Report 08-202, coastal bulk carrier *Anatoki* and bulk carrier *Lodestar Forest,* collision, Tauranga Harbour roads, 28 April 2008

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

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

Report 08-202

coastal bulk carrier *Anatoki* and bulk carrier *Lodestar Forest* collision

Tauranga Harbour roads

28 April 2008

The *Lodestar Forest* at anchor in Wellington

Photograph courtesy of Coastal Bulk Shipping Limited

The *Anatoki* entering Nelson Harbour

Executive Summary

On Monday 28 April 2008 at about 0633, the coastal bulk carrier *Anatoki* was approaching Tauranga Harbour when it collided with the bulk carrier *Lodestar Forest,* which was departing after disembarking its pilot. At the time of the collision both vessels were navigating in restricted visibility (fog) within the compulsory pilotage area for the Port of Tauranga. There were no injuries and only minor damage to both vessels that did not affect the watertight integrity of either.

The collision occurred when both vessels' masters and the pilot lost situational awareness. The master and pilot on board the *Lodestar Forest* lost situational awareness when the correct rigging of the pilot disembarkation ladder took longer than anticipated. The master on board the *Anatoki* lost situational awareness when he failed to appreciate that his vessel was still moving at slow speed into an area where his radar had suggested a vessel was present, a radar return he believed to be false so had not mentioned it to his crew.

Significant factors which contributed to the accident were:

- the bridge cultures on both vessels meant that senior crew on each vessel did not share all relevant information or question developing situations so that each bridge team shared an up to date picture of their vessel's situation and intentions
- the *Anatoki* did not have an automatic identification system which would have meant both vessels would have seen positive identification of each other and their positions on their radar screens. Such a system was not required on the *Anatoki* because its measured length was not sufficient as the result of a modification to allow operation in New Zealand waters, under New Zealand Regulations, despite its weight and size being typical of vessels that do
- the crew were not totally familiar with the operation of the radio systems aboard the *Anatoki* owing to the manuals and labels being in Japanese
- the lack of a vessel traffic system for Tauranga Harbour. This would have included shore-based radar observation and radio advice to masters of vessels in the area.

Other factors that contributed to the accident included:

- crew alertness and performance on the *Lodestar Forest* was likely to have been impaired by disturbed rest periods during the night as its sailing was repeatedly delayed owing to the poor visibility
- inadequate observance on both vessels of aspects of the international rules for collision avoidance, including the use of incorrect whistle signals by both, may have hindered the management of the collision once the situation was noticed

As a result of its investigation the Transport Accident Investigation Commission has recommended that:

- Environment Bay of Plenty and Port of Tauranga Limited review their Tauranga Harbour safety plan with a view to introducing a traffic management system
- Maritime New Zealand address the safety issue of commercial vessels above the internationally accepted size for the carriage of automatic identification systems operating in New Zealand waters without fitment of these systems
- Maritime New Zealand address the safety issue of crew holding certificates of equivalency who may not be required to have undergone bridge resource management training.

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

Contents

Figures

Abbreviations

°	degrees
AIS	automatic identification system
ARPA	automatic radar plotting aid
BRM	bridge resource management
class NK	Nippon Kaiji Kyokai
Envbop	Environment Bay of Plenty Regional Council
IMO	International Maritime Organization
ISM Code	International Management Code for the Safe Operation of Ships and for Pollution Prevention
kW	kilowatt(s)
m	metre(s)
Maritime NZ	Maritime New Zealand
Metservice	Meteorological Service of New Zealand
mm	millimetre(s)
NK rules	Nippon Kaiji Kyokai construction rules
nm	nautical mile(s)
NS* (Bulk Carrier) (ESP)MNS*	vessel constructed to NK rules, vessel type, ship applies enhanced survey programme for bulk carriers and tankers, main propulsion machinery built to NK rules
SMS	safety management system
SOLAS	International Convention for the Safety of Life at Sea, 1974 as amended
SSM	safe ship management
STCW-95	standards of training certification and watchkeeping 1978 as amended in 1995
t	tonne(s)
UTC	coordinated universal time
VDR	voyage data recorder
VHF	very high frequency
VTS	vessel traffic service

Glossary

bell book	a book in which all orders affecting the main engines of a ship, and other items of note, are recorded before being transferred into the bridge log book
con (conning)	direct the course and speed 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
port	left-hand side when facing forward
starboard	right-hand side when facing forward
summer draught	draught of the vessel's primary load line; it is from this mark that all other marks are derived. The position of the summer load line is calculated from the Load Line Rules and depends on many factors such as length of ship, type of ship, type and number of superstructures, amount of shear, bow height. The horizontal line through the circle of the Plimsoll mark is at the same level as the summer load line

Data Summary

Vessel Particulars:

Name:	*Anatoki*	*Lodestar Forest*
Type:	coastal bulk carrier	bulk carrier
Class:	NZ safe ship management	NS* (Bulk Carrier) (ESP) MNS*
Limits:	NZ coastal	SOLAS
Classification:	Maritime New Zealand	Nippon Kaiji Kyokai
Length overall:	51.03 m	175.53 m
Breadth:	8.3 m	29.4 m
Gross tonnage:	550	19789
Built:	Furimoto Tekko Shipbuilding, Japan in 1992	Hakkodate dockyard, Japan 07 January 2005
Propulsion:	single medium-speed Matsui 6M26KGS-01 diesel engine developing 415 kW driving a single fixed-pitch propeller through a Niigata MN630 gearbox	single slow-speed-direct-reversing Mitsubishi 6UEC52LA diesel engine developing 6840 kW, driving a single fixed-pitch propeller
Service speed:	10 knots	14.4 knots
Owner: Charterer: Operator:	Coastal Bulk Shipping 2007 Limited	IMA Lines Co. S.A. NYK Line CHH Lodestar Operations NZ
Port of registry:	Nelson	Panama
Minimum crew:	4	14

Date and time:		28 April 2008 at about 0633[1]	
Location:		Tauranga Harbour roads	
Persons on board:	crew:	4	21
Injuries:	crew:	nil	nil
Damage:		minor to both vessels	
Investigator-in-charge:		Captain Iain Hill	

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

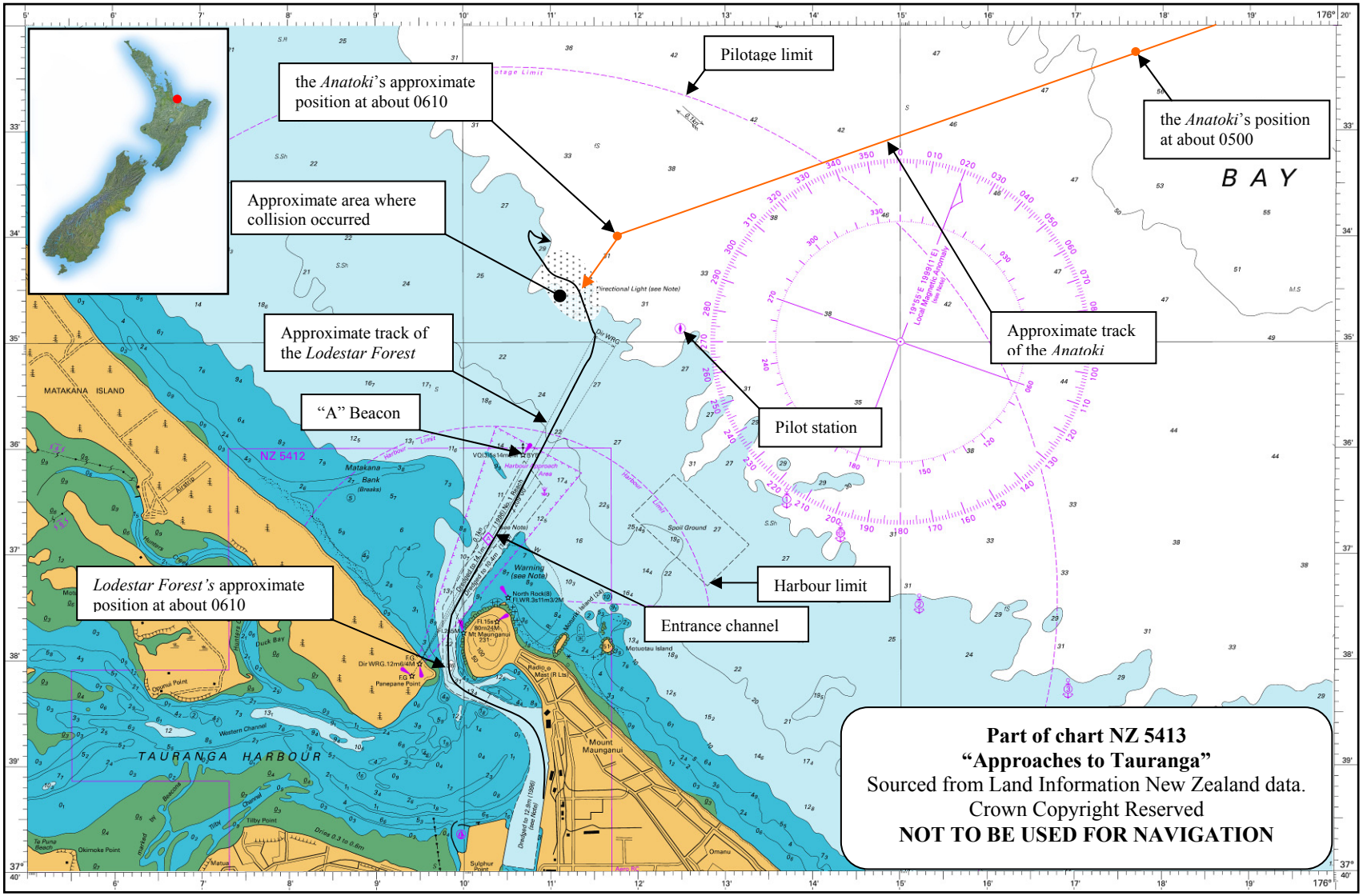


Figure 1
Chart of the all-purpose area

1 Factual Information

1.1 Narrative[2]

Events on board the *Anatoki*

1.1.1 On 25 April 2008, the *Anatoki* sailed, in ballast, from Wanganui. The planned course was for the vessel to pass through Cook Strait and up the east coast of the North Island before rounding East Cape and into the Bay of Plenty. After entering the Bay of Plenty the planned course was amended to pass inside of White Island to put what sea and swell there was behind the vessel to improve the vessel's motion.

1.1.2 The vessel had made good speed on the voyage around the North Island and could have arrived at the port of Tauranga pilot station at about 0200 on 28 April. However, the pilot had been booked for 0600 that morning, so the master planned for the vessel to idle back and forth some distance from the port to await the designated pilot time.

1.1.3 The master handed the bridge watch over to the watchkeeper at midnight then went to bed. He left night orders for the mate to call port of Tauranga at 0400 to confirm the estimated time of arrival of 0600. The mate relieved the watchkeeper of the watch at 0400 then contacted the Customer Service Centre at Tauranga port by cellphone. The Customer Service Centre also acted as Tauranga Port Radio for any radio traffic to the port and could monitor activity in the port by radar. The Customer Service Centre advised the mate that the pilot would be boarding at about 0615, a quarter of an hour later than previously arranged, and the pilot would probably be coming out to the pilotage area on another vessel. The Customer service centre advised that there was fog in the area and requested the *Anatoki* to make its way to the pilot station.

1.1.4 At about 0500, when the vessel was about 5 nautical miles (nm) to the east-northeast of the pilot station on a heading of about 250 degrees (°), the mate of the *Anatoki* woke the master who then went to the bridge and acquainted himself with the situation. The engineer had already been woken by the mate at 0445 to start getting the engine room ready for entering port.

1.1.5 At about 0530, the *Anatoki* entered the pilotage area and at about 0610, the *Anatoki* was about one nautical mile north of the pilotage position and all the crew were awake and getting ready for entry into the port. The master had assumed the con of the vessel from the mate, who was completing the pre-arrival checklists. The mate said later that he had communicated with Tauranga Port Radio on very high frequency (VHF) radio channels 16 and 12 at about this time. However, no such calls could be found on the Tauranga Port Radio recordings.

1.1.6 The master was controlling the direction of the *Anatoki* using the autopilot and maintaining steerage by adjusting the bridge control for the engine to control the vessel's speed. The vessel became engulfed in fog, so the mate started the whistle to sound the prescribed fog signal for a vessel underway and making way.

1.1.7 The master was using the radar and had detected a target that he believed to be the outbound vessel in the channel. He started plotting the target. He observed the target appear to make its way along the channel then turn to port; he continued to monitor the progress of the outbound vessel as it turned to port across the *Anatoki*'s bow. He stated later that he did not take any action as he thought that the radar was giving him a false reading. He did not know the name of the vessel and made no attempt to make radio contact.

[2] There was a discrepancy between the times recorded by the *Anatoki*, the *Lodestar Forest* and those recorded by the message recorder at Tauranga Port Radio. The *Anatoki*'s times were about 3.5 minutes slow on Tauranga Port Radio's and the *Lodestar Forest*'s were about 2.5 minutes fast. All timings after 0610 on 28 April 2008 have been amended to "Tauranga Port Radio time" for ease of comparison.

1.1.8 After the master noticed the outbound vessel turn to port on the radar, the mate who was on the port bridge wing and the watchkeeper who was on the main deck readying the pilot ladder both heard 5 blasts on a whistle followed by 2 blasts on a whistle just before the shape of a large vessel became discernable through the fog. The master, nearly at the same time, saw a light to port and the black shape of a vessel's hull come in to view.

1.1.9 The vessel that the master and crew saw appeared to be heading from the port side across the bow of the *Anatoki* at close range. The mate had moved inside the wheelhouse from the bridge wing and told the master that he thought the other vessel "wanted us to stop, he's turning to port". The mate then sounded one long blast followed by 3 short blasts on the vessel's whistle and moved the bridge control for the engine from dead slow ahead through the neutral position and into the dead slow astern position. After the mate had watched the approaching vessel for a few seconds, he put the bridge control for the engine to the full astern position, switched the autopilot into manual steering and put the wheel to hard to starboard. The master meanwhile continued to plot the target on the radar.

