immediately after grounding were unsuccessful despite the assistance of the fishing vessel *Rockfish*. The vessel refloated without assistance on the next rising tide and was able to continue the passage to Lyttelton, although the starboard engine could not be used due to propeller damage sustained in the grounding.

Safety issues identified included insufficient safety precautions taken for the transit of French Pass and the inadequacy of the shore navigation lights to the north-east of French Pass. Safety recommendations were made to the chief executive of Pacifica Shipping (1985) Limited and to the harbourmaster of Marlborough District Council to address these issues.



Figure 1
Spirit of Vision aground at French Pass

Transport Accident Investigation Commission

Marine Accident Report 98-206

Vessel Particulars:

Type:	Ro Ro cargo vessel
Classification:	Germanisher Lloyd 100 A 4 E + MC E AUT "Standardised for Container Transport". Strengthened for Heavy Loads
Class:	VII: Foreign going cargo vessel (SOLAS)
Length overall:	93.71 m
Beam:	18.24 m
Summer draught:	4.56 m
Gross tonnage:	4285 t
Construction:	Steel
Built:	Werft Noiskrug GmbH, Rendsburg, Germany in 1983
Propulsion plant:	2 x Mak 6M452 diesel engines of 1100 kW at 480 rpm each driving through a Reintjes reduction gearbox a KaMeWa controllable pitch four-bladed propeller turning at 263 rpm
Service speed:	11.5 knots
Steering gear:	2 x AEG Electro-hydraulic ram type
Bow thruster:	Pleuger 220 kW with 3 stage switching port and starboard
Owner/Operator:	Pacifica Shipping (1985) Limited
Port of Registry:	Dunedin, New Zealand ¹
Persons on board:	Crew: 11
Injuries:	Nil
Damage:	Minimal to hull at bow Distortion of starboard rudder stock Fracture of one and distortion of three blades of the starboard propeller Moderate indentation of aft keel area
Location:	French Pass
Date and time:	Thursday, 30 April 1998, at about 0250 ²
Investigator-in-Charge:	Captain John Mockett

¹ See section 1.4.2

² All times in this report are NZST (UTC + 12 hours) and are expressed in the 24 hour mode.

