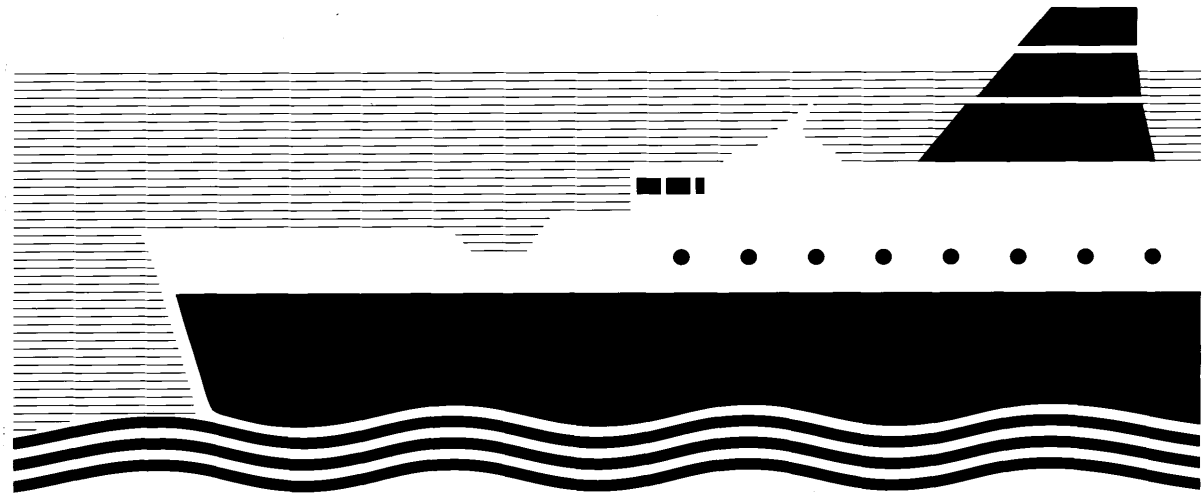
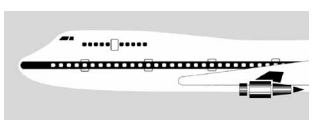
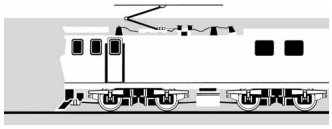


MARINE OCCURRENCE REPORT

04-209 **fishing vessel *Joanne* and motor tanker *Hellas Constellation*, collision, entrance to the Port of Tauranga** **19 May 2004**


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 04-209

fishing vessel *Joanne* and motor tanker *Hellas Constellation*

collision

entrance to the Port of Tauranga

19 May 2004

Abstract

On Wednesday 19 May 2004 at about 0117, the fishing vessel *Joanne* collided with the tanker *Hellas Constellation* in the approach channel to the Port of Tauranga. The *Joanne,* with 2 people on board, was returning from fishing grounds in Bay of Plenty. The *Hellas Constellation,* with a full cargo of automotive gas oil, was entering the Port of Tauranga under pilotage. There were no injuries.

The *Joanne* suffered minor damage to the bow only. The *Hellas Constellation's* hull plating and framing were set in, but not ruptured, and there was no spillage of its cargo of oil.

The *Hellas Constellation* subsequently berthed safely at the Mount Maunganui tanker terminal. The *Joanne* berthed at the Tauranga fishing wharves after grounding twice while on passage through the harbour.

Safety issues identified included:

- the lack of a watchkeeping monitor alarm on the fishing vessel for a single-handed wheelhouse operation
- the undertaking of navigational watchkeeping tasks whilst impaired by the effects of fatigue.

Safety recommendations were made to the Chief Executive of the Rawlinson Business Trust and the General Manager, Trade and Information, of the Seafood Industry Council.

The *Joanne* alongside at Tauranga

The *Hellas Constellation* entering Wellington Harbour

Contents

Figures

Abbreviations

bhp	brake horse power
colregs	International; Regulations for Preventing Collisions at Sea 1972
FISHgroup	Fishing Industry safety and Health Advisory Group
GPS	global positioning system
GRT	gross registered tonnage
IMO	International Maritime Organization
ISM Code	International Management Code for the Safe Operation of Ships and for Pollution Prevention
kt	knot(s)
kW	kilowatt
m	metre(s)
mm	millimetre(s)
MSA	Maritime Safety Authority
nm	nautical mile(s)
SOLAS	International Convention for Safety of Life at Sea
SSM	Safe ship management
t	tonne(s)
UTC	co-ordinated universal time
VHF	very high frequency

Glossary

amidships	middle section of a vessel, mid length
beam	width of a vessel
bridge	structure from where a vessel is navigated and directed
class	category in classification register
conning (con)	directing the course and speed of a ship
draught	depth in water at which a ship floats
frame	rigid profile providing strength to the hull of a vessel
gross tonnage	a measure of the internal capacity of a ship; enclosed spaces are measured in cubic metres and the tonnage derived by formula
knot	one nautical mile per hour
leading light(s)	light(s) that identify the safest track in a channel
longitudinal	pertaining to length. Applied to any fore and aft member of a ship's structure
neap tide	tidal undulation that has the highest low water, and lowest high water, in a series
port	left hand side when facing forward
spring tide	period of highest and lowest tides in a lunar cycle
starboard	right hand side when facing forward
tidal range	difference in height between successive high and low waters

Data Summary

Vessel particulars:

Name:		*Hellas Constellation*	*Joanne*
Type:		double-hulled oil tanker	fishing trawler
Class:		SOLAS	Fishing Ship
Limits:		unlimited	Offshore
Classification/Safe ship management provider:		American Bureau of Shipping ✠A1 (E) oil carrier; SH; RES; ✠AMS; ✠ACCU	SGS M&I
Length:		183.24 m	15.41 m
Breadth:		32.20 m	5 m
Gross tonnage:		27645	48.67
Built:		1999	1973
Propulsion:		1 Hyundai MAN B&W 6S50 direct reversing diesel engine	1 Kelvin T6 direct reversing diesel engine
Service speed:		15 kt	8 kt
Owner/Operator:		Consolidated Marine Management Incorporated	Rawlinson Business Trust
Port of registry:		Panama	Auckland
Minimum manning requirement:		14	1
Date and time:		Wednesday 19 May 2004 at about 0117[1]	
Location:		entrance to the Port of Tauranga	
Persons on board:	crew:	22	2
Injuries:	crew:	nil	nil
Damage:		indentation to hull and paint damage forward of amidships	one weld in hull split above waterline and paint damage
Investigator-in-charge:		Captain I M Hill	