1.1.10 At about 0631, the master on seeing the other vessel immediately used the main VHF radio on channel 16 to call the approaching vessel and said that his engines were hard astern, and asked the other vessel to go hard to port.

1.1.11 At about 0633, the bow of the *Anatoki* collided with the starboard side of the *Lodestar Forest* in way of frames 42 to 45 forward of the accommodation.

Events on board the *Lodestar Forest*

1.1.12 The *Lodestar Forest* was scheduled to leave the port of Tauranga at 0130 on 28 April 2008 after arriving on 25 April, discharging its cargo of coal and loading a part cargo of logs. The vessel was readied for departure and the pilot boarded the vessel at about 0130.

1.1.13 After boarding, the pilot checked the visibility and informed the master that the visibility was too bad for the vessel to depart. He informed the master that he would reassess the situation at 0300 then departed the vessel at 0136.

1.1.14 At about 0300, the vessel's agent telephoned the vessel to inform the master that the vessel's sailing had been put back to 0600. Later Tauranga Port Radio called the vessel to inform the master that the pilot had booked the vessel for 0530 sailing.

1.1.15 At about 0525, a different pilot boarded the vessel for the departure. He and the master exchanged information and discussed the passage plan and also the fact that there was fog present in the harbour entrance. The pilot then requested the *Tauranga II*, the pilot launch, to proceed to Tanea buoy so the pilot could gauge the visibility. The launch reported that although it was clear in the harbour it was "a bit murky out in No.1 and 2 reach".

1.1.16 The master was concerned about the visibility, but accepted the pilot's advice that the conditions were favourable enough for departure, so at about 0554 ordered the vessel's lines let go and proceeded to sea with the pilot conning the vessel. The pilot noted that the crew appeared to be "a bit tired". The pilot requested the *Tauranga II* to proceed out to "B" and "C" buoys and assist him in gauging the visibility.

1.1.17 The bridge was manned with master, third mate, helmsman and pilot. The third mate was keeping a lookout, operating the engine telegraph, plotting the vessel's position on the chart as it passed the buoys, and occasionally looking at the radar for targets. The master was overseeing the conning of the vessel and keeping a lookout visually and by radar with the pilot.

1.1.18 As the vessel got underway the pilot requested that the master arrange for a pilot ladder to be rigged on the port side of the vessel at a height of 2 m above the water. The pilot explained to the master that as there had been bad weather the day before, there was still a swell present from the northeast to easterly direction and that it would be necessary to swing the vessel to port to provide a lee for the pilot to disembark. The master arranged for the deck crew to rig the ladder as requested.

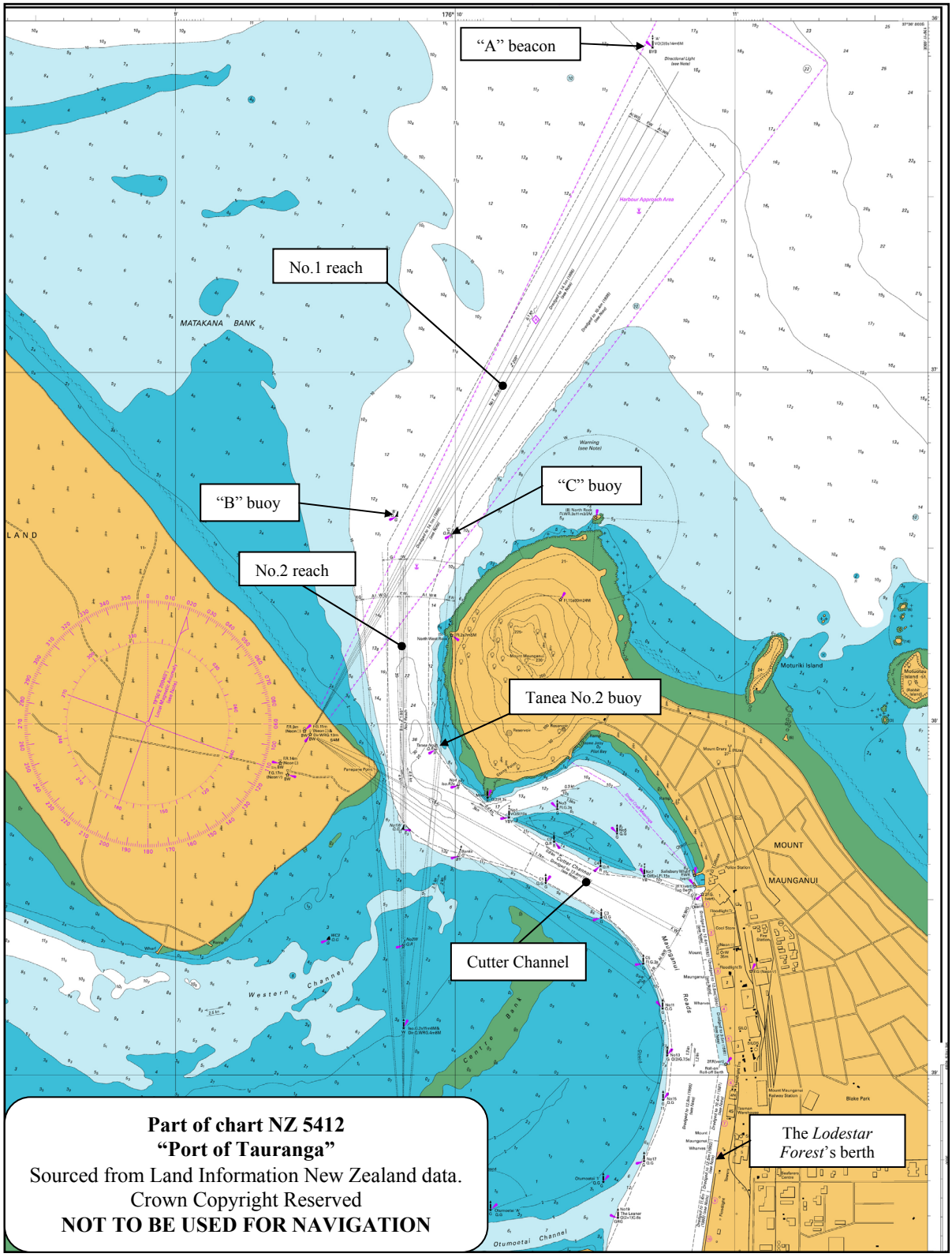


Figure 2
Tauranga Harbour and entrance channels

1.1.19 At about 0609, as the vessel left the Cutter Channel and entered No.2 reach, the pilot informed the *Tauranga II* that he could see the launch's searchlight and "B" and "C" buoys at a distance of about 0.7 nm. The launch then continued ahead of the *Lodestar Forest* towards "A" beacon. The pilot said later that at this time when he checked the vessel's radar he could "see a target that he assumed to be the *Anatoki* about 3 miles beyond "A" beacon".

1.1.20 At about 0618, as the *Lodestar Forest* approached "A" beacon, the visibility deteriorated further down to about 0.4 nm. The pilot started getting ready to disembark. He pointed out the target on the radar to the master, which at that time was about 3 nm outside "A" beacon broadly in line with the channel leading marks. He explained that when he got to the pilot ladder he would ask the master to swing the vessel to port to allow him to disembark, then the master could swing the vessel back to starboard and head off on the vessel's planned route clear of the inbound vessel. The pilot then handed over the con of the vessel to the master.

1.1.21 The third mate was to escort the pilot down to the pilot ladder and was equipped with a portable VHF transceiver to relay messages to the navigating bridge and master. Before the pilot and third mate left the navigating bridge, the first mate returned from his docking station on the forecastle. The pilot's departure from the bridge was delayed while the third mate handed over to the first mate. The first mate checked the vessel's position with the third mate, then went to stand by the engine telegraph. No member of the bridge team on the *Lodestar Forest* plotted the radar target that was pointed out to the master by the pilot.

1.1.22 At about 0622, the third mate and pilot left the navigating bridge for the pilot station. When the third mate and pilot arrived at the pilot ladder, the pilot launch master advised the pilot that the ladder was too high for him to disembark and that the ladder would need to be lowered by about one metre.

1.1.23 At about 0627, after the ladder had been lowered to the correct height the pilot requested the master via the third mate's portable VHF transceiver to commence altering the vessel's course 20° to port. He alerted the launch master that the vessel was starting to turn and he was coming down the pilot ladder. The vessel's master went to the port bridge wing to see that the pilot safely disembarked the vessel.

1.1.24 At about 0628, the launch reported to Tauranga Port Radio that the pilot was off the *Lodestar Forest* and the first mate noted it in the bell book on board the *Lodestar Forest*. Once the master had seen the pilot disembark and the pilot launch clear, he ordered the helm to starboard 20° and the engine set to full ahead and sounded one short blast on the vessel's whistle. He then checked the vessel's position.

1.1.25 After checking the vessel's position the master checked on the inbound vessel's position and saw that the inbound vessel was 5 cables (0.5 nm) away. He instructed the first mate to contact the other vessel by VHF radio, then ordered helm hard to port and the engine to dead slow ahead then stop. The master then sounded 2 short blasts on the vessel's whistle.

1.1.26 The first mate checked the vessel's automatic identification system (AIS) to see if he could ascertain the name of the approaching vessel. He could not, so he then called the vessel on his starboard bow on VHF Channel 16. When he received no reply to his VHF call, the first mate said he sounded 5 short blasts on the vessel's whistle. At this point he had no visual contact with the *Anatoki*.

1.1.27 The master on the *Anatoki* meanwhile was also broadcasting on VHF Channel 16 that his engines were hard astern and requesting the other vessel to go hard to port. Both vessels' transmissions were clearly audible on the Tauranga Port Radio's recordings.

1.1.28 the master on the *Lodestar Forest* said that when the 2 vessels got to within about 3 cables [0.3 nm] of each other the *Anatoki* became visible and that the propeller wash on the *Anatoki* appeared to indicate that its engines were going astern. As the collision appeared imminent, the master on the *Lodestar Forest* ordered the helm hard to starboard. He did this in an attempt to swing the stern away from the *Anatoki* and minimise the impact.

1.1.29 At about 0633, the bow of the *Anatoki* collided with the starboard side of the *Lodestar Forest* in way of frames 42 to 45 forward of the accommodation.

Events after the collision

1.1.30 Immediately after the collision the master of the *Lodestar Forest* ordered the crew mustered and once they had all been accounted for sent the chief mate with some of the crew to check on the damage and watertight integrity of the hull. He also contacted the pilot, on the pilot launch, to ascertain the name of the other vessel so that he could contact the master and record details.

1.1.31 The pilot directed the *Tauranga II* down the starboard side of the *Lodestar Forest* so that he could assess the damage externally to the hull and was able to report to the master that the damage did not appear to be substantial. The pilot then went to the *Anatoki* to act as inward pilot to Tauranga.

1.1.32 The master of the *Anatoki* requested the mate to stay on the navigating bridge and made his way to the forecastle to see the damage. When he arrived there he found that the watchkeeper had already made his way forward and had also inspected the damage, which did not appear to be substantial. The watchkeeper had also checked for water ingress and found none.

1.1.33 The master of the *Anatoki* returned to the navigating bridge and after the pilot boarded the vessel, the *Anatoki* continued on passage into Tauranga and berthed without further incident.

1.1.34 The master of the *Lodestar Forest,* after discussion with the agent and the owners, decided to go to anchor off the port until the harbourmaster and a Maritime New Zealand (Maritime NZ) representative had been on board to gather information.

1.1.35 When questioned after the event, the master of the *Lodestar Forest* stated that at no time did he hear any sound signals from the approaching vessel; the master and mate on board the *Anatoki* both said that they heard what appeared to be 7 or 5 followed by 2 blasts on the approaching vessel's whistle. The engineer on board the *Anatoki* said after the event that he could just about hear the *Anatoki*'s fog signal from the main deck aft of the accommodation block, where he was laying out ropes in preparation for arrival.

1.2 Recorders

1.2.1 The *Lodestar Forest* was equipped, as required, under the SOLAS convention with a voyage data recorder (VDR), which is a data recording system designed to collect data from various sensors on board a vessel. The system digitises, compresses and stores the information in a protective tamper-proof storage unit. The stored data, in the unit, is volatile and is eventually overwritten by new data after a certain amount of time. However, after an incident if requested within the time span of the unit's memory, the data can be saved then downloaded for analysis by the authorities or vessel owners for incident investigation.

1.2.2 The Commission was not notified of the incident until 26 hours after the event; neither Maritime NZ, the harbourmaster nor the master of the *Lodestar Forest* thought to save the data for later download. So when the Commission commenced its investigation, the data was unavailable for its enquiries.

1.2.3 The *Anatoki* as a non-SOLAS vessel was not required to be fitted with a VDR and was not fitted with one.

1.2.4 Tauranga Port Radio was fitted with equipment to record VHF radio messages and telephone calls. Copies of all relevant messages and calls were used by the Commission in its enquiries.