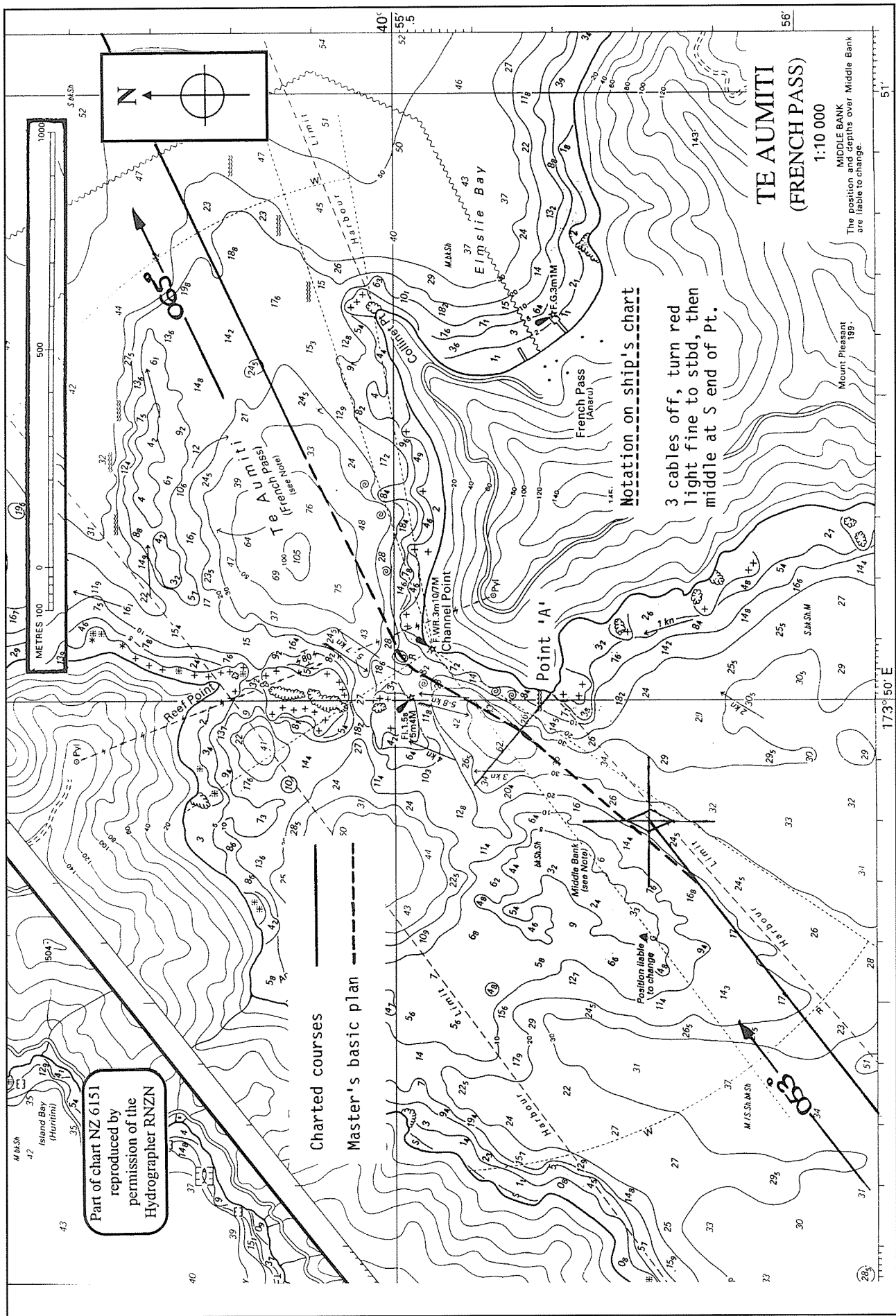


Figure 2
Section of chart NZ 6151 showing French Pass and the planned passage

1. Factual Information

1.1 History of the trip

- 1.1.1 The Ro Ro cargo vessel *Spirit of Vision* left Nelson at 2342 on Wednesday, 29 April 1998 bound for Lyttelton with a crew of eleven.
- 1.1.2 Prior to departure from Nelson, the master extracted the tidal data for French Pass from the New Zealand Nautical Almanac (Almanac) and estimated that his vessel could arrive at the Pass with about 1.5 hours of north-east ebb tidal stream remaining and so chose to take the inshore route through French Pass.
- 1.1.3 Once clear of Nelson, the vessel was put to UMS³ mode and the master retired to his cabin leaving the conduct of the vessel to the second mate. Also on the bridge was an integrated rating (IR) on lookout duties. The master left instructions that he should be called 20 minutes before the vessel was due at French Pass.
- 1.1.4 The master was called at 0230 and arrived on the bridge shortly thereafter. He took a few minutes to acclimatise himself to the dark and the status of the bridge.
- 1.1.5 In preparation for passage through the narrows the second steering motor and its associated two pumps were switched on and tested. The autopilot was then disengaged and the IR commenced hand steering the vessel.
- 1.1.6 The second mate made the required call on very high frequency (VHF) radio to warn all ships of the position of *Spirit of Vision* and the intention to transit French Pass. There was no indication of any conflicting traffic.
- 1.1.7 The master took over the conduct of the vessel at about 0240 at which time the vessel was steering 053 degrees and making a speed of about 11.5 knots. The charted 053 degree course line terminated at a position two cables from the headland (hereafter known as Point 'A') to the south-south-east of Channel Point. Courses for the transit through French Pass were not charted. (See figure 2)
- 1.1.8 The master plotted the position of the vessel at 0245 and found that it was slightly south of the charted course and three cables distant from Point 'A'. He altered course to about 045 degrees which initially put Point 'A' right ahead. He expected a tidal stream which would set the vessel to the north-west until passing Point 'A'. (See figure 3)
- 1.1.9 As predicted, the *Spirit of Vision* was set quite strongly to the north-west and passed Point 'A' at what the master considered to be the usual distance off. At this point he expected that the tidal stream would turn to the north-north-east and run with the vessel, so he altered course to put Channel Point light fine on the starboard bow and then instructed the helmsman to "head for the middle".
- 1.1.10 However, the vessel continued to be set to the north-west resulting in it approaching the narrows closer to the light beacon, and angled more to starboard, than usual.

³ Unmanned Machinery Space

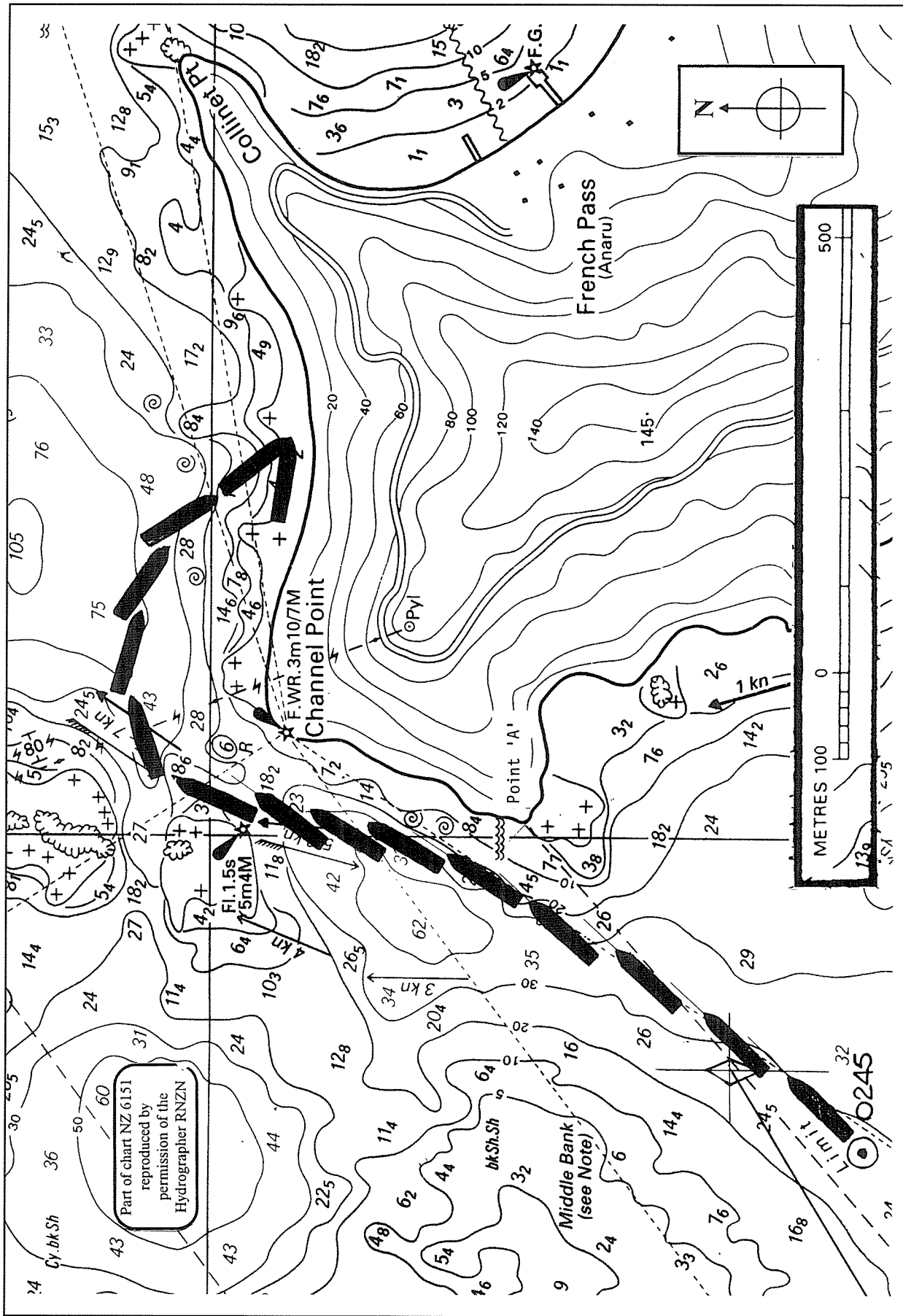


Figure 3
 Section of chart NZ6151 showing estimated track of *Spirit of Vision*

- 1.1.11 The second mate was positioned on the port bridge wing to monitor the position of the vessel relative to the light beacon. At no time did he consider that the vessel was so close to the beacon that he had to alert the master. He said that he was able to see the effect of the north-east tidal stream to the north of the light beacon. The recorded time of passing between Channel Point and the light beacon was 0248.
- 1.1.12 Because of the angle of approach to the narrows, the master ordered 20 degrees port helm as the bow passed the beacon to ensure that the stern remained clear. As the port quarter cleared the beacon, the vessel was swinging slowly to port and the master ordered “steady” to arrest the swing.
- 1.1.13 To initiate a required turn to starboard, the master ordered 20 degrees starboard helm. The vessel did not respond to this immediately, so he ordered “hard to starboard”. The vessel then responded and commenced swinging rapidly to starboard.
- 1.1.14 With the starboard turn initiated, the master ordered “steady” and then “steady as she goes”. The helmsman applied 20 degrees port helm but this had little effect in reducing the rate of turn. He was about to inform the master of this when the master ordered “hard to port”.
- 1.1.15 The second mate returned from the port bridge wing to the wheelhouse. He said later “I saw the ship take a shear to starboard and heard the master tell the helmsman to go hard to port and it had no effect at all, we just kept swinging to starboard”.
- 1.1.16 The vessel had turned through an arc of about 90 degrees to starboard and was heading towards the land between Channel Point and Collinet Point when the master put the pitch of the port engine to full astern to slow the vessel and assist in arresting the turn to starboard.
- 1.1.17 The vessel steadied and began to turn slowly to port. However, by this time it was so close to the land ahead that grounding was inevitable. The master put the pitch of the starboard propeller to full astern. He also ordered “hard to starboard” in an attempt to keep the propellers and rudders away from the land.
- 1.1.18 At about 0250 the *Spirit of Vision* grounded, bow first, in a position almost halfway from Channel Point to Collinet Point and on a heading of about 140 degrees.
- 1.1.19 The vessel had grounded at slow speed and the master continued to run both engines at full astern hoping to pull clear of the shore. During this initial attempt, the starboard engine stalled. The master restarted it but some vibration was noticed.
- 1.1.20 Running along the coastline there was a strong westerly counter current which pushed the stern of the vessel around to settle on a heading of about 100 degrees. At this point the master suspended the attempt to re-float the vessel.

