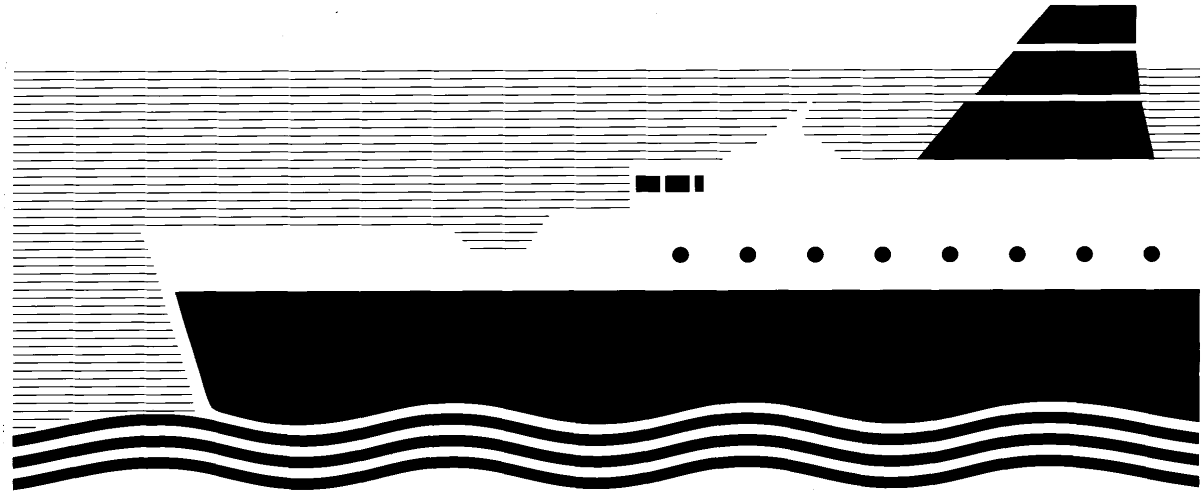
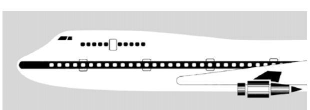
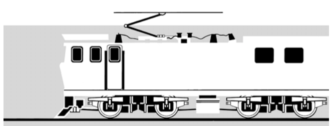
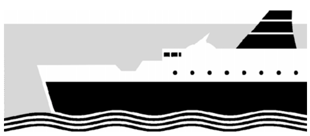


MARINE OCCURRENCE REPORT

04-219 **restricted limit passenger vessel *Tiger 111*, grounding, Cape Brett** **18 December 2004**







TRANSPORT ACCIDENT INVESTIGATION COMMISSION
NEW ZEALAND

Report 04-219

restricted limit passenger vessel *Tiger III*

grounding

Cape Brett

18 December 2004

Abstract

On Saturday 18 December 2004, at about 1510 the restricted limit passenger vessel *Tiger III,* while on a cruise to the Hole in the Rock with 59 passengers and 3 crew on board, grounded in the small bay under the Cape Brett lighthouse. The boat was pushed into a narrow gut and came to rest alongside the rocks on the shore.

All the passengers were able to get ashore and congregated at the old lighthouse keeper's cottage, from where they were flown by a fleet of helicopters back to Paihia. No major injuries were sustained.

The boat was unsalvageable and was declared a constructive total loss.

Safety issues identified were:

- the absence of operating limitations and guidelines
- the distraction of the Master from his primary function of navigating the boat.

Safety recommendations were made to the Chief Executive of Fullers Bay of Islands and the Executive Officer of the Marine Transport Association to address these issues.

The *Tiger III*

Contents

Figures

Abbreviations

ADH	Advanced Deckhand
CLM	Commercial Launchmaster
ILM	Inshore Launchmaster
kW	kilowatt
m	metre(s)
m/s	metres per second
mm	millimetre(s)
MWM	Motoren-Werke Mannheim
RPM	revolutions per minute
°T	degrees true
VHF	very high frequency

Glossary

alternator	a machine that converts mechanical power into alternating electrical current, often called a genset
catamaran	vessel with 2 hulls
gut	narrow water passage
lean	when referring to a fuel-to-air mixture, means there is insufficient fuel (or too much air)
pitch	the angle of propeller blades, expressed in inches of theoretical travel in one revolution of the propeller
rich	when referring to a fuel-to-air mixture, means there is too much fuel (or too little air)
service speed	the designed operating speed of the vessel; usually slightly less than the vessel's actual maximum speed

Data Summary

Vessel particulars:

Name:	*Tiger III*
Type:	restricted limit passenger
Safe Ship Management:	Maritime Management Services Limited
Limits:	inshore
Length:	20.92 m
Breadth:	8.75 m
Gross tonnage:	181
Built:	1985
Propulsion:	two 605 kW Motoren-Werke Mannheim (MWM) AG TBD 234 V12 diesel engines each driving through a reduction gearbox a fixed-pitch propeller
Service speed:	21 knots
Owner/operator:	Fullers Bay of Islands Limited
Port of registry:	Paihia
Maximum number of passengers	235
Crew:	3 or 4 dependent on passenger numbers and area of operation

Date and time:	18 December 2005 at about 1510[1]
Location:	Cape Brett
Persons on board:	crew: 3 passengers: 59
Injuries:	crew: 1 minor passengers: 3 minor
Damage:	constructive total loss
Investigator-in-charge:	Captain Doug Monks

[1] Times in this report are New Zealand Daylight Time (UTC + 13 hours) and are expressed in the 24-hour mode.

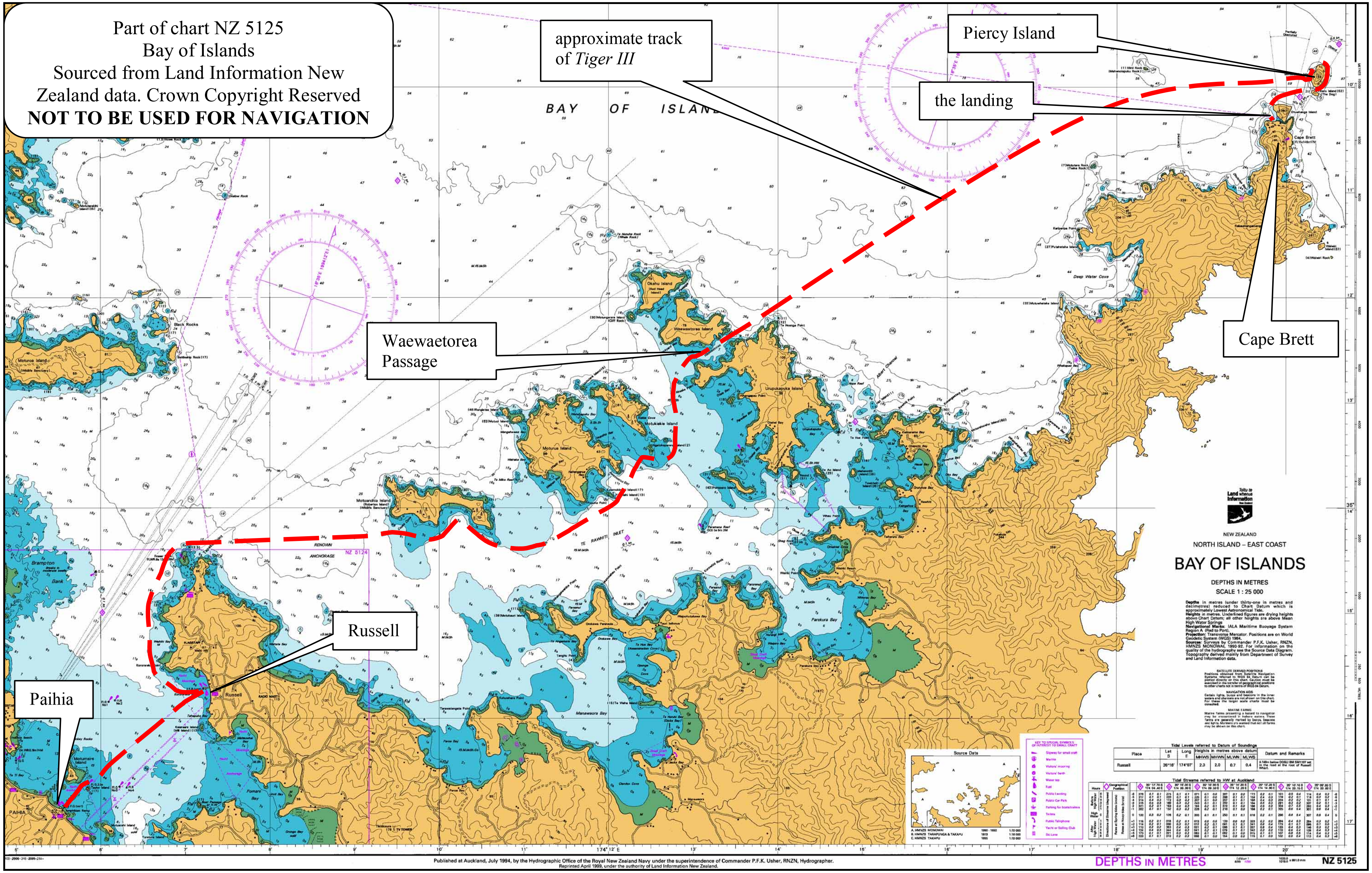


Figure 1
Chart of the Bay of Islands

1 Factual Information

1.1 Narrative

1.1.1 On Saturday 18 December 2004 at about 0700, at Opua in the Bay of Islands, the Master boarded the restricted limit passenger vessel *Tiger III* to prepare it for the day's sightseeing trips. After the usual start-up checks and procedures, and the arrival of the remainder of the crew, the Master took the vessel to Paihia and Russell where it embarked passengers for the trip to the Hole in the Rock at Motukokako, commonly known as Piercy Island (see Figure 1). A total of 60 passengers were on board.