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

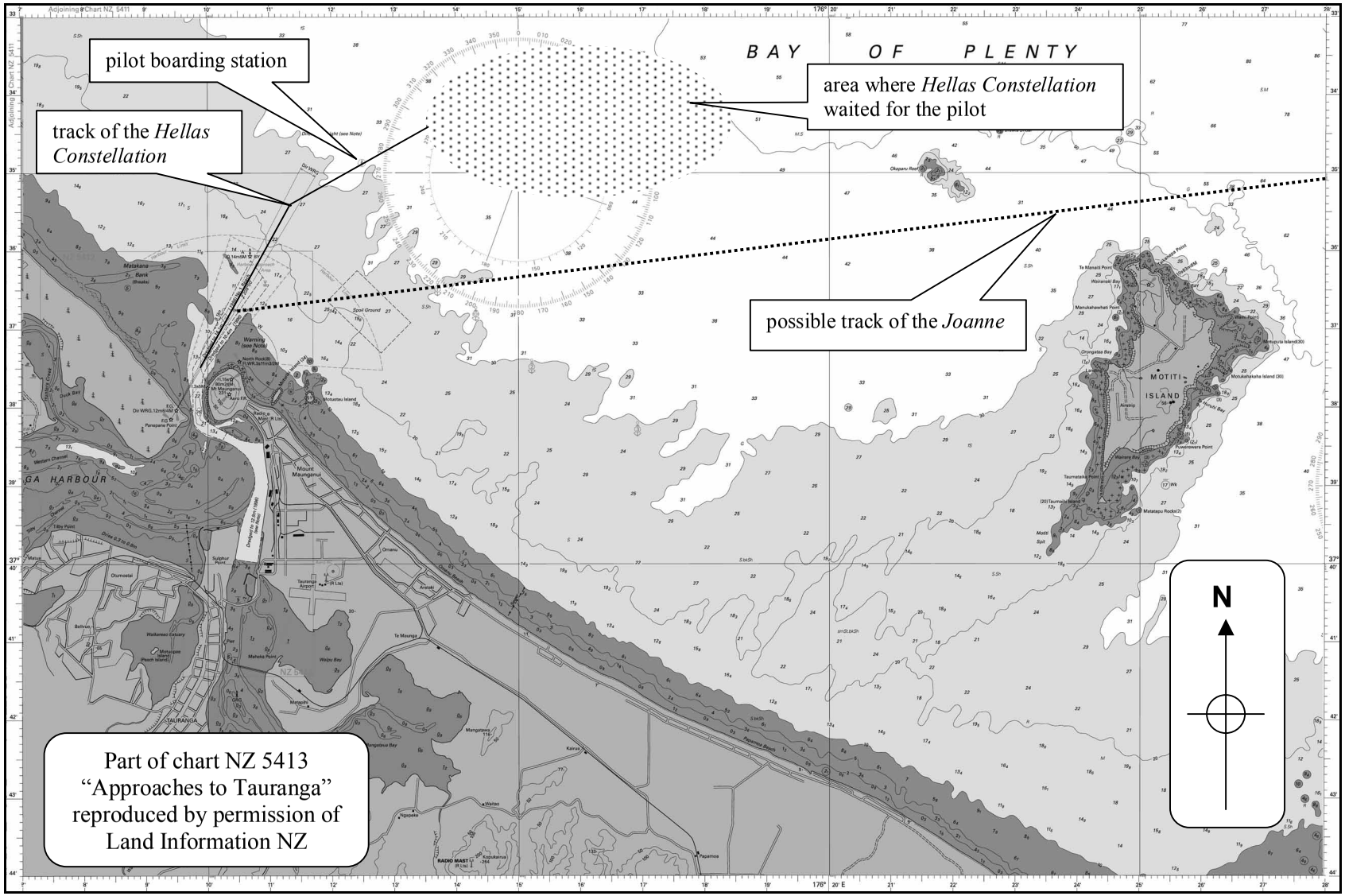


Figure 1
General area of the accident

1 Factual Information

1.1 History of the voyages

Joanne

1.1.1 On 15 May 2004 at about 1200, the *Joanne* departed from Tauranga with a skipper and deckhand on board to fish in Bay of Plenty. After reaching a position chosen by the skipper they trawled until dark, when they anchored for the night. They processed the catch before eating and going to bed at about 2200.

1.1.2 On 16 May 2004 the skipper and deckhand got up at about 0430 and after breakfast fished until dark, when they again anchored for the night. They processed the catch before going to bed at about 2100.

1.1.3 On 17 May they again got up at about 0430 and fished until dark. After they had processed the catch they proceeded across Bay of Plenty to an area known as "the Crater" near White Island. Arriving at around midnight, they drifted for the remainder of the night. During drifting, watches were not kept.

1.1.4 On the morning of 18 May 2004 the skipper and deckhand got up at about 0500 and fished until dark. After hauling their last catch of the day, the skipper decided to return to Tauranga to discharge their catch. The skipper called the operator's representative by cellphone and they arranged for the *Joanne* to return to Tauranga and discharge the catch at a fishing company's wharf early on the morning of 19 May 2004.

1.1.5 The skipper set a course on the autopilot to take the *Joanne* towards Tauranga while he and the deckhand processed and stowed the catch. At about 2130 when they had completed processing the fish the deckhand took the first lookout duty, and the skipper went to bed.

1.1.6 At about 2315, before the *Joanne* had passed Motiti Island, the deckhand woke the skipper for the next watch. After handing over the watch the deckhand went to bed. The skipper remained in the wheelhouse, and the *Joanne* continued towards Tauranga in autopilot at a speed of about 6 kt.

1.1.7 Some time later the skipper fell asleep in the helmsman's chair. The *Joanne* continued on course towards Tauranga. As the *Joanne* neared Tauranga approach channel, it passed astern of the dredge *Pelican* and ahead of the pilot boat *Tauranga II,* and collided with the port side of the tanker *Hellas Constellation,* which was entering port under pilotage (see Figure 2).

1.1.8 The skipper was woken by the collision and immediately took the engine out of gear. The deckhand was also woken by the collision. The *Joanne* slid down the side of the *Hellas Constellation* and cleared the stern. The skipper and deckhand carried out a safety check and found that the boat was not leaking and everything appeared to be working satisfactorily.

1.1.9 The *Tauranga II* came alongside the *Joanne* and the crew asked if everything was all right, to which the skipper and deckhand of the *Joanne* said it was. The *Tauranga II* then followed the *Joanne* into port to ensure that they were safe.

1.1.10 The skipper said later that as the *Joanne* entered the harbour through No. 2 Reach he became disorientated. He conned the boat inside Tanea, No. 2 and No. 4 buoys and into Pilot Bay channel. The skipper then tried to regain the main, Cutter, channel but ran aground on the bank separating the 2 channels.

1.1.11 The *Tauranga II* went to the *Joanne's* assistance and pulled it free of the bank. The crew of the *Tauranga II* advised the *Joanne's* skipper to follow them through Pilot Bay channel back to the main channel. However, the skipper attempted to retrace his course and then regain the main channel, but ran aground on the bank between the 2 channels again.

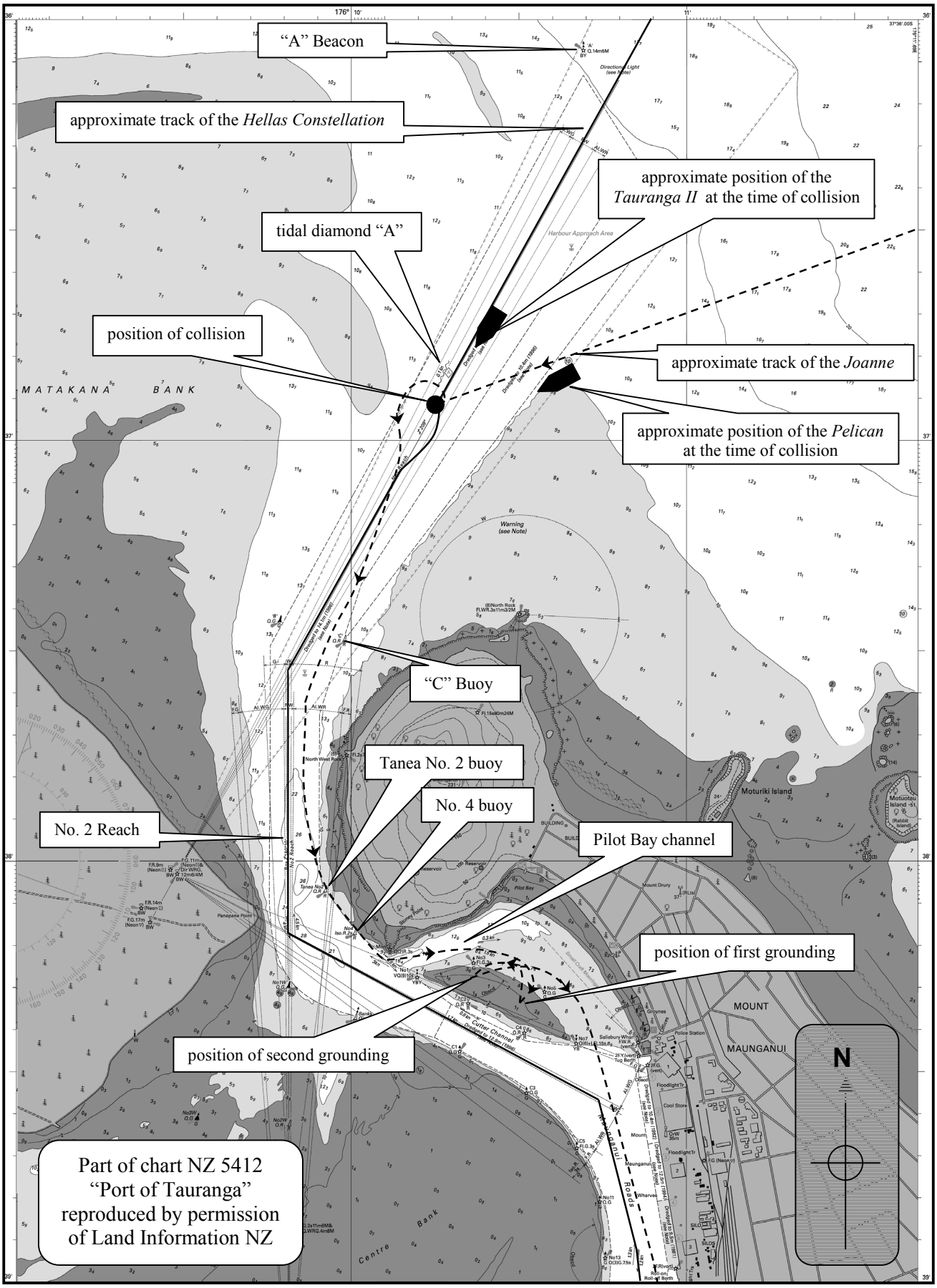


Figure 2
Accident site and tracks of respective vessels

1.1.12 The *Tauranga II* again pulled the *Joanne* off the bank, ensured that the *Joanne* made the main channel and shadowed the *Joanne* through the harbour to a fisheries wharf where it berthed without further incident.