1.2 Post-grounding information

- 1.2.1 Once the vessel settled, the master rang the general alarm bells to alert the crew, and also notified Wellington Maritime Radio of the grounding by VHF radio.
- 1.2.2 The fishing vessel *Rockfish* had been waiting in the area near Clay Point for the tidal stream to turn. The bridge watchkeeper heard the VHF call and woke the skipper, who called the *Spirit of Vision* on VHF radio and was requested by the master to proceed to the scene of the grounding. The skipper gave an estimated time of arrival as 0400.

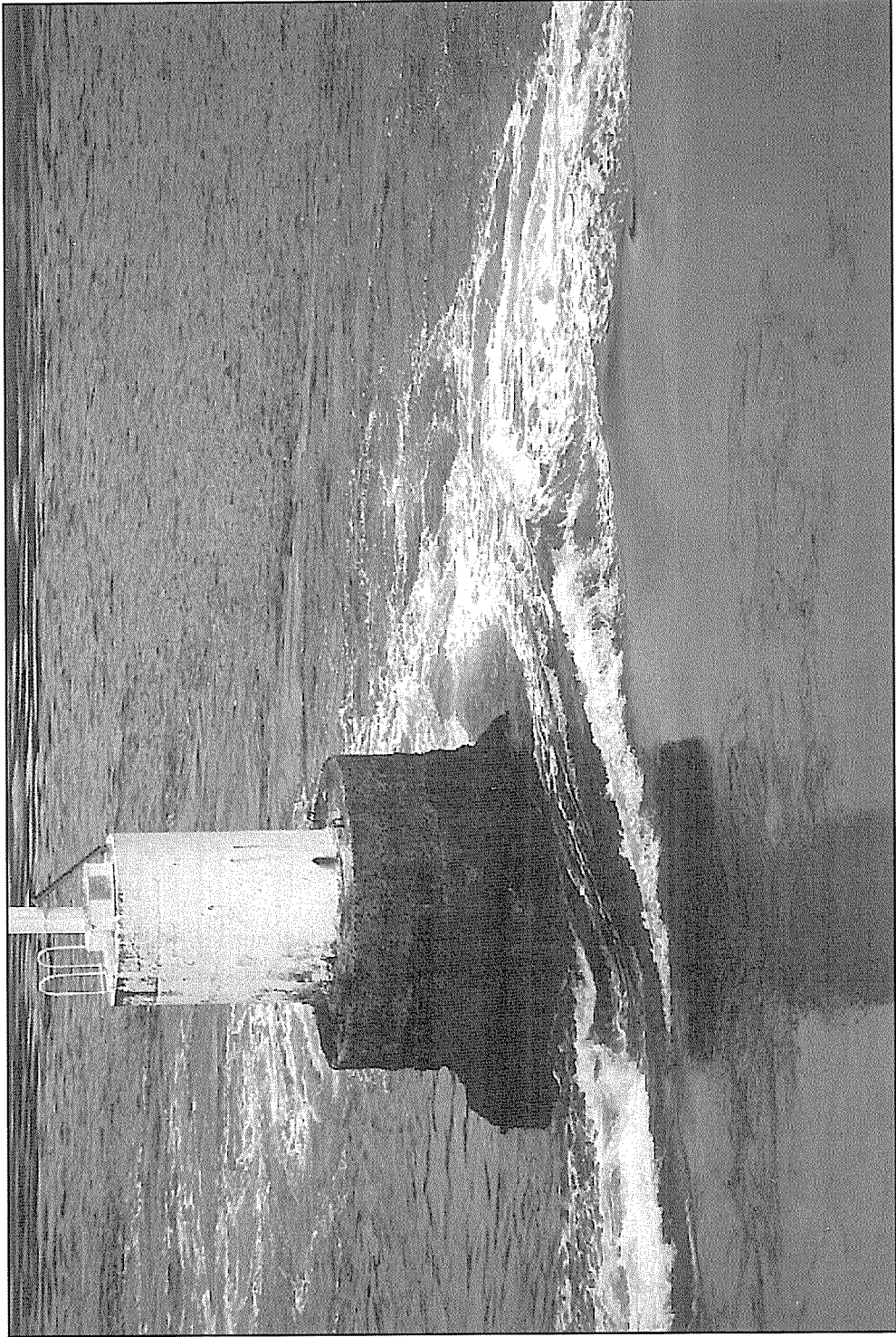


Figure 4
Tidal flow around narrows light beacon

- 1.2.3 A Cook Strait cargo vessel, *Straitsman*, was also on passage from Nelson to Wellington and had transited the French Pass earlier. On request by the master of *Spirit of Vision* and Wellington Maritime Radio, the vessel returned to the Pass and stood by to assist.
- 1.2.4 The crew of *Spirit of Vision* took soundings around the vessel to determine the extent of the grounding and also checked internal spaces of the vessel to verify that its watertight integrity had not been breached.
- 1.2.5 The crew determined that the vessel was aground at the bow and along the starboard side and saw that the starboard quarter was close to a rocky area of the shore.
- 1.2.6 As the vessel was still watertight, the master instructed that the seawater ballast in the forepeak be discharged and other ballast shifted within the vessel. When the vessel grounded it had been trimmed by the head at draughts of 3.4 m and 3.1 m. The Master calculated that after the ballasting operation the vessel was trimmed by the stern at draughts of 2.6 m and 3.6 m.
- 1.2.7 Meanwhile the master of *Spirit of Vision* advised Pacifica Shipping management personnel of the grounding. They agreed to arrange for a tug from Wellington to assist.
- 1.2.8 After the ballast operation was complete the master continued with attempts to refloat the vessel. He tried various combinations of the engines, bow thruster and helm. His attempts were unsuccessful and the chief engineer advised him to abandon any further use of the starboard engine as there was considerable vibration when it was running and that his instrumentation showed that there was less than expected load being produced by the propeller.
- 1.2.9 The *Rockfish* arrived at the scene at about 0400. The skipper attached a line to the stern of *Spirit of Vision* and from 0430 attempts were made to pull the stern away from the shore to facilitate further attempts to refloat. Although a small movement was achieved, the *Rockfish* did not have the power to pull the *Spirit of Vision* away from the shore sufficiently for the master to attempt refloating using the port engine.
- 1.2.10 As the tide ebbed, the *Spirit of Vision* remained aground and on an approximate heading of 100 degrees. The attempt was abandoned at about 0600 and the line between the two vessels released. *Rockfish* stood by in the area in case further assistance was required.
- 1.2.11 The *Straitsman* arrived at the scene at about 0600 and stood by to render any assistance that might be required.
- 1.2.12 The tide began to flood at about 0600 and the master of *Spirit of Vision* instructed that both anchors be lowered to the seabed to keep the vessel steady and to provide some additional control should the vessel refloat on the rising tide.
- 1.2.13 At about 0800 the master released the *Rockfish* and it proceeded on passage to Nelson.
- 1.2.14 As the tide rose the *Spirit of Vision* began to move and at 0842 it floated free. The master manoeuvred the vessel away from the shore and into Admiralty Bay, using only the port engine, and then on to Port Gore where he anchored the vessel for inspection by divers.
- 1.2.15 Once *Spirit of Vision* was afloat and clear of the French Pass area, the master released the *Straitsman* and it continued on to Wellington. He informed Pacifica Shipping management and they cancelled the request for assistance from the tug which was proceeding from Wellington.
- 1.2.16 The divers' inspection, which took from 1230 to 1500, confirmed the vessel was able to continue the voyage so the master proceeded to Lyttelton using only the port engine.

