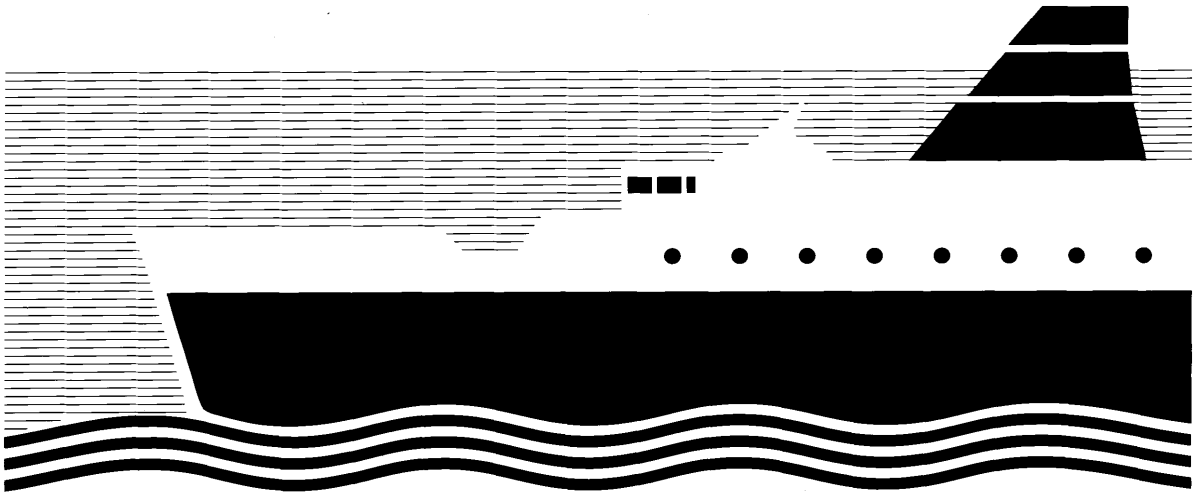
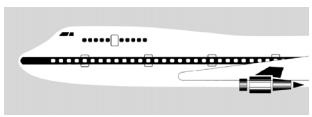
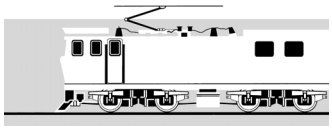


MARINE OCCURRENCE REPORT

05-201 **Report 05-201, passenger ferry *Quickcat* and restricted passenger vessel *Doctor Hook*, collision, Motuihe Channel** **4 January 2005**


TRANSPORT ACCIDENT INVESTIGATION COMMISSION
NEW ZEALAND

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

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

Report 05-201

restricted limits passenger ferry *Quickcat* and restricted limits passenger ship *Doctor Hook*

collision

Motuihe Channel

4 January 2005

Abstract

On Tuesday 4 January 2005 at about 1029, the catamaran passenger ferry *Quickcat* was in the Motuihe Channel on passage from Auckland to Waiheke Island with 8 crew and 377 passengers on board, when it collided with the charter fishing boat *Doctor Hook*, which had a skipper and 7 passengers on board.

The skipper of the *Doctor Hook* made a distress call. Some of the passengers on board the *Doctor Hook* were initially transferred to the *Quickcat* for medical care and then to a Police boat. The others and the skipper were treated on board the *Doctor Hook,* transferring to a Coastguard boat before they were all transported ashore for hospital treatment.

One passenger on board the *Doctor Hook* suffered serious injuries from which she died some 3 weeks later. The skipper and the other passengers on board the *Doctor Hook* suffered minor injuries. The passengers and crew of the *Quickcat* did not sustain any injuries.

The *Doctor Hook* sustained significant damage to its hull and superstructure resulting in it being declared a constructive total loss. The *Quickcat* sustained only superficial damage to its starboard bow.

Safety issues identified include:

- the navigational watchkeeping on board both vessels
- the forward visibility from the conning position on board the *Quickcat*
- the possible fatigue of the charter fishing vessel skipper
- the separation between recreational vessels and high-speed ferries.

A safety recommendation was made to the owner/operator of Doctor Hook Fishing Adventures. Due to the safety actions taken by Fullers Group Limited and Auckland Regional Council no safety recommendations were made to them.

Photograph courtesy of K. Ingram

The *Quickcat* under way after the accident

Photograph courtesy of K. Ingram

The *Doctor Hook* with 2 rescue boats alongside after the accident

Contents

Figures

Abbreviations

CO_2	carbon dioxide
GPS	global positioning system
kt	knot(s)
kW	kilowatt(s)
m	metre(s)
mm	millimetre(s)
OBC	Outboard Boating Club
SSM	Safe Ship Management
STCW-95	International Convention on Standards of Training, Certification and Watchkeeping, 1978 as amended in 1995
U.M.S. gross	universal measurement system, gross tonnage
UTC	co-ordinated universal time
VHF	very high frequency