1.3 Vessel information

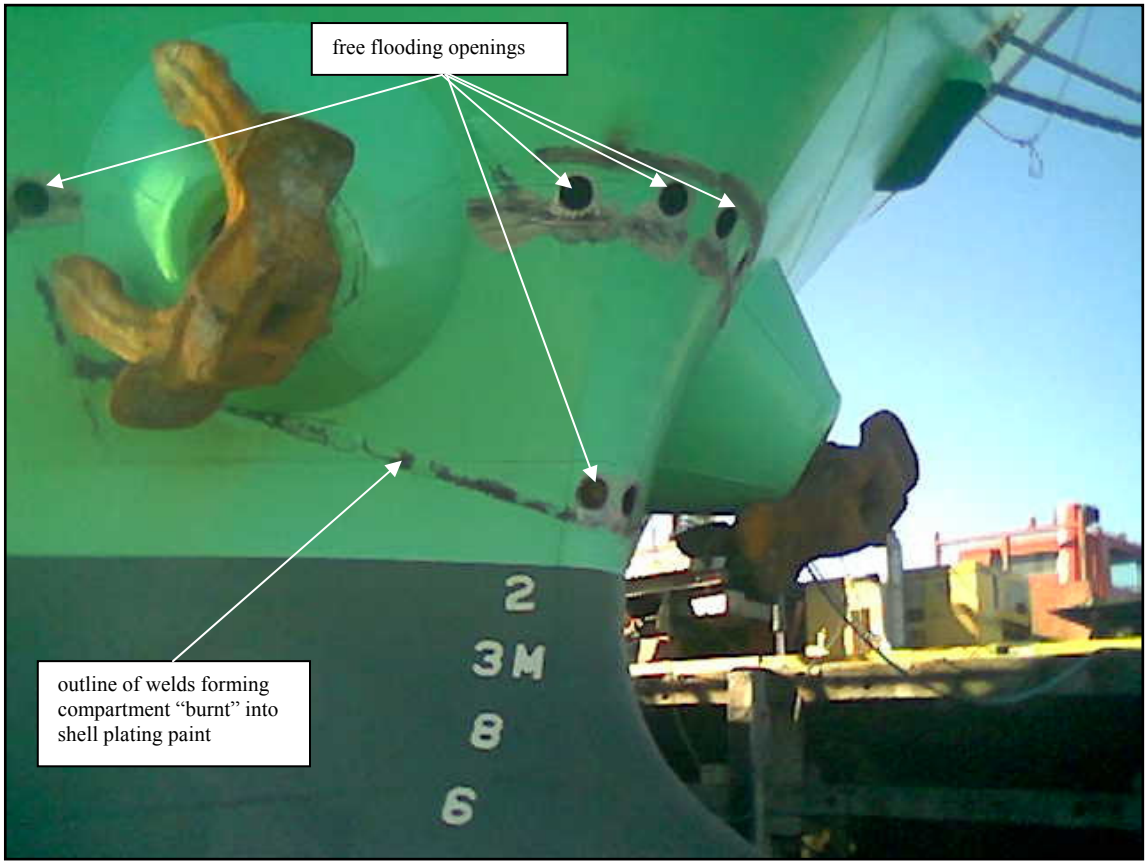
Anatoki

1.3.1 The *Anatoki* was a coastal bulk carrier built in Japan in 1992, owned and operated by Coastal Bulk Shipping 2007 Limited (owner). The vessel was registered in New Zealand and had valid certificates issued by or on behalf of Maritime NZ. The *Anatoki* was under safe ship management (SSM) with Survey Nelson Limited.

1.3.2 The *Anatoki* had an overall length of 51.03 m and a breadth of 8.3 m, with a gross tonnage of 550. It had a summer draught of 3.19 m.

1.3.3 The *Anatoki* was powered by a single Matsui 6M26KGS-01 diesel engine developing 415 kW driving a single fixed-pitch propeller through a Niigata MN630 reversing gearbox, giving a service speed of 10 knots. It had a Becker rudder located directly behind the propeller. The vessel was not fitted with a bow thruster.

1.3.4 The *Anatoki* was fitted with 2 radars (one with an automatic radar plotting aid (ARPA)), an electronic chart plotter, a global positioning system receiver, an echo sounder, an autopilot, one dual-watch VHF radio, 2 handheld VHF radios, a gyro compass and a magnetic compass.



Photograph courtesy of Captain M. Pryce

Figure 3
The *Anatoki*'s bow showing "free flooding openings"

1.3.5 The *Anatoki* had been purchased in Japan by the owner in December 2007. Prior to its sale the *Anatoki* had been under Japanese Government Registration and had been used mainly for the transportation of steel products between ports in Japan. The majority of the vessel's work had been in the sheltered waters of Japan's Inland Sea.

1.3.6 The *Anatoki* was purchased by the owner in December 2007 and was issued with an exemption for voyage and manning (single voyage permit) by Lloyds Register in Japan on behalf of Maritime NZ to enable the vessel to make a delivery voyage from Japan to Nelson, New Zealand. The vessel arrived in Nelson in January 2008 and the owner registered the vessel under New Zealand registry.

1.3.7 Before the arrival of the vessel in New Zealand, the owner contacted Lloyds Register representatives in New Zealand, who indicated that the vessel could be brought into Lloyds Register classification as a non-SOLAS coastal vessel. However, after the vessel's arrival in Nelson and the commencement of survey by Lloyds Register New Zealand, Lloyds Register's head office declined to accept the vessel into classification on the basis of the vessel's age.

1.3.8 Maritime Rules Part 40 B required any New Zealand non-passenger ship of 45 m or more in length that was not engaged on an international voyage and that proceeded outside restricted limits to be designed, constructed and maintained in compliance with the structural, mechanical and electrical requirements of a classification society recognised for that purpose by the Director of Maritime NZ. The owners were effectively unable to operate the *Anatoki* on the New Zealand coast.

1.3.9 The owner discussed with Maritime NZ the alternative of having the *Anatoki*'s registered length measured at 85% of the vessel's hull depth reduced to less than 45 m. The vessel could then be entered into the SSM system administered by Maritime NZ. The owner engaged a Maritime NZ-recognised naval architect to design a hull modification that would reduce the registered length of the vessel to less than 45 m. The naval architect designed a modification to the bow area of the vessel that consisted of a free-flooding, open-to-the-sea compartment with a structure equivalent to the existing shell plating. The free flooding was achieved by holes cut into the existing shell plating into this compartment both at the top and bottom to prevent pressurisation when the bow went into a wave (see Figure 3).

1.3.10 The modification was made while the vessel was in dock in Nelson prior to its commencement of operation. The owner was then able to apply to enter the vessel into the SSM system and man the vessel under Maritime Rules Part 31B Crewing and Watchkeeping Offshore, Coastal and Restricted (Non-Fishing Vessels).

Lodestar Forest

1.3.11 The *Lodestar Forest* was a bulk carrier built in Japan in 2005, owned by IMA Lines Co. S.A. of Japan, chartered by NYK Line and operated by CHH Lodestar Operations NZ. The vessel was registered in Panama and had valid certificates issued by Class NK on behalf of the Panamanian Government.

1.3.12 The *Lodestar Forest* had an overall length of 175.53 m and a breadth of 29.4 m, with a gross tonnage of 19 789. It had a summer draught of 9.569 m giving a displacement of 39 233 tonnes (t). At the time of the occurrence the mean draught was 5.56 m and the vessel was carrying about 2900 t of logs as cargo.

1.3.13 The *Lodestar Forest* was powered by a single Mitsubishi 6UEC52LA direct-reversing diesel engine developing 6840 kW, driving a single fixed-pitch propeller, giving a loaded service speed of 14.40 knots. It had a semi-balanced rudder fitted directly behind the propeller. The vessel was not fitted with a bow thruster.

1.3.14 The *Lodestar Forest* was equipped with the standard range of navigation equipment, including 2 radars (one of which was equipped with ARPA), 2 global positioning system receivers, one gyro compass, a magnetic compass, a chart plotter, an echo sounder, an autopilot, 2 VHF radios, an AIS, and a VDR.

1.4 Personnel information

Anatoki

1.4.1 Under Maritime Rules Part 31B Crewing and Watchkeeping Offshore, Coastal and Restricted (Non-Fishing Vessels) (see Appendix 2), the manning of the *Anatoki* had to be sufficient for the safe operation of the vessel, the minimum crew being derived either from the applicable tables and flow charts or from an application for a minimum safe crewing document issued by the Director of Maritime NZ. Maritime Rules 31B also contained a list of acceptable equivalents for the required certificates of competency.

1.4.2 After substantial dialogue between the owner and Maritime NZ, the manning was set at 2 New Zealand offshore master certificates of competency, one New Zealand offshore watchkeeper certificate of competency and one marine engineer class 4 certificate of competency (including equivalent certificates) as laid down in Maritime Rules Part 31B.

1.4.3 The master of the *Anatoki* had worked on fishing vessels for about 16 years. His position as master on the *Anatoki* was his first job on the type of vessel. He held a certificate of competency as a master of a deep sea fishing vessel and a Global Maritime Distress and Safety System certificate of competency.

1.4.4 The mate of the *Anatoki* first went to sea when he was 18, mainly on fishing boats, except that for the 2 years previous to his appointment to the *Anatoki* he had worked as an able seaman on board a roll-on roll-off vessel. He held a New Zealand offshore master's certificate of competency, which he gained in 2005, and an able bodied seaman's certificate of competency, which he gained in 2007.

1.4.5 The chief engineer of the *Anatoki* had first gone to sea in 1966 and had held various appointments at sea and in shore-based employment, mainly in the maritime sector, until the present day. He held a United Kingdom class 1 chief engineer's certificate of competency which was not standards of training certification and watchkeeping 1978 as amended in 1995 (STCW) compliant. The chief engineer had applied to have his certificate recognised in New Zealand as a marine engineer class 4 certificate of competency. This allowed him 3 months from initially joining the *Anatoki* to obtain his letter of recognition. During these 3 months he could work as an engineer on New Zealand-registered non-STCW-compliant vessels.

1.4.6 The watch keeper on board the *Anatoki* had worked in the fishing industry for about 18 years. He had worked on a variety of fishing vessels, predominantly in the Sealord fleet, prior to being employed by Coastal Bulk Shipping 2007 Limited. He held a New Zealand offshore watchkeeping certificate of competency and a qualified fishing deckhand certificate of competency.

1.4.7 The master and deck crew of the *Anatoki* worked a standard 4 hours on, 8 hours off watch routine where the master took the 8-12 watch, the watchkeeper the 12-4 watch and the mate the 4-8 watch. The master and crew had been on watches for the duration of the voyage from Wanganui, offering them ample time for rest. The master had gone to bed at midnight with instructions to call him at 0500; the mate was on watch at the time after having an 8-hour rest period from 2000 to 0400. The watchkeeper had been on watch from midnight to 0400 after an 8-hour rest period and had asked to be called 40 minutes before arrival at the pilot boarding ground.

1.4.8 Neither the master nor the remaining deck crew had any experience in the operation of general or bulk cargo vessels, but all had extensive experience in fishing boat operations.

Lodestar Forest

1.4.9 The master of the *Lodestar Forest* was a South Korean national and held a Panamanian STCW-95-compliant master's certificate of competency issued on 12 March 2007 as a certificate of equivalent competency to his Korean certificate. He had joined the *Lodestar Forest* on 20 August 2007.

1.4.10 The chief officer of the *Lodestar Forest* was a Vietnamese national and at the time of the occurrence held a Vietnamese STCW-95-compliant master's certificate of competency with a transition certificate of endorsement in accordance with regulation I/10 of the STCW convention for a Panamanian certificate issued on 25 March 2008. He had joined the *Lodestar Forest* on 26 March 2008.

1.4.11 The third officer of the *Lodestar Forest* was a Vietnamese national and at the time of the occurrence held a Vietnamese STCW-95-compliant operational level certificate of competency with a transition certificate of endorsement in accordance with regulation I/10 of the STCW convention for a Panamanian certificate issued on 25 March 2008. He had joined the *Lodestar Forest* on 26 March 2008.

1.4.12 The master and crew had been working their normal routines while the vessel had been in port for the previous 2 days. Owing to the departure delays caused by the reduced visibility, the master's, and crew's rest periods prior to sailing had been disturbed several times during the hours prior to the vessel's departure.

Port of Tauranga

1.4.13 The pilot had first gone to sea in 1970 and had attained a master's certificate of competency. He had started work as a marine pilot in 1982 and became a pilot in Tauranga in 1985, becoming an "A" grade unrestricted pilot in 1988. He held a New Zealand STCW-95 compliant master's certificate of competency.

1.4.14 The pilot had just completed 4 days as second call pilot and was on his first day as third call pilot on the duty roster. In the previous 7 days he had completed 12 acts of pilotage totalling about 10.5 hours of piloting. In the previous 24 hours he had piloted 3 vessels, with his last pilotage act before the accident being on 27 April 2008 between 1540 and 1650.

1.4.15 The pilot launch master had worked for the Port of Tauranga Limited for about 30 years and had been employed as launch master for the previous 7 years. He held a master restricted limit launch certificate of competency with a radar endorsement, which had equivalency to an inshore launch master certificate of competency.

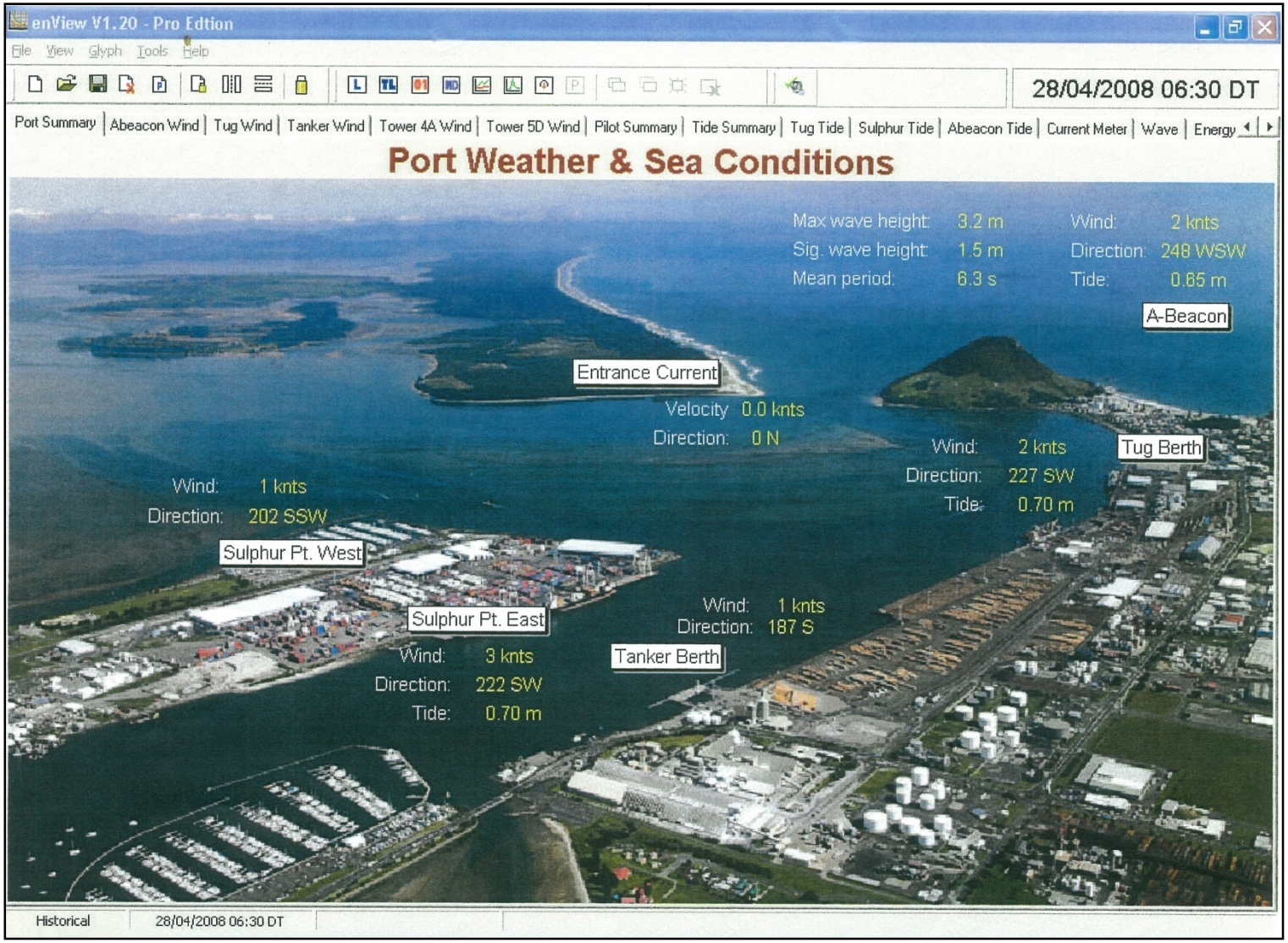
1.5 Environmental conditions

1.5.1 The accident happened in the Plenty coastal waters forecast area. The New Zealand Meteorological Service (MetService) issued coastal waters' forecasts at regular times.