Hellas Constellation

1.1.13 On 18 May 2004 at about 2130 the *Hellas Constellation* arrived at Maunganui Roads from Kaohsiung, Taiwan with a cargo of automotive gas oil. Tauranga Port Control informed the master that the pilot would board the vessel at 0030 on 19 May 2004.

1.1.14 Rather than anchor the master decided to drift in a safe area until it was time to embark the pilot. At about 2330 Tauranga Port Control informed the master that the pilot would not be on board until about 0045 on 19 May 2004.

1.1.15 At about 0055, the pilot boarded the *Hellas Constellation* from the *Tauranga II*. The pilot completed the master/pilot exchange, which included the standard Port of Tauranga passage and berthing plan. The second officer and helmsman, as members of the bridge team, were included in the briefing. The pilot mentioned the presence of the dredge *Pelican* in the area and that a deep draught vessel, the *Athena Sea*, would be using the channel to depart before the *Hellas Constellation* could enter.

1.1.16 After the exchange of information with the master, the pilot made contact with the *Athena Sea* by very high frequency (VHF) radio and arranged to pass starboard to starboard seaward of "A" Beacon. After passing the *Athena Sea* as agreed, the pilot conned the *Hellas Constellation* onto the main leads of No. 1 Reach, the approach channel. At about 0112, the vessel passed "A" Beacon and the pilot reported his position by VHF radio to Tauranga Port Radio.

1.1.17 The pilot sighted the *Pelican* and one other target, a fishing boat, later identified as the *Joanne,* moving towards the harbour entrance. The pilot made contact with the *Pelican* by VHF radio and agreed with its master that the *Hellas Constellation* would enter the channel first, with the *Pelican* waiting outside the channel.

1.1.18 As the *Hellas Constellation* negotiated the channel, the pilot increased to full harbour speed to maintain a speed of 10 kt in No. 2 Reach, and to counter the current at the alter course position off No. 4 buoy.

1.1.19 As the *Hellas Constellation* negotiated the channel the pilot, master and bridge team were watching the progress of the *Joanne* and the *Pelican*. At about 0115 the pilot ordered the engine to be put to half-ahead manoeuvring.

1.1.20 When the vessel was about 0.6 nm from "C" buoy, the pilot and master concluded that the *Joanne* was on a collision course with the *Hellas Constellation.* The pilot remembered that he could occasionally see the green side light of the *Joanne* as it approached. The pilot ordered one long blast on the whistle, shortly followed by 5 short blasts in an attempt to attract the attention of the watchkeeper on the *Joanne*. The pilot decided to stand on as he had little room for manoeuvre due to his draught and the confines of the channel.

1.1.21 The master, second officer and helmsman all recollected that the pilot also tried to contact the fishing boat by VHF radio. However, the pilot could not recall doing so.

1.1.22 The *Tauranga II,* having disembarked the pilot from the *Athena Sea,* was close astern of the *Hellas Constellation* on its port side. The launch master had also seen the *Joanne* closing from the port side, but had lost sight of it in the glare of the lights on the *Pelican*. When he saw the *Joanne* again and heard the whistle signals he comprehended the situation and increased the speed of his boat to try to intercept the *Joanne.* He used his searchlight first to illuminate the wheelhouse of the *Joanne* and then the side of the tanker to try to attract the attention of the watchkeeper on the *Joanne*.

1.1.23 At about 0120, and before the *Tauranga II* could reach it, the *Joanne* collided with the port side of the *Hellas Constellation*. The pilot immediately ordered the helm to port to swing the stern away from the stricken vessel and anyone who might be in the water. However, as soon as the *Joanne,* was clear of the *Hellas Constellation* the pilot ordered helm to starboard to stop the tanker swinging out of the channel.

1.1.24 The pilot reported the collision to Tauranga Port Radio, which instigated its emergency plan and dispatched the 2 tugs that were waiting to assist the berthing of the *Hellas Constellation* to aid the *Joanne*. However, almost immediately, the *Tauranga II* advised that the *Joanne* was safe and could make it to its berth without assistance and the tugs were stood down.

1.1.25 The *Hellas Constellation* continued into harbour and berthed without further incident at the tanker berth where an examination of the damage to the hull was made before the vessel commenced discharge of its cargo.

1.2 Vessel information

Joanne

1.2.1 The *Joanne* was a 15.41 m, steel-hulled fishing trawler built in Auckland, New Zealand in 1973. The boat had a moulded beam of 5.0 m and a gross tonnage of 48.67.

1.2.2 The *Joanne* was certified to operate in the offshore area, as defined in Maritime Rule Part 20, up to 100 nm off the coast with a correctly qualified skipper and crew on board. To operate in this area, Maritime Rule Part 31C required the skipper to hold a New Zealand Offshore Master's certificate. The skipper at the time of the accident was correctly qualified to operate in the offshore area.

1.2.3 The *Joanne* was powered by a Kelvin T6 diesel engine developing 180 bhp [134 kW] driving a single fixed-pitch propeller.

1.2.4 The *Joanne's* wheelhouse was equipped with the standard equipment necessary for navigation and fishing, which included: a magnetic compass, an autopilot, a radar, a depth sounder, 2 global positioning system (GPS) receivers, a single-side-band radio transceiver and a VHF radio transceiver.

1.2.5 A watchkeeping alarm[2] was fitted to the *Joanne*. The watchkeeping alarm was tested after the accident by a marine electrical contractor and was found to be in working order. However, the skipper reported after the accident that it was not working and had not been for some time. The watchkeeping alarm was not in use at the time of the accident.

1.2.6 The Maritime Safety Authority (MSA) promoted the use of watchkeeping alarms on small fishing vessels operating at night with a single watchkeeper as an aid in developing appropriate fatigue management arrangements.

1.2.7 The MSA had also convened the Fishing Industry Safety and Health Advisory Group (FISHgroup) in mid-2001 as part of the measures to counter the effects of fatigue on fishing vessel crews. One of the recommendations in the FISHgroup's final report, dated June 2003, was:

> the fitting and use of watchkeeping alarms (or suitable alternative warning systems) on fishing vessels for night operations with a single watchkeeper (while recognizing the limited benefits of this approach and the need for broader-based countermeasures), and ask that this work also consider the possibility of providing incentives for the use of such systems.

FISHgroup was replaced by fishSAFE with the primary aim of developing and managing an implementation plan to give effect to the recommendations in the FISHgroup report.

[2] An alarm in the wheelhouse that activates at a predetermined time interval and has to be manually cancelled.

1.2.8 The MSA informed the Commission on 27 July 2004 that:

> The fitment of bridge watchkeeping alarms will not be made mandatory for any Non-SOLAS New Zealand ship under a maritime rule, but MSA will develop education material, codes of practice or guidelines, as appropriate, highlighting the benefit of such fitment.
>
> Priority will be given to the development of a "code of practice for fishers" which will include guidelines for the management of fatigue and the use of bridge watchkeeping alarms.
>
> It should be noted that the mandatory fitting of bridge watchkeeping alarms did not satisfy cost benefit requirements.

Hellas Constellation

1.2.9 The *Hellas Constellation* was an oil tanker built in Korea in 1999, owned by Westport Marine SA of Panama, and operated by Consolidated Marine Management Incorporated of Greece. The ship was registered in Panama and had valid certificates issued by or on behalf of that Government and the American Bureau of Shipping.

1.2.10 The *Hellas Constellation* had an overall length of 183.24 m and a breadth of 32.20 m, with a gross tonnage of 27 645. It had a mean summer draught of 12.217 m giving a displacement of 55 768 t. The ship's arrival draught at Tauranga prior to the collision was stated to be 10.1 m. At the time of the collision the ship was carrying about 32 000 t of automotive gas oil.

1.2.11 The *Hellas Constellation* was powered by a single Hyundai B&W 6S50 MC direct reversing diesel engine developing 10 440 bhp [7785 kW] driving a single fixed-pitch propeller giving a loaded service speed of 15 kt. It had a semi-balanced rudder, located directly behind the propeller. The ship was not fitted with a bow thruster.