1.3 Damage assessment

1.3.1 The report on the inspection by divers while the vessel was anchored at Port Gore stated the following:

Starboard side:

Bow section:	No impact or paint damage down to Bay 1
Bay 1 to Bay 5:	Superficial paint abrasion. Antifouling removed in some place down to bare metal.
Bay 5 to Bay 10:	Paint abrasion heavier but still superficial.
Total starboard length: stations.	Shows no visual signs of damage at the frame stations.
Starboard side stern tube:	No visible contact evident.
A-Frame braces:	Show no visible damage.
Starboard propeller:	Heavily damaged. One blade missing with 300 mm remaining on hub. No visible oil leaks from the blades, hub or stern tube. Adjacent 3 blades folded 90 degrees aft from their normal position.
Starboard rudder:	No visible damage.
Keel centre aft:	Dent approximately 3 metres forward from stern on starboard side. Three sections of plating have compressions 50 to 75 mm. All seam welds in the area show no visible cracking.

Port side:

Bow section to stern:	Shows no visible damage, only very minor abrasions.
Stern tube, propeller and rudder:	No visible damage or abrasions.
A-Frame braces:	No visible damage.
Note:	At the engineer's request, both propellers were cycled through their full pitch ranges with no problems or oil leakage.

1.3.2 The vessel was dry-docked two weeks after the grounding and inspection substantiated the findings of the divers with the addition that the starboard rudder stock was found to be distorted.

1.3.3 The remaining section of the broken propeller blade was inspected by a metallurgist who stated:

- there was no evidence of any flaw in the metal which would have contributed to the fracture,
- the blade had failed in overload, with load applied perpendicular to the face of the blade, and
- it was unlikely that the propeller had been turning at the time of the fracture.

1.4 Vessel information

1.4.1 *Spirit of Vision* was a 93.71 m, 278 TEU⁴ cargo vessel with capacity to load 132 TEU in the hold and 146 TEU on the deck. The vessel was fitted with a stern door to facilitate Ro Ro operations and two 35 tonne capacity Liebherr deck cranes for self-loading/discharging operations. The bridge and accommodation was right forward with the cargo space aft.

1.4.2 The vessel was built in 1983 at Rendsburg, Germany, originally for German owners and named *Godewind*. It was registered in both Germany and Antigua and Barbuda, West Indies. Pacifica Shipping acquired and renamed the vessel in 1995. In September 1996, Pacifica Shipping applied for New Zealand registry and de-registered the vessel in Germany and the West Indies. At the time of the grounding, the New Zealand registry application was not complete and no Certificate of Registry had been issued, although Dunedin was marked on the stern of the vessel. All other required statutory trading certificates were in place and valid at the time of the grounding.

1.4.3 Propulsion was by two Mak 6M452 diesel engines of 1100 kW at 480 rpm each driving through a Reintjes reduction gearbox a KaMeWa controllable pitch propeller turning at 263 rpm giving a service speed of 11.5 knots. The vessel was fitted with two AEG electro hydraulic ram type steering gears operating twin rudders, and a Pleuger 220 kW bow thruster with three stage switching.

1.4.4 Bridge equipment included:

- two Ratheon Mariners Pathfinder radars
- one Sirius Mk.2 gyro compass
- one Cassens and Plath standard magnetic compass
- one Racal Decca autopilot
- one Trimble Navigation global positioning system (GPS)
- one Atlas Echograph Krupp echo sounder

1.4.5 The crew of *Spirit of Vision* comprised the master, two deck officers, two engineers, a chief integrated rating, three integrated ratings, a cook and a steward.

1.5 Weather information

1.5.1 The weather synopsis at 0300 on Thursday, 30 April 1998 as given by the Meteorological Service of New Zealand (MetService) was that:

“a ridge of high pressure covers most of New Zealand.”

1.5.2 The records taken from the logbook of the *Spirit of Vision* are:

⁴ Twenty foot container or Equivalent Unit

Date	Time	Wind direction speed (knots)	Swell direction Height (m)	Vessel movement	Remarks
28/4/98	2000	WNW 20	WNW 2	rolling easily	Depart Onehunga Last line 1412
	2400	WSW 20	SW 2	pitching and rolling	Start passage 1612
29/4/98	0400	WxS 35-40	WSW 3-4	rolling heavily	Arrive Nelson
	0800	WSW 25	SW 2 ~ W 2	rolling heavily at times	End passage 1930
	1200	SWxW 20	SW 3	rolling heavily at times	In position 2025
	1600	ENE 5-10	W 2-3	moving easily	
	2000	N 10			Depart Nelson
	2400	N 5-10	N <1	moving easily	Last line 2342 Start passage 2355

1.6 Site information

1.6.1 French Pass is under the jurisdiction of the Maritime Safety Authority. The coasts and waters bounding the Pass are under the jurisdiction of the Marlborough District Council with the northern side being within D'Urville Island Harbour limits and the southern side within the Croisilles Harbour limits to the west and the Admiralty Bay Harbour limits to the east.

1.6.2 The following information is extracted from the New Zealand Pilot (Pilot Book):

Route

Te Aumiti (French Pass) connects Admiralty Bay with Current Basin affording an inner route between Cook Strait and Tasman Bay. This route saves about 15 miles in distance as compared with the coastal route N of Stephens Island, or through Stephens Island Passage, and W of D'Urville Island; it also avoids the heavy cross sea frequently met N of those islands. The route is generally deep but is subject to severe restrictions in Te Aumiti (French Pass).

Tidal Streams

Te Aumiti (French Pass). The tidal streams are strong and do not follow the channel; see information on the plan (figure 1). A daily table giving the times of the streams is published in the New Zealand Nautical Almanac. The NE-going stream starts about -0230 [2 hours 30 minutes before] HW Nelson and the SW-going stream about -0215 [2 hours 15 minutes before] LW Nelson; slack water lasts only about 20 minutes. At equinoctial spring tides the NE-going stream has been known to attain a rate of 8.5 knots and the SW-going stream 8 knots. The great irregularity of the bottom and narrowness of the channel cause many eddies.