Glossary

abaft	towards the rear of a vessel
aft	towards the rear, or the rear of a vessel
bow	the front of a vessel
catamaran	a twin-hulled vessel
circadian rhythm	the inherent pattern of physical and mental characteristics related to a 23-to 25-hour internal central nervous system activity cycle
Coastguard	Royal New Zealand Coastguard Federation
Colregs	International Regulations for Preventing Collisions at Sea, 1972
con (conduct)	in control of a vessel
distress call	a customary and statutory call that a vessel or her personnel are in danger and in need of assistance
echo sounder	electrically operated instrument that uses sound waves to determine the depth of water under a vessel.
fish finder	electrically operated instrument similar in design to an echo sounder used to determine the presence of fish shoals under a vessel
Fullers	Fullers Group Limited
gross tonnage	a measure of the internal capacity of a ship; enclosed spaces are measured in cubic metres and the tonnage derived by formula
helm	the amount of angle that a rudder is turned to port or starboard to steer a ship
monohull	a single-hulled vessel
point	a measure of direction (one point = 11¼ degrees of arc)
Police	New Zealand Police
port	left-hand side when facing forward
quarter	that part of a ship between the beam and the stern
sheerstrake	the uppermost continuous line of plating or planking extending along a hull from forward to aft
starboard	right-hand side when facing forward
superstructure	cabins, accommodation or other structures built above the main deck of a vessel

Data Summary

Vessel particulars:

Name:		*Quickcat*	*Doctor Hook*
Type:		passenger ferry	charter fishing boat
Limits:		restricted limits	restricted limits
Safe Ship Management:		Dunsford Marine Limited	Plunket and Falconer Limited
Length:		33.38 m	8.70 m
Breadth:		13.26 m	n/a
Gross tonnage:		456	
Built:		1986 by SBF Engineering in Western Australia	1999 in New Zealand
Propulsion:		Two 2320 kW, MWM TBD 604B V12 diesel engines each driving a fixed-pitch propeller through a ZF-BU455 gearbox	One 126 kW Yanmar 4LH diesel engine driving a fixed-pitch propeller through a stern drive
Service speed:		24 kt	20 kt
Owner/operator:		Fullers Group Limited	Doctor Hook Fishing Adventures
Port of registry:		Auckland	Auckland
Crew:		up to 8	one
Date and time:		4 January 2005 at about 1029[1]	
Location:		Motuihe Channel	
Persons on board:	crew:	8	one
	passengers:	377	7
Injuries:	crew:	nil	one minor
	passengers:	nil	6 minor one major, subsequently fatal
Damage:		minor paint damage	constructive total loss
Investigator-in-charge:		Captain I M Hill	