1.2.12 The *Hellas Constellation* was equipped with the standard range of navigation equipment including: 2 automatic radar plotting aid radars, 3 (GPS) receivers, gyro compass, magnetic compass, echo sounder and 2 VHF radios.

1.3 Damage

Joanne

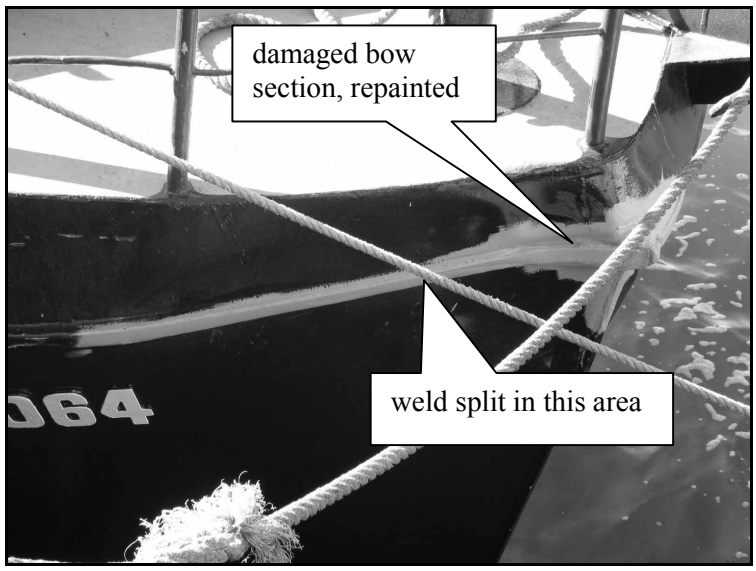


Figure 3
Damage to the bow of the *Joanne*

1.3.1 The *Joanne* sustained paint damage to the bow and a split weld in the hull just below the level of the foredeck (see Figure 3).

Hellas Constellation

1.3.2 The *Hellas Constellation* sustained paint damage to the exterior and interior of the hull plating forward of amidships in way of No. 2 water ballast tank. The hull plating was indented to a depth of about 100 mm in the centre of an area of about 600 mm x 450 mm, causing deformation to a side longitudinal and a web frame.

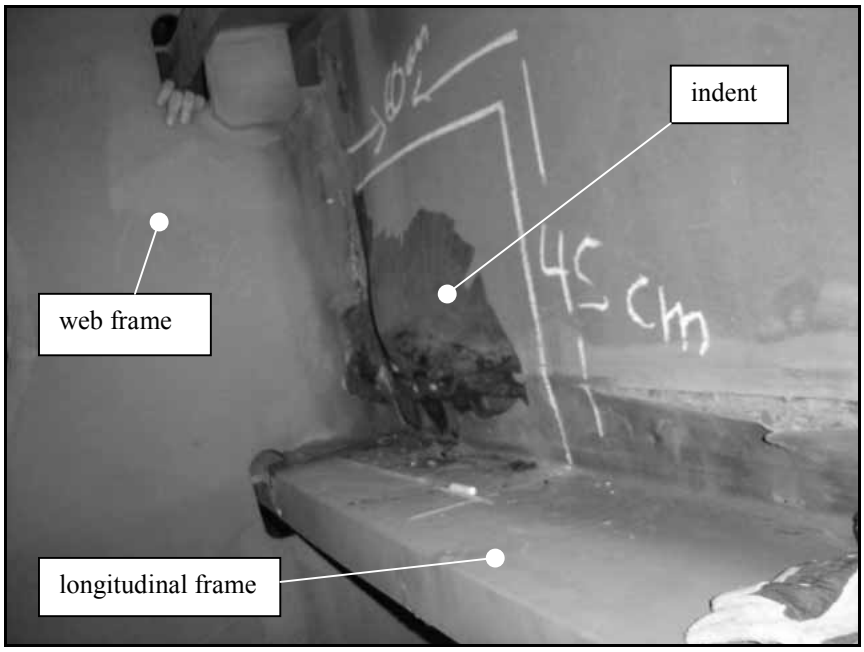


Figure 4
Internal damage to the *Hellas Constellation*

1.4 Climatic and tidal conditions

1.4.1 At the time of the accident it was a clear night with little wind and a low swell, with excellent visibility.

1.4.2 Tidal stream rates are shown on chart NZ 5412 for specific geographical positions designated by a magenta diamond shape enclosing a letter, known as a tidal diamond. The rates shown are for average spring or neap tides referred to high water at Tauranga. If the tidal range is greater than normal the rates will be increased roughly in proportion. The spring rate of tides tabulated in the New Zealand Nautical Almanac for Tauranga was 1.59 m and the neap range 1.23 m. The range at the time of the collision was 1.20 m and therefore a neap tide. The neap rates for the relevant diamond were:

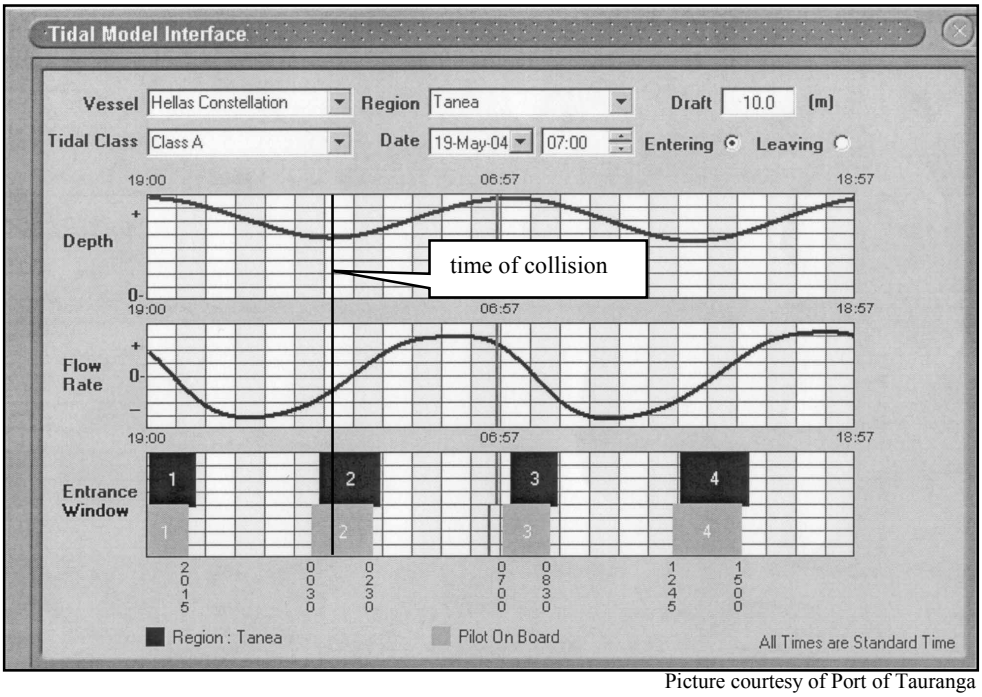
Position	Time	Direction	Rate
Diamond "A" 37º 36'.85S 176º 10'.29E	19/05/2004 0058	268º	0.1 kt
	19/05/2004 0109	257º	0.2 kt
	19/05/2004 0209	250º	0.2 kt

1.4.3 The Admiralty Sailing Directions New Zealand Pilot (NP51) states the following (in part) about the tidal streams at the entrance to Tauranga Harbour:

> Off North Rock (37º 37'.4S, 176º 10'.5E), the in-going tidal stream begins about +0555 HW Auckland [0109 19 May 2004] and sets W. Another in-going stream sets S over Matakana Bank. The two streams meet off North West Rock. The combined stream sets S through No. 2 Reach, attaining a rate of up to 4 kt at spring tides, and through the harbour entrance as indicated on the chart, before fanning out over the sandbanks in the harbour to the S.

At the end of No. 2 Reach, in the fairway on the W side, the out-going stream begins about HW Auckland but it may be delayed up to about 30 minutes; at the N end of the reach the stream begins about +0030 HW Auckland. The stream setting W around Stoney Point Light-Beacon (37º 38'.2S, 176º 10'.1E), joins a stream setting out of Western Channel. The combined stream sets through the harbour entrance, as indicated on the chart, and through No. 2 Reach. At the N end of No. 2 Reach, where it attains a rate up to 4 kt at spring tides, it sets NE to the vicinity of North Rock and then generally E. On the E side of the reach the out-going stream begins to set N about 30 minutes before the turn of the S-going stream on the W side. Slack water is of short duration and sometimes barely discernable at the S end of No. 1 Reach. At the S end of No. 2 Reach, W and NW of Stoney Point, slack water occurs about HW Auckland and lasts up to about 20 minutes. S of Stoney Point, slack water lasts from 10 to 30 minutes.