1.5.2 The coastal waters' forecast issued on 27 April 2008 at 1200 for the Plenty coastal area was:

> SITUATION AT 1200 NZST ON 27 APR 2008
>
> A broad trough of low pressure is moving southeastwards across the country today and early Monday. A second broad trough developing over the Tasman Sea during Monday is expected to move eastwards across the nation from Tuesday through to Thursday.
>
> PLENTY
>
> Northeast rising to 30 knots this afternoon, then easing to variable 10 knots from the west tonight. Rough sea easing. Northeast swell 2 metres easing. Poor visibility in thundery rain, easing from the west early morning.
>
> OUTLOOK FOLLWING 3 DAYS
>
> Northeast 15 knots rising Tuesday afternoon to 25 knots and Tuesday night to 35 knots with very rough sea. Change early Wednesday to westerly 20 knots, easing Thursday for a time 10 knots. Moderate northeast swell developing Wednesday, Easing Thursday.

1.5.3 MetService stated that coastal weather forecasts are valid within 60 nm (about 100 kilometres) of the New Zealand coastline. Because most coastal forecast areas cover some thousands of square miles, the forecast describes in a general sense the weather conditions expected. Over small parts of the forecast area (for example, off a particular headland in a particular wind flow), weather conditions may be significantly different from those forecast.



Picture courtesy of Port of Tauranga

Figure 4
Pictorial summary of climatic and sea conditions in Tauranga Harbour at about the time of the collision

1.5.4 At the time of the accident Tauranga was sat in near-calm conditions with warm-moist air in a trough of low pressure behind an occluded front. These conditions were susceptible to the formation of fog around Mount Maunganui, Tauranga Harbour entrance and the port approaches.

1.5.5 Anecdotal evidence from port company employees and others indicated that fog could "collect" around Mount Maunganui and affect the entrance channel. The fog was also reported, on occasions, to form in distinct layers where the bridge of a vessel was engulfed in fog while the hull and the tugs' navigating bridges at a lower altitude were in clear air.

1.5.6 Port of Tauranga Limited had numerous meteorological sensors around the port, which were used to produce a picture of the conditions within the port and out to "A" beacon (see Figure 4). The prevailing conditions at the time of the accident are shown, which for "A" beacon are light airs from a west-south-westerly direction, a significant wave height of 1.5 m and a tide of 0.65 m.

1.5.7 The predicted tides for Tauranga were;

	Date	High Water	Low Water	High Water	Low Water
Tauranga	28/04/2008	0019 1.7 m	0627 0.5 m	1229 1.6 m	1837 0.5 m

1.6 Damage

Anatoki

1.6.1 The *Anatoki* sustained damage to the bow consisting of the jack staff being bent, the shell plating on the centreline was deformed and indented to a depth of approximately 200 millimetres (mm).

Figure 5
Damage sustained by the *Anatoki*

Lodestar Forest

1.6.2 The *Lodestar Forest* sustained damage to the starboard side shell plating in way of number 5 hatch where the plating was indented about 30 mm between frames 42 and 45.

Figure 6
Damage sustained by the *Lodestar Forest*

1.7 Organisational and management information

Anatoki

1.7.1 As part of new legislation, Maritime Rules Part 21 Safe Ship Management Systems came into force in 1997. The SSM system was based on the established International Safety Management (ISM) system, but was modified for domestic commercial vessels. Part 21 was supported by and included the New Zealand Safe Ship Management Code, which outlined how an SSM system should be implemented. Since 2001, Maritime NZ has been preparing a revised Part 21; at the time of writing it had been circulated internally within Maritime NZ and to the SSM companies, but still had to be circulated for comment to the general public. In 2005, it produced a Safe Ship Management Code of Practice, which set down the requirements and responsibilities of participants in the system.

1.7.2 The philosophy of the SSM system was for owners and operators to take responsibility for their own safety and to develop their own safety management system (SMS) in conjunction with their chosen SSM provider. At the time of writing there were 7 general SSM companies and one company that administered its own in-house SSM system. Part 21 provided a broad standard format of what was required of the industry.

1.7.3 On 11 April 2008, the owners of the *Anatoki* obtained the design approval letter for the vessel signed by a recognised naval architect stating that the vessel was fit for its intended service and intended operating limits. This letter contained details of the vessel, its intended service, intended operating limits, and service restrictions.

1.7.4 On 18 April 2008, the owners signed the SSM membership agreement with Survey Nelson Limited and a fit for purpose document was issued by Survey Nelson Limited. The vessel was given a Coastal Limits area of operation with the manning requirements as agreed with Maritime NZ. Special conditions/limitations and/or restrictions were placed on the operation of the vessel which included stability, loading, displacement and operational sea state (see Appendix 4).

1.7.5 On 18 April 2008, the owners in conjunction with Survey Nelson Limited applied to Maritime NZ for an exemption to have an SSM certificate. This allowed the *Anatoki* to operate under SSM with a generic SSM system manual, which was to be made vessel specific and have operating routines and systems entered into it. After a stipulated period, usually about 3 months, the vessel and its systems were audited by Maritime NZ and, if satisfactory, a full SSM certificate would be issued.

1.7.6 The collision occurred after the owners entered into the SSM agreement with Survey Nelson Limited and the vessel was operating with an exemption issued by Maritime NZ whilst the crew on board were still in the process of compiling the vessel-specific parts of the SSM manual.

Lodestar Forest

1.7.7 In October 1989 the International Maritime Organization (IMO) adopted resolution A.647 (16), Guidelines on Management for the Safe Operation of Ships and for Pollution Prevention in response to a number of serious accidents that had occurred during the late 1980s that were manifestly caused by human errors, with management faults identified as contributing factors. The purpose of the guidelines was to provide those responsible for the operation of vessels with a framework for the proper development, implementation and assessment of safety and pollution prevention management in accordance with good practice.

1.7.8 The guidelines recognised the existing international instruments as the most important means of preventing maritime casualties and included sections on management and the importance of safety and environmental policies.

1.7.9 In 1993, after some fine tuning of the system, the IMO adopted the International Management Code for the Safe Operation of Ships and for Pollution Prevention (ISM Code); and in 1998 the ISM Code became mandatory. The ISM Code established safety management objectives and required an SMS to be established by the company, which was defined as the ship owner or any person, such as the manager or bareboat charterer, who had assumed responsibility for operating a vessel. The company was then required to establish and implement a policy for achieving these objectives, including providing the necessary resources and shore-based support. The procedures required by the ISM Code were to be documented and compiled in a safety management manual, a copy of which was to be kept on board.

1.7.10 On 19 September 1996, Imabari Senpaku Company Limited, the owner of the *Lodestar Forest,* was audited by Class NK under the authority of the Government of the Republic of Panama and was found to comply with the requirements of the ISM Code. The owner was issued with a document of compliance certificate, which was renewed, after verification of continued compliance, at regular intervals. The most recent certificate of compliance had been issued on 4 September 2006 and was valid until 18 September 2011. The first annual verification had taken place on 2 November 2007.

1.7.11 On 1 July 2005, the *Lodestar Forest* had been similarly audited and the vessel's SMS had been found to comply with the requirements of the ISM Code. The vessel was issued with a safety management certificate on 23 August 2005, which remained valid, subject to periodic verification, until 30 June 2010. The *Lodestar Forest* had undergone an intermediate verification on 2 February 2008.

1.7.12 Many of the IMO's most important technical conventions contain provisions for vessels to be inspected when they visit foreign ports to ensure that they meet IMO requirements. These inspections were originally intended to be back-up to flag State implementation.

1.7.13 Port State control (PSC) is the inspection of foreign vessels in national ports to verify that the condition of the vessels and their equipment comply with the requirements of international regulations and that the vessels are manned and operated in compliance with these rules. The primary responsibility for vessels' standards rests with the flag State – but Port State control provides a "safety net" to catch substandard vessels.

1.7.14 Maritime NZ as the regulator and as New Zealand's IMO representative inspects 90% of all eligible foreign vessels during their time spent in New Zealand ports under Section 54 of the Maritime Transport Act 1994. If a vessel is substandard, Maritime NZ inspectors have the power, under Section 55/397 of the Maritime Transport Act, to detain it until it is brought up to standard, or to impose conditions upon its operation.

1.7.15 On 4 May and 6 May 2008, about one week after the collision, the *Lodestar Forest* was inspected by Port State Control officers and one deficiency in recording and one deficiency of unfamiliarity with the operation of the voyage data recorder were noted. Both of these deficiencies were closed out in the agreed timeframe. Under the Asia Pacific memorandum of understanding on Port State Control targeting scheme the *Lodestar Forest* had a target factor of 5, which was considered low risk where 0-9 was low risk, 10-29 was medium risk and 30+ was high risk. The *Lodestar Forest* had never been detained for any deficiencies under port State control.

Port of Tauranga

1.7.16 The procedures for piloting vessels into and out of the port of Tauranga by pilots employed by Port of Tauranga Limited were contained in the Piloting Procedures booklet. They contained, amongst other, the following:

> This manual contains information relating to piloting at the Port of Tauranga. Procedures are listed and information made available through attachments to allow pilots to make measured and informed decisions. This should not, however, be taken to mean that this document deals comprehensively with all of the concerns which will need to be addressed. It is not the intention of this document to take decision-making away from a pilot.
>
> **Visibility**
>
> The port is occasionally subjected to restricted visibility. Extreme care should be exercised when navigating in the port under such conditions. Factors to consider include (but are not limited to):-
>
> Size of Vessel (manoeuvrability)
> Suitability of the Radar on the Vessel
> Availability of ECDIS [Electronic Chart Display and Information System]
> Strength of Current
> Other Traffic Movement
> Bridge Team Efficiency
>
> Heavy rain can also reduce visibility for periods. When passage planning the loss of visibility from time to time should be considered.

1.7.17 The New Zealand Port and Harbour Marine Safety Code (code) was published in August 2004. Its objective was to provide for the safe management of vessels in ports and harbours, including preventing serious harm to people and protecting the environment and property.

1.7.18 The code was developed following a number of serious accidents involving large vessels in the approaches to or within New Zealand harbours in 2002-03. Investigations revealed a need for more rigour and consistency in the standard of safety management of New Zealand ports and harbours.

1.7.19 The code was prepared by Maritime NZ in consultation with relevant parties. The code identified the duties and powers under existing legislation of those involved in port and harbour safety. The code was voluntary and recommended that regional councils, as the principal local regulators of navigational safety, undertake risk assessments and develop SMSs for the harbours in their regions. Maritime NZ provided advice to councils on these tasks and approved the completed assessments and safety management plans.

1.7.20 The code was supported by a series of guidelines of good practice, of which one was the Guidelines for Port & Harbour Risk Assessment and Safety Management Systems in New Zealand. Environment Bay of Plenty Regional Council (Envbop) and Port of Tauranga Limited jointly employed an outside marine consultancy firm specialising in marine risk assessment, risk management and vessel traffic surveys to conduct the navigational risk assessment in accordance with the requirements of the code.

1.7.21 The results of the navigational risk assessment were presented to Envbop and Port of Tauranga Limited in June 2007. The assessment identified 73 hazards at the overview level, which were ranked according to risk. Of these 73 hazards, 18 referred to collisions; of the 18 collision hazards, 4 referred to the possibility of a collision in the compulsory pilotage area outside the harbour limits, and none referred to a scenario involving 2 large, over 500 gross tons, commercial vessels. Of the 4 possible collisions in the compulsory pilotage area, 2 referred to restricted visibility.

1.7.22 One of the core recommendations from the navigational risk assessment was to investigate and if thought necessary to provide appropriate vessel traffic services (VTS). At the time of writing, the development of the port SMS in response to the navigational risk assessment had yet to be completed. VTS evolved as a response to the need to reduce collision risk by maintaining a safe and sequential traffic flow and to provide support to the mariner in harbour approach channels where risks are probably at their greatest. SOLAS chapter V, regulation 12 (1) states:

> VTS contributes to the safety of life at sea, safety and efficiency of navigation and protection of the marine environment, adjacent shore areas, worksites and offshore installations from possible adverse effects of maritime traffic

1.7.23 Guidelines for VTS were laid down by the IMO in Resolution A.857(20) and VTS could be made up of one or more of 3 services, namely:

> (1) Information Service – a service to ensure that essential information becomes available in time for in-board navigational decision-making
>
> (2) Navigational Assistance Service – a service to assist on-board navigational decision-making and to monitor its effects
>
> (3) Traffic Organisation Service – a service to prevent the development of dangerous maritime traffic situations and to provide for the safe and efficient movement of vessel traffic within the VTS area.