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

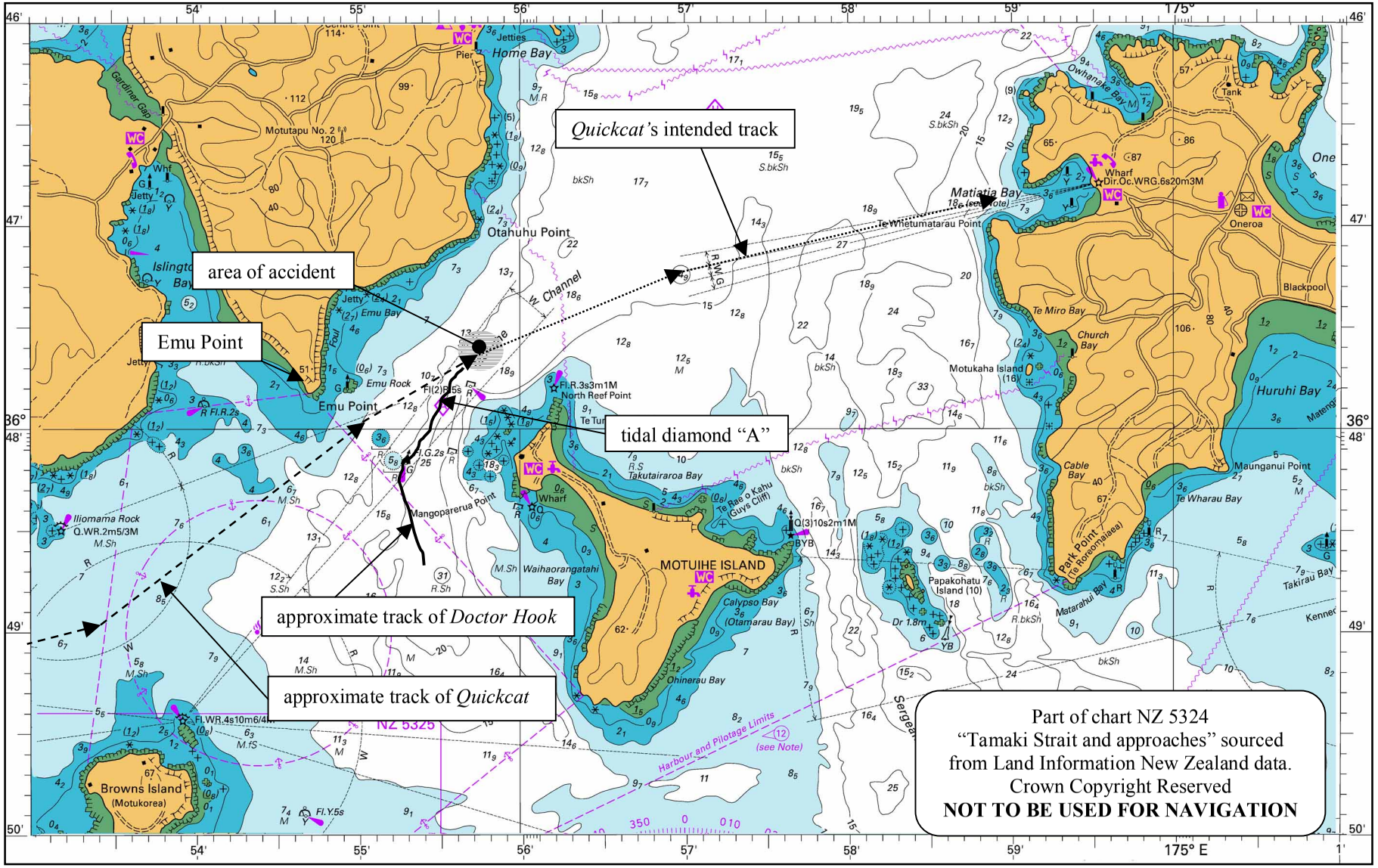


Figure 1
General area of occurrence

1 Factual Information

1.1 History of the trip

Quickcat

1.1.1 On Tuesday 4 January 2005 at about 0630 the Master of the *Quickcat* boarded the vessel at Auckland ferry terminal and commenced the pre-service checks. The rest of the crew for the day boarded the vessel during the next half-hour ready for the commencement of the shift at 0700.

1.1.2 After the pre-service checks were completed and the vessel was readied for service, the freight was loaded and the passengers boarded for the first trip of the day to Matiatia on Waiheke Island. The ferry departed from the Auckland ferry terminal at about 0815.

1.1.3 The trip to Matiatia was uneventful. At about 0900,the *Quickcat* departed Matiatia for the return trip. On the way back to Auckland the Master noted the presence of, what he estimated to be about 15, recreational fishing boats in the Motuihe Channel.

1.1.4 At about 1000, the *Quickcat* left Auckland ferry terminal for the second trip of the day with 377 passengers and 8 crew on board. On the bridge for the departure were the Master, engineer and service supervisor.

1.1.5 As the vessel passed North Head the service supervisor left the bridge to do her rounds of the vessel and check on the passengers. By this time the *Quickcat* was travelling at its normal service speed of about 24 kt. As the vessel passed Rangitoto Island, the engineer asked the Master if he might leave to do his rounds of the engine room and if the Master required another person on the bridge. The Master said he did not.

1.1.6 As the *Quickcat* approached Emu Point (see Figure 1) the Master stood up from his seat to get a better view of the channel past the vessel's deck crane, and saw a clear fairway to con the vessel through. He later stated that most of the recreational fishing boats appeared to be to starboard behind the green Motuihe Channel buoy, with a couple of fishing boats clear on his port side.

1.1.7 The Master sat down again, scanning his instruments and keeping a lookout. As the vessel passed the red Motuihe Channel buoy he leaned over to starboard and looked round the deck crane and saw a small fishing boat, later identified as the *Doctor Hook*, "just about under my bow".

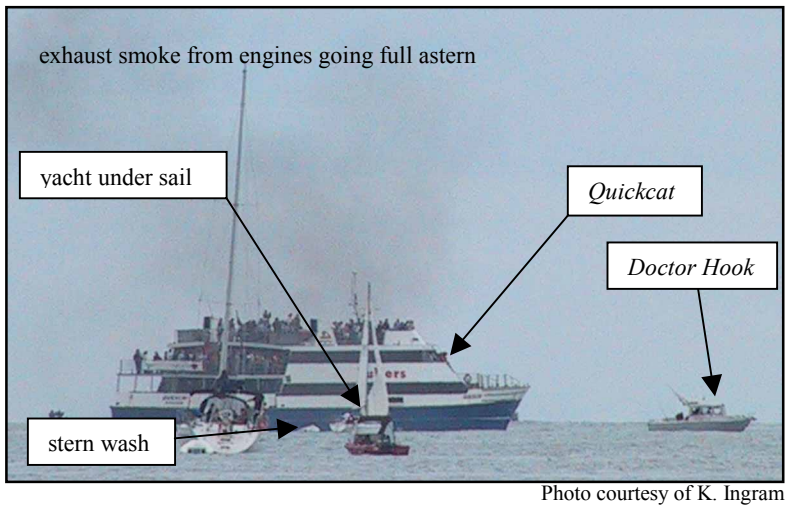


Photo courtesy of K. Ingram

Figure 2
Accident scene just after the collision

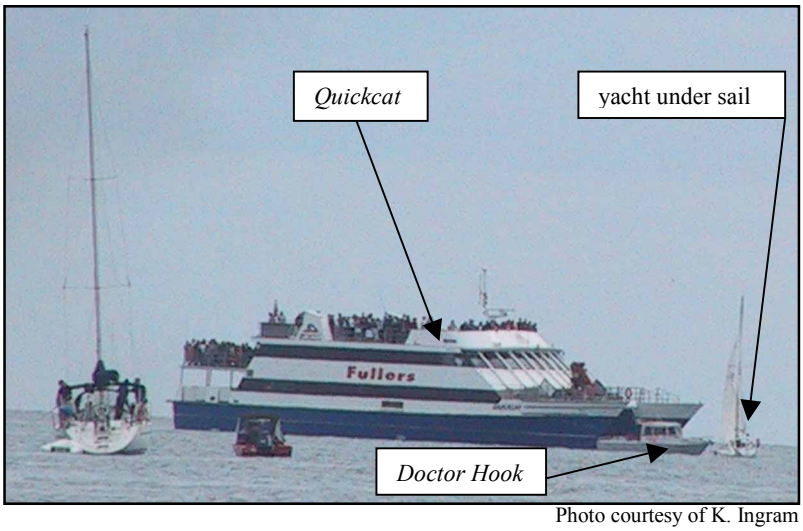


Photo courtesy of K. Ingram

Figure 3
The *Quickcat* coming alongside the *Doctor Hook* to render assistance

1.1.8 The Master immediately pulled the engine controls back to neutral to reduce speed, and applied port helm. However, the *Doctor Hook* was so close that he was unable to avoid a collision. After the collision the Master put the engine controls to full astern to stop the vessel in the water and then go astern (see Figure 2). He was about to make a distress call, but heard someone else making the distress call so he went to the starboard wing control station to manoeuvre the vessel back alongside the *Doctor Hook*.