1.1.2 The Hole in the Rock trip was a scenic tour giving passengers some history of the Bay of Islands and, weather permitting, a trip through the Hole in the Rock.

1.1.3 The weather in the morning was such that the Master elected not to pass through the Hole in the Rock but to reverse in from the southern side. In addition, he chose not to go into the landing, the small bay between Otuwhanga Island and Cape Brett; instead he continued past. After a stop at Otehei Bay the morning trip finished at Paihia at about 1300.

1.1.4 The passengers for the afternoon cruise were embarked at about 1320 and the boat left Paihia at 1330. On the way across to Russell, a trip of a few minutes only, the Master informed the passengers of the weather and sea conditions, giving any who were concerned the opportunity to disembark at Russell. The crew similarly informed the 4 new passengers who boarded in Russell. The boat left Russell with 59 passengers on board. The Master welcomed the passengers onboard, explained the facilities on the vessel and gave a safety briefing.

1.1.5 The cruise took the boat past the inner islands and then out through the Waewaetorea Passage into the open sea. When the boat arrived at Piercy Island, the conditions were similar to those of the morning, so the Master decided not to transit the Hole, but to reverse in from the southern side. At about 1500, they left Piercy Island and headed towards Cape Brett.

1.1.6 The Master initially intended to pass by the bay as he had done that morning, but as they approached it he estimated that the sea conditions at the landing had improved since the morning, with a reduction in the residual northerly swell. He decided to revert to the normal cruise routine and go into the bay. He intended to head in and then turn the boat slowly to port to give all the passengers a chance to photograph the scenery, while he gave them the commentary on the history of the lighthouse.

1.1.7 As they headed into the bay the Master said that he was a bit further to the south than he would normally have been, so he steered a course slightly to the left of the lighthouse keeper's cottage (see Figure 2). The trip from the Hole had been at cruising speed of about 20 knots, so as they entered the bay the Master had progressively pulled the throttles back to neutral (see Figure 2 position 4). Soon after, at a distance estimated by the Master of about 8 boat lengths or 160 m from the shore (see Figure 2 position 5), he applied some port helm and put the port engine astern. As he was doing this, a swell hit the stern, pushing the boat forward.

1.1.8 At about this time, the No. 2 deckhand who was on the afterdeck of the *Tiger III* noticed an unusual smell, something like burning rubber. She headed to the bridge to inform the Master. The No. 1 deckhand said that he had also smelt strong fumes, possibly diesel fumes when he was on the afterdeck at about the same time.

1.1.9 About 20 seconds later (see Figure 2 position 6), the Master, who was still describing Cape Brett and the lighthouse to the passengers, noticed that the boat was not turning to port as he expected it to; rather it was heading straight for the rocky shore ahead. Checking the engine readouts, he saw that the port engine was indicating 500 revolutions per minute (RPM), much less than he expected for the throttle setting he had applied. He pulled the port engine throttle further astern without any noticeable increase in RPM. At this point the Master assumed that the port engine had stalled.

1.1.10 By this time the boat was closing rapidly with the rocks, so the Master put the starboard engine astern to prevent the boat grounding ahead. The astern movement stopped the boat about 40 m from the shore, but it also screwed the stern to port, leaving the boat across the bay and across the wind and sea coming into the bay (see Figure 2 positions 7 and 8). He kept the starboard engine running astern to increase the distance between the bow and the rocks.

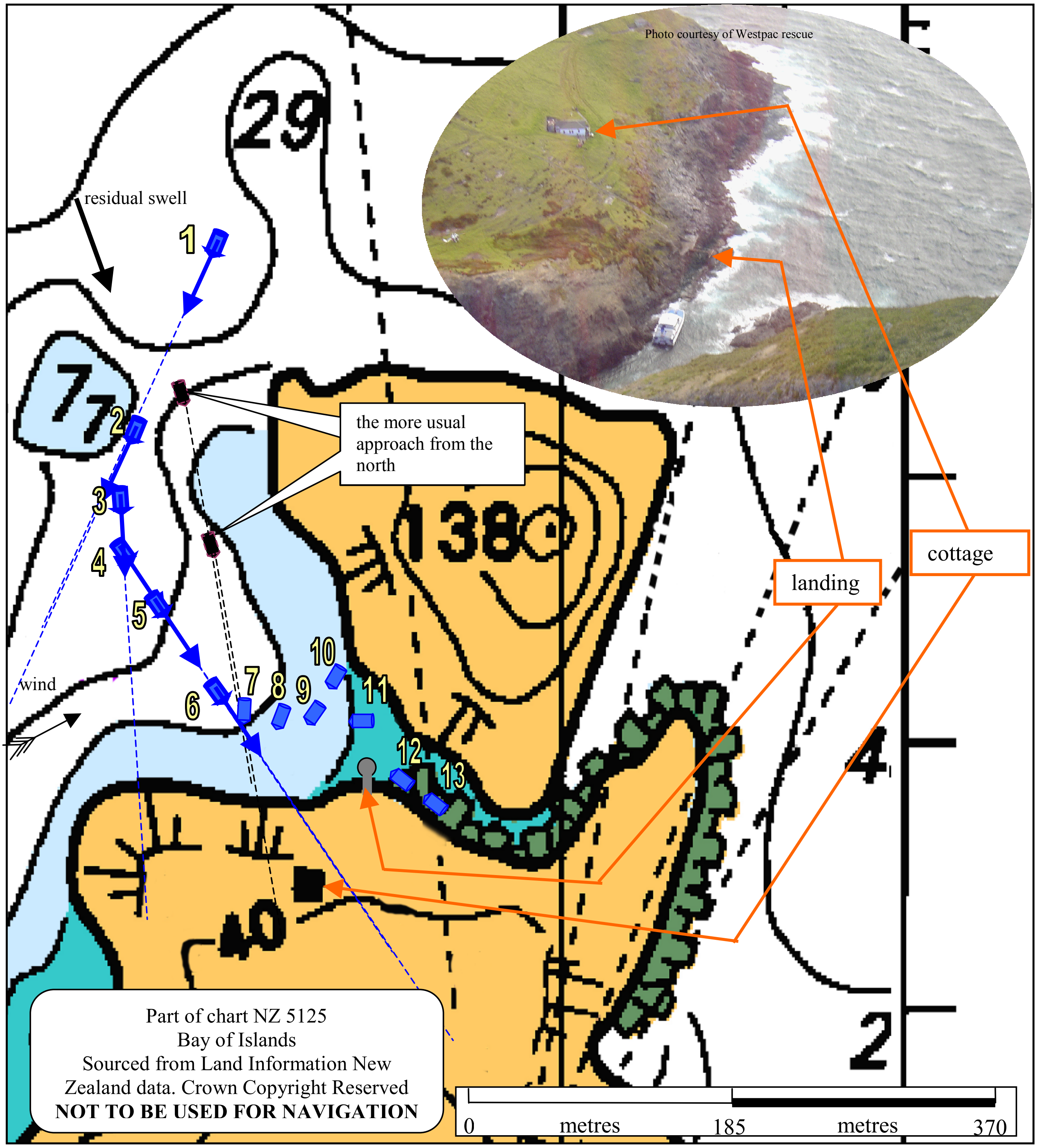


Figure 2
Part of chart NZ 5125 showing probable grounding sequence of the *Tiger III*

No.	Engine controls	Speed	Direction	Notes
1	full service speed ahead both	20 knots plus	passing by the landing	Master intending to bypass the landing
2	full service speed ahead both	20 knots plus	passing by the landing	Master changes mind and decides conditions suitable to approach the landing
3	full service speed ahead both	20 knots plus	turning onto a course to port of the cottage	
4	both neutral	slowing	on a course to port of the cottage	
5	port astern starboard neutral	about 8 knots	continues on course to port of the cottage	swell hits stern of the boat and pushes it forward. About 160 m from shore. Master giving commentary on the lighthouse
6	more throttle on port starboard neutral	about 6 knots	remains on original course	Master notices no change in direction
6A	almost immediately - starboard astern			Master thinks port engine has stalled and decides to stop boat on starboard engine
7	port astern starboard astern	almost stopped	stern starts to turn to port under reverse thrust of starboard engine and transverse thrust	Master continues to try to manoeuvre on starboard engine
8	port astern starboard astern	stopped	boat across the bay and now subject to the wind and sea	boat stops about 40 m from the rocks ahead
9	port astern starboard astern	going astern	moving away from the rocks ahead, closing with the rocks astern	boat being set towards the gut
10	port astern starboard neutral	going astern/stopped	boat pushed onto rocks on the northern side of the gut	port propeller grounds and stalls engine. Master tries to restart without success
10A	port stopped starboard neutral/possibly ahead	stopped		awaiting *Dolphin Seeker* to assist. Master tries to restart port engine
11	port stopped starboard neutral	stopped	moving across the gut	boat towed by *Dolphin Seeker*, but sailed across the wind before tow rope parted and *Tiger III* grounded to the east of and close to the landing
12	port stopped starboard neutral/possibly ahead	stopped	aground pointing towards the landing and being pushed further into the gut	
13	both stopped	stopped	fast aground	crew manage to get mooring lines out and secure *Tiger III* alongside the rock face

Key to the boat positions in Figure 2

1.1.11 The Master said that he then put the throttle lever for the port engine into neutral and pressed the start button, but nothing happened.