1.4.4 Port of Tauranga used its own electronic tidal and current prediction system as part of its harbour management system. This also showed the times when it was considered safe for vessels to enter (see Figure 5), there being 4 "entrance windows" in each day.



Picture courtesy of Port of Tauranga

Figure 5
Tide and tidal stream curve for Tanea area from Port of Tauranga's electronic system

1.5 Personnel information

1.5.1 The skipper of the *Joanne* had commenced his career in the fishing industry in 1991. He had fished deep sea and inshore in New Zealand and deep sea in Ireland. He was the skipper of the *Joanne* from January 2003 until the time of the accident. He had gained his Qualified Fishing Deck Hand's certificate in 1993 and his New Zealand Coastal Master's certificate in 1996.

1.5.2 The deckhand had been working in the fishing industry for about 3 years, mostly in Australia, but had returned to New Zealand about 3 months previously and had been working on fishing boats out of Tauranga since then. The deckhand held no fishing certification.

1.5.3 The master of the *Hellas Constellation* first went to sea in 1977. He had served on a multitude of different vessels, from large luxury yachts to passenger vessels and tankers. He had gained his master's certificate of competency in 1983 and had served as master since that time.

1.5.4 The second officer of the *Hellas Constellation* first went to sea as a deck officer cadet in 1993. He gained his second mate's certificate of competency in 2000. He had joined the *Hellas Constellation* in November 2003.

1.5.5 The pilot on board the *Hellas Constellation* had first gone to sea in 1979, gaining his master's certificate in 1989 after serving on a wide range of vessels. He commenced training as a pilot in another New Zealand port in 1991 and moved to the Port of Tauranga in 1997, where he had become an "A grade, unrestricted" pilot. He had completed about 3000 acts of pilotage.

1.6 Routines and remuneration

1.6.1 The bridge team on the *Hellas Constellation* consisted of the master, the second officer as watch officer, and the helmsman. The helmsman was stationed at the steering console steering the vessel by hand from orders given by the master or pilot depending on who had the con.

1.6.2 The second officer was charting the progress of the vessel from visual and radar bearings and distances taken either from one of the compass repeaters situated on the bridge wings or from one of the radars in the wheelhouse. The second officer was also recording the vessel's progress, engine orders and other items of interest in the vessel's movement book.

1.6.3 The master and pilot were moving between the forepart of the wheelhouse, where they had a virtually uninterrupted view forward and to both sides of the vessel, and the radars. At the front of the wheelhouse on the vessel's centre line, a gyro compass repeater was situated for taking bearings.

1.6.4 After the pilot had completed the berthing meeting with the bridge team he decided that, due to the good weather, he would con the vessel visually with only occasional reference to the radar.

1.6.5 A bearing is the direction of an object in degrees either by compass or in relation to the bow of the ship. By taking a succession of bearings of a target the risk of collision can be established. If the bearing of a target is changing then the target will pass ahead or astern. If the bearing is not changing then a risk of collision exists. The accuracy of this method of determining the collision risk is reduced if the targets are very large, very close, or both. However, in most situations the method gives a good indication of the possibility of collision.

1.6.6 As the *Hellas Constellation* passed "A" Beacon, the pilot sighted the *Pelican* and another target. He monitored the vessel's progress in relation to the 2 targets by observing their bearings. The bearing of the *Pelican* was changing while the bearing of the other target remained steady.

1.6.7 Fishing boats entering the Port of Tauranga regularly approached the main channel at an angle before paralleling the course of the channel, thus staying clear of the channel and avoiding the ships transiting it. The pilot had become used to fishing boats carrying out such a manoeuvre. Consequently, he said that he had not become concerned until the fishing boat did not make any attempt to turn towards the harbour entrance.

1.6.8 The Bay of Plenty Regional Navigational and Safety Bylaws 2001, Section 6, Tauranga Harbour, states that:

> the master of every pleasure craft shall not navigate so as to impede the navigation of any vessel of 500 gross tonnage or more.
>
> vessels over 100 GRT and pilot exempt are required to call Tauranga Port radio on marine VHF channel 12 and report the intention of the vessel to enter the harbour. Such vessels shall also maintain a listening watch on marine VHF channel 12 whilst inside the harbour.

No such requirements were applicable to vessels under 100 gross registered tonnage (GRT), such as the *Joanne*. On 1 July 2004, the Regional Council, Environment Bay of Plenty, commenced a review of the Navigational and Safety Bylaws.

1.6.9 The crew on the *Joanne* were self-employed share fishermen, as was the case on most New Zealand fresh fish vessels. They were not paid wages or salaries but received a percentage share of the catch value. Each person's percentage was dependent on their position on board. Their earnings were therefore directly proportional to the amount of fish caught.

1.6.10 Both of the *Joanne's* crew worked as required, shooting and hauling the net, and dealing with and stowing the catch. Meals and rest periods were taken around those work periods, and therefore had no fixed routine.

1.6.11 When the boat was trawling, on passage between fishing grounds and proceeding to or from its home port, the skipper and deckhand took turns to steer and keep a lookout whilst the other either rested or carried out routine tasks.

1.7 Collision Regulations

1.7.1 The International Regulations for Preventing Collisions 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 are minor editorial changes between the Colregs and Part 22, but the changes do not alter the meaning of the rules pertaining to this occurrence.

1.7.2 The paragraphs of Maritime Rules Part 22 relevant to this investigation are:

> 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.
>
> 22.7 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; and
> (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.

22.09 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 then 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.

(3) A vessel engaged in fishing must not impede the passage of any other vessel navigating within a narrow channel or fairway.

(4) A vessel must not cross a narrow channel or fairway if such crossing impedes the passage of a vessel which can safely navigate only within that channel or fairway. If the vessels are in sight of one another, the latter vessel may use the following sound signal as prescribed in rule 22.34(4) if in doubt as to the intention of the crossing vessel -

At least five short and rapid blasts on the whistle. This may be supplemented by a light signal of at least five short and rapid flashes.

(5) If vessels are in sight of each other in a narrow channel or fairway, when overtaking can take place only if the vessel to be overtaken has to take action to permit safe passing, the following provisions apply -

(a) the vessel intending to overtake must signal its intention by sounding one of the following sound signals prescribed in rule 22.34(3)(a) -

(i) two prolonged blasts followed by one short blast, to mean “I intend to overtake you on your starboard side”; or

(ii) two prolonged blasts followed by two short blasts, to mean “I intend to overtake you on your port side.”; and

(b) the vessel to be overtaken must, if in agreement, sound the following signal as prescribed in rule 22.34(3)(b) and take steps to permit safe passing: four blasts consisting of one prolonged, one short, one prolonged, one short; and

(c) if the vessel to be overtaken has any doubt, it may sound the following sound signal as prescribed in rule 22.34(4): at least five short and rapid blasts on the whistle. This may be supplemented by a light signal of at least five short and rapid flashes. This rule does not relieve the overtaking vessel of its obligation under rule 22.13 for overtaking vessels.

(6) A vessel nearing a bend or an area of a narrow channel or fairway where other vessels may be obscured by an intervening obstruction must navigate with particular alertness and caution, and must sound the following sound signal prescribed in rule 22.34(5): one prolonged blast. Such a signal must be answered with a prolonged blast by any approaching vessel that may be within hearing around the bend or behind the intervening obstruction.

(7) Any vessel must, if the circumstances of the case allow, avoid anchoring in a narrow channel.

22.13 Overtaking

(1) Despite anything contained in subsections 1 and 2 of section 1 of this Part, any vessel overtaking any other must keep out of the way of the vessel being overtaken.
(2) A vessel will be considered to be overtaking when coming up to another vessel from a direction of more than 22.5 degrees abaft its beam, that is, in such a position where at night the sternlight, but neither of the sidelights of the vessel being overtaken, would be visible.
(3) When a vessel is in any doubt as to whether it is overtaking another, it must assume that it is and act accordingly.
(4) Any subsequent alteration of bearing between the two vessels -
    (a) does not make the overtaking vessel a crossing vessel within the meaning of this Part; and
    (b) does not relieve the overtaking vessel of its duty to keep clear of the overtaken vessel until it is finally past and clear.

22.15 Crossing Situation

When two power-driven vessels are crossing so as to involve risk of collision, the vessel which has the other on its own starboard side must keep out of the way. The vessel required to keep out of the way must, if the circumstances of the case allow, avoid crossing ahead of the other vessel.

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.