1.1.9 As the Master was manoeuvring the vessel alongside the fishing boat (see Figure 3), the engineer and the service supervisor returned to the bridge, and he ordered them to check their own passengers and assist the *Doctor Hook* and its passengers.

Doctor Hook

1.1.10 On Tuesday 4 January 2005 at about 0815 the skipper of the *Doctor Hook* arrived at the Outboard Boating Club (OBC) at Hobson Bay in Auckland. After readying the boat for the day's activities the skipper departed the OBC at about 0840.

1.1.11 The skipper conned the boat to Pier Z in Westhaven Marina to pick up his passengers for the day. The passengers boarded the boat at about 0930 and, after the skipper had given them a safety talk and explanation on how the boat's equipment worked, he departed Pier Z at about 0945.

1.1.12 The 7 passengers were an extended family comprising maternal grandparents, parents, 2 sons and a daughter. They had chartered the *Doctor Hook* for a fishing trip in the Hauraki Gulf.

1.1.13 The skipper conned the vessel out of the Waitemata Harbour and through the Motukorea Channel before commencing to look for a suitable fishing spot in the Motuihe area. He tried 2 positions off Wharf Bay before heading into the Motuihe Channel to check some other fishing spots.

1.1.14 During the journey out, the passengers positioned themselves around the boat where they could get comfortable (see Figure 4). As the skipper started searching for his selected fishing spot, the passengers generally observed the scenery and the other boats in the vicinity. At least 3 of the passengers saw the ferry approaching at what they estimated to be a distance of at least one kilometre.

1.1.15 As the skipper conned the Doctor Hook into the Motuihe Channel at a speed of about 6 kt, he was concentrating on his combined global positioning system (GPS) navigator, fish finder and echo sounder. The skipper was also engaged in a conversation on his cellphone with another person about fishing spots.

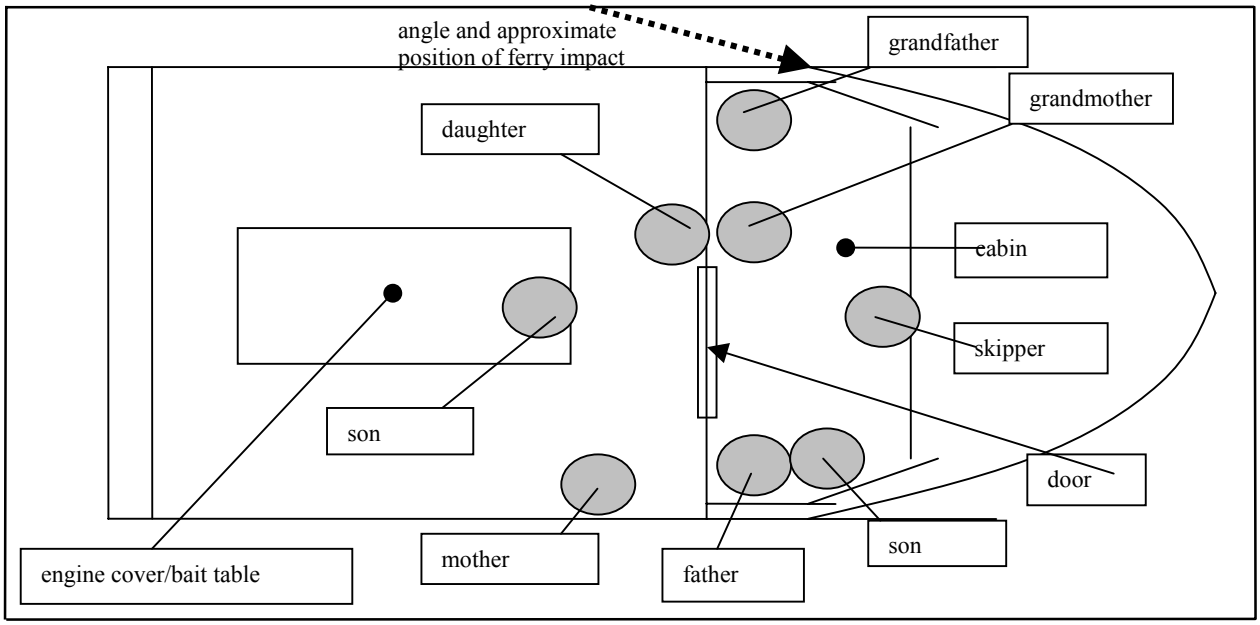


Figure 4
Passenger and crew positioning on board the *Doctor Hook* just prior to impact

1.1.16 Seeing the ferry at what he thought was about 200 m to 300 m away, the father asked the skipper if he was aware of the ferry astern. The skipper turned in his chair and looked aft and the father thought he had seen it. However, the skipper later recollected that he had glanced aft but could not see the ferry through the windows as the grandmother obscured his view.