1.7.24 The International Association of Lighthouse Authorities developed standards for VTS and produced a range of documents and manuals that covered all aspects of VTS operations, including training. These standards were known as V-103 and were used internationally for the provision of VTS.

1.8 Legislation

1.8.1 On 1 April 2003, Maritime Rules Part 90 came into force, replacing the vestiges of the pilotage regime established under the Harbours Act 1950 and the previous Part 90 – Pilotage rules. Maritime Rules Part 90 provided an interim pilotage regime for New Zealand pending the completion of a wide-ranging, first-principles review of port risks including pilotage.

1.8.2 Maritime Rules Part 90.5 Compulsory Pilotage stated that:

> (2) Subject to rule 90.5(3), the master of any ship other than an oil tanker, a chemical tanker or a gas carrier must ensure that the ship –
> (a) carries a pilot entitled under this Part to pilot that ship; or
> (b) where a pilot is unable to transfer to or from the ship safely, receives advice from a pilot entitled under this Part to pilot that ship, for example via shore signal, radio communication, or guidance from another vessel –
> when navigating in a pilotage area if the ship meets or exceeds any of the limits specified for that pilotage area in the third column of the Schedule.

(3) Subject to any direction under section 60A of the Act, the master of a ship other than an oil tanker, a chemical tanker or a gas carrier is not required to ensure the carriage of a pilot on the ship in a pilotage area if the master holds a master's pilotage exemption issued under rule 90.10 that is applicable to –
(a) the pilotage area; and
(b) the type or size of ship; and
(c) the propulsion and steering arrangements on the ship, if specified on the exemption.

The schedule included the designated pilotage areas including the port of Tauranga, and stated (in part):

Pilotage Areas
A ship that meets or exceeds any of the limits specified in the third column of this Schedule is subject to compulsory pilotage within the applicable pilotage area.

Pilotage areas	Area description	Limits
Tauranga	The area comprising the Bay of Plenty Harbour bounded by an arc of a circle of radius five nautical miles centred on North Rock and including all the commercial area of Tauranga Harbour.	100 gross tons

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

1.8.4 Maritime Rules Part 22 was divided into sections and subsections. Section 1 contained the steering and sailing rules and consisted of the following subsections:

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

Section 3, Rules 22.32 to 22.37, contained the sound and light signals. In particular:

- Rule 22.34 contained manoeuvring and warning signals for vessels in sight of one another,
- Rule 22.35 contained sound signals in restricted visibility for use in or near an area of restricted visibility, by day, and by night.

1.8.5 Envbop's regional jurisdiction extended out to the 12 nm international limit from the shoreline within the regional council's territorial border. Envbop had developed the Bay of Plenty Regional Navigation and Safety Bylaws, which applied to all waters within the Bay of Plenty region, to ensure the safe use of the harbours, rivers, lakes and coastal waters of the Bay of Plenty. The regional navigation and safety bylaws were supplemental to the relevant Maritime Rules (see Appendix 3).

1.8.6 The regional navigation and safety bylaws:

- reinforced the compulsory pilotage area (Bylaw 6.1.1)
- stated the requirement to contact Tauranga Port Radio on VHF channel 12 prior to entering Tauranga Harbour (Bylaw 6.1.3)

- stated the requirement to maintain a radio listening watch on VHF channel 12 (Bylaw 6.1.3)
- reqired that any master of a vessel unable to communicate with Tauranga Port Radio by VHF radio should not transit Tauranga Harbour entrance during the hours of darkness or during restricted visibility (Bylaw 6.1.4).

1.9 Human factors and bridge resource management

1.9.1 Human factors is that branch of science and technology that includes what is known and theorised about human behavioural, cognitive and biological characteristics that can be validly applied to the specification, design, evaluation, operation and maintenance of products, jobs, tasks and systems to enhance safe, effective and satisfying use by individuals, groups and organisations[3].

1.9.2 Humans can suffer from hazardous attitudes from which hazardous thoughts develop and affect the standard of their decision-making. These attitudes depend upon an individual's characteristics and the type of environment in which they are operating. Factors that can influence decision-making are commercial pressure, peer pressure and the corporate environment in which the decisions are made[4].

1.9.3 Bridge resource management (BRM) is the use and co-ordination of all the skills and resources available to the bridge team to achieve the established goal of optimum safety and efficiency[4].

1.9.4 The use of BRM helps eliminate the potential for one-person error, and aids the flow of information between members of the bridge team, and between the bridge team and the outside world. Part of the flow of information between members of the bridge team is challenge and response and the use of closed-loop communications to ensure that orders and information are correctly heard and understood.

1.9.5 When challenge and response is encouraged, the other members of the bridge team can reasonably challenge an order or information to ensure that it is correct and that the most suitable option available has been chosen.

1.9.6 When used effectively, BRM ensures that all the bridge team members share a common view of the intended passage, maintain situational awareness, anticipate dangerous situations, acquire all relevant information and act upon it in a timely manner, avoid an error chain being formed, and avoid preoccupation with minor problems.

1.9.7 One of the many factors known to inhibit good BRM is "authority gradient". Individual countries can exhibit authority gradients in their national cultures; Korea, Vietnam and New Zealand all exhibit different authority gradients. This was analysed by Geert Hofstede in 1980[5] from an idea first based on a large research project into national cultural differences across subsidiaries of a multinational corporation, IBM, in 64 countries, and subsequent studies by others covered students in 23 countries, elites in 19 countries, commercial airline pilots in 23 countries, up-market consumers in 15 countries, and civil service managers in 14 countries. Together these studies identified and validated 4 independent dimensions of national cultural differences. One of these dimensions, the power distance index, was equivalent to a national authority gradient.

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[3] Christensen, Topmiller, and Gill 1988. Human factors definitions revisited. Human Factors Society Bulletin, 31, 7-8.

[4] Captain Kari Larjo, Scandinavian Airline Service (SAS) Flight Academy AB, 1993, SAS-BRM – Student's workbook – Edition 6.

[5] Hofstede, Geert. Culture's Consequences, Comparing Values, Behaviors, Institutions, and Organizations Across Nations, 2nd edition, Thousand Oaks CA: Sage Publications, 2001

1.9.8 Hofstede's power distance index measured the extent to which the less powerful members of organisations and institutions (like the family) accepted and expected that power was distributed unequally. This represented inequality (more versus less), but defined from below, not from above. It suggested that a society's level of inequality was endorsed by the followers as much as by the leaders. Thus the higher the power distance index of a country, the less likely a national of the country is to question the actions and authority of an individual seen to rank above them. Some relevant examples are shown below:

Country	Power distance index
Malaysia	104
Philippines	94
China	**80**
Indonesia	78
Thailand	64
South Korea	**60**
Japan	54
New Zealand	**22**

1.9.9 Although Hofstede et al. did not quantify the power distance index for Vietnam, the history and geographic vicinity meant that Vietnamese people shared many of the cultural and business practices of their Chinese neighbours. In the words of Hofstede (1980), the Vietnamese culture could be described as high power distance, high collectivism, moderate uncertainty avoidance and high context (Swierczek, 1994, Quang, 1997; Ralston et al., 1999)[6].

2 Analysis

Lodestar Forest – decision to sail

2.1 Reduced visibility at the port of Tauranga was not unusual but infrequent, and as such Port of Tauranga Limited had developed a checklist for pilots to consider when making their decision on whether to sail. The checklist relied heavily on the judgement of the pilot in each case, with several factors put forward for the pilot to consider before deciding whether to undertake the pilotage. Other than using the pilot boat to help gauge the visibility, and in the absence of a VTS scheme for the port, the pilot had only the resources on board the ship with which to conduct the pilotage. His checklist referred to some of those considerations, such as the state of the bridge equipment and the efficiency of the bridge team. Other pressures can often come to bear, such as pilot rosters and managing the traffic flow in and out of the port, including berth availability. In this case there was little such pressure, other than the pilot was scheduled to bring the *Anatoki* in immediately following the departure of the *Loadstar Forest*.

[6] Swierczek, F.W. (1994) "The Praxis of Cross Cultural Management", Cross-Cultural Management: An International Journal, 1:1, pp14-pp20.
Quang, Truong. (1997), 'Conflict Management in Joint-Ventures in Vietnam', Transitions, 38(1&2), 282-306.
Ralston, D. A., Nguyen van Thang & Napier, N. K. (1999). 'A Comparative Study of the Work Values of North and South Vietnamese Managers', Journal of International Business Studies, 30(4), 655-672.

2.2 Some of the considerations the master had to take into account were: the experience of his own bridge team working in restricted visibility, his own experience and knowledge of the port, the technical difficulty of navigating the passage, and the confidence he had in the pilot. Other pressures can often come to bear, such as delays to the vessel's schedule. In this case, even though the sailing had been delayed already, the schedule for the vessel was not so tight to consider this a factor.

2.3 After the pilot had boarded the *Lodestar Forest* at about 0525, the pilot and master conducted a pilot-master information exchange. This interchange was brief, but succinctly covered the points contained on the pilot's pilotage card. The pilot was aware that the master had undertaken departure manoeuvres from the port of Tauranga several times before and as such decided to keep the interchange to a minimum.

2.4 The master of the *Lodestar Forest* did not question the pilot using the pilot boat for gauging the visibility. The fog was known to form in layers in the entrance channel and around Mount Maunganui. The pilot boat may have been sitting under a denser layer of fog and been able to see further than those on the navigating bridge of the *Lodestar Forest*, or the fog could just as easily have closed in once the pilot boat had travelled further out, and once the vessel had left the berth.

2.5 Given that the tide in the channel at the time was negligible and that the likelihood of encountering significant small-boat traffic in the channel at that time of the day was negligible, the decision to sail was reasonable provided that the bridge team was fully briefed and prepared for the departure, but it was not. The pilot and master briefly exchanged their own information but the rest of the bridge team was not briefed as a team should be for such a departure. This became evident once the vessel had entered fog in the channel and as it neared the point where the pilot was to disembark. Each member of the bridge team was undertaking their own tasks with little exchange of information. A key omission was the failure for any person to plot the progress of the *Anatoki* once it was detected by radar.

Lodestar Forest – bridge performance

2.6 Nobody on the bridge of the *Lodestar Forest*, including the pilot, was truly aware of what the *Anatoki* was doing. The pilot had not managed to make contact with the *Anatoki* at all, and was only assuming the vessel he saw on the radar ahead was it. He handed the con over to the master and told him that the other vessel was stopped, which it wasn't. He did not tell the master what the vessel's name was; consequently soon after, when the bridge team was trying to contact the *Anatoki* as part of its collision avoidance manoeuvre, valuable time was lost and ambiguous communication resulted; "ship on my starboard bow". When BRM is working at its best, the bridge team should be working cohesively as a team and be collectively fully aware of the situation. The con handover from the pilot to the master should be able to occur seamlessly, with little change required of the rest of the team, other than receiving instruction from the master instead of the pilot. On this occasion the master accepted the con then became engrossed with the task of disembarking the pilot, while the rest of the team continued to not monitor the progress of their own vessel and not monitor the progress of the *Anatoki*.

2.7 From that point the bridge team led by the master should have been focusing on navigating and collision avoidance. Instead the master was still accepting helm instructions from the pilot via the third mate's radio from a position on the main deck, in the fog, and with now virtually no situational awareness of the *Lodestar Forest* position, nor of that of the *Anatoki*.

2.8 Maritime Rules describe that a master of a vessel required to carry a pilot must ensure that they carry a pilot as required, or if one is not able to be transferred to or from the vessel, then they must receive advice from a pilot. The Maritime Rule gives the examples of "via a shore signal, radio communication, or guidance from another vessel".

2.9 In this situation the duty of care is divided. The master has a duty to navigate their vessel with due care and diligence, and the pilot similarly must give advice with due care and diligence. The Commission concludes that neither was the case in this situation.

2.10 The master of the *Lodestar Forest* arranged for the pilot ladder to be placed at the height required by the pilot shortly after the vessel left the berth and the ladder had been placed in position well before the pilot left the navigating bridge. Standard procedure for the pilot launch was to trail the outgoing vessel astern and slightly to one side, so that the master of the pilot launch could observe the placement of the pilot ladder and inform the pilot if it was at the correct height. However, occasionally the pilot launch was used for other tasks such as placing a pilot on another vessel or gauging the visibility out to "A" beacon, as it was this time, thus it was ahead of the *Lodestar Forest* when the pilot left the bridge. When rigging the pilot ladder it can be difficult to assess accurately the height of the bottom of the ladder above the water as the personnel rigging the ladder have to lean out over the vessel's side and are looking vertically downward along the length of the ladder trying to assess where the bottom rung is located. On this occasion it would have been more prudent for the pilot to request that the ladder height be checked for correctness by the pilot boat and confirmed with the pilot before he departed the navigating bridge, thus reducing the time before the pilot requested the swing to port for disembarkation and reducing the likelihood of the pilot losing situational awareness.

2.11 A similar collision between 2 foreign-going vessels occurred near the entrance to Tauranga Harbour in 1995 (Commission report 95-208). In that case the visibility was good, but it was night-time. The collision occurred while the pilot was in transit between the 2 vessels, having just piloted one out and being about to board the inbound vessel. The collision bore similarities to this collision, where each bridge team was focused on the pilot; one disembarking the pilot, the other making preparations to board the pilot. This collision and the previous one are suggestive that the port company would benefit from a review of current procedures for pilotage and traffic management within the compulsory pilotage zone where pilot exchanges take place.

Human performance

2.12 To be alert and to function well, each person requires a specific amount of nightly sleep. If individual "sleep need" is not met, the consequences are increased biological sleepiness, reduced alertness, and impaired physical and mental performance. For most people, getting 2 hours' less sleep than they need on one night (an acute sleep loss of 2 hours) is enough to cause measurable impairment of performance and alertness the next day. The reduction in performance capacity is particularly marked if less than about 5 hours' sleep is obtained[7].