22.28 Vessels Constrained by Their Draught

A vessel constrained by its draught may, in addition to the lights prescribed for power-driven vessels in rule 22.23, exhibit where they can best be seen, three all round red lights in a vertical line or a black cylinder.

22.34 Manoeuvring and Warning Signals

(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.

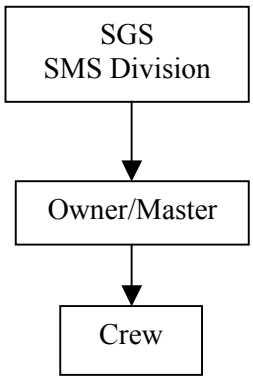
This signal may be supplemented by a light signal of at least five short and rapid flashes.

1.8 International ship management / safe ship management

1.8.1 The *Hellas Constellation* complied with the requirements of the International Management Code for the Safe Operation of Ships and for Pollution Prevention (ISM Code) as adopted by the International Maritime Organization (IMO) by resolution A.741(18), as amended. The ship's certificate of compliance was issued on 12 December 2000, and was valid until 26 June 2005, subject to periodic verification and following verification that the document of compliance for the managing company was valid for this type of ship. An intermediate verification had been carried out on 25 July 2002. The document of compliance for the managing company was issued on 24 March 2003 and was valid, subject to periodic verification, until 10 February 2008. An intermediate verification had been carried out on 17 December 2003.

1.8.2 The *Joanne* was under safe ship management (SSM) with SGS M&I. The certificate was issued on 8 April 2004 and, subject to periodic audit/inspection of the ship and its management system, was valid until 31 January 2008.

1.8.3 The SSM manual for the *Joanne* included the following:

> In the implementation of the Ship's Safety Management System, the following structure will apply:
>
> 
>
>
> The owner will, at all times, employ only appropriately qualified, certified, experienced and medically fit seafarers to man this ship. The only exception to qualifications will be seafarers under training and then only as additional crew to the minimum manning levels required by legislation or regulation.
>
> Ships Master: Responsibilities:
>
> - The Master has the ultimate responsibility for the operation of this ship and is responsible to the owner.
> - He/she is responsible for ensuring that the safety and environmental protection policies defined in the Ships Management System are strictly adhered to.
> - He/she is responsible for ensuring that all crew are trained in and understand the Ships Management System and observe the requirements.
> - He/she is responsible for all instructions and orders given relating to the operation of the ship, that these instructions and orders are simple, clearly understood and followed by all crew or land-based support staff who from time to time report to him/her.
> - He/she is responsible for verification that all of the foregoing is observed.
> - He/she is responsible for reviewing the Ships Management System and reporting to the Company any improvements identified or deficiencies found.

Authorities

- The Master has ultimate authority, while at sea, to decide on and take whatever action he sees fit to maintain the safety of the crew, the environment, the ship, and its cargo.
- In conjunction with the owner, the Master has the authority to recruit appropriately qualified and experienced persons to fill crew positions.
- In all other respects he/she has the authorities as detailed in his /her conditions of employment.

1.8.4 The manual did not detail any information with regard to fitness for duty or fatigue.

1.9 Fatigue

1.9.1 The skipper of the *Joanne* confirmed that he fell asleep while on watch.

1.9.2 There are many definitions of fatigue but no universally accepted one. The extent to which individuals may be affected by a given set of circumstances will vary. The definition most widely accepted by the shipping industry was that used by the IMO, namely:

> A reduction in physical and/or mental capability as the result of physical, mental or emotional exertion which may impair nearly all physical abilities including strength; speed; reaction time; co-ordination; decision-making or balance.

1.9.3 The IMO International Convention on Standards of Training, Certification and Watchkeeping, 1995 (STCW-95) prescribes specific minimum hours of rest for watchkeepers. STCW-95 does not apply to fishing vessels. However, the IMO International Convention on Standards of Training, Certification and Watchkeeping for Fishing Vessel Personnel, 1995 (STCW-F) recommends watchkeeping in the deck department to be arranged so that personnel are not impaired by fatigue, but no minimum hours of rest are prescribed.

1.9.4 On 1 February 2001 Maritime Rules Part 31C, Crewing and Watchkeeping Fishing Vessels, came into force, replacing the Shipping (Manning of Fishing Boat) Regulations 1986. Part 31C took account of STCW-F and introduced new requirements that supported an awareness of fatigue issues and their countermeasures.

1.9.5 Section 4 of Part 31C was entitled Watchkeeping and stated in part:

> **31C.14 Fitness for Duty**
>
> (1) The owner and master of a fishing vessel must establish and implement procedures in respect of the vessel's crew, taking into account the requirement in 31C.15(1), to ensure that all crew are fit for duty when keeping a watch.
>
> (2) The crew of a fishing vessel must ensure, taking into account the requirement in rule 31C.15(2), that they are fit for duty at all times when keeping a watch.
>
> **31C.15 Fatigue**
>
> (1) When the owner and the master of a fishing vessel establish and implement procedures for ensuring a seafarer's fitness for duty, they must take into account that-
>
> (a) the level of alertness of a person keeping a navigational or engine-room watch may be affected by fatigue; and
>
> (b) whenever alertness is affected by fatigue, performance can be impaired.
>
> (2) A seafarer on a fishing vessel, when considering his or her fitness for duty, must take into account-
>
> (a) the signs, symptoms, and effects of fatigue, and
>
> (b) that fatigue will affect his or her level of alertness, and

(c) that the performance of any person whose alertness is affected by fatigue can be impaired.

31C.16 Watchkeeping Standards

(1) The owner and the master of a fishing vessel must establish and implement watchkeeping procedures addressing-

(a) for navigational watchkeeping-

(i) the composition of the watch; and

(ii) the fitness of duty of the watchkeepers; and

(iii) navigation planning and duties; and

(iv) the use of navigational equipment; and

(v) look-out duties; and…

(2) The crew of a fishing vessel must comply with watchkeeping procedures established under rule 31C.16(1).

1.9.6 The advisory circular that accompanied Part 31C stated that owing to the diverse range of vessels covered by the rule, actual hours of work or rest could not be prescribed. However, it had a table of the signs and symptoms of fatigue and a section titled Fitness for Duty, which stated:

> The watch system should be such that the efficiency of watchkeeping personnel is not impaired by fatigue. Duties should be so organised that the first watch at the commencement of a voyage and the subsequent relieving watches are sufficiently rested and otherwise fit for duty.

1.9.7 FISHgroup's final report identified that fatigue was a significant causal factor that led to fatalities and injuries in the fishing industry. FishSAFE, which replaced FISHgroup, was formed with the aim of developing and managing an implementation plan to give effect to the recommendations in the FISHgroup report.

1.9.8 FishSAFE had its inaugural meeting on 21 May 2004; the group comprised representatives from the MSA, the Seafood Industry Training Organization, the Accident Compensation Corporation and a wide spectrum of the fishing industry.

1.9.9 Under the umbrella of FishSAFE the MSA was undertaking 2 projects relating to fatigue management:

1. development of a safe code of working practice for commercial fishers, focusing primarily on the owner/operator end of the commercial sector. The fitting and use of watchkeeping alarms would be covered in this code.
2. development of practical fatigue management guidelines in consultation with industry and to use these as the basis for the development of fatigue management training and education throughout the maritime industry with the following objectives:
    - raise awareness of the importance of fatigue management amongst workers in the maritime industry
    - develop practical methods of managing fatigue
    - provide training in fatigue management techniques to both employers and employees within the maritime industry.

1.9.10 After the accident the skipper and the deckhand gave their recollections about their sleep/wake/work pattern in the 72 hours prior to the accident.

Date	Undertaking	Period of Possible Sleep
15 May	Sailed from Tauranga at 1200 and fished during the day	Some rest
15 May/16 May	Anchored at about 1830, weighed anchor at about 0500	7 hours
16 May	Fished all day	Some rest
16 May/17 May	Anchored at about 1830, weighed anchor at about 0500	7 hours
17 May	Fished all day, then moved to "Crater Area" arriving at about 2400	Some rest
18 May	Drifted from 0000, no watch kept, started fishing at about 0500	4 hours
18 May	Fished all day, processed fish, rang owner at 2000.	Some rest
18 May/19 May	Commenced return voyage to Tauranga at about 2000, Collision	Skipper 2 hours

1.9.11 The accuracy of the sleep information supplied by the skipper and deckhand is inherently limited by the fact that subjective reports of sleep duration and timing are not necessarily reliable, and by the fact that the accident had intervened between the sleep episodes and when they were being recalled.