1.1.12 At about 1510, the Master made a very high frequency (VHF) radio call to another cruise boat, the *Dolphin Seeker,* that he had seen arriving at the Hole in the Rock as the *Tiger III* was leaving. He asked the Master of that boat to come and assist them, which he did. While waiting for the other boat to arrive, the Master tried to manoeuvre the *Tiger III* on the starboard engine alone. The wind coming into the bay continued to push the *Tiger III* towards the shore near the gut that ran between the island and the main land.

1.1.13 When the *Dolphin Seeker* arrived in the bay, about 3 or 4 minutes after the radio call, its Master found the *Tiger III* in line with the gut and a little way from the shore. That Master decided to turn the *Dolphin Seeker* and reverse towards the *Tiger III*. A tow rope was passed from the stern of the *Dolphin Seeker* to the starboard bow of the *Tiger III*. As the weight started to come on the towline, the *Dolphin Seeker* was set towards the rocks on the southern side of the bay. To prevent it grounding, the Master applied full ahead power on his port engine and astern power on the starboard engine; this turned his boat away from the rocks, but in the process the port propeller touched a rock, causing minor damage to that propeller. The power was too much for the towline, which parted. Rather than turning the *Tiger III* to starboard as might have been expected, the weight on the towline had caused the boat to sheer towards the rocks on the landing side of the gut where it grounded. The *Dolphin Seeker* was unable to again approach close enough to give any further assistance (see Figure 2 position 11).

1.1.14 At about this time, the Master of the *Tiger III,* who was too busy to do so himself, asked the Master of another vessel, the *Dolphin Discovery IV*, to transmit a distress message on his behalf. Maritime Radio responded to the Mayday Relay and set in place a rescue operation.

1.1.15 The *Tiger III* continued to be pushed into the gut and with the bow aground on the rocks the boat swung so that it was parallel to the coast. The sea continued to push the boat into the gut and pound it on the bottom (see Figure 2 positions 12 and 13). The crew managed to jump ashore and secure some mooring lines to the rocks to keep the boat alongside the shore. The Master endeavoured to manoeuvre the boat using the starboard engine, but when it was in the gut the starboard engine stalled, probably due to the propeller hitting a rock.

1.1.16 Some time between the initial grounding and the crew managing to secure the boat alongside the rock face, the interior lights went out due to the alternator failing.

1.1.17 Once the boat was secured alongside the shore and relatively stable, the Master decided that it would be safer to put the passengers ashore. The crew assisted the passengers onto the rocks from where they were able to climb along the rocks and up the track to the old lighthouse keeper's cottage. The last of the passengers was ashore by about 1630. Maritime Radio had asked a number of boats to stand-by in the bay but released them at this time.

1.1.18 About 45 minutes later a number of helicopters started to ferry the passengers back to Paihia, where they were checked for injuries and given hot drinks.

1.1.19 The No. 2 deckhand went out on the last of the helicopters. The Master and No. 1 deckhand remained with the boat, trying to minimise the damage. Maintenance engineers joined them by boat at about 1900. They stayed overnight in the lighthouse keeper's cottage, taking turns to monitor the condition of the boat.

1.2 Vessel information

1.2.1 The *Tiger III* was a twin-hulled restricted limit passenger vessel built in 1985. It was 20.92 m long with a beam of 8.75 m and had a gross tonnage of 181. It held a safe ship management certificate issued by Maritime Management Services on 19 August 2001 that was valid, subject to periodic inspection, until 28 July 2005. The boat was certified to carry 235 passengers and 5 crew, and carried lifesaving appliances for 304 persons.

1.2.2 The *Tiger III* was powered by two 605 kW MWM diesel engines, each driving, through ZF BW195 gearboxes with a ratio of about 2.5:1, a 5-bladed fixed-pitch propeller. A single lever controlled both the direction and the speed of each engine, via Morse cables.The maximum engine speed was about 2100 RPM and the idle speed was 720 RPM.

1.2.3 The *Tiger III* was used for tourist cruises to the Hole in the Rock at Cape Brett. As such it was used almost every day of the year except when on its annual survey. Routine maintenance was programmed to be carried out at night so that it did not interfere with operations. Faults and failures were, where possible, also dealt with at night. The engines of the *Tiger III* were last serviced on 3 December 2004. The lubricating oil filter, fuel filters, air filters and lubricating oil were all changed at that time. Since then the main engines had run 102 hours up to the morning of the accident. The service interval was 250 hours, so the boat was less than half way through its allotted maintenance schedule.

1.3 Engine and fuel system

1.3.1 The engines on the *Tiger III* had been replaced in 1995, and the new engines had done a little under 20 000 hours up until the time of grounding. The new engines did not have electronic control systems; rather they used a mechanical governor to control their speed.

1.3.2 The boat had 2 fuel tanks, one in the port hull (see Figure 3) and the other in the starboard hull, situated in the compartment immediately forward of the engine room. The starboard tank supplied the starboard engine, and the port tank supplied the port engine and the auxiliary alternator engine. On the outlet side of each of the fuel tanks there was a remote solenoid-operated fuel cut-off valve. From that valve, flexible hoses fed the fuel to a common inlet rail connected to which were 2 Racor primary filters that were mounted on the forward engine room bulkhead. The Racor filters had valves that allowed one or other or both filters to be used at any one time. However, it was usual practice for only one Racor filter to be used at a time, with the other being on stand-by. When the maintenance period was reached or if the in-use filter became blocked, the crew or maintenance staff could quickly switch to the stand-by filter while the other was changed. At the time of the grounding the port engine inboard Racor filter was in use and the outboard one was isolated.

1.3.3 There was a crossover line between the port and starboard fuel tanks that enabled both engines to draw fuel from either tank, however this was not used on this occasion and each engine was drawing fuel from its respective tank. The 2 Racor filters were connected to a common outlet rail, which fed, through fixed piping and the secondary filter on the back of the engine, the fuel pump. Pressurised fuel from the fuel pump was then fed to the individual fuel injectors in each of the engine's cylinders.

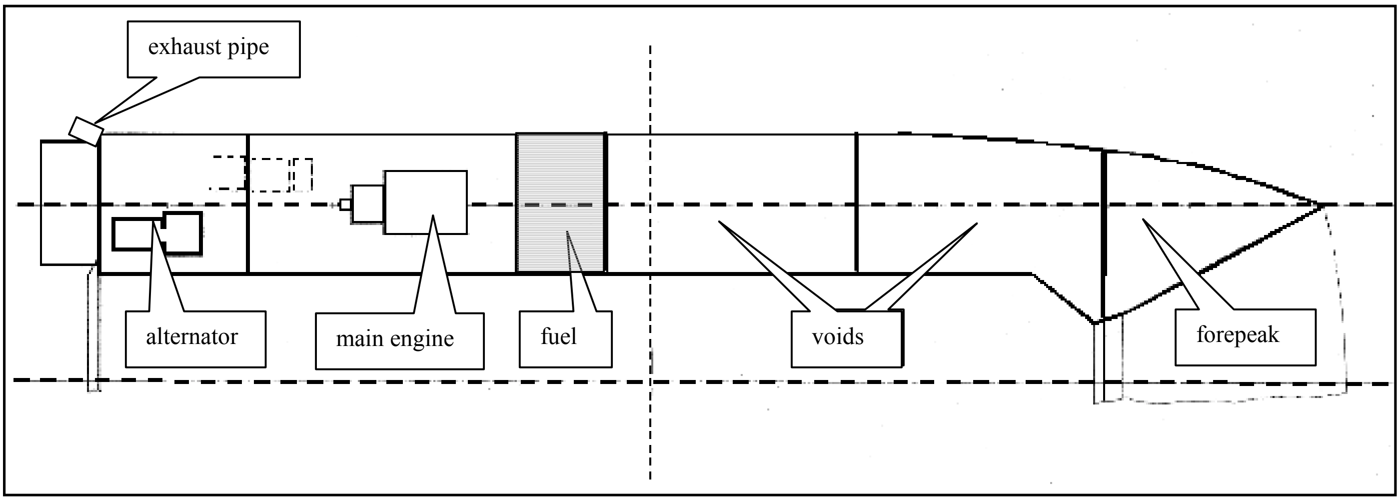


Figure 3
Line diagram of the port hull

1.3.4 When the recovered port hull was brought ashore an engineer examined the engines and fuel systems. He found that:

- the set-up of the port governor was in the normal position for starting and for maintaining idling speed
- the remote-operated fuel cut-off valves were closed. Maintenance engineers had closed these after the vessel had grounded
- the port outboard Racor filter was found to be full of clean diesel fuel
- the port inboard Racor filter was found to contain seawater with about 15 mm of diesel fuel on top
- debris was lying in the interface between the seawater and the fuel of the port inboard Racor filter
- the port inboard Racor filter material was found to be saturated with seawater and partly collapsed inward
- the port main engine secondary filter was full of clean diesel fuel
- the auxiliary engine secondary filters were heavily contaminated with seawater
- the crankcases of the main engines and the auxiliary engine were flooded with seawater
- the air filters were saturated by seawater.