Directions

Te Aumiti (French Pass)

With local knowledge and care vessels can navigate Te Aumiti (French Pass) at slack water, or with the tidal stream. Passage against the tidal stream is very dangerous as not only does a vessel sometimes fail to answer her rudder owing to stream on her bow, but there is the possibility of meeting another vessel coming in the opposite direction, and they may not see each other in time to avoid collision. A vessel meeting a contrary stream should therefore anchor to await the turn of the stream, or proceed N around Stephens Island or through Stephens Island Passage. Radio Reporting Points are marked on the charts in Current basin and Admiralty Bay. All vessels intending to transit Te Aumiti (French Pass) are to give warning to "All Ships", 10 minutes before reaching the narrows, on VHF channels 16 and 63.

When proceeding ENE through the pass care should be taken to prevent a vessel being swung round on to Collinet Point by an eddy that sets towards the point.

- 1.6.3 A daily table of times for the flood and ebb streams making is found in the predictions section of the New Zealand Nautical Almanac. The following caution is on the prediction page:

Tidal streams may be subject to irregularities, and these times should be regarded as approximate only.

- 1.6.4 There is a narrative section in the Almanac devoted to tidal streams, which includes a caution for the French Pass area. The caution is essentially the same as that extracted from the Pilot Book.
- 1.6.5 The information taken from the Almanac predicted that the north-east stream would begin at 2158 on Wednesday, 29 April 1998 and the south-west stream would begin at 0436 on Thursday, 30 April 1998. According to the Pilot Book there would have been a 20 minute period of slack water prior the start of each stream.
- 1.6.6 The north-east tidal stream occurs during an ebb tide. When the stream begins, the height of tide allows it to flow through the whole width of the Pass. As the tide recedes, the reef to the north of the light beacon dries and the stream is restricted to the deep water of the navigable passage and one other deeper area resulting in a stronger flow.
- 1.6.7 The skipper of the fishing vessel *Rockfish* had been awaiting the south-west stream to make his passage through French Pass. He commented that north-east stream was particularly strong that day.
- 1.6.8 Both the master of *Spirit of Vision* and the skipper of *Rockfish* agreed that the tide in the area of the grounding started to flood at about 0600.

1.7 Routines, schedules and passage planning

- 1.7.1 Pacifica Shipping normally retained sea staff on one vessel on a particular trade for long periods of time. Sea staff generally worked two weeks on and two weeks off. The master, second mate and helmsman had all been serving on *Spirit of Vision* for about 15 months and before that on the sister vessel *Spirit of Progress*. Reliefs for each rank were staggered so as to not have the full complement changing at one time. As a result all staff were familiar with the vessel and the trade.
- 1.7.2 At the time of the grounding, the master had been on board for 10 days; the second mate for 3 days and the helmsman for 13 days.
- 1.7.3 When in port, cargo operation duties were shared between the first mate and second mate. At sea, the master kept the 8 to 12 watch, the second mate the 12 to 4 watch and the first mate the 4 to 8 watch.
- 1.7.4 Prior to departure from port, the bridge equipment was tested by the master. The tests included those of the steering gears. The operation of the steering gear was normal during testing prior to departure Nelson on the evening of Wednesday 29 April 1998.

1.7.5 The trading pattern on which the *Spirit of Vision* was employed was established in November 1995. The vessel traded between Lyttelton, Onehunga and Nelson. The advertised schedule for the *Spirit of Vision* was:

	Arrival	Departure
Lyttelton	Thursday 2030	Friday 2200
Onehunga	Sunday 1200	Tuesday 1200
Nelson	Wednesday 1500	Wednesday 1830

1.7.6 The sister ship, *Spirit of Progress* was also employed on the trade but it operated on a reverse rotation to that of the *Spirit of Vision*.

1.7.7 The distances between ports were such that, in order to maintain the schedule, *Spirit of Vision* needed to be run at, or close to, full speed throughout.

	total time hours	time out hours	time in hours	time on passage hours	distance nautical miles	required speed knots
Lyttelton to Onehunga	38.0	0.5	2.0	35.5	418	11.77
Onehunga to Nelson	27.0	20.	0.5	24.5	254	10.37
Nelson to Lyttelton (1)	26.0	0.5	0.5	25.0	236	9.44
Nelson to Lyttelton (2)					249	9.96
Nelson to Lyttelton (3)					251	10.04

The distances for Nelson to Lyttelton are those for via French Pass (1), via Stephens Passage (2) and outside Stephens Island (3).

1.7.8 Within the longer port stays in Lyttelton and Onehunga there are periods when cargo is not normally worked. If the vessel fell behind schedule, the port stay was shortened to make up time. Over an extended period the vessel was able to maintain the overall schedule.

1.7.9 The company maintained a Standard Practices Manual, which included procedures to be followed during approaches to harbour, movements within harbour limits, berthing and unberthing. The manual did not detail any procedures to be followed when transiting through confined waters on passages between ports.

1.7.10 The responsibility for courses steered and the speed of the vessel lay with the master. The company gave no specific routing instructions to masters and clarified their position by the following entries in the Standard Practices Manual:

Steering Courses

The master will have sole responsibility for the courses steered and distances to pass off land, obstructions and other vessels. In doing this he will be required to take notice of regulations, and instructions issued by local authorities and Maritime Division Ministry of Transport. At all times he will steer courses that are recognised as safe, having due regard to good seamanship.

Speed of Vessels and Fuel Economy

The master is responsible for maintaining as far as possible the ship's schedule. In doing so he must bear in mind that the safety of the crew, the vessel and its cargo are his primary consideration. He should, at the same time, take all reasonable measures to conserve fuel and in this matter he should confer with the Chief Engineer.

- 1.7.11 The master said that although there was an underlying requirement to maintain the schedule, he had always routed his vessel with safety as his priority and in this had always received support from the company management even on the occasions when the vessel was behind schedule.
- 1.7.12 When the Nelson call was incorporated into the trade in November 1995, the master considered his routing options to be:
- through French Pass
 - through Stephens Passage or
 - outside Stephens Island.
- 1.7.13 The master felt that the route through French Pass had to be considered because of its shorter distance and that it avoided the heavy cross-seas that can be encountered north of Stephens Island. Prior to the inclusion of Nelson into the schedule, he had not navigated through French Pass.
- 1.7.14 Before transiting French Pass for the first time, the master consulted the Pilot Book, the Almanac and the charts of the area. He also discussed the area with other masters, from Pacifica Shipping and other companies, who had experience of the route. He concluded that the French Pass route could be taken by a vessel of the size and power of the *Spirit of Vision* but that there were two main limiting criteria;
- the vessel must pass through with the flow of the tidal stream
 - the visibility must be good.
- 1.7.15 The master took the following safety precautions on his passages through French Pass until he built up his local knowledge and experience:
- the master to have the conduct of the vessel
 - all steering motors and pumps to be operating while transiting the narrows
 - vessel to be in hand steering for the narrows
 - both radars to be running for the approach to and passage through the narrows
 - bow thruster running and ready for use
 - the engine room to be manned
 - passage to be made in daylight only
 - passage to be made only at slack water.
- 1.7.16 The master decided that strict passage planning could be made only to the entrance of the Pass and away from the exit. Because the strength and direction of the tidal stream and the position of eddies varied considerably, each transit of the narrows was different and had to be navigated on a trip-by-trip basis even though following a basic plan.