2.13 The *Lodestar Forest* had been ready to sail at 0130 and a pilot boarded the vessel only to depart again because of the poor visibility. The pilot informed the master that they would re-assess at 0300. At 0300 the sailing was once again delayed until 0600, which was later changed to 0530. The effect of these changes on the master and crew of the *Lodestar Forest* was that the majority of the vessel's crew had disturbed rest periods during the night, leading to loss of sleep and the onset of tiredness that was likely to have affected their performance. This was partially substantiated by the pilot's observation that the crew appeared "a bit tired".

2.14 Almost all teams, including the bridge teams on board the *Lodestar Forest* and the *Anatoki*, require some degree of authority gradient, which can be defined as the balance of decision-making power or the steepness of command hierarchy in a given situation, otherwise roles are blurred and decisions cannot be made in a timely fashion. However, members of a crew or organisation with a domineering, overbearing or dictatorial team leader experience a steep authority gradient where expressing concerns, questioning, or even simply clarifying

[7] Philippa Gander, BSc, MA(hons), PhD (Auckland), Sleep/Wake Research Centre, in collaboration with Te Ropu Rangahau Hauora a Eru Pomare and the Wellsleep Clinic at the Wellington School of Medicine and Health Sciences. Expert Testimony: Collision of the passenger ferry Aratere and the fishing boat San Domenico, 5th of July 2003, NZ Transport Accident Investigation Commission, 2003.

instructions requires considerable determination on the part of the team members who perceive their input as devalued or unwelcome. Conversely, members of a crew or organisation where the authority gradient is too low or "flat" have an overly relaxed attitude toward cross-checking each other's actions or confirming other information. Effective team leaders consciously establish a command hierarchy appropriate to the training and experience of the team members.

2.15 The *Anatoki* reached the pilot boarding position at about the time specified by Tauranga Port Radio in its last communication with the *Anatoki*; however, this time may have needed to be amended owing to operational reasons within the port, and this information could not be passed to the *Anatoki* owing to difficulty with radio communications with the vessel. The *Anatoki* was not supposed to enter the pilotage area except under direction from either the pilot or the harbour radio. The master did not seem aware of what the engine was doing, going dead slow ahead, and thought that his vessel was stopped in the water. The mate on the *Anatoki* was aware that the vessel was still underway and making way and was making the appropriate signals on the fog signalling apparatus. He was, however, unaware that the master was plotting an outbound vessel. Efficient BRM would have resulted in an exchange of information between the bridge team, ensuring that all members had a shared knowledge of the plan and were situationally aware. This performance is indicative of a low power distance index exhibiting an overly relaxed attitude towards cross-checking each other's actions or confirming other information, extending to information from the pilot or harbour radio.

2.16 On the *Lodestar Forest* the pilot pointed out to the master a target on the radar about 3 nm beyond "A" beacon, which he thought was the *Anatoki,* and said that he thought the target was stopped. The pilot left the bridge at about 0622 and at 0627, 9 minutes after checking on the distance of the target ahead, requested the vessel's course be altered to port. In that 9 minutes the *Lodestar Forest* would have travelled about 1.2 nm, at harbour half-ahead speed, towards the last noted position of the *Anatoki*. The turn was made to port to disembark the pilot rather than being a collision-avoidance manoeuvre. This would have placed the *Lodestar Forest* to the west of the designated approach area. Once the pilot had disembarked, the master of the *Lodestar Forest* would have had to decide whether to pass the inbound vessel to the north (astern) or south (ahead). However, as the *Anatoki* was still making way and not stopped, as the pilot thought, and it was also heading to the west side of the approach area, the distance between the 2 vessels was steadily diminishing. The pilot standing at the disembarkation ladder had no navigational aids available to him. He would have had little situational awareness without recourse to any information from the pilot boat, harbour radio or bridge team on the location of the inbound vessel. This loss of situational awareness would have been exacerbated by the delay in setting the pilot ladder to the correct height.

2.17 The master of the *Lodestar Forest* did not plot the *Anatoki*, nor did he know the name of the vessel. The first mate relieved the third mate on the navigating bridge as the master made his way to the port bridge wing to watch the disembarkation of the pilot. Neither the third mate nor the first mate plotted the *Anatoki* and neither communicated with the master as he stood on the bridge wing. The master lost situational awareness of where he was positioned in relation to the *Anatoki*. Good BRM would have ensured that the whole bridge team had a shared mental model of the intended pilotage, with challenge and response leading to an enhanced situational awareness. The bridge team on board the *Lodestar Forest* comprised individuals from South Korea and Vietnam. South Korea scores moderately highly in the power distance index and Vietnam by its close ties could be expected to have a power distance index similar to that of Chinas. The bridge team performance described before is indicative of such a case.

Collision regulations

2.18 Both vessels were required to comply with the international collision regulations, which in New Zealand are contained in Maritime Rules Part 22. Both vessels were navigating in or near an area of restricted visibility and neither vessel was in sight of the other. As such each vessel was required to follow the Rules contained in section 1, subsection 1 conduct of vessels in any condition of visibility; subsection 3, conduct of vessels in restricted visibility; and section 3, Rule 22.35 sound signals in restricted visibility. In respect of the collision regulations:

- each vessel had its engines ready for immediate manoeuvre, which was correct
- each vessel was proceeding at a safe speed given the consideration of Maritime Rules Part 22.6 to the low traffic density, environmental conditions and the efficiency of the equipment available to determine if risk a of collision existed
- both vessels had detected the presence of another vessel by radar alone, which was correct
- both vessels should have determined if a risk of collision existed, which they did not
- each vessel should have taken avoiding action in ample time as specified by the Rules, which they did not
- the *Anatoki* was making the correct sound signals for a vessel in restricted visibility underway and making way
- the *Lodestar Forest* was not making the correct sound signals for a vessel in restricted visibility underway and making way
- when the first mate of the *Lodestar Forest* did not receive a reply to his VHF radio call, he sounded the signal for vessels in sight of one another when either vessel fails to understand the intentions or actions of the other, which was not correct because they were not in sight of one another
- when the mate of the *Anatoki* saw the *Lodestar Forest* ahead of him, he sounded the signal for a vessel in restricted visibility being towed, which was incorrect
- when the mate of the *Anatoki* saw the *Lodestar Forest* ahead of him, he attempted to take all way off the vessel then go astern, which was correct, only the action was delayed for a short time
- when the master of the *Lodestar Forest* saw the *Anatoki* on his starboard side, he attempted to swing the stern of his vessel away from the other vessel so as to mitigate the impact, which was correct.

2.19 The actions taken by each bridge team once they saw the other vessel were appropriate in the circumstances; however, the collision regulations are primarily written to prevent vessels entering close-quarters situations. The situation that was allowed to develop instead tested the last defence written into the Rules, that is, to lessen the impact of an inevitable collision.

Port communications and pilotage

2.20 At the entrance to the port of Tauranga, the pilot boarding ground was situated about 2 nm within the compulsory pilotage area. Around the New Zealand coast there are 2 other ports, Auckland and Port Marlborough, where the pilot boarding ground is within a compulsory pilotage area, so, although unusual, The port of Tauranga pilot boarding ground is not unique. Where the pilot boarding ground is situated within a compulsory pilotage area extra requirements fall upon both the vessel's master entering the pilotage area and the pilotage provider and port authority.

2.21 There was a requirement under Maritime Rules Part 90 that when a vessel was within a compulsory pilotage area it was to be in contact with the pilot or the harbour radio so that a pilot entitled under the Maritime Rules to pilot that vessel could give advice and directions to the master of the vessel.

2.22 The *Anatoki* was not in contact with the pilot, although the pilot had attempted to contact the *Anatoki* several times, and had only occasional contact with the harbour radio. Whether this was due to a lack of understanding of the Maritime Rules or simply poor use and monitoring of radio channels could not be established from the master's comments.

2.23 The *Anatoki* was fitted with a dual-watch VHF transceiver as part of the navigating bridge equipment. After the incident, when members of the bridge team were interviewed, there was an evident lack of understanding of the use of the dual-watch function that allowed the bridge team to monitor and respond to VHF traffic on 2 channels. As the dual-watch VHF transceiver was part of the in-built equipment, the antenna was placed in the best possible position for reception of all VHF traffic. However, the bridge team were using a handheld VHF transceiver on channel 12, the dedicated port channel. The handheld VHF transceiver can be shielded from the surrounding metal superstructure, resulting in the poor reception. As well, the transmitting power of the portable VHF transceiver is much reduced from the fixed installation VHF transceiver, meaning it would be less likely to be heard by the pilot or harbour radio.

2.24 Port of Tauranga Limited at the time of the incident operated a port information service, which was designed to improve port safety and co-ordination of port services within the port community. As such it was mainly concerned with the management of the port facilities. This type of service did not require the operators to be trained to the V-103 standard and was very port specific.

2.25 Envbop, as the statutory harbour authority, and its appointed representative, the harbourmaster, had a duty to ensure the safe and efficient use of the harbour by those who had the right to use its facilities and navigate its waters, which included a duty to regulate navigation using its available powers[8].

2.26 To ensure the safe and efficient use of the harbour and to regulate navigation effectively the harbourmaster or their servants would need to communicate with the users of the harbour. At the time of the incident Port of Tauranga Limited and Envbop did not have a joint method of communicating with harbour users, although discussions had been entered into after the navigational risk assessment had recommended investigating a VTS scheme. Envbop and Port of Tauranga Limited could, as the navigational risk assessment suggested, have invested in a joint VTS control centre with staff trained to the appropriate V-103 standard. If the minimum IMO guidelines for an information service had been introduced, the staff would then have been trained to provide the navigation team on board both vessels with essential information to allow informed navigational decisions to be made, which would probably have averted the collision.

2.27 For a VTS scheme at Tauranga to operate effectively, the scheme would require all vessels to monitor a dedicated VHF channel so the transfer of essential information could be handled expeditiously. At the time of the incident all commercial vessels were requested to maintain a listening watch on VHF channel 12; however, in this case the monitoring of VHF channel 12 by the *Anatoki* was less than optimal. If the scheme were supplemented with AIS capability and radar coverage, this would provide the VTS operators with a visual representation of traffic within the VTS scheme without having to rely exclusively on VHF radio. This of course would only be useful for monitoring vessels equipped with AIS.

Anatoki regulatory requirements

2.28 The *Anatoki* had been issued with an exemption to have a New Zealand SSM certificate issued to the vessel from 21 April 2008 until 21 July 2008. This exemption was requested by the SSM company after the completion of a survey by it to prove that the vessel complied with or would comply with all relevant Maritime Rules. However, the lack of operating documentation for required bridge communication equipment, amongst others, in the working language of the vessel would have hampered the safe and efficient operation of the vessel.

2.29 The master and crew on board the *Anatoki,* although having sailed together previously, had not been on board the *Anatoki* for a long period of time; they were in the process of developing their systems and procedures for SSM. However, it would be reasonable to expect that the bridge team were familiar with the use and fine tuning of all the installed bridge equipment. The majority of the bridge equipment was that supplied to the vessel when it was constructed in

[8] Local Government Act 1974 No 66, Public Act, Part 39A Navigation.

Japan, and as such there were few English or English-translated operational manuals available. This would probably have made it more difficult for the bridge team to use the full range of features offered by the equipment effectively.

2.30 The process of issuing an exemption was supposed to allow time for the accumulation of records that would prove the operator was measuring and monitoring standards, investigating accidents and incidents and taking corrective actions in the spirit of the concept of continuous improvement.

2.31 The SMS system though, should have been fully designed and implemented, with all crew fully conversant with their respective roles in the operation of the vessel before such an exemption was issued.

2.32 The master and crew on board the *Anatoki* held the required qualifications for the size of vessel that they were on; however, the majority of recent experience that the crew had, had come from serving on board fishing vessels. Only one of the bridge team had served on cargo vessels and this service, although recent, had been in a position as seaman. Larger fishing vessels, similar to the ones on which the crew of the *Anatoki* had previously served, which exceeded the size requirements for a pilot, would have taken pilots when entering and leaving port as a matter of course, so the act of embarking a pilot would not have been unusual for the crew on board the *Anatoki*. The standard of qualifications held by the crew should not therefore have contributed to the incident. Instead a lack of experience with the navigating bridge equipment, entering a different port for the first time, and failure to follow the principles of good BRM contributed to the incident.

2.33 The *Anatoki* was innovatively modified in the bow area after its arrival in New Zealand. This modification, to alter the waterline length, was a commercial decision to enable the vessel to operate on the New Zealand coast. The modification at the time aroused much interest and debate in the maritime community and was submitted to and gained design approval from the regulator, Maritime New Zealand. Although the modification was unique and complied with Maritime Rules, many voiced their opinion that it was not in the spirit of the law. The Commission's role is to identify the circumstances and causes of this particular accident; it also has a role to identify any other potential safety issues that it learns about as a result of its enquiries.

2.34 When Maritime NZ and the *Anatoki*'s owner started corresponding to find the "best fit" within the rules for the *Anatoki*, it immediately became apparent that the vessel naturally fell somewhere between a SOLAS vessel and a coastal vessel less than 45 m, but it was more than 45 m so fell within a manning scale that was realistically too high for such a vessel.

2.35 While Maritime NZ was understandably trying to enforce the vessel into its appropriate class under Maritime Rules, when it learned of the proposed modification to bring the vessel under 45 m in length, a more pragmatic approach could have been taken. While the modification complied in all respects with the relevant construction rules, the cost of the modification together with the risk of altering the structure in the bow, the part of the vessel that takes the greatest loads in service, warranted another approach, even in the form of an exemption. The conundrum here is once exemptions are issued, precedents are set and the question of where to stop will be forever argued. Maritime NZ has been criticised in the past for overuse of exemptions.

2.36 The underlying problem appears to be the one-size-fits-all structure of the Rules, making them inflexible to an industry that is forever changing with technological advances in vessel design, construction and efficiency. Inflexible or over-simplistic rules can entice operators to explore unique opportunities to have their vessels fit into lower class categories, sometimes at the risk of compromising safety in other areas. While this was not necessarily the case with the *Anatoki*, it would be useful when developing future measures to regulate the various requirements for constructing, equipping and crewing New Zealand vessels, and to consider allowing a greater degree of flexibility than the current system that uses vessel length as the main criterion for assigning such conditions.