1.3.5 The debris found in the port inboard Racor filter was analysed in February 2005 and found to be a combination of aluminium particles, paint particles and ferrous material. The sample also showed diesel bug infection and the slime associated with it. The filter cartridge was saturated by seawater (see Figure 4).

Figure 4
Filter cartridge from the port inboard Racor primary fuel filter

1.3.6 Cladosporium resinae and Aspergillus fumigatus are 2 of many microbiological organisms that are commonly called diesel bug or microbiological contamination. They can grow at the interface between water and fuel. These organisms could block fuel filters and stop an engine at any time. Microbiological contamination propagates in warm, humid climates and generates slime that can block fuel filters and, in severe cases, fuel lines.

1.3.7 Boats that were idle for extended periods were most susceptible to microbiological contamination because of the condensation that forms in the fuel tanks. Boats used daily that had a consistent throughput of fuel were unlikely to become contaminated. Fullers Bay of Islands did not have any precautions in place for its regularly used boats, but those that were inactive for extended periods were treated with additive. There had not been any previous incidence of microbiological contamination on the *Tiger III*.

1.3.8 Despite the microbiological contamination found in the port inboard primary fuel filter, there was no evidence of microbiological organisms on the inner surfaces of the port fuel tank.

1.3.9 In October 2003, the then Master of the *Tiger III* noted in the boat's logbook that the port engine was slow to pick up speed. In March 2004, a propeller specialist from Auckland was asked to investigate the boat's propellers as it was thought there was an imbalance between the port and starboard ones. When the *Tiger III* was slipped it was found that the port propeller was larger, heavier and of an older design than the starboard one, and was more suited to a conventional boat rather than a high-speed catamaran. The propeller was changed to a spare one that was the same size and design as the starboard propeller.

1.3.10 After the grounding the propellers were recovered and were found to be marked to the effect that their pitch had been altered, by the propeller specialist, from 45 inches to 43 inches. That is for each rotation they moved less distance through the water and so applied less load on the engine. The maintenance records of the boat did not show when the pitch of each propeller was adjusted, but it probably happened when the port propeller was changed.

1.3.11 In December 2003 there were 2 failures of the port engine. Eventually it was found that a copper pipe fitting on the fuel pump had developed a hairline fracture in a silver-soldered joint. This allowed air to be drawn into the fuel system, causing the engine to pick up speed slowly, not achieve full power and to idle below normal speed. The fault was difficult to diagnose because the fitting concerned was concealed in the "V" between the banks of cylinders and the fracture didn't become visible until the engine was hot. When diagnosing the problem, the engineering maintenance staff initially thought that air was entering the system at the Racor filters, so they rigged a temporary fuel line that drew from a different pick-up point on the fuel tank and bypassed the Racor filters. This did not fix the problem and the original fuel system was reinstated in February 2004, after the fractured fitting was discovered and replaced. More adjustments were made to the idle speed of the port engine later in February 2004, and since then there had been no reports of further failures.

1.3.12 The operation of an internal combustion engine requires fuel, air and an ignition source. In a diesel engine, the fuel is pressurised by a fuel pump and introduced into the cylinders as a very fine mist by fuel injectors. Air is drawn through a filter and pressurised by a turbo charger prior to entering the space between the piston and the cylinder head. The heat for ignition is developed by compressing the air and fuel mixture in the cylinder as the piston moves upwards. When the mixture combusts explosively, the piston is forced downwards and the cycle repeats.

1.3.13 Should the main engine idle speed of an engine fall below that recommended and then the throttle advanced too quickly, more fuel than can be immediately burnt is injected into the cylinders, causing incomplete combustion and a failure to pick up speed. The engine may stall, but more likely it would increase speed but slowly until it matched the throttle setting. Thick black smoke caused by the incomplete combustion of the fuel would be expelled through the exhaust pipe.

1.3.14 Should an air filter become blocked, the performance of an engine will gradually decline as the fuel and air mixture becomes too rich, resulting in incomplete combustion and again black smoke in the exhaust would have resulted.

1.3.15 The most likely cause of insufficient fuel reaching an engine and the fuel and air mixture becoming too lean was a filter blockage. However, this would probably be noticed as a gradual loss of performance over all ranges of the engine's operation, but would have been particularly noticeable at full power. There was no indication that this was the case before the grounding.

1.3.16 When recovered, the primary Racor filter cartridge was withdrawn and the contents of the filter were sent for examination. The filter cartridge was found to be saturated by dirty seawater, but did not appear to be clogged by solid matter as would be expected had the filter been blocked before the fuel tank was ruptured. Solid particulate debris, mainly paint and aluminium, was found on the filter cartridge. The cartridge showed signs of collapse inward, consistent with the filter being totally blocked and the engine trying to draw fuel through it.

1.3.17 There were engine gauges on the bridge for the Master to monitor the engines. There were also engine alarms for low lubricating oil pressure and high engine temperatures for each engine. If an engine were to stop it would be expected that a low oil pressure alarm would sound. There had been no history of failures in the operation of the alarms.

1.3.18 When a propeller-driven boat quickly reduces speed or stops, a pressure wave that has built up behind the boat catches up with it. Usually the pressure wave passes under the boat but sometimes, particularly when there is a following sea, it can hit the stern and push the boat forward.

1.3.19 The exhaust pipes were only a short distance above the seawater level and extended from the corner where the transom met the side plating at a horizontal angle of about 15° to the fore and aft line (see Figure 3). At the time the Master put the port engine astern, a swell struck the stern of the boat, pushing the boat ahead and possibly forcing seawater into the exhaust pipe.

1.3.20 The engine-to-gearbox input shaft indirectly drove a hydraulic oil pump, which engaged the clutch. If the engine stopped, the input shaft stopped turning, stopping the hydraulic pump and disengaging the clutch. Consequently, the engine had to be running for the clutch to be engaged.

1.3.21 The master said that twice in the past 5 years he had experienced a situation where an engineer working in the engine room had accidentally hit the emergency switch for the engine. On each occasion, the Master said, the engine revolution indicator continued to read 1500 RPM until the engine control was put into neutral. The engine manufacturer, and an independent marine engineer, said that the engine revolution indicator was designed to show the speed of the engine and, unless faulty, it was impossible for it to continue reading when the engine was stopped.

1.3.22 The gearbox, including the clutch plates, and the transmission coupling showed no sign of failure, undue wear or overheating.

1.4 Manoeuvring

1.4.1 Propellers are classified as either right-handed, that is, when viewed from behind they rotate in a clockwise direction to propel a boat ahead, or left-handed, which rotates anti-clockwise. There are 2 components to the thrust of a propeller, the ahead or astern movement and a smaller sideways movement, or transverse thrust. Transverse thrust on a right-hand propeller driving ahead cants the bow of the boat to port and when going astern to starboard. The transverse thrust effect is more noticeable at slow speeds, particularly when going astern, so the effect is often referred to as the direction the stern cants when the boat is going astern. In the case of a right-handed propeller the stern of a boat cants to port when the engine is driving astern.

1.4.2 On vessels with twin propellers it was usual that the propellers were counter-rotating, they were either inward or outward turning to help reduce the effect of the transverse thrust. On the *Tiger III*, both propellers were right-handed; this would have exaggerated the transverse thrust effect, which would cause the stern to cant significantly to port when the engines were going astern.

1.4.3 Catamarans with an engine in each hull were very manoeuvrable and suited to operations where tight turning was required. Judicious use of the engines, one ahead and one astern, could turn the boat within its own length. Two engines also gave built-in redundancy, so that should one engine fail the other could be used to get a boat home or to safety. However, because the engines were so far from the centreline of the boat (about 4 m in the case of the *Tiger III*) ,when only one engine was used, it created a large turning moment away from the side of the engine in use. When going ahead on the starboard engine, the bow would turn to port and when going astern the stern would turn to port.