1.7.17 The master's plan was to alter course when the vessel was three cables from Point 'A' and put Channel Point light fine on the starboard bow. This course would be followed until Point 'A' was abeam to starboard, at which time the course was altered to head for the central point between Channel Point and the light beacon in the narrows. When the vessel was passing between the lights the course would be altered to starboard to line up to the next charted course in Admiralty Bay. This basic plan was marked on the chart in note form as follows:

3 cables off, turn red light fine to stbd, then middle at S end of Pt.

1.7.18 This plan was utilised by other masters that served on the *Spirit of Vision*.

1.7.19 When the time of departure from Nelson was known, the master calculated the estimated time of arrival at French Pass allowing three hours steaming time. He then extracted the tidal stream information from the Almanac. If the vessel was due to arrive at French Pass during the time of the north-east stream, he considered that route as his first option. He then considered the current weather conditions and the forecast. If he was able to predict clear visibility, the French Pass option was generally taken.

1.7.20 No calculation was made for the height of tide as there was sufficient depth of water in the Pass for *Spirit of Vision* to transit at any time.

1.7.21 As the master's local knowledge and experience of the French Pass area increased, some of his operating procedures changed. He no longer deemed it necessary to have the bow thruster running. The engine room remained UMS with no engineer standing by in the engine room. Notably, the passage was no longer restricted to daylight hours, and passages were made at any stage within a following tidal stream.

1.7.22 The shipboard Standing Orders relating to procedures for French Pass that were in place at the time of the grounding were:

1. Master to be called approximately 20 minutes prior to the Pass.
2. All 4 steering motors to be switched on.
3. Master takes over Bridge.
4. Steering and pitch control tested.
5. 10 minute call made at position marked on chart, on ch. 16 & 65.
6. At the same time helmsman takes over hand steering.
7. Vessel navigated through Pass.

1.8 Personnel information

1.8.1 The master of *Spirit of Vision* started his sea-going career in 1963 with the New Zealand Shipping Company, where he remained until attaining his First Mates Certificate. He then joined Union Steam Ship Company of New Zealand Limited, where he remained until 1978. He had attained his Masters Certificate in August 1973 and rose to the rank of chief officer. In 1978 he joined Swire Pacific Offshore and worked for six years as master of supply boats, dive support tugs and crane ships in the Persian Gulf and Singapore area. He then spent six months as a pilot in the port of Dubai, followed by two years as skipper with Fullers Blue Boats in Auckland. He joined Pacifica Shipping as third mate in 1988. He rose through the ranks and became relieving master in 1991, and permanent master in 1993. He had served on the *Spirit of Vision* and its sister ship, the *Spirit of Progress*, for the five years prior to the grounding.

1.8.2 Two nights prior to the grounding, the master had had a full nights sleep while the *Spirit of Vision* was alongside in Onehunga. On the passage from Onehunga to Nelson he had periods of eight

and four hours each available for rest, although the poor weather resulted in disturbed sleep. He had a two hour rest prior to departure from Nelson and another two hour rest prior to arrival at French Pass. He said that he became fully acclimatised about five minutes after arriving on the bridge for transit of the Pass.

- 1.8.3 The second mate of *Spirit of Vision* served an apprenticeship with Shaw Saville Line and on attaining his Second Mate Certificate joined the New Zealand Shipping Company where he remained for 11 years. He had attained his Masters Certificate in August 1960 and risen to the rank of chief officer. He came to New Zealand and sailed with Holm and Company for three years as second mate, first mate and master. He returned to the United Kingdom and sailed with Houlder Brothers for two years. On his return to New Zealand he sailed as master with the Dutch Dredging Company. Then for eight years he worked as a stevedore in various ports around the New Zealand coast before joining the Cook Strait ferries. He sailed on the ferries as third mate, second mate and first mate. He then sailed as master on a bulk oil/ore carrier around New Guinea before joining Pacifica Shipping in 1995. During his time with Pacifica Shipping he had sailed, first on *Spirit of Progress*, and then on *Spirit of Vision* for 15 months prior to the grounding.
- 1.8.4 The second mate had re-joined the *Spirit of Vision* in Onehunga on Monday, 27 April 1998 after two weeks leave. He had a full nights sleep that night while the vessel was alongside. On the passage from Onehunga to Nelson he estimated that he had eight hours quality sleep despite some poor weather. He had slept for three hours prior to departure Nelson and felt capable of taking his watch.
- 1.8.5 The helmsman of *Spirit of Vision* began his sea-going career in 1976. He had served on various classes of vessels including tankers, container ships, offshore tender vessels and roll-on/roll-off vessels. He held an Integrated Rating Certificate. He had joined Pacifica Shipping about five years prior to the grounding and had served on *Spirit of Vision* and *Spirit of Progress*.
- 1.8.6 The helmsman was at the end of a tour of duty, during which time he had been on the 12 to 4 watch. His routine allowed adequate off duty periods and he had been sufficiently rested for the duties assigned to him during his watch on the morning of the grounding.

1.9 Company information

- 1.9.1 Pacifica Shipping (1985) Limited was part of the Pacifica Transport Group. The Group operated an integrated freight service which included shipping transport, road and rail transport and warehousing. The Group was ISO 9002 accredited.
- 1.9.2 At the time of the grounding the company was working towards the formulation of a Safety Management System (SMS) under the International Safety Management (ISM) Code. Under the International Convention for the Safety of Life at Sea, 1974 (1994 Amendments) the requirements of the ISM Code must be completed by 1 July 2002.
- 1.9.3 The introduction of a SMS requires that an operating company develop and implement safety management procedures to ensure that conditions, activities and tasks, both ashore and at sea, affecting safety and environmental protection are planned, organised, executed and checked in accordance with legislative and company requirements.

1.9.4 Pacifica Shipping had in place a Standard Practices Manual that had been issued and implemented in July 1994. The opening paragraph of the manual stated:

The purpose of the Pacifica Standard Practices Manual (SPM) is to collate, itemise and centralise the Company's structure, chain of responsibility, policies, shipboard procedures, practices and facts.

1.9.5 In addition to the documented routine instructions contained in the Standard Practices Manual, voyage briefing meetings were held between Pacifica management staff, the master and senior officers during the time that a company vessel was berthed in Lyttelton.

1.9.6 The Standard Practices Manual formed an established base on which Pacifica Shipping was able to build for the formulation of their SMS. The new operations manual for SMS was being developed through consultation between interested parties, including the involvement of ship and shorebased staff.