1.9.12 When hauling and shooting the net, and processing catch, both the skipper and the deckhand were needed. Such a system did not allow the skipper to have a spare deckhand resting while these operations were in progress. However, when trawling either the skipper or deckhand could rest and possibly sleep.

Fatigue study information

1.9.13 Work-related fatigue has three main causes:

1. excessively long and/or hard work (time-on-task fatigue and workload)
2. inadequate, irregular or poor-quality sleep
3. working and resting at inappropriate times in the circadian rhythm[3], which leads to reduced task performance and impaired sleep quality respectively.

1.9.14 To be alert and able to function well, each person requires a specific amount of nightly sleep, the average for an adult being 7 to 8 hours. If the individual "sleep need" is not met, the consequences are increased sleepiness and impaired performance. For most people, getting 2 hours' less sleep than they need on one night produces an acute sleep loss and is enough to consistently impair their performance and alertness the next day. The reduction in performance is particularly marked if fewer than 5 hours' sleep are obtained.

1.9.15 Short sleep would usually mean long periods of time awake. Laboratory studies consistently show that the longer a person stays awake, the sleepier they become and the more slowly and inaccurately they perform any type of work.

1.9.16 The effects of several nights of reduced sleep accumulate into a "sleep debt", with sleepiness and performance becoming progressively worse. Recovery of the lost hours of sleep need not be on an hour-for-hour basis, but it typically takes 2 good nights' sleep to return to normal after sleep loss.

[3] The inherent pattern of physical and mental characteristics related to a 23- to 25-hour internal central nervous system activity cycle.

1.9.17 Sleep is not equally possible across the 24-hour day. How quickly a person can fall asleep and how long they remain asleep are regulated by their circadian body clock. This can be visualised in terms of competing sleep and wake "drives". The sleep drive is highest in the early hours of the morning when the urge to fall asleep is most overwhelming and can be completely uncontrollable.

1.9.18 Not only the amount of sleep but also the quality of sleep can have important effects on wake-time functioning. Sleep that is restless and fragmented by frequent awakenings leaves a person sleepy and at increased risk of making errors. Sleep can be disrupted by a wide variety of factors including physical sleep disorders and other health problems, changing work and rest schedules, poor sleep habits and ill-informed attitudes about increasing wake-time activities by cutting back on sleep.

1.9.19 Environmental factors can have an important effect on sleep quality. For crew sleeping on board, such factors as noisy or cramped quarters and rough sea conditions can be expected to reduce sleep quality.

1.10 Previous occurrences

1.10.1 On Friday 26 March 2004 at about 0215, the fishing boat *Bronny G* grounded on rocks at Steep Head on Banks Peninsula while the boat was on passage back from fishing grounds to Lyttelton Harbour (TAIC Marine Occurrence Report 04-205).

1.10.2 On Thursday 16 April 2004 at about 0215 the fishing boat *Poseidon* grounded on the beach to the north of the Manukau Harbour entrance while the boat was on passage back from fishing grounds to Onehunga (TAIC Marine Occurrence Report 04-207).

1.10.3 Safety issues identified in both groundings included:

- the lack of a working watchkeeping monitor alarm for a single-handed wheelhouse operation
- the undertaking of navigational watchkeeping and helmsman tasks whilst suffering from the effects of fatigue.

2 Analysis

2.1 The skipper had been recently woken, after a short sleep, to take over the navigational watch, which he undertook from the helmsman's chair as the boat was operating in autopilot. The regular noise of the engine, the warm conditions inside the wheelhouse, and the lack of required input to steering coupled with his sitting position could possibly have lulled the skipper, who was not yet properly awake, back to sleep.

2.2 Owing to the inherently irregular and prolonged nature of work during fishing operations and the harsh, uncomfortable and noisy conditions often experienced aboard fishing boats, fatigue is common amongst fishing boat crews. This fact has been recognised and legislation requires the owner, skipper and crew to take responsibility for recognising and managing the problem.

2.3 Although the skipper and deckhand had opportunity for rest during the working day when trawling and had a period of about 7 hours at night in which to sleep, the conditions were probably not conducive to restorative rest.

2.4 As both the skipper and deckhand were required to haul the net and process the fish there was nobody available to be rested to watchkeep on the journey back to port.

2.5 Had the SSM manual contained procedures and guidelines regarding fitness for duty and fatigue, and the owner's, operator's and crew's requirements to ensure that they implemented the contents of Maritime Rules Part 31C, the crew might have been better informed. Had they

undertaken the required measures, the owner, operator and crew would have been more aware of the symptoms and dangers of fatigue and could have taken appropriate measures to manage it and avert the collision.

2.6 The lack of a watchkeeping alarm for whatever reason, either broken, disabled or switched off, deprived the skipper of a valuable defence against the effects of fatigue. The alarm by its very nature is designed to be intrusive and require immediate attention. The possibility that the alarm was either disabled or switched off because of its intrusive nature cannot be justified against the increased safety it provides the boat and crew.

2.7 Under the meaning of the Maritime Rules Part 22, both vessels were power-driven vessels with no special limiting manoeuvring characteristics. As the pilot had the occasional glimpse of the *Joanne's* starboard sidelight he deduced that the *Joanne* was either a crossing or overtaking vessel. As the *Joanne* had the *Hellas Constellation* on its own starboard side and possibly approaching from more than 2 points [22.5º] abaft the beam it was therefore the give-way vessel and under Maritime Rules Part 22.15, Crossing Situation, or Maritime Rules Part 22.13, Overtaking. The *Joanne* should therefore have kept clear of the *Hellas Constellation;* this it failed to do.

2.8 The *Hellas Constellation* was being conned down the line of the leading lights on No. 1 Reach, the approach to Tauranga Harbour. With the draught of the *Hellas Constellation* and the available depth of water outside the fairway, the ship could be considered to be constrained by her draught to the fairway. Under Maritime Rules Part 22.09 the *Joanne* should have kept clear of the *Hellas Constellation*. The *Hellas Constellation* could have exhibited the appropriate light signal of three all round red lights where they can best be seen to warn other traffic in the area.

2.9 The *Hellas Constellation* was the stand-on vessel and as such was required to maintain its course and speed. However, as soon as it became apparent that the *Joanne* was not taking appropriate action, the stand-on vessel may have taken action to avoid a collision by its manoeuvre alone. The pilot on the *Hellas Constellation* maintained the course because the room he had for manoeuvre was limited. He did alter the speed of the ship but the alteration was small, because he needed to maintain the ship's headway against the current and to alter course across the current. The alteration in speed did not adequately remove the risk of collision.

2.10 The *Hellas Constellation* at first sounded one long blast on the whistle, which although not a recognised sound signal under the Maritime Rules may have alerted the skipper of the *Joanne* to the situation. However, the *Hellas Constellation* then sounded the appropriate sound signal of at least 5 rapid blasts on its whistle as required by Maritime Rules Part 22.34(4), Manoeuvring and Warning Signals.

2.11 The pilot boat also tried to attract the attention of the *Joanne* without success, indicating there was no one in the wheelhouse or they were asleep.

2.12 The pilot on the *Hellas Constellation* followed the correct procedures for the pilotage and conning of the vessel into the port of Tauranga. Because the pilot was used to the close proximity of small boats as he made his approach, his level of concern as the *Joanne* approached was probably reduced until it was too late to take appropriate avoiding action.

2.13 The angle of contact between the vessels was about 55°. The angle was sufficiently acute to allow the *Joanne* to glance off and pass around the ship's stern. However, had the angle been broader, and the *Hellas Constellation* more lightly loaded, the *Joanne* may well have skidded down the side of the *Hellas Constellation* and been drawn into its propeller, causing major damage to both vessels and the possible loss of life of those on the fishing boat.

2.14 The practice of small boats coming close alongside and then altering course to parallel larger ships in the channel is a perilous undertaking. It would be considerably safer for the small boats not to impede the navigation of a ship that was restricted to the channel by either waiting for the ship to pass or to run ahead of it. There was no requirement under the bylaws current at the time of the accident for commercial vessels under 100 GRT not to impede vessels of over 500 GRT using the approach channel. However, as the watchkeeper of the *Joanne* was asleep he was unaware that his boat impeded the safe passage of the *Hellas Constellation*. If the practice stopped then the pilot on the larger vessel would be more circumspect at a small boat approaching on a steady bearing.

2.15 The *Hellas Constellation* was a 4-year-old double-hulled tanker with ballast tanks surrounding the cargo tanks. Had the *Joanne* ruptured the hull of the *Hellas Constellation* during the collision this design reduced the risk of environmental pollution and the possibility of an explosion caused by a spark during the collision.