1.4.4 As part of the emergency preparedness, the crews practised operating the boat on one engine. The masters said that in open water the boat steered well on one engine, but a minimum speed of 6 or 7 knots was necessary for the steering to overcome the turning moment produced by the single engine. Consequently, to manoeuvre on one engine, plenty of sea room was necessary to gain the required steerage way.

1.4.5 The Master estimated that the boat was travelling at about 8 knots when he put the port engine astern. Eight knots equates to about 4 metres per second (m/s). The boat's speed would have continued reducing from the time that he put the engines into neutral, and so an average speed of 6 knots or 3 m/s was used for calculations.

1.5 Personnel information

1.5.1 The Master of the *Tiger III* had worked on boats from an early age. Originally he had worked part time on boats on the inland waterways of England. He had taught sailing and competed in dinghy racing. He had spent time on charter yachts and had been operations manager of charter yacht operations, both in Europe and more recently in New Zealand. He gained his Commercial Launchmaster (CLM) certificate in 1990, and had started working on cruise boats in the Bay of Islands in 1992. He had worked for Fullers Bay of Islands since 1995, commanding all the boats in the fleet, but was more usually employed on the Hole in the Rock cruises. He also held an Engineer Local Ship certificate.

1.5.2 Besides the Master, there were 2 crew on the *Tiger III*. The No. 1 deckhand/cabin attendant had been with Fullers Bay of Islands for 16 years and had worked on the vessels for 12 of those. The No. 2 deckhand had worked for Fullers Bay of Islands for about a year in total. She had taken temporary employment in Australia, during the New Zealand winter, from July to October, as a deckhand on boats servicing the Whitsunday Islands.

1.5.3 The Master, in common with all the seagoing personnel employed by Fullers Bay of Islands, spent time on each vessel in the fleet, including a car ferry that connected Opua and Russell and the various scenic cruise boats.

1.5.4 The crews took part in monthly emergency drills. Crew members had onboard training, which included how to manoeuvre the vessels should the Master become incapacitated.

1.5.5 The Director of Maritime Safety had issued the *Tiger III* with a minimum safe crewing document on 8 December 2003 (see Appendix 1). This required that when carrying between 50 and 99 passengers in the inshore area, as in this case, there should be 3 crew on board, the Master to hold an Inshore Launchmaster's (ILM) certificate and one of the crew to hold an Advanced Deckhand (ADH) certificate.

1.5.6 The Master held a CLM, which was equivalent to an ILM. Neither of the deckhands had been issued with an ADH, but a letter from the Maritime Safety Authority dated 29 October 2002 stated that:

> If a crew member had been a deckhand aboard a particular vessel for 2 years or more he/she can be considered to be equivalent to an ADH under Part 31B.5(b) for that vessel only, or for similar vessels in a company fleet; provided he/she is signed off by that company's internal training system.

The No. 1 deckhand had been working on the company's vessels for 12 years and had completed the in-house training, and as such was considered an ADH. To reinforce this, the previous Operations Manager of Fullers Bay of Islands had written to each of the company's longstanding deckhands confirming that they were considered to be qualified as ADHs (see Appendix 2).

1.5.7 The Master and crew worked different rosters. The Master worked 3 days on, 2 days off, 3 days on, one day off, 3 days on and 2 days off. So in each 14 days the Master worked 9 days and had 5 days off. On this occasion, Saturday, the day of the grounding, was the Master's first day back at work after 2 days off. The crews worked a 4 days on and 2 days off roster.

1.5.8 When more than 99 passengers were carried a third crew member was required to be carried. To allow for this contingency, 3 crew were rostered on each day, but the third crew member was only required to work if the passenger numbers exceed 99. On the day of the accident, the No. 2 deckhand had been the third crew member and so should not have been working, but she had been called in to replace the original No. 2 deckhand who had become ill during the morning cruise.

1.6 Climatic conditions

1.6.1 The weather forecast that the Master received at 0735 was for northwest wind at 20 knots becoming southwest 35 knots in the morning with fair visibility and showers. A gale warning was in effect for the Brett area. The outlook was for southwest 25 knots.

1.6.2 The Master said that weather from the west had less impact on the operation of the cruises than if the weather was coming from the east. Southwest wind was off the shore and as such did not cause a significant increase in the height of the sea. In the morning the Master had noticed that there was a significant residual swell from the northwesterly weather of the previous day, but in the afternoon he felt that it had moderated. On the day of the grounding, the Master informed the passengers about the adverse weather, explaining that it could get a little uncomfortable when they were at the Cape, and he invited anyone who had concerns to leave the boat in Russell.

1.6.3 An automatic weather station was situated on the Purerua Peninsula, 35.117° S 174.017° E, about 16 miles to the west of the accident position. The surface data from that station, supplied by the New Zealand MetService, gave the following readings for the wind throughout the day.

Date	Time	Wind direction °(T)	Wind force (knots)
18-Dec-04	0700	270	8
18-Dec-04	1000	250	19
18-Dec-04	1300	260	20
18-Dec-04	1600	250	20
18-Dec-04	1900	250	12
18-Dec-04	2200	270	9

1.6.4 High water at Auckland was at 1328 on 18 December 2004. The tidal stream information contained on chart NZ 5125, Bay of Islands for tidal diamond "F", which was situated between Piercy and Otuwhanga Islands, indicated that at about 1.5 hours after high water at Auckland it would be slack tide. Thus slack tide at the landing would have been at about 1500.

1.6.5 The New Zealand Nautical Almanac predicted a low water of 2.1 m at 1439, at the secondary port of Whangamumu Harbour, about 5 miles south of Cape Brett.

1.7 Damage and injuries

1.7.1 An attempt to salvage the vessel was made in the days following the grounding. However, the weather conditions were such that by the time salvage vessels and equipment arrived at Cape Brett, both hulls of the *Tiger III* were so damaged that there was insufficient buoyancy to float the whole boat off the rocks on which it had become impaled (see Figure 5). On Wednesday 22 December 2005 the *Tiger III* was declared a constructive total loss.

Figure 5
The *Tiger III* at high water some days after the grounding

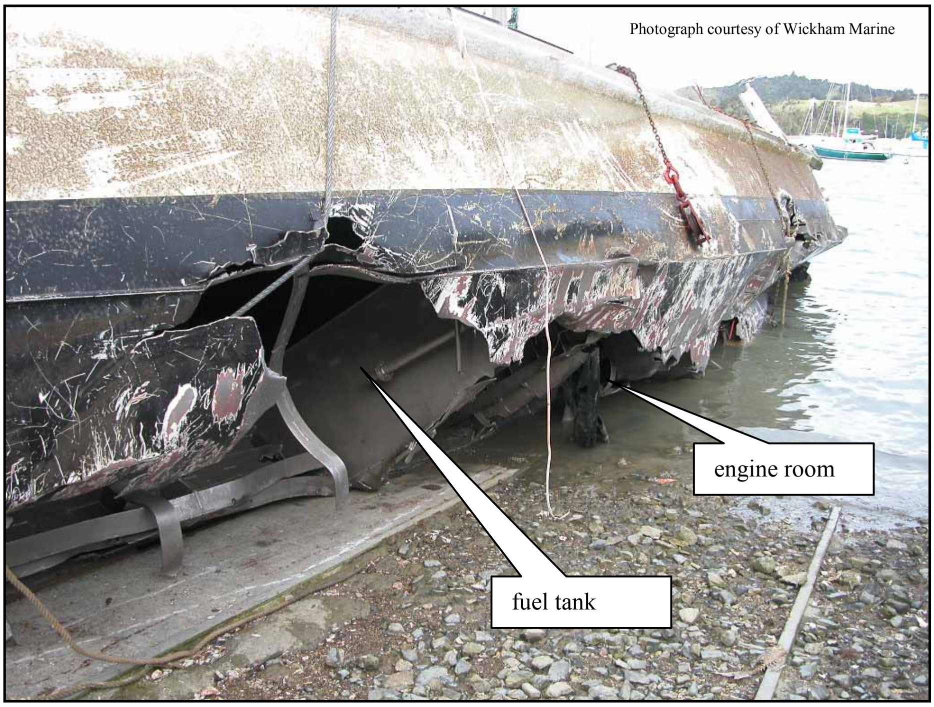


Figure 6
Port hull of the *Tiger III* being dragged up the slipway at Opua

1.7.2 In January 2005, the protection and indemnity insurance company employed a salvage team to remove the wreckage. This was done by cutting the boat into several large pieces that were transported to Opua by barge.

1.7.3 Each hull was recovered in one piece. During the month that the boat had sat on the rocks, the port hull had been pounded, with virtually the entire lower part of the hull missing or crumpled (see Figure 6). The hull had been completely submerged at high tide; consequently when recovered, all the equipment that was not watertight was filled with, or saturated by, seawater.

1.7.4 The propellers were extensively damaged, with the port one showing the greatest mutilation (see Figure 7). The tips of all 5 blades of the port propeller were bent over with many scallops out of them. The greatest damage was to the trailing edges, those on the back of each blade when going ahead, which were bent forward.