1.1.17 The mother then asked the father if he had told the skipper about the ferry. He replied that he had. However, as the ferry continued to close, the mother's growing concern caused her to shout a warning to the skipper when the ferry was about 100 m away. The skipper did not appear to hear the warning.

1.1.18 The mother looked at the ferry again, turned, reached into the cabin, shook the skipper by the arm and shouted a further warning. The skipper turned and saw the ferry about to collide with the side of the *Doctor Hook*.

1.1.19 The skipper later stated that on being confronted with the danger of collision he turned the *Doctor Hook* 4° to 5° to port which he felt "was the best scenario to create a deflection impact".

1.1.20 Several of the passengers mentioned later that the *Quickcat* was coming up on them very fine on the port quarter and that they thought that the skipper, when he saw the *Quickcat*, altered the helm slightly to port and put the engine into neutral and then appeared to "freeze". The skipper had no recollection of this.

1.1.21 The force of the impact caused the skipper and passengers of the *Doctor Hook* to be thrown about. The skipper recovered from the force of the impact and broadcast a distress call on very high frequency (VHF) radio, maritime channel 16. As he was making the distress call he noticed the hole in the side of the boat and switched on the bilge pump.

Post accident

1.1.22 When the skipper made his distress call Maritime Radio responded to the call and then issued a distress relay call on VHF channel 16. The Royal New Zealand Coastguard (Coastguard) also issued a distress relay call on VHF channels 86 and 82. The first boat on the scene was one of the Coastguard boats, followed by a New Zealand Police (Police) boat with 2 St John personnel on board, who were en route to Waiheke Island.

1.1.23 The crew on board the *Quickcat* felt a bump when the collision occurred. Three of the crew, in the lower cafeteria, went outside onto the after deck and looked over the side. Seeing what had happened they reacted by donning lifejackets before assisting the *Doctor Hook*. After securing the boat alongside, one of the ferry's crew jumped into the fishing boat and assisted the mother and children onto the ferry along with some of the loose gear on board the fishing boat. Another of the crew readied the sickbay station and got the first aid kit and blankets ready. Other members of the crew kept the ferry passengers clear of the rescue area and provided assistance to the Master on the bridge. This broadly followed the operational procedures as documented in the Safe Ship Management (SSM) manual (see Appendix 1).

1.1.24 An announcement was made over the public address system asking any doctors on board to come to assist. Three doctors and a nurse responded to the announcement and provided what care they could give. One doctor went on board the *Doctor Hook* and provided some care to the grandmother and grandfather before they and the skipper were moved to a Coastguard boat for transfer ashore.

1.1.25 One of the sons on board the *Doctor Hook* organised the issue of lifejackets to the rest of the family, prior to being helped aboard the *Quickcat*. After being attended to on board the *Quickcat* by doctors and St John personnel the mother, father and children were transferred ashore by the Police boat.

1.1.26 After the Coastguard and Police boats had arrived, the Master of the *Quickcat* was concerned that he may drift into shallow water, so he ordered the ferry to be anchored until he was able to resume passage to Waiheke Island and disembark his passengers.

1.2 Vessel information

Quickcat

1.2.1 The *Quickcat* was a catamaran built in 1986 by SBF Engineering in Western Australia. The *Quickcat* had an overall length of 33.38 m, a breadth of 13.26 m and a gross tonnage of 456. Propulsion was provided by 2 MWM TBD 604B V12 diesel engines producing a total power of 2320 kW. Each engine drove a fixed-pitch propeller through a ZF-BU455 gearbox.

1.2.2 The vessel was owned and operated by Fullers Group Limited (Fullers). It was certificated to carry 607 passengers in Auckland, Barrier, Northland and Bay of Plenty inshore limits and 650 passengers in the enclosed-water limits of the above inshore limits. It required between 2 and 8 crew depending on passenger loadings. The *Quickcat* was operated under SSM supplied by Dunsford Marine Limited. The SSM certificate was issued on 24 September 2004 and was valid, subject to periodic audit and inspection, until 23 September 2008.

1.2.3 The navigating bridge/wheelhouse was at the forward end of deck 2 and was fitted with engine controls and alarm panel, steering console, compass, radar, echo sounder, GPS, VHF radio communications, ultra high frequency trunk radio system, single side band radio system, internal public address system, fire detection panel, CO_2 release panel, and electrical switchboards.

1.2.4 To aid the loading and discharge of freight onto the foredeck, the *Quickcat* was equipped with a Palfinger PK9700 BV13-6HS crane on the starboard side of the foredeck in front of the navigating bridge.

1.2.5 In the stowed position the crane stood 2.8 m high, restricting the forward view to the starboard side from the conning position (see Figure 5). The restriction was such that a small platform had been provided for the Master to stand on to see over the crane and it was common practice for the Master to stand up or lean over to starboard to see around the crane.