2. Analysis

2.1 Considering the schedule of the *Spirit of Vision* for the three day period prior to the grounding, there had been sufficient rest periods available to the crew. Although there had been some poor weather during the night prior to the grounding, the duty personnel were adequately rested and able to undertake their respective duties.

2.2 The master of *Spirit of Vision* estimated that his vessel would arrive in the narrows at about 0300 on Thursday, 30 April, which was an hour and 36 minutes before the tidal stream was predicted to begin to the south-west. Even allowing for irregularities and the approximate nature of predictions, it was appropriate to expect a north-east stream to be still flowing at the time of transit through the narrows.

2.3 The Pilot Book warned mariners that passage against the tidal stream was dangerous as a vessel may fail to answer her rudder owing to the stream on the bow. The possibility existed that predictions were in error due to an irregularity that resulted in *Spirit of Vision* confronting an adverse stream.

2.4 There were several indications that show that not only was the stream still north-east-going but that it was particularly strong on the morning of the grounding:

- the set to the north-west when the vessel was south of Point 'A' was noticeably stronger than previously encountered by the master,
- once past Point 'A' the master expected that the stream would swing to the north-north-east as indicated on the chart, but in fact the vessel continued to be set to the north-west,
- from his vantage point on the port bridge wing, the second mate could see that the stream was running to the north-east,
- during the attempts by *Rockfish* to pull the stern of *Spirit of Vision* around, observations were made from both vessels that the height of tide reduced. The north-east stream is an ebb tide and the reduction of height is indicative that it was still running when *Spirit of Vision* transited the narrows,
- The master of *Spirit of Vision* and the skipper of *Rockfish* both observed that the tide began to flood at about 0600,
- The skipper of *Rockfish* was waiting for the south-west stream and noted that the north-east stream was stronger than usual that morning.

- 2.5 As the *Spirit of Vision* approached the narrows and the helmsman steered towards the centre of the passage, the continued set to the north-west meant that the vessel had become angled more to starboard than usual. Considering that the second mate, who was specifically watching the light beacon, did not deem it necessary to give a warning, it is probable that the master envisaged the vessel to be closer to the beacon than it really was. This perception caused him to make an unnecessary initial turn to port.
- 2.6 The movement of the vessel thus created, took it further north than normal and necessitated the helm being put hard to starboard to start the turn. Once the turn was initiated it is probable that the stern was caught in the strong north-easterly tidal stream which rapidly increased the rate of turn to starboard to a point where the subsequent counter helm to port had little effect in arresting the turn.
- 2.7 As the vessel progressed through the starboard turn, the bow would have entered the westerly counter current along the coast which further accentuated the rate of turn and reduced the effectiveness of the helm.
- 2.8 The vessel was operating with the bow deeper than the stern. When a vessel, which is down by the head, is turning rapidly longitudinal pressure forces encourage the turn therefore counter helm to arrest the turn may be sluggish because the steering lever is reduced.
- 2.9 The vessel only began to answer the port helm when assisted by the power of the astern propulsion of the port engine. Once the master put astern power on both engines the vessel slowed rapidly and subsequent application of helm would have little effect.
- 2.10 About two minutes elapsed from the time that the *Spirit of Vision* got into difficulties to the time of the grounding. The master reacted swiftly with the engines and prevented a more dramatic grounding with potential for considerable damage, injury and pollution. Considering the slow speed of the vessel, the impact of the grounding might have been further reduced if the master had been able to use the anchors.
- 2.11 When transiting French Pass in a north-easterly direction and at night, visual orientation of the approach was gained from the shore navigation lights on Channel Point and the light beacon which mark the edges of the narrows. These two lights are situated close together and in the absence of a more distant light to create a transit, did little to assist the master in identifying any sideways drift of his vessel.
- 2.12 The orientation afforded by the lights in the narrows was suddenly lost to the master as the bridge passed between them. At that point, it was necessary to alter course to starboard, but there was no shore navigation light ahead of the vessel to give the master directional awareness or appreciation of the rate of turn of the vessel.
- 2.13 In vessels with the bridge situated right forward and very little horizontal separation between the bow and the conning position, the assessment of direction and rate of turn is particularly difficult and often best judged by watching astern rather than ahead.
- 2.14 On the *Spirit of Vision* the only object ahead of the bridge which the master could use to monitor change in direction visually was the foremast which was too close to the bridge to be effective.
- 2.15 Once through the narrows, an effective shore navigation light ahead of the vessel would have been of significant benefit to the master, allowing him to accurately monitor the changing direction of the vessel.

- 2.16 The starboard engine stalled in the initial stages of the grounding probably due to the propeller striking rocks. At this stage all four blade tips were bent, which created the vibration noted when the engine was restarted.
- 2.17 At some stage during the time that the vessel was aground and the engines stopped, it is likely that one blade of the starboard propeller contacted an obstruction and fractured, which would explain the increased vibration when subsequent attempts were made to refloat the vessel.
- 2.18 The master had navigated through the French Pass on many occasions on both *Spirit of Vision* and *Spirit of Progress* over a period of two and a half years. Those passages included transits in either direction at various states of tide and tidal stream and various light conditions. During this time he became progressively more familiar with the area and experienced variation in the strengths of the tidal stream and the extent and positions of eddies within the area.
- 2.19 The passage through French Pass was at least as complicated as any of the port arrivals and departures on the trade. As mentioned in the cautions contained in the Pilot Book and the Almanac, the area can be dangerous, irregular and unpredictable. Therefore the French Pass should be treated with at least the same caution as port approaches.
- 2.20 During the period that the master was gaining experience and building his local knowledge of the area around French Pass, the limitations and safety precautions he set in place were appropriate. An additional precaution which should have been in place was to have had the anchors ready for use with a crew member standing by on the bow.
- 2.21 As the master gained his experience and also took example from other operators using the French Pass, some of his procedures and practices changed. His limitation of daylight transit gradually opened to include twilight and eventually no limits regarding the time of day existed. The withdrawal of this limitation was appropriate.
- 2.22 The relaxation of the safety precautions initially taken by the master of *Spirit of Vision* was not appropriate, and left him without the immediate recovery defences should his vessel get into difficulties.
- 2.23 Notwithstanding the ultimate responsibility of the master for the safety of the vessel, its crew and cargo, it is also incumbent on an operating company to define safety procedures and practices. Guidelines and advice to masters should outline the management's expectation of minimum safety precautions to be taken in specific areas of identified risks. It is not appropriate to place total responsibility for the formation and implementation of safe procedures and practices with the master.
- 2.24 There was no legislative limitation on the size of vessels permitted to utilise French Pass. However, the physical parameters of the area and its inherent dangers would suggest that vessels the size of the *Spirit of Vision* are approaching the maximum dimensions which a prudent operator would consider appropriate.
- 2.25 The route through French Pass was considered by the master as a first option for the trip between Nelson and Lyttelton when the tidal stream and visibility were suitable. This consideration had resulted from the underlying requirement on the master to maintain the schedule and the hidden pressure which that involved. There would also have been a degree of unstated peer pressure in that other masters also transited French Pass whenever practicable.
- 2.26 To consider the French Pass route as one of several options would be more appropriate than as a first option, although it is of particular value when adverse weather prevails to the north of Stephens Island.