1.7.5 Photographs of the port propeller were sent to 3 propeller experts and 2 marine engineers for their opinions on the damage to the propeller. In each case the respondent opined that the propeller was rotating under power at the time of the grounding.

Figure 7
The port propeller showing severe damage to every blade

1.7.6 The starboard propeller had impact marks on all the blades, but only one blade was badly bent forward (see Figure 8).

1.7.7 After the *Tiger III* was tied up alongside the rocks in the gut, and all the passengers had been evacuated, the Master tried to start the port engine locally in the engine room. At this time water had flooded the engine room to just below the bottom of the gearbox and engine. The engine failed to turn over, even though the starter motor sounded as if it was trying to turn the engine. He then went to the starboard engine room and managed to start that engine, and off it ran the emergency bilge pump to suck water from the port engine room. The pump had insufficient capacity to prevent the progressive flooding of the port engine room.

1.7.8 It took between 60 and 90 minutes for the rescue helicopters to arrive at the Cape, but once they did, the passengers were quickly transported back to Paihia, where their medical condition was assessed. On arrival they were taken to the local hall where they were given hot drinks and food to offset the chill they had experienced on the Cape. A few passengers suffered minor injuries, mostly cuts and bruises sustained as they scrambled over the rocks and climbed the track to the lighthouse keeper's cottage.

Figure 8
Starboard propeller showing one blade that had been bent forward

1.7.9 The No. 2 deckhand suffered severe bruising to her back and a sprained knee, having been repeatedly squashed between the passengers she was helping ashore and the rocks behind her.

1.8 Cape Brett and the Hole in the Rock

1.8.1 The cruise to the Hole in the Rock initially passed through the inner islands of the Bay of Islands before heading out into the open sea through one of the many passages between the islands. In this case they passed through the Waewaetorea Passage. The Hole in the Rock completely penetrates Piercy Island from the northwest to the southeast near the southern end of the Island. When weather and sea conditions permitted, vessels went through the Hole, otherwise it was often possible for a Master to reverse his boat into the Hole from the southeastern side of Piercy Island.

1.8.2 Otuwhanga Island and Cape Brett on the mainland are separated by a narrow cleft or gut that runs virtually east to west. This gut is navigable by small vessels. The topography of the area is very steep with cliffs on both the Cape and the Island. The bay on the western side is relatively open but narrows rapidly towards the gut. The coast around the bay is very rugged with jagged rocks close to the shore (see Figure 9), however there were no reports of any isolated rocks in the deeper water away from the coast in an area frequently used by many boats for a number of years.

1.8.3 Cape Brett lighthouse was one of the original lighthouses in New Zealand. It was situated at an elevation of 146 m on the eastern side of the Cape. The light was automated in 1978 and as a consequence the lighthouse keepers' cottages had been removed with the exception of one that is now used as a trampers' hut. Below the remaining cottage there was a landing that consisted of a concrete pier on which used to be mounted a crane for lifting stores and equipment from a supply vessel. A formed track still joined the landing with the cottage, which was used by the passengers after they had been evacuated from the boat.

1.8.4 Section 7.1 of the Safety Management Policy document stated:

> Operating Parameters
>
> The business has put in place the following operating parameters for this vessel.
>
> Non-operable weather / sea conditions to be determined after consultation between rostered Skippers and Duty Operations Manager.
>
> Skipper to receive adequate training from a competent instructor in the use of radar equipment.
>
> Operations at Motukokako Island (Piercy Island) to be in accordance with company policy – procedure manual
>
> Vessel will only be operated by suitable qualified persons

This was the only guidance to Masters about limiting conditions or areas of operation. All decisions concerning where the boat should operate were left to the discretion of the Master.

Figure 9
The landing from seaward

1.8.5 During the morning cruise on the day of the accident, the Master decided that the conditions were too rough at the landing and had chosen to pass the area without stopping. In the afternoon the Master was also considering bypassing the landing but at the last moment decided that the sea had eased enough for him to go in. Because of his late decision, his approach towards the landing was more acute than it would normally be and the boat was travelling slightly faster than normal.

1.9 Human factors

1.9.1 Stress, attention and workload are 3 related factors that affect human performance. Stress is the body's response to stressors. Attention is the ability to focus one's mind on information providers or senses. The mind does have a limitation on the amount of information that can be absorbed and processed at any one time, consequently as our workload increases we may channel our attention to what we perceive as important or relevant to the exclusion of other information.

1.9.2 When the demands of certain tasks approach or exceed the capability of an operator, stress develops. One of the primary outcomes of this type of stress is that the person starts to load-shed and focuses on one or more tasks to the exclusion of others. Load shedding and channelled attention are primary symptoms of poor situational awareness, preventing an operator forming an accurate overall mental model and enabling them to take the correct action to recover from an unexpected situation.

1.9.3 Decision-making, the assimilation of information before an action is carried out, can be separated into 2 basic types: analytical and intuitive. Analytical decisions are knowledge based and primarily made by someone who is competent but not particularly experienced. They tend to be slower and take a large proportion of the available cognitive processes, leaving less time for other tasks. Intuitive decisions are skill based and are based on experience gained over many years. They are rapid and take less of the available cognitive processes but they are susceptible to biases, which may result in an incorrect decision being made.

1.9.4 When an unexpected event occurs, an individual's workload suddenly increases as they react to the situation. The effect of this sudden increase in workload can be minimised by having practised contingency plans in place, thus saving the need to go through the involved cognitive process of forming a plan, evaluating whether it would be successful and then implementing it. Contingency planning reduces an individual's workload and the likelihood of load shedding.

2 Analysis

2.1 The operating parameters specified in the company and vessel policy and procedure manual were unspecific. The Master, in conjunction with the Operations Manager, was to decide if conditions were suitable to continue operations. Operations at the Hole in the Rock were addressed directly in the operations manual, with specific instructions on the operating parameters. None of the documents gave guidance as to limiting conditions for any other part of the voyage, leaving the Masters in virtual isolation.

2.2 The Hole in the Rock was obviously an operation with inherent risks, consequently the company and Masters had analysed the risks involved and put in place procedures and limitations. Conversely, visiting the landing was perceived as a simple operation in a relatively open piece of water and as such had not been included in the risk management of the boat.

2.3 The wind at the time of the grounding was stronger than in the morning, but the Master considered that the westerly wind had knocked down some of the northerly sea that had been running. The boat having been hit by a swell as the Master put the port motor astern suggests that a significant sea was still present.

2.4 The Master had decided to bypass the landing in the morning, and had been intending to do so again in the afternoon, but had changed his mind when he estimated that it was calmer further into the bay. Consequently the conditions were probably only slightly better than the Master's own limiting parameters.

2.5 The wind and sea were both flowing into the bay and once the *Tiger III* was turned across the bay, it was pushed steadily towards the lee shore close to the entrance of the gut.

2.6 The port engine failure probably occurred in 2 distinct and separate events. First, the port engine was slow to respond to the Master's order for astern thrust, which led to the Master having to use the starboard engine to prevent the boat grounding. This resulted in the stern of the boat canting to port, the boat becoming cast across the bay and grounding on rocks close to the gut. The port engine would have ultimately stalled when the propeller made contact with the rocks.

2.7 Following the grounding, the port diesel fuel tank was ruptured and seawater mixed with the diesel fuel oil. This seawater and oil mixture was drawn into the primary fuel filter, eventually saturating and blocking that filter. Water contamination was not found in the main engine secondary filters, indicating that that engine was stopped by the time the diesel oil and seawater became mixed. The secondary fuel filter of the auxiliary alternator engine did have water in it, indicating that water was probably injected into that engine along with the fuel, and that was the cause of it stopping.

2.8 If the port engine had stopped or stalled early in the accident sequence, as thought by the Master, it would be reasonable to expect that the low oil pressure alarm would have sounded, but no alarms were heard at that time. The Master only determined that the port engine had stopped from the boat failing to make the turn to port as he expected it to from the settings on the throttles. The only gauge he managed to look at throughout the accident sequence was the port engine revolution indicator, which he remembered indicated about 500 RPM at about the time he put the starboard engine astern. This reading does indicate that the engine was still running but had not picked up speed as the Master expected.

2.9 The Master was of the opinion that the propeller continued to turn the port engine due to the forward momentum of the boat. However, the design of the clutch discounted such a theory. If the engine stopped driving, the clutch disengaged and the propeller shaft was disconnected from the engine.

2.10 The Master contended that the engine revolution indicator had on occasion failed to return to zero when an engine was accidentally stopped. The engine manufacturer was adamant that such a thing could not occur with the engine monitoring equipment fitted to the vessel.

2.11 When the port engine did not respond and the Master realised that there was a likelihood of grounding forward, his attention probably became totally focused on that problem. This channelled attention might explain why he could not recall the readings from the engine gauges, and only assumed that the engine had stalled because the boat had not turned as expected.