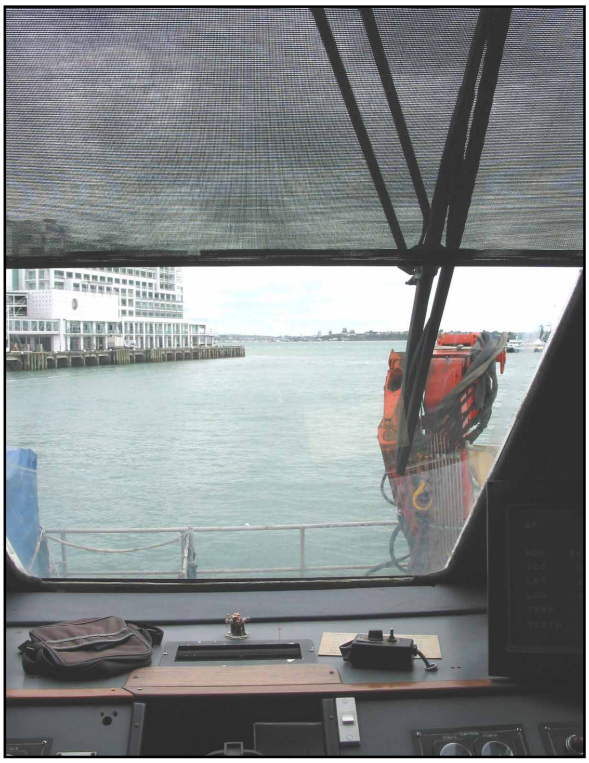


Figure 5
View from conning position on board the *Quickcat*

Doctor Hook

1.2.6 The *Doctor Hook* was an all-aluminium monohull built in 1999; it had an overall length of 8.70 m. Propulsion was provided by a single Yanmar 4LH diesel engine producing 126 kW power driving a single fixed-pitch propeller through a stern drive.

1.2.7 Doctor Hook Fishing Adventures operated the vessel. It was certificated to carry 8 passengers in the Auckland, Barrier and Northland inshore limits and had a minimum crewing requirement of one. It was operated under SSM supplied by Plunket and Falconer Limited. The SSM certificate was issued on 13 February 2004 and was valid, subject to periodic audit and inspection, until 19 January 2007.

1.2.8 The skipper navigated the boat from inside the small cabin; this was equipped with a steering console, engine controls and a combined multifunction GPS, echo sounder and fish finder. The boat was unpainted and therefore the colour of weathered aluminium.

1.3 Damage

Quickcat

1.3.1 The *Quickcat* sustained only superficial damage to the paintwork on the starboard side of the starboard hull (see Figure 6).

Doctor Hook

1.3.2 The *Doctor Hook*'s hull was torn midway along the port hull from near the waterline to the top of the sheerstrake. The deck was torn and the cabin superstructure torn and displaced in the area of the impact. The whole cabin superstructure was deformed towards the forward end, and most of the windows were displaced or broken except along the rear cabin bulkhead (see Figure 7).

1.3.3 The *Doctor Hook* was declared a constructive total loss.

Figure 6
Damage to the *Quickcat*'s hull

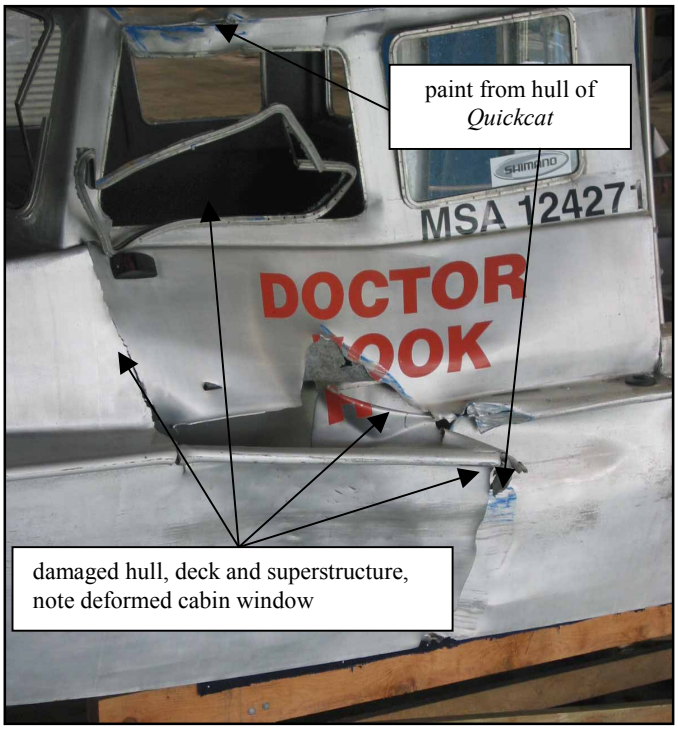


Figure 7
Damage to the port side of the *Doctor Hook*

1.4 Personnel information

1.4.1 Maritime Rule 31B Crewing and Watchkeeping Offshore, Coastal and Restricted (Non Fishing Vessels), Section 2 – Minimum Safe Crewing subsection 31B.6 General Requirements stated, in part:

> (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)

1.4.2 The minimum number of crew required on board the *Quickcat* was contained in the Minimum Safe Crewing Document issued by the Maritime Safety Authority from a proposal by the owner. This document stated that for enclosed waters the crew required was:

Rank	Qualifications	Passenger numbers						
		<99	100-199	200-289	290-379	380-469	470-559	560-651
Master	ILM	1	1	1	1	1	1	1
Engineer[1]	MEC 5	1	1	1	1	1	1	1
ADH			1	1	1	1	1	1
Crew			1	1	2	3	4	5
Safe Crew		**2**	**3**	**4**	**5**	**6**	**7**	**8**

[1] Engineer may be Master or Deckhand

The number on board the *Quickcat* at the time of the accident was 8.