2.37 When Maritime NZ incorporated the SOLAS requirements into the Maritime Rules, certain changes were made to align the SOLAS requirements with those of New Zealand. Had the *Anatoki* been a SOLAS vessel engaged in international trade, it would have been required to be fitted with AIS by 31 December 2004. If not engaged in international trade, and over 45 m in length, it would have been required to be fitted with AIS from 1 July 2008 which was after the incident. There was nothing in the SOLAS regulations that prevented an Administration from requiring its nationally registered vessels within its jurisdiction to implement the regulations in advance of the promulgated date if it considered the safety benefits were justified.

2.38 By altering the design of the vessel so as to enable it to be New Zealand registered and under SSM, the equipment carriage requirements changed such that the vessel was not required to carry AIS equipment and thus the bridge teams on board the *Anatoki* and the *Lodestar Forest* as well as the harbour radio were denied the benefit that AIS equipment would provide for collision avoidance. Crews of foreign-registered vessels engaged in international trade and visiting New Zealand could naturally think that vessels the size of the *Anatoki*, over 500 gross tons, would be equipped with AIS as required under SOLAS and enforced in many parts of the world. An example was the first mate on the *Lodestar Forest* moving straight to the AIS to try to identify the *Anatoki*, an action preferable to what he reverted to, calling "ship on my starboard bow". A lack of this equipment on this type of vessel would amount to a missed opportunity to reduce the risk of incidents between foreign and nationally registered vessels.

2.39 An AIS had the function of providing real-time actual courses and speeds of target vessels, which had an advantage over radar plotting. Any change in the course or speed of either vessel would have been almost immediately apparent, whereas with radar any change would not be immediately apparent.

3 Findings

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

3.1 The *Anatoki* and the *Lodestar Forest* collided in Tauranga Harbour roads in reduced visibility because the masters on board both vessels and the pilot on board the *Lodestar Forest* never attained full situational awareness because of questionable standards of BRM on both vessels.

3.2 The pilot on board the *Lodestar Forest* was working in comparative isolation when he made the decision to sail, but the decision to sail would have been reasonable had the bridge team been fully prepared and working as a cohesive team.

3.3 The *Lodestar Forest*'s master and crew's alertness and performance were likely impaired by the disturbed rest periods they had had during the preceding night.

3.4 Good BRM should have overcome the steep authority gradient on the bridge of the *Lodestar Forest*, and the low authority gradient on the bridge of the *Anatoki*, both resulting from the power distance index of the respective nationalities involved.

3.5 Non-compliance on board both vessels with the international rules for preventing collisions at sea for vessels in any condition of visibility and for vessels not in sight of one another contributed to the collision.

3.6 Lack of familiarity with the use of installed equipment and lack of operational manuals in the working language of the crew on board the *Anatoki* restricted the efficient use of some bridge equipment, including the dual-channel VHF transceiver, which meant that the bridge team did not receive all relevant communications.

3.7 The *Anatoki* had been modified to reduce its waterline length, to enable it to trade in New Zealand waters under SSM; however, this also had the effect of putting the vessel below the length that required it to be fitted with an AIS installation, thus increasing the risk of incorrect identification of the vessel and its intentions.

3.8 The lack of AIS on vessels of a similar size to that of the *Anatoki* around the New Zealand coast increases the risk to maritime safety when crews of SOLAS-compliant foreign vessels in New Zealand waters would expect these vessels to be so equipped.

3.9 Had Tauranga Harbour been equipped with a VTS system, it is likely that information provided by the VTS system to each vessel on the location of the other would have greatly reduced the likelihood of the collision occurring. AIS equipment being a part of VTS would have enhanced the information that could have been made available, provided all vessels involved were so equipped.

4 Safety Actions

4.1 On 1 September 2008 Maritime NZ implemented a number of improvements to the SSM system to tighten up Maritime NZ's oversight and survey requirements. The changes made were:

- Maritime NZ started issuing all full-term SSM certificates instead of the SSM companies
- exemption certificates were no longer utilised for entry into SSM
- SSM companies were required to submit to Maritime NZ all evidence upon which the issue of reissue of a SSM certificate was based
- Maritime NZ recruited a marine surveying technical advisor to mentor and train SSM surveyors
- Maritime NZ recruited a technical trainer to conduct workshops with owners and lift the owners' level of knowledge and understanding of the requirements of SSM and health and safety legislation
- Maritime NZ worked with SSM company surveyors to compile a common check sheet for vessel surveying and introduced training in the use of the common check sheet
- Maritime NZ introduced training for SSM company surveyors and auditors in the new requirements.

5 Safety Recommendations

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

5.1 On 21 May 2009 it was recommended to the Director of Maritime Safety that she:

020/09 through the approval process for New Zealand port and harbour safety management systems, encourage port companies and administrations responsible for navigational safety in ports with a high or complex traffic flow to consider establishing vessel traffic management services to one of 3 levels contained in IMO resolution A.857(20)

021/09 address the safety issue whereby large commercial vessels above the internationally accepted size for the carriage of AIS are operating into and around busy New Zealand ports without AIS fitted, potentially compromising the effectiveness of traffic management systems and other measures to prevent collisions between vessels.

022/09 address the safety issue whereby crew who hold certificates of equivalency that allow them to crew small coastal vessels are not required to have undergone bridge resource management training.

5.2 On 12 June 2009 the Director of Maritime New Zealand replied to the Safety Recommendation:

020/09 Maritime NZ accepts this recommendation and will ensure that a copy of this report is sent to regional councils and port companies at all ports where there is compulsory pilotage for their consideration; and will promote the establishment of appropriate levels of VTS at all such ports.

021/09 Maritime NZ accepts the recommendation but notes that such vessels are not currently required to carry AIS. However, Maritime NZ accepts there is safety issue, and will ensure that such vessels are aware of this recommendation and will strongly recommend that AIS is fitted pending consideration of an amendment to the maritime rule.

022/09 Maritime NZ accepts the recommendation and notes that this matter will be considered as part of Maritime NZ's major review of seafarer qualifications and operational limits which is currently underway.

Approved on 21 May 2009 for publication

Hon W P Jeffries
Chief Commissioner

Appendix 1

Relevant Rules from Maritime Rules Part 22

Section 1 - Steering and Sailing

SUBSECTION 1 - CONDUCT OF VESSELS IN ANY CONDITION OF VISIBILITY

22.4 Application of Subsection 1

Rules in this subsection apply in any condition of visibility.

22.5 Look-out

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

22.6 Safe speed

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

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

1) For all vessels -
   a) the state of visibility:
   b) the traffic density, including concentrations of fishing vessels or any other vessels:
   c) the manoeuvrability of the vessel, with special reference to stopping distance and turning ability in the prevailing conditions:
   d) at night, the presence of background light such as from shore lights or from the back scatter of the vessel's own lights:
   e) the state of wind, sea, and current, and the proximity of navigational hazards:
   f) the draught in relation to the available depth of water.
2) Additionally, for vessels with operational radar -
   a) the characteristics, efficiency, and limitations of the radar equipment:
   b) any constraints imposed by the radar range scale in use:
   c) the effect on radar detection of the sea state, weather, and other sources of interference:
   d) the possibility that small vessels, ice, and other floating objects may not be detected by radar at an adequate range:
   e) the number, location, and movement of vessels detected by radar:
   f) the more exact assessment of the visibility that may be possible when radar is used to determine the range of vessels or other objects in the vicinity.

22.7 Risk of Collision

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

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

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

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

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

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

22.8 Action to avoid collision

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

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

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

(a) it is made in good time;

(b) it is substantial; and

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

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

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

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

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

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

SUBSECTION 3 - CONDUCT OF VESSELS IN RESTRICTED VISIBILITY

22.19 Conduct of vessels in restricted visibility

(1) This subsection applies to vessels not in sight of one another when navigating in or near an area of restricted visibility.

(2) Every vessel must proceed at a safe speed adapted to the prevailing circumstances and conditions of restricted visibility.

(3) A power-driven vessel must have its engines ready for immediate manoeuvre.

(4) Every vessel must have due regard to the prevailing circumstances and conditions of restricted visibility when complying with subsection 1 of this section.

(5) (a) A vessel which detects by radar alone the presence of another vessel must determine whether a close-quarters situation is developing and must determine if risk of collision exists. If so, it must take avoiding action in ample time.

(b) If such action consists of an alteration of course, the following must, as far as possible, be avoided:

(i) an alteration of course to port for a vessel forward of the beam, other than for a vessel being overtaken; and

(ii) an alteration of course towards a vessel abeam or abaft the beam.

(6) Except where it has been determined that there is no risk of collision, every vessel that hears the fog signal of another vessel apparently forward of its beam, or cannot avoid a close-quarters situation with another vessel forward of its beam, must -

(a) reduce its speed to the minimum at which it can be kept on its course; and

(b) if necessary, take all way off; and

(c) in any event navigate with extreme caution until the danger of collision is over.

Section 3 - Sound and light signals

22.32 Definitions relating to this Section

In this section -

"Prolonged blast" means a blast of from four to six seconds duration:

"Short blast" means a blast of about one second's duration:

"Whistle" means any sound signalling appliance capable of producing the prescribed blasts and which complies with the specifications in Appendix 3 to this rule.

22.33 Equipment for sound signals

(1) A vessel of 12 metres or more in length must be provided with -

(a) a whistle; and

(b) a bell; and

(c) in the case of a vessel of 100 metres or more in length, a gong.

(2) The tone and sound of the gong must not be able to be confused with that of the bell.

(3) The whistle, bell, and gong must comply with the specifications in Appendix 3 to this rule.

(4) As long as they can still be sounded manually, the bell or gong or both may be replaced by other equipment having the same respective sound characteristics.

(5) A vessel of less than 12 metres in length is not obliged to carry the sound signalling appliances prescribed, but if it does not carry the prescribed sound signalling appliances, it must be provided with some other means of making an efficient sound signal.

22.34 Manoeuvring and warning signals

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

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

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

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

(2) Any vessel may supplement the whistle signals prescribed in rule 22.34(1) with the following light signals, repeated as appropriate, whilst the manoeuvre is being carried out -

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

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

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

The duration of each flash must be about one second, the interval between successive flashes must be about one second, and the interval between successive signals must not be less than 10 seconds.

The light used for this signal must, if fitted, be an all-round white light. It must be visible for a minimum distance of 5 miles and comply with the provisions of Appendix 1.12 of this Part.

(3) When in sight of one another in a narrow channel or fairway -

(a) a vessel intending to overtake another must indicate its intention in compliance with rule 22.9 (narrow channels) by sounding one of the following sound signals on its whistle:

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

two prolonged blasts followed by two short blasts to mean “I intend to overtake you on your port side”;

(b) the vessel about to be overtaken when acting in compliance with rule 22.9 (narrow channels) must indicate its agreement by sounding the following signal on its whistle:

one prolonged, one short, one prolonged and one short blast, in that order.

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

at least five short and rapid blasts.

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

(5) A vessel nearing a bend or an area of a channel or fairway where other vessels may be obscured by an intervening obstruction must sound one prolonged blast.

Such 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.

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

22.35 Sound signals in restricted visibility

In or near an area of restricted visibility, by day and by night, the following signals must be used:

(a) subject to rule 22.35(b) -

(i) a power-driven vessel making way through the water must sound one prolonged blast at intervals of not more than 2 minutes;

(ii) a power-driven vessel underway but stopped and making no way through the water must sound two prolonged blasts in succession with 2 seconds between them at intervals of not more than 2 minutes:

(b) the following vessels -

(i) vessels not under command, vessels restricted in their ability to manoeuvre, vessels constrained by their draught, sailing vessels, vessels engaged in fishing, vessels engaged in towing or pushing another vessel; and

(ii) vessels engaged in fishing at anchor and vessels restricted in their ability to manoeuvre when carrying out work at anchor; must sound three blasts in succession, namely one prolonged followed by two short blasts, at intervals of not more that 2 minutes:

(c) if crewed, a vessel towed or, if more that one vessel is towed, the last vessel of the tow, must sound four blasts in succession, namely one prolonged followed by three short blasts:

This signal must be made at intervals of not more than 2 minutes, and where practicable, be made immediately after the signal made by the towing vessel.

(d) When a pushing vessel and a vessel being pushed ahead are rigidly connected in a composite unit, they are to be regarded as a power-driven vessel and sound the appropriate sound signal as described in rule 22.35(a):

(e) A vessel at anchor must ring a bell rapidly for about 5 seconds at intervals of not more than 1 minute and -

(i) if the vessel is 100 metres or more in length, the bell must be sounded in the forepart of the vessel; and

(ii) immediately after the ringing of the bell the gong must be sounded rapidly for about five seconds at the after part of the vessel.

A vessel at anchor may additionally sound three blasts in succession, namely one short, one prolonged, and one short blast to give warning of its position:

(f) a vessel aground must give the bell signal, and (if required) the gong signal, prescribed for a vessel at anchor in rule 22.35(e),

AND in addition must give three separate and distinct strokes on the bell immediately before and after the rapid ringing of the bell.

A vessel aground may also sound an appropriate whistle signal:

(g) a vessel less than 12 metres in length is not obliged to give the above mentioned signals, but, if it does not, must make some other efficient sound signal at intervals of not more than 2 minutes.

(h) when engaged on pilotage duty, a pilot vessel may in addition to the signals prescribed for power-driven vessels (rule 22.35(a)) or vessels at anchor (rule 22.35(e)), sound an identity signal consisting of four short blasts.

Appendix 2

Relevant Rules from Maritime Rules Part 31B

Section 1 – General
31B.5 – Equivalent Certificates
Where Part 31B requires a person who holds a specific certificate of competency to be carried on board a vessel
(a) the Director will accept another certificate of competency issued in New Zealand that is specified in Table 1 as being equivalent to that certificate, subject to any applicable conditions specified in Table 1; and
(b) the Director may accept as equivalent to that certificate another certificate of competency not referred to in Table 1, if the Director is satisfied that the requirements to obtain the certificate are not less than those required to obtain the certificate required by this Part.