2.12 From the Master's estimated distances and speeds, events unfolded very quickly once he had decided to go into the bay. He said that the boat was travelling slightly faster than it would normally be and that he was approaching from a more southerly position than normal. At the time of the port engine astern movement he estimated they were about 160 m from the shore and travelling at about 8 knots. At that speed he would have had to use the starboard engine at least 80 m off the shore to prevent the boat grounding ahead. At an estimated average speed of 6 knots (3 m/s), it would have taken no more than 26 seconds for the boat to cover the 80 m between the 2 engine movements. In that time the Master had to determine that the port engine movement was not having the desired effect, apply more throttle to the port engine and then apply full astern on the starboard engine. During that time, he had continued to give a commentary to the passengers and it was only when the boat continued on a straight course towards the shore that he realised something was wrong. Had he been able to concentrate solely on manoeuvring the boat, he may have noticed that the boat was not turning earlier and been able to take alternative corrective action.

2.13 Once the preconceived plan failed due to the port engine not turning the boat, there was no alternative plan readily available to the Master. Had he realised the effect of putting the starboard engine astern he may have considered putting the starboard engine full ahead to turn the boat to port. When asked why he had not tried such a manoeuvre he said that such a response would have been excessive for what he, at that point, thought was a minor problem. There would have been only a very short time when such a manoeuvre would have been possible, if it had been possible at all. It would have taken great confidence in the manoeuvrability of the boat to apply full ahead thrust when within 80 m of a rocky shore.

2.14 Most of the times and positions referred to were those remembered by the Master. Historically, the chronology of accidents can differ markedly between that recalled and the actual sequence of events. This could be due to the participant becoming focused on trying to get out of a perilous situation to such an extent that all surrounding stimuli were excluded or at least not mentally recorded. The damage to the port propeller suggested that the initial grounding was earlier than thought by the Master and was probably before the *Dolphin Seeker* arrived on the scene to assist. Given the wind speed, it was probable that once the *Tiger III* came beam on to the wind it would have grounded in a very short time, as little as one or 2 minutes.

2.15 The condition of both propellers, but more particularly the port one, indicated that it was still turning under engine power at the time that it struck the rocks. In actual fact, the blades being bent forward and the trailing edges showing more damage indicated that the propeller was driving astern and the boat was moving astern at the time of impact. Given the distances and the times involved, it was probable that the vessel had already grounded and the port engine stalled prior to the Master putting the control into neutral and trying to restart the engine.

2.16 There were several possibilities to explain why the port main diesel engine would not pick up when the throttle was increased. They were:

- too much fuel being injected into the cylinders of an engine that had slowed below its normal idle speed. This was unlikely because the resulting exhaust would have been black due to incomplete combustion of the diesel oil and this was not reported by the witnesses

- an almost total blockage of the fuel filters resulting in insufficient fuel. This was unlikely to have been the cause. The primary fuel filter had not shown signs of being blocked during the full speed run from Piercy Island to the Cape, which it would have done had it been almost completely blocked. However, it did eventually become totally blocked when it was contaminated with seawater

- air entering the fuel system, in particular the fuel pump, resulting in insufficient fuel. This was a likely possibility; the symptoms were the same as that experienced the previous December and January. It would have resulted in the fuel air mixture being too lean, which would have produced white smoke and fumes

- a faulty governor restricting the amount of fuel. The governor was found to be operable, so this was discounted as a cause

- absence of engine controls, no throttle or failure to engage ahead or astern gears caused by broken control cable or linkages. The control cables and linkages in the engine room were found to be operable. This was an unlikely scenario as any cable or linkage breakage would have caused a terminal failure and probably would not have allowed reverse gear to be engaged at all

- water in the fuel. It was possible, but unlikely, that there was water in the fuel tank before the boat grounded. However, if there were water in the fuel tank, the rough crossing from Piercy Island might have caused it to be drawn into the engine. There was no evidence of water in the main engine secondary fuel filter. Seawater in the fuel was certainly the cause of the ultimate stoppage of the auxiliary alternator, but that occurred after the initial grounding

- a blocked air filter resulting in insufficient air or an over-rich fuel-to-air mixture. This would have resulted in a gradual loss of power over an extended period and would not be expected to be responsible for a rapid decrease in efficiency as experienced here

- back pressure on the exhaust caused by water in the exhaust. Had water been forced into the exhaust pipe by the wave hitting the stern, it could have created a back pressure on the turbo chargers, slowing them and reducing the quantity of air being forced into the cylinders. The might have resulted in a temporary loss of performance by there being insufficient air to complete the combustion process. This was an unlikely scenario, but given the short time intervals involved any loss of power could have resulted in the boat not turning as expected

- the boat was travelling faster than normal when the port engine was put astern. It was possible that the propeller, which would have still been rotating in the ahead direction, put excessive load on the engine causing a delay before the revolutions picked up. While possible, there was no evidence to support whether this could have occurred on this occasion.

2.17 The aluminium particles and paint particles found in the port inboard Racor filter matched the material of the hull, and were consistent with the tearing of the hull during the grounding. The ferrous material was likely to be the waste from grinding discs used to prepare the paintwork having impregnated the paint. This shows that the auxiliary alternator was still running and drawing fuel after the grounding.

2.18 There had been no prior incidence of microbiological contamination in the fuel of the *Tiger III*. The contamination found was restricted to the port inboard Racor filter, with no growth found in the port fuel tank as would be expected if contamination were present throughout the fuel system. Therefore, it was probable that the microbiological organisms grew during the period between the grounding and the wreckage being recovered and the contamination did not contribute to the accident.

2.19 The propellers were both right-handed. When operating astern they produced a significant transverse thrust that canted the stern to port. If, as suspected, the port engine had gone astern but had not picked up speed, the turning moment created by the limited astern motion of that engine would have been counteracted by the transverse thrust effect. When the Master found the boat rapidly approaching the rocky shore on the southern side of the bay, it was reasonable for him to put the starboard engine full astern. However, in doing this, the boat would have been subjected to increased transverse thrust and the turning moment created by the starboard propeller turning faster than the port one. The net effect would have been that the boat stopped, but in doing so the stern would have been turned rapidly to port, leaving the boat across the bay, from where it was pushed towards the rocks on the eastern side, near the gut, by the prevailing weather.

2.20 The *Tiger III* was considered by the company Masters to be a highly manoeuvrable boat. With the propellers being about 8 m apart the turning moment was considerable. However, when operating on one engine only, the large turning moment had to be overcome by the steering. This was possible but necessitated sufficient headway to give steerage, consequently the boat's head would initially fall off to the side opposite that of the operating engine until enough speed was attained to give steerage; even then it would have required about 15° of corrective helm to maintain a straight course.

2.21 In open water the failure of one engine would not normally cause a problem; the Master would have been able to manoeuvre the boat to safety on the remaining operational engine. However, in confined waters a single engine operation was difficult. On this occasion, once the boat was across the bay with the shore on its port side, any ahead or astern movement of the starboard engine resulted in the boat initially turning towards the shore, making it difficult, if not impossible, for the Master to manoeuvre clear. Fundamentally he was caught on a lee shore by the wind and the configuration of his propulsion.

2.22 The Master said that before they grounded, he put the port engine throttle into neutral and pressed the starter button, but nothing happened. Given the damage to the propeller, the port engine must have been running at the time of grounding. It was probable that the boat had turned to such an extent that the port side grounded before the Master tried to restart it. The propeller then being in contact with the rocks would have prevented it starting.

2.23 About an hour and a half after the grounding, the Master tried unsuccessfully to start the port engine. The failure of the engine to turn over could have been due to a number of factors, one of which may have been pressure on the engine bed plate by the rocks on which the boat was sitting, causing the crankshaft to be under tension and unable to turn.

2.24 The action of securing the towline to the starboard bow of the *Tiger III* was a natural choice, however, in this case, had the line been secured to the stern of the *Tiger III* the other boat may have been able to tow it clear of the coast without risking grounding itself. Notwithstanding failing to save the *Tiger III,* the Master of the *Dolphin Seeker* acted in a professional and timely manner, giving his best effort to salve the *Tiger III* without putting his own passengers and crew at undue risk.

2.25 Following the grounding, the crew of the *Tiger III* acted competently. The passengers who were spoken to made particular mention of the No. 2 deckhand, and the confident way she handled the situation and the calming effect she had on them.

2.26 It took some time for the helicopters to arrive on the scene but because all the passengers were able to be landed ashore this did not cause any difficulty. A flotilla of boats stood by off the landing ready to assist, but they were not needed.

2.27 The weather in the days following the grounding was such that it made salvage impossible. The wind and sea continued to flow into the bay causing the boat to rise and fall on the rocks on which it was grounded. The hull eventually became breached to such an extent that the salvors could not provide enough buoyancy to float the boat free.

2.28 The *Tiger III* held the appropriate documentation and the number and qualifications of the crew met the requirements of the minimum crewing document.

3 Findings

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

3.1 The port engine was slow to pick up astern speed; this prevented the boat turning to port as the Master expected.

3.2 Other than the Master's opinion, there was no evidence that the port engine stalled at the beginning of the accident sequence. The damage to the port propeller and the absence of engine alarms indicated that the port engine continued running until the boat grounded.