- 2.27 In making the decision whether or not the French Pass route is to be taken, it would be appropriate to give consideration to reducing the available 'window' to times when not only is there a following tidal stream but that the height of the tide is such that the stream spills through the whole of the Pass and is not restricted to the navigable passage. In every case good visibility would be a requirement.
- 2.28 If the inner route is to be taken, it would be appropriate that the following safety precautions are in place for the transit of French Pass:
- the master to have the conduct of the vessel
 - another officer to be on the bridge
 - the vessel to be in hand steering
 - all steering motors and pumps running
 - both radars to be running
 - the engine-room to be manned
 - the bow thruster running and ready for use
 - anchors ready for use with a crew member standing by.
- 2.29 The saving in distance by taking the inner route was a maximum of 15 nautical miles which equates to about 1.3 hours at a service speed of 11.5 knots. In making the decision whether or not to utilise the inner route, masters and the company management should take into consideration:
- the value of the relatively small time saving
 - the manpower needed to put adequate safety precautions in place
 - the inherent dangers of French Pass
 - the potential for serious damage, injury and pollution in the event of an accident
 - the potential for ship and personnel time out-of-service subsequent to an accident.
- 2.30 The company has an ideal opportunity in the formation of their Safety Management System to make provision for greater guidance, advice and instructions to masters on the procedures and practices to be implemented in specific areas of their trading pattern. Together with the sea staff they will be able to identify risk areas such as arrivals, departures and transit areas and put into place constructive guidance to minimise those risks and maximise defences against them.

3. Findings

Findings and safety recommendations are listed in order of development and not in order of priority.

- 3.1 The *Spirit of Vision* was crewed and operated in accordance with legislation.
- 3.2 With the exception of its Certificate of Registry, the required statutory certificates were valid.
- 3.3 The lack of a Certificate of Registry did not contribute to the grounding.
- 3.4 The master and crew were all appropriately qualified.
- 3.5 The crewing level of the bridge was adequate for the operation being undertaken.
- 3.6 The two over-riding criteria for making a passage through French Pass, that transit was made with the flow of the tidal stream and in good visibility were appropriate and were met.

- 3.7 For the transit of French Pass it would have been appropriate for the master to have retained the safety precautions of having the bow thruster running and the engine-room manned and to have included the precaution of having the anchors ready for use with a crew member standing by.
- 3.8 Pacifica Shipping should have identified the confined waters of French Pass as an area of risk and included an instruction in the Standard Practices Manual for masters to maintain safety precautions similar to those normally in place when manoeuvring in harbour areas.
- 3.9 The tidal stream encountered by *Spirit of Vision* as it approached French Pass was stronger than previously experienced by the master but was not outside the warnings given in the various nautical publications.
- 3.10 The tidal stream included eddies and irregularities larger than previously experienced by the master although they too are warned against in the various nautical publications.
- 3.11 With only 1.5 hours remaining of the predicted ebb tidal flow, the north-east tidal stream was concentrated in the navigable passage of the narrows.
- 3.12 Once the turn to starboard had been initiated, the stern was pushed by the strongest part of the north- easterly tidal steam which increased the rate of turn.
- 3.13 The rate of the starboard turn was greater than the master's expectation and previous experience for the amount of helm applied.
- 3.14 With the bridge right forward and no shore navigation lights ahead of the vessel, to evaluate the rate of turn properly, it was necessary for the master to be looking aft to observe the stern in relation to the lights in the narrows.
- 3.15 A shore navigation light positioned to the north-east of French Pass would significantly improve the safety of vessels transiting in a north-easterly direction.
- 3.16 The turn to starboard progressed to a point where the bow entered a westerly counter current which further increased the rate of turn.
- 3.17 The master's use of engines to arrest the starboard turn and slow the vessel was appropriate and reduced the extent of damage sustained in the grounding.

4. Safety Actions

- 4.1 Pacifica Shipping is continuing the development of a full Safety Management System under the International Safety Management Code. The system is being progressively implemented and is expected to be formally developed and adopted by early 1999 some three years prior to the completion deadline of 1 July 2002.

5. Safety Recommendations

- 5.1 On 21 September 1998 it was recommended to the Chief Executive of Pacifica Shipping (1985) Limited that:
- 5.1.1 while formulating the company's Safety Management System, he gives priority to those sections which relate to procedures and practices for the critical shipboard operations of passage planning and navigation in confined waters. (064/98)
- 5.2 On 5 October 1998 the Chief Executive of Pacifica Shipping (1985) responded as follows:
- 5.2.1 Pacifica Shipping (1985) Ltd as noted in the report under 1.9.2 was, at the time of the vessel grounding, formulating a Safety Management System under the International Safety Management System. The Safety Management System is due for completion by 31 March 1999 some three years before the international requirement for implementation.
- Pacifica Shipping (1985) Ltd has implemented sections of its Safety Management System relating to passage planning and navigation in confined waters on all vessels operated by the company.
- 5.3 On 18 September 1998 it was recommended to the harbourmaster of the Marlborough District Council that, in consultation with the Maritime Safety Authority, the Council:
- 5.3.1 establishes a suitable navigational light beacon on Anatakupu Island, or on such suitable alternative site as might be identified, to improve the directional awareness of masters transiting French Pass in a north-easterly direction and to maintain the safety of navigation through French Pass. (065/98)
- 5.4 On 21 September 1998 the harbourmaster of the Marlborough District Council responded as follows:
- 5.4.1 At a recent meeting of Council's Resource Management and Regulatory Committee, an item was submitted regarding the establishment of a light on Anatakupu Island.
- The committee resolved that: "Council contribute 50% of the costs of establishing an additional navigation light to the north-east of French Pass to enhance navigational safety, if it seen appropriate by the Maritime Safety Authority"
- and
- "that Iwi be consulted on the placement of any navigation light." Please note that the wording of the resolutions is as shown within the inverted commas.
- At this stage it is not possible to determine the completion date as this will be dependant on Maritime Safety Authority agreeing to the placement of the above light.
- 5.5 On 18 September 1998 it was recommended to the Director of Maritime Safety that the Authority:
- 5.5.1 assists the Marlborough District Council to the extent necessary to ensure a navigational light beacon is established on Anatakupu Island, or on such suitable alternative site as might be identified, to improve the directional awareness of masters transiting French Pass in a north-easterly direction and to maintain the safety of navigation through French Pass. (099/98)

5.6 On 5 October 1998 the Director of Maritime Safety responded as follows:

5.6.1 The Authority is in agreement with your recommendation to establish a navigational beacon on Anatakupu Island.

The Authority will now liaise with the Marlborough District Council to establish the process of implementation.

Approved for publication 30 September 1998

Hon. W P Jeffries
Chief Commissioner