3 Findings

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

3.1 The *Joanne* collided with the *Hellas Constellation* because there was nobody monitoring the *Joanne's* progress. The skipper who was in the wheelhouse fell asleep because he was probably suffering from the effects of fatigue.

3.2 The number of crew aboard the *Joanne* complied with the stipulated minimum crewing level. However, the way the fishing operation was organised meant that there were not enough crew to work the vessel and still have a well rested person available to navigate the vessel back to port.

3.3 The pilot who was conning the *Hellas Constellation* was unable to manoeuvre the ship out of harm's way as the ship was constrained within the confines of the channel.

3.4 The pilot was used to fishing vessels approaching close to the ships he was conning before altering course, leaving him insufficient time to react to the threat of collision.

3.5 The 2 vessels were either in a crossing or overtaking situation as prescribed in the Maritime Rules Part 22. In either case the *Joanne* was the give-way vessel. Consequently, the *Hellas Constellation* was the stand-on vessel.

3.6 The *Joanne* did not take any action to avoid a collision as required by Maritime Rules.

3.7 Any large alteration in speed of the *Hellas Constellation* would probably have jeopardised the safe transit of the ship through the approach channel. However, the reduction in the speed that the pilot was able to make was insufficient to avoid the collision.

3.8 The SSM system under which the *Joanne* was operating did not adequately address the responsibilities for preventing fatigue on board as required by Maritime Rule Part 31C.

3.9 Had the fitted watchkeeping alarm system been in use it is probable that the skipper would have been woken and the accident averted.

3.10 Had the *Joanne* not collided with the *Hellas Constellation* it would most likely have grounded on Matakana Island.

4 Safety Actions

4.1 Since the accident, Environment Bay of Plenty Regional Council reviewed the Navigation and Safety Bylaws and included amended sections to incorporate changes as follows:

- under the Directions for Entering & Navigating in Tauranga Harbour (vessels over 100 GRT and Pilot Exempt Vessels:
    - amended the section dealing with the limits of narrow channels as defined under Maritime Rules Part 22.9 to include: No. 1 Reach, Maunganui Roads and the Stella Passage
    - recommended all vessels, commercial and recreational, where fitted with a marine VHF to maintain a listening watch on marine VHF channel 12 when approaching and transiting the Tauranga Harbour entrance and whilst within the Tauranga pilotage area
- under the General Directions for Navigating in Tauranga Harbour:
    - required the master of any vessel whilst navigating within the Tauranga Harbour pilotage area not to impede the navigation of any vessel of 500 GRT or more, any hovercraft or any seaplane in the process of taking off or landing
- under the Tauranga Harbour Reporting procedures for vessels sailing from wharves or anchorages:
    - recommended all other vessels, commercial or recreational (where VHF is fitted), to maintain a listening watch on Marine VHF channel 12 when sailing from wharves or anchorages within the Tauranga Harbour and whilst within the Tauranga pilotage area.

The amended bylaws came into force on 15 October 2004.

4.2 The Chief Executive of Environment Bay of Plenty Regional Council advised on 13 September 2004 that:

> the Harbourmaster's office has obtained a list of commercial fishing vessels and their owners from the local MSA (Maritime Safety Authority) and is in the process of advising them of the changes to the Bylaws and the importance of monitoring VHF Ch 12 (Tauranga Port Radio). Consideration has also been given to including a recommendation for the installation and use of Watchkeeping Alarms or suitable alternative warning systems in this mail out.

4.3 The Chief Executive of Environment Bay of Plenty Regional Council further advised on 13 September 2004 that it had:

- consulted with the Port of Tauranga and its pilots over the use of the additional lights as prescribed for vessels constrained by their draught in Maritime Rules Part 22.28. However, as all vessels under pilotage navigating the Tauranga pilotage area are constrained by their draught this was considered not necessary
- consulted with the Port of Tauranga and its pilots over the pilots' practice of sounding one prolonged blast on the vessel's whistle to alert other vessels in the vicinity of their presence and as a warning signal to other harbour users in addition to the sound signals prescribed in Maritime Rules Part 22.34. This action was endorsed by the harbourmaster and encouraged by the Port of Tauranga.

4.4 In view of these actions no safety recommendations concerning the safe passage of large vessels that can only navigate within the confines of the navigational channels have been made to Environment Bay of Plenty Regional Council.

5 Previous Safety Recommendations

5.1 Following the grounding of another fishing vessel (Marine Occurrence Report 04-205) the Commission recommended on 2 August 2004 to the General Manager of SGS M&I Ships Management Systems, that he:

> Implement the requirements of Maritime Rule Part 31C Section 4 for all vessels under the SGS M&I Safe Ship Management system. (042/04)
>
> Include a section in the SGS M&I Safe Ship Management manual on the signs, symptoms and effects of fatigue and practical methods of managing fatigue. (043/04)

On 22 July 2004, the General Manager of SGS M&I Ships Management Systems responded to the preliminary safety recommendations, which were subsequently adopted unchanged as the Commission's final safety recommendations. That response stated, in part, the following:

- we will be pleased to adopt your recommendations that we include more detail in our manual regarding fatigue. This will include, as we have done for hazard recognition, a simple document that can be displayed on the vessel for all to see, which highlights symptoms of fatigue and its causes, as well as including an appropriate section within the manual.
- As an observation we strongly believe that the curriculum for the training of seafarers should be reviewed and amended to include an appropriate module to cover the requirements of Safe Ship Management, and "man management" with respect to recruitment and manning with appropriately qualified persons, and Alcohol, Drug, and Fatigue management. This we believe should be mandatory for ILM and above qualifications.

The safety recommendations are equally applicable in this case so, no further recommendations relating to the requirements of Maritime Rule Part 31C Section 4 or fatigue management have been made to SGS M&I Ships Management Systems.

5.2 Following the grounding of another fishing vessel (Marine Occurrence Report 04-205) the Commission recommended on 20 August 2004 to the Director of Maritime Safety that he:

> develop with industry a communication and education strategy to implement fatigue management guidelines taking into account the outcomes and recommendations from the fatigue management study currently being conducted by the MSA. (052/04)

On 23 August 2004 the Director of Maritime Safety replied, in part:

> This recommendation is acceptable to the Maritime Safety Authority, and we will be implementing it over the next 12 months as our fatigue management study is completed.

The safety recommendation is equally applicable in this case so no further recommendations relating to developing with industry a communication and education strategy to implement fatigue management guidelines have been made to the Director of Maritime Safety.

6 Safety Recommendations

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

6.1 On 16 September 2004, the Commission recommended to the Managing Director of the Rawlinson Business Trust that he:

6.1.1 in conjunction with the Safe Ship Management Company, implement the requirements of Maritime Rule Part 31C for all vessels operated by his company and update the safe ship management manual as necessary. (068/04)

6.1.2 in conjunction with the Safe Ship Management Company, include a section in the Safe Ship Management manual on the signs, symptoms and effects of fatigue and practical methods of managing fatigue. (069/04)

6.1.3 put in place procedures to ensure that the watchkeeping alarms fitted to all vessels operated by his company are used whenever a navigational watch is undertaken. (070/04)

6.2 On 16 September 2004, the Commission recommended to the General Manager, Trade and Information of the Seafood Industry Council that he:

6.2.1 include an article in the Seafood New Zealand magazine featuring this report, the intent of Maritime Rule Part 31C together with its advisory circular and the work of the Maritime Safety Authority-convened FISHgroup and FishSAFE initiatives. (072/04)

6.3 On 30 August 2004, the Communications Manager of the Seafood Industry Council replied:

> we intend publishing a summary of the 04-207 and 04-209 reports in the October and November issues of Seafood NZ magazine.

Approved on 22 September 2004 for publication

Hon W P Jeffries
Chief Commissioner

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04-205	fishing vessel *Bronny G*, grounding, Banks Peninsula, 26 March 2004
04-204	restricted limit passenger vessel *Freedom III*, grounding, Lake Manapouri, 24 February 2004
04-203	coastal passenger and freight ferry *Arahura*, heavy weather incident, Cook Strait, 15 February 2004
04-202	restricted limit passenger vessel *Queenstown Princess*, grounding, Lake Wakatipu, 13 February 2004
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03-209	container vessel *Bunga Teratai 4* and fishing vessel *Mako*, collision, Tasman Bay, 4 July 2003
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03-202	launch *Barossa* and trimaran *Triptych*, collision, Hauraki Gulf, 18 February 2003
03-201	passenger ferry *Harbour Cat*, engine room fire, Auckland Harbour, 16 January 2002
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02-206	bulk carrier, *Tai Ping*, grounding, Bluff Harbour, 8 October 2002

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