3.3 There were a number of possibilities why the port engine did not pick up speed astern. The most likely was a repeat of the previous failure that allowed air into the fuel system.

3.4 Given the circumstances in which the Master found himself, the full astern movement on the starboard engine was understandable, but probably by that time, given the weather conditions, the boat would have been unable to clear the bay. The alternative manoeuvre of putting the starboard engine full ahead was not one that would sit comfortably with a Master given the rocky shore ahead.

3.5 Two propellers rotating the same way increased the transverse thrust, which increased the boat's turning moment.

3.6 When the port propeller initially hit the rocks, the engine was running astern and the boat was moving astern.

3.7 It was probable that the *Tiger III* had already grounded by the time the *Dolphin Seeker* arrived to assist.

3.8 Once the engine stopped, the clutch disengaged. Consequently, it was not possible for a propeller, driven by the momentum of the boat, to turn a stopped engine and indicate engine revolutions.

3.9 The port fuel tank was breached when the boat grounded, allowing seawater into the fuel system causing the auxiliary alternator to stop.

3.10 On the day of the grounding, the weather was marginal for the boat to approach the landing.

3.11 There was little guidance to Masters and no operational limitations contained in the Safe Ship Management documentation except for the operation around the Hole in the Rock at Piercy Island.

3.12 There were no company contingency plans for the boat's operation. If there was a failure, it was left to the Master's intuition and ability to react to it. Decisions made at the time of a failure could be greatly improved if contingency plans have been developed for such a failure.

3.13 The crews were trained for operating the boat on one engine, but that presupposed that the boat would be in open water; it did not allow for the boat to be close to the rocky shore.

3.14 Continuing to give a tour commentary to the passengers may have delayed the Master noticing that the boat was not responding to the port engine command.

3.15 The actions of the crew following the grounding were appropriate and commendable. The organisation of the helicopters to bring the passengers back to Paihia did take a significant time to organise, however once underway the operation went very smoothly.

3.16 The boat and crew met the statutory requirements for that type of vessel.

3.17 The weather in the days after the grounding prevented a successful salvage being completed, and the boat was deemed a constructive total loss.

4 Safety Recommendations

4.1 On 16 September 2005 the Commission recommended to the Chief Executive of Fullers Bay of Islands that he:

4.1.1 Carry out a comprehensive risk assessment of the company's marine operations and develop operating limitations and contingency plans to assist the Masters. Such plans should be included in the safe ship management documentation. (081/05)

4.1.2 Ensure that the provision of a tour commentary by the Master is properly identified as a possible hazard and noted in the hazard register of each vessel. A suitable section should be inserted into the safe ship management documentation noting the potential hazard of a Master giving a tour commentary. Masters should be directed in the operations manual that if a situation arises where giving a tour commentary poses a risk to the vessel, then the commentary should be stopped or delegated to one of the crew. (082/05)

4.2 On 4 October 2005, with respect to recommendation 082/05, Fullers Bay of Islands replied in part:

4.2.1 Implementation will be completed by 14th October 2005.

4.3 On 6 October 2005, with respect to recommendation 081/05, Fullers Bay of Islands replied in part:

4.3.1 I can confirm that we will conduct a risk assessment of particular aspects of our Cape Brett operations with our senior skippers by November 1st. The results of this will be included in our operating manuals.

4.4 On 16 September 2005 the Commission recommended to the Executive Officer of the Marine Transport Association that he:

4.4.1 Promote the findings of this report through an article in the Association's in-house magazine Seabiz. The article should advise Association members that under certain conditions a Master giving a tour commentary may pose a potential hazard to the safe navigation of the vessel and that this should be identified in the hazard register and safe ship management documentation. (083/05)

4.5 On 26 September 2005, the Marine Transport Association replied in part:

4.5.1 The Governing Committee of the NZMTA [New Zealand Marine Transport Association] yesterday considered the above letter and were agreed that the proper course is to insert a piece in *Seabiz* along the lines you have suggested. That will go in the November issue a copy of which will be sent you. It will fully a fairly advise readers of the stated hazards and the need to avoid them through a process of individual ship management documentation.

Approved on 22 September 2005 for Publication

Hon W P Jeffries
Chief Commissioner

Appendix 1

MINIMUM SAFE CREWING DOCUMENT
(Issued pursuant to maritime rule 31B.7)
Issued by/on behalf of the Director of Maritime Safety

Name of Vessel : TIGER III | **MSA Number: 100697**

Vessel Type: PASSENGER | **Home Port: WHANGAREI**

Owner / Operator: FULLERS BAY OF ISLANDS LTD | **Length Overall: 21.80 mts**

Number of Passengers: ENCLOSED 240 ; INSHORE 240

The vessel is to carry the following minimum crewing in the ENCLOSED area (when carrying between 100 and 240 passengers):-
Master 1 Qualification ILM ADH 1
Total safe crewing complement 4 persons

The vessel is to carry the following minimum crewing in the INSHORE area when carrying between 50 and 99 passengers:-
Master 1 Qualification ILM ADH 1
Total safe crewing complement 3 persons

The vessel is to carry the following minimum crewing in the INSHORE area when carrying between 100 and 240 passengers:-
Master 1 Qualification ILM ADH 1
Total safe crewing complement 4 persons

Conditions:
This document is not valid unless:
1. A valid Safe Ship Management Certificate is in force for the vessel.
2. The owner/operator, operating limits and all other conditions and limitations of the Safe Ship Management Certificate remain the same.
3. The effectiveness of the permitted minimum crewing must be continually monitored.

Additional Operational Limitations:
1. This certificate supersedes the certificate issued on 28th November 2002
2. Maters holding CLM are Restricted to the limits specified for those certificates in the Shipping (Manning of Restricted – Limit Ships) Regulations 1986

Dated at Wellington this 8th day of December 2003

Russell Kilvington
Director of Maritime Safety

Note also the additional requirement in maritime rule 31B.6(1) to have on board the number of crew necessary to operate the vessel safely at all times.

27- 6-03;15:47 ;FULLERS ;64 9 4027158 # 4/ 5

FULLERS

Bay of Islands

31 January 03

[redacted]

Dear [redacted]

Advanced Deckhands

As from 1 February 2003 maritime regulations require an Advanced Deckhand to be aboard our vessels Tiger III and Tangaroa whilst operating with 100 or more passengers.

As you are all too aware there have been several obstacles encountered in obtaining this qualification. Consequently, this letter will confer upon you the status of a company Advanced Deckhand which will be sufficient to cover our legal crewing obligations until the completion of the current Northland Polytechnic course.

Further to my memo of 9 January 2003, please return the completed forms to me by 7 February so that we can expedite the formal examination date.

Yours faithfully

[redacted]

Maritime Operations Manager

NEW ZEALAND TOURISM AWARDS 2000/01 SUPREME AWARD

Head Office. PO Box 145, Paihia, Bay of Islands, New Zealand. DX: AA21501 Paihia
Ph: (09) 402 7422 Fax: (09) 402 7158 Email: admin@fullers-bay-of-islands.co.nz Web:www.fullers-bay-of-islands.co.nz

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

05-201	passenger ferry *Quickcat* and restricted passenger vessel *Doctor Hook*, collision, Motuihe Channel, 4 January 2005
04-219	restricted limit passenger vessel *Tiger 111*, grounding, Cape Brett, 18 December 2004
04-217	fishing vessel *San Rochelle*, fire and foundering, about 96 nm north-north-west of Cape Reinga, 27 October 2004
04-216	passenger freight ferry *Aratere*, total power loss, Queen Charlotte Sound, 19 October 2004
04-215	restricted limit passenger vessel *Southern Winds*, grounding, Charles Sound, Fiordland, 15 October 2004
04-214	passenger freight ferry *Aratere*, loss of mode awareness leading to near grounding, Tory Channel, 29 September 2004
04-213	restricted limits passenger ferry *Superflyte*, engine room fire, Motuihe Channel, Hauraki Gulf, 22 August 2004
04-212	Fishing vessel *Iron Maiden*, foundered off Pandora Bank, Northland, 16 August 2004
04-211	coastal cargo vessel *Southern Tiare,* loss of rudder, off Mahia Peninsula, 4 July 2004
04-210	restricted limit passenger vessel *Esprit de Mer,* fire, Milford Sound, 30 June 2004
04-209	fishing vessel *Joanne* and motor tanker *Hellas Constellation,* collision, entrance to the Port of Tauranga, 19 May 2004
04-208	jet boat *CYS*, propulsion failure and capsize, Waimakariri River, 13 May 2004
04-207	fishing vessel *Poseidon,* grounding, north of Manukau Harbour entrance, 15 April 2004
04-205	fishing vessel *Bronny G*, grounding, Banks Peninsula, 26 March 2004
04-204	restricted limit passenger vessel *Freedom III*, grounding, Lake Manapouri, 24 February 2004
04-203	coastal passenger and freight ferry *Arahura*, heavy weather incident, Cook Strait, 15 February 2004

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

Price $ 28.00 ISSN 1173-5597