1.4.3 The Master of the *Quickcat* held a New Zealand offshore watchkeeping certificate, a certificate as an engineer local ship and a commercial launchmaster's certificate. He had worked for Fullers since 1990 and had been Master of the ferries *Quickcat*, *Superflyte* and *Jet Raider* for about the previous 4 years.

1.4.4 The engineer on board the *Quickcat* held a New Zealand marine engineer class 5 certificate. He started work at sea in about 1992 on ferries in Australia before working in Europe on superyachts. He came to New Zealand in 2003 and had been working for Fullers for about 2 months.

1.4.5 The service supervisor on board the *Quickcat* held an STCW-95 compliant New Zealand certificate as second mate of a foreign going ship. She had worked for Fullers since November 2004.

1.4.6 The minimum number of crew required on board the *Doctor Hook* was calculated from the tables and flow charts contained in Maritime Rule 31B Crewing and Watchkeeping Offshore, Coastal and Restricted (Non Fishing Vessels), Section 3 – Passenger Vessels, subsection 31B.9 Inshore area and 31B.10 Enclosed Area. For a vessel of up to 20 m in length and less than 20 passengers, the minimum crew required was one and the minimum required qualification for the skipper was a local launch operator's certificate. At the time of the accident the *Doctor Hook* had a crew of one.

1.4.7 The skipper of the *Doctor Hook* held a New Zealand local launch operator's certificate. He had been a skipper in the charter boat industry for the previous 4 years.

1.5 Navigational

1.5.1 The Admiralty Sailing Directions New Zealand Pilot (NP 51) sixteenth edition 2004 stated the following about the Motuihe Channel:

> Motuihe Channel (36° 48'S 174°55'E) separates Motuihe Island from Motutapu Island, 1 mile NW. It may be approached either from N through Rakino Channel, or from NW. The sea is frequently rough, particularly with a strong wind against the tidal stream.

1.5.2 The channel was about 1800 m wide at its narrowest point but had rocky ground on either side that reduced the width to about 1200 m. Two shoal patches located near the south-south-west entrance further congested the channel.

1.5.3 The channel was on the main ferry route between the Auckland and Matiatia Bay terminals. On public holidays Fullers ran 14 ferry sailings in each direction through the day. Other ferry operators also plied the route. Recreational fishermen also favoured the channel and the approaches, and concentrations of over 150 boats had been reported as well as other recreational watercraft both powered and under sail.

1.5.4 The distance from where the *Quickcat* passed Iliomama Rock to the collision site was about 2.4 nm, and from passing Emu Point was about 0.8 nm. The time taken to cover these distances at the 24 kt service speed of the *Quickcat* was about 6 minutes and about 2 minutes respectively.

1.5.5 From examination of photographs taken shortly after the collision (Figures 2 and 3) submissions were made to the Commission that the yacht under sail may possibly have crossed between the *Quickcat* and the *Doctor Hook* prior to the collision.

1.6 Climatic and tidal conditions

1.6.1 The weather at the time of the incident was light overcast sky with light south-easterly winds and a slight sea. The weather was described as a light grey day with very little wind and good visibility.

1.6.2 Tidal stream rates were shown on chart NZ 5324 for specific geographical positions designated by a magenta diamond shape enclosing a letter, known as a tidal diamond (see Figure 1). The rates shown were for average spring or neap tides referred to high water at Auckland. If the tidal range is greater than normal, the rates will be increased roughly in proportion. The spring rate of tides tabulated in the New Zealand Nautical Almanac for Auckland was 2.60 m and the neap range 1.93 m. The range at the time of the accident was 2.00 m and therefore a neap tide. The neap rates for the relevant diamond were:

Position	Time	Direction	Rate
Diamond "A" 36º 47'.90S 174º 55'.50E	04/01/2005 0920	068º	0.2 kt
	04/01/2005 1020	044º	0.4 kt
	04/01/2005 1120	032º	0.7 kt

1.7 Bylaws and collision regulations

1.7.1 Auckland Regional Council Navigation Safety Bylaws 2000 that came into force on 1 January 2001 stated that:

> **3 Operating requirements**
> **3.2 Speed of vessels**
> 1. No person may propel or navigate a vessel (including a vessel towing someone or some object) at a proper speed exceeding 5 knots:
>
> (a) within 50 metres of any other vessel, raft, or person in the water; or

(b) within either 200 metres of the shore or of any structure, or on the inshore side of any row of buoys demarcating that distance from the shore or structure; or

(c) within 200 metres of any vessel or raft that is flying Flag A of the International Code of Signals; or

(d) within 200 metres of an area designated by a harbourmaster.

5. Nothing in this clause applies to:

(a) a commercial vessel over 500 tons gross tonnage, if the vessel cannot be safely navigated in compliance with this clause; or

(b) a vessel solely powered by sail participating in a yacht race or training or coaching administered by a club affiliated to Yachting New Zealand Inc. in accordance with its rules and constitution; or

(c) a tug, harbourmaster vessel or police vessel when the vessels duties cannot be performed in compliance with this section

(d) any reserved area if it is reserved for the purposes of allowing vessels to travel at a speed exceeding 5 knots

(e) any access lane.