Table *1*

Certificate required	*Equivalent Certificates that are acceptable*	*Conditions under which equivalents are acceptable*
1MFG	CFG	
	Class 1 Deck Officer	
NZOM	1MFG or equivalent	
	Class 2 Deck Officer	
	Second Mate Foreign Going	
	Master Deep Sea Fishing Vessel	
	Skipper Deep Sea Fishing Boat	
	Mate Deep Sea Fishing Vessel	Must have previously held NZOM or New Zealand Coastal Master
	Mate Deep Sea Fishing Boat	
	Master Home Trade	
	Skipper Coastal Fishing Boat	Limited to within 100 miles of the coast
	Master Small Home Trade Ship	
	New Zealand Coastal Master	
NZOW	NZOM or equivalent	
	Master River Ship	
ILM	NZOW or equivalent	Must have a maritime engineering qualification issued by the Director, if no other engineer is carried
	Master Restricted Limit Launch	Restricted to the limits specified for those certificates in the Shipping (Manning of Restricted- Limit Ships) Regulations 1986
	Commercial Launch Master	
LLO	ILM or equivalent	
	Local Launchman's Licence	Limited as endorsed
CDH	ADH	
	LLO or equivalent	
	Advanced Deck Hand Fishing Endorsement	
	AB Certificate	
	Integrated Rating	
MEC2	MEC1	
	First Class Engineer	
	Second Class Engineer	
	MEC 2 ECE	
MEC4	MEC 2 or equivalent	
	First Class Coastal Motor	
	First Class Diesel Trawler Engineer	

	Chief Tug Engineer	Limited to ship handling harbour tugs
MEC5	MEC 3	
	MEC 4 or equivalent	
	Marine Engineer Watchkeeper	
	Second Class Coastal Motor	
	Engineer Local Ship	
	Engineer Local Motor Ship	
	River Engineer	
MEC6	MEC 5 or equivalent	
	Second Class Diesel Trawler Engineer	

Section 2 – Minimum Safe Crewing

31B6 – General Requirements

(1) Except as provided in rules 31B.6(2) and (7), the owner and the master of a vessel must not operate that vessel unless there is on board the number of crew necessary to operate the vessel safely, taking into account the requirements of rule 31B.8, and at least the minimum number of crew including seafarers holding the qualifications required by
   (a) the applicable tables and flow-charts in rules 31B.9 to 31B.15 inclusive; or
   (b) a Minimum Safe Crewing Document issued by the Director in accordance with rule 31B.7(3).

Section 4 – Non-Passenger Vessels

31B.13 – Coastal Area

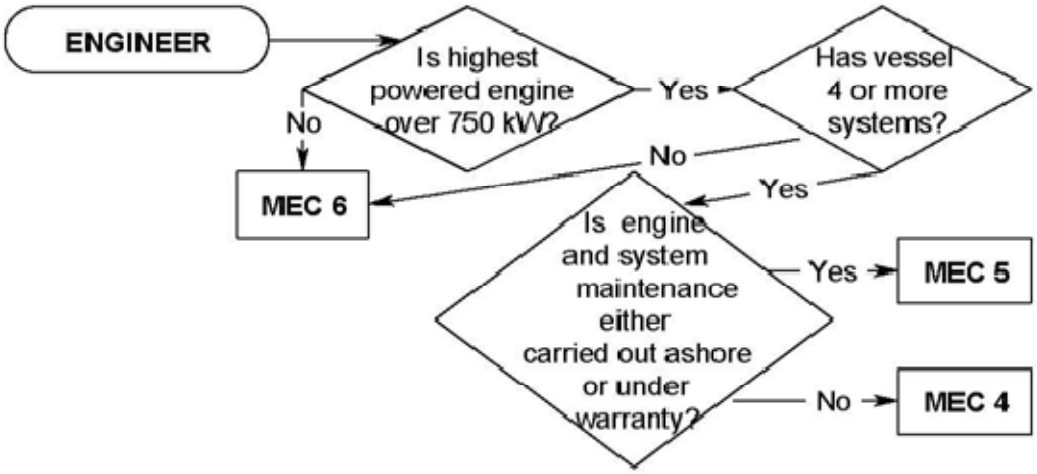
Except as provided by rule 31B.6(1)(b), non-passenger vessels operating in the coastal area must carry at least –

(a) seafarers holding the minimum required qualifications specified in Table 5 and in the accompanying flow-chart; and

(b) the minimum crew specified in Table 5

Table 5

Vessel	*Minimum Required Qualifications*	*Minimum Crew*
24 m or more length overall but less than 45 m in length	Master – NZOM Mate – NZOW Engineer – in accordance with flow chart and may be the mate	3
Less than 24 m length overall	Master – NZOW with command endorsement Mate – ILM Engineer – qualification in accordance with flow chart and may the mate	2



Appendix 3
Bay of Plenty Regional Navigational and Safety Bylaws 2004 (Part)

2 General Matters

2.10 Applicable Maritime Rules

Maritime Rules Part 22 Collision prevention and Part 90 Pilotage apply to all waters within the Region. All jet boating and rafting operators must comply with Maritime Rule Part 80: Marine Craft involved in Adventure Tourism or subsequent legislation. A breach of these Maritime Rules shall constitute a breach of these bylaws

6 Tauranga Harbour

6.1 Directions for Entering and Navigating in Tauranga Harbour (Vessels over 100 Gross Registered Tonnage and Pilot Exempt Vessels)

6.1.1 Compulsory Pilotage is required in that area of the Bay of Plenty – Tauranga Harbour, bounded by an arc of a circle of radius five nautical miles, centred on North Rock and to include all the commercial area of Tauranga Harbour.

6.1.2 That part of Tauranga Harbour known as Number 1 Reach, Number 2 Reach, the Cutter Channel, Maunganui Roads and the Stella Passage shall be deemed to be a narrow channel in accordance with Part 22.9 of the Collision Prevention Rules, Narrow Channels.

6.1.3 Prior to entering Tauranga Harbour, the Master of a vessel shall call “Tauranga Port Radio” on marine VHF Ch 12 and report the intention of the vessel to enter the harbour. Such vessels shall maintain a listening watch on marine VHF Ch 12 whilst inside the harbour.

6.1.4 The Master of a vessel not carrying a working marine VHF radio and unable to communicate with “Tauranga Port Radio” shall not transit the Tauranga Harbour entrance during the hours of darkness or during restricted visibility, except in an emergency.

6.1.5 All other vessels, commercial and recreational, (where a VHF is fitted), are recommended 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.

6.2 Navigation in the Area of No.1 Reach

(a) In this bylaw “No.1 Reach” shall mean that area marked as No.1 Reach on nautical charts of the area.

(b) Vessels shall keep to their starboard side of the channel in the No.1 Reach, except that:

Notwithstanding the International Regulations for Preventing Collision at Sea, New Zealand Maritime Rules Part 22 Collision Prevention, vessels navigating in the area of No.1 Reach of the dredged channel contained between a line drawn 270° True from North Rock Light and a line drawn 090° True from ‘A’ Beacon, may pass starboard to starboard in that part of No.1 Reach provided prior arrangements have been made by the Pilots and/or Exempt Masters of such vessels. In such cases, prior radio communications shall be established and maintained by the Pilots and/or Exempt Masters undertaking such manoeuvres.

6.3 General Directions for Navigating in Tauranga Harbour

6.3.1 The Master shall ensure that while within Tauranga Harbour:

(a) automatic-steering “pilot” devices are not to be used, unless a helmsman is standing by in the immediate vicinity of the helm or wheel, otherwise the vessel is to be in the hand-steering mode; and

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

(c) anchors are to be immediately available for use in an emergency, and capable of being used without power; and

(d) all information from aids to navigation and charts is fully monitored.

(e) all vessels, whether under pilotage or pilot exempt shall have an agreed passage plan for transit within pilotage limits.

(f) the number of crewmembers on the bridge shall be sufficient to safely carry out the agreed passage plan.

(g) in determining the composition of the bridge team, due regard shall be taken to the following; the operation of all controls, monitoring the progress of the vessel visually, the use of all available aids to navigation and that the appropriate up to date navigational charts are in use.

6.3.2 While within Tauranga Harbour all aids to navigation on board vessels, including but not limited to radar and depth recording devices, are to be in continuous operation and fully utilised.

6.3.3 The number of persons on the bridge of the vessel shall be sufficient to enable compliance with sub clause 6.3.1.

6.3.4 Whilst within the Tauranga Harbour Pilotage area, the Master of any vessel shall navigate so as not to impede the navigation of any vessel of 500 gross registered tonnage or more, any hovercraft or any seaplane in the process of taking off or landing.

6.3.5 However outside the Tauranga Harbour Pilotage area, all inner harbours and inland waters normal rules of the road for the prevention of collision at sea will apply. This does not detract from the responsibility of all Masters and persons in charge of any vessel to adhere to all maritime regulations and the good practice of seamanship at all times.

6.4 Tauranga Harbour – Radio Reporting Procedures for Vessels Sailing from Wharves or Anchorages

6.4.1 At least ten minutes prior to planned departure the Master of any vessel over 100 gross registered tonnage shall call “Tauranga Port Radio” on marine VHF Ch 12 to report their intentions, to obtain information about known shipping traffic movements, and to obtain current weather conditions at the harbour entrance.

6.4.2 After leaving a berth or anchorage, the Master of any vessel over 100 gross registered tonnage shall, as soon as practicable, call “Tauranga Port Radio” on marine VHF Ch 12 and report that the vessel has cleared the berth or anchorage.

6.4.3 All other vessels, commercial, or recreational (where VHF is fitted), are recommended to maintain a listening watch on Marine VHF Ch 12 when sailing from wharves or anchorages within the Tauranga Harbour and whilst within the Tauranga Pilotage area

6.5 Navigational Documents required for Tauranga Harbour

When navigating in any part of the harbour all vessels of 6 metres in length and above shall carry and consult a current copy of Charts NZ 5412 and NZ 5411 (or approved electronic equivalent).

Appendix 4

Survey Nelson Ltd

☑ FIT FOR PURPOSE DOCUMENT ☐ SURVEYORS CONFIRMATION

Name of Ship:	ANATOKI	**Project No.**_____
Owner(s) Full Name	Transport Logistics Ltd	
Address	41 Buchanans Road Hornby Christchurch	
Contact	Doug Smith	
Contact Phone	03 349 2707 or 029 374 4716	
Vessel Phone		MSA / MNZ No. 133088

Ship Details

Call sign	ZMA2078	LOA	51.0 meters
Fishing No.		Engine Power	410 kW
Home Port	Nelson	Tonnage (Rule 48)	550
Port of Registry	Nelson	Loadline (Rule 47)	1909 mm min
Official No.	876440	Freeboard (Rule 40D) (trawlers)	mm min
Year of Build	1993	Hull materials	Steel

Fit To Ply As: Non-Passenger N/A N/A

Limits (Rule 20)	C							
Passengers								
Crew	6							
LSA	6							

Limits: Enclosed Waters - Inshore - Restricted Coastal - Coastal - Restricted Offshore - Offshore - Unlimited.
Coastal

Special Conditions / Limitations / Restrictions
Stability conditions to be checked for each voyage.
Loading is to be within the limits permitted by the Loadline
Minimum cargo density for homogeneous cargo to be at least 0.71 t/m3
Maximum operating displacement limited to 920 t
Wave height 3.0m where wave length is greater than 100m
Wave height 2.5m where wave length is less than 100m

Manning requirements (Rule 31 A, B, C): As per MNZ

Ship Survey Due Dates (Rule 46.17(b)

Hull & Valves		Opened	Yes / No	Date Due	~~06/2008~~	04/2012	
Shaft	Main Due	~~06/2008~~	04/2012	Port Due	_____	Stbd	_____
Rudder Shaft	Main Due	~~06/2008~~	04/2012	Port Due	_____	Stbd	_____

Other Valid Certificates Specify:ITC, LL, Ship Reg.
MNZ issued Exemptions Specify:

Remarks: recomendation that Harry Stronach check loading conditions on each load. Free surface effects to be minimized

☑ This Ship and its equipment complies with the applicable Maritime Rules and Marine Protection Rules (21.13(2)(VII), Ships Registration Act 1992 and Health & Safety in Employment Act 1992 (as amended)
The Ship is Fit for its Intended Service & Intended Operating Limits on (Date) 15 · 04 · 2008

☐ Confirmation that the ship meets the requirements of Rule 21.13(11)(i) Maintenance & (ii) remains Fit For intended Purpose. (Date)_____

Name of Surveyor of Ships TERRY Signature

FFP Issue 9 19/10/05 See TERMS & CONDITIONS overleaf

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

07-202	Report 07-202, fishing vessel Walara-K, flooding and sinking, 195 nautical miles off Cape Egmont, 7 March 2007
07-207	Report 07-207, Bulk carrier, Taharoa Express, Cargo shift and severe list 42 nautical miles southwest of Cape Egmont, 22 June 2007
08-201	Fishing charter vessel, *Pursuit*, grounding, Murimotu Island, North Cape (Otou), 13 April 2008
06-207	restricted limit passenger vessel, *Milford Sovereign,* engine failure and impact with rock wall, Milford Sound, 31 October 2006
06-204	fishing vessel "Kotuku", capsized, Foveaux Strait, 13 May 2006
07-201	charter catamaran, *Cruise Cat*, collision with navigational mark, Waikato River entrance, Lake Taupo, 22 February 2007
06-208	fishing vessel *Santa Maria II*, engine room fire, L'Esperance Rock, Kermadec Islands, 10 December 2006
05-212	restricted limit passenger vessel Milford Sovereign, loss of directional control, Milford IncorporatingSound, 20 November 2005 incorporating:
06-206	restricted limit passenger vessel Fiordland Navigator, heel due extreme wind gust in Milford Sound, 8 July 2006
06-201	passenger freight ferry *Aratere*, Heavy weather incident resulting in cargo shift, Cook Strait, 3 March 2006
06-205	fishing vessel, *Lady Luck*, collision and subsequent foundering, Motiti Island, Bay of Plenty, 23 June 2006
06-203	fishing vessel *Venture*, grounding, Tipi Bay, Tory Channel, 19 April 2006
05-211	container ship *Spirit of Resolution,* collision with bridge, Onehunga, 8 October 2005
05-210	restricted limit passenger vessel *Milford Mariner*, engines' stall resulting in grounding, Harrison Cove, Milford Sound, 18 September 2005
05-208	passenger freight ferry *Santa Regina*, near grounding, Tory Channel eastern entrance, 9 June 2005

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