3.10 Collision Prevention

1. No person may operate any vessel in breach of Maritime Rule 22 (Collision Prevention), made under the Maritime Transport Act 1994

2. Every person commits an offence against these Bylaws who, being required by an Officer of the Council under sub clause (i) of this bylaw to do anything, fails to comply with that requirement as soon as is reasonably possible.

3.12 Priority of Large Vessels within Pilotage Limits

1. The Master or person in charge of any vessel, including a sailing vessel, shall, when that vessel is within Auckland's Pilotage Districts, keep the vessel out of the way of any vessel of U.M.S. gross 500 or upwards, such distance of clearance to be a minimum of 50 metres.

2. All vessels of U.M.S. gross 500 tonnes or upwards, whether under pilotage or pilotage exempt, shall have an agreed passage plan for transits within pilotage limits.

3. The number of crew members on the bridge shall be sufficient to safely carry out the agreed passage plan.

4. In determining the composition of the bridge team, due regard shall be taken of the need to steer, operate manoeuvring machinery, monitor the progress of the vessel visually, use all available aids to navigation and refer to an appropriate navigation chart.

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

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

22.5 Look-Out

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

22.7 Risk of Collision

(1) Every vessel must use all available means appropriate to the prevailing circumstances and conditions to determine if the risk of collision exists. If there is any doubt, such risk must be considered to exist.
(2) Proper use must be made of radar equipment, if fitted and operational, including long-range scanning to obtain early warning of the risk of collision and radar plotting or equivalent systematic observation of detected objects.
(3) Assumptions must not be made on the basis of scanty information, especially scanty radar information.
(4) In determining if the risk of collision exists, the following considerations must be among those taken into account —
  (a) such risk must be considered to exist if the compass bearing of an approaching vessel does not appreciably change; and
  (b) such risk may sometimes exist even when an appreciable bearing change is evident, particularly when approaching a very large vessel or a tow or when approaching a vessel at close range.

22.8 Action to Avoid Collision

(1) Any action to avoid collision must, if the circumstances of the case allow, be positive, made in ample time and with due regard to the observance of good seafaring practice.
(2) Any alteration of course or speed or both to avoid collision must, if the circumstances of the case allow, be large enough to be readily apparent to another vessel observing visually or by radar. A succession of small alterations of course or speed or both should be avoided.
(3) If there is sufficient sea-room, alteration of course alone may be the most effective action to avoid a close-quarters situation provided that—
  (a) it is made in good time; and
  (b) it is substantial; and
  (c) it does not result in another close-quarters situation.
(4) Action taken to avoid collision with another vessel must be such as to result in passing at a safe distance. The effectiveness of the action must be carefully checked until the other vessel is finally past and clear.
(5) If necessary, to avoid collision or to allow more time to assess the situation, a vessel must slacken its speed or take all way off by stopping or reversing its means of propulsion.
(6) (a) A vessel that, by any rules in this Part, is obliged not to impede the passage or safe passage of another vessel must, when required, take early action to allow sufficient sea-room for the safe passage of the other vessel.
  (b) A vessel that is required not to impede the passage or safe passage of another vessel is not relieved of this obligation if approaching the other vessel so as to involve risk of collision. It must, when taking action, have full regard to the action which may be required of itself and the other vessel by this section of Part 22.
  (c) A vessel the passage of which is not to be impeded remains fully obliged to comply with this section of Part 22 when the two vessels are approaching one another so as to involve risk of collision.

22.13 Overtaking

(1) Despite anything contained in subsections 1 and 2 of section 1 of this Part, any vessel overtaking any other must keep out of the way of the vessel being overtaken.
(2) A vessel will be considered to be overtaking when coming up to another vessel from a direction of more than 22.5 degrees abaft its beam, that is, in such a position where at night the sternlight, but neither of the sidelights of the vessel being overtaken, would be visible.
(3) When a vessel is in any doubt as to whether it is overtaking another, it must assume that it is and act accordingly.

(4) Any subsequent alteration of bearing between the two vessels -
(a) does not make the overtaking vessel a crossing vessel within the meaning of this Part; and
(b) does not relieve the overtaking vessel of its duty to keep clear of the overtaken vessel until it is finally past and clear.

22.15 Crossing Situation

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

22.16 Action by Give-Way Vessel

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

22.17 Action by Stand-On Vessel

(1) If one of two vessels is to keep out of the way, the other must keep its course and speed.
(2) As soon as it becomes apparent to the stand-on vessel that the vessel required to give way is not taking appropriate action in compliance with this Part—
(a) it may take action to avoid collision by its manoeuvre alone; and
(b) if it is a power-driven vessel in a crossing situation, if the circumstances of the case allow, it must not alter course to port for a vessel on its own port side.
(3) When, from any cause, the stand-on vessel finds itself so close that collision cannot be avoided by the action of the give-way vessel alone, it must take whatever action will best avoid collision.
(4) This rule does not relieve the give-way vessel of its obligation to keep out of the way.

22.34 Manoeuvring and Warning Signals

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

at least five short and rapid blasts.

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

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

1.7.5 If a target is on a steady bearing and is hidden from view on the observing ship by an obstruction, it will remain hidden from view behind that obstruction provided the heading of the observing ship does not alter.

1.8 Operating procedures

Quickcat

1.8.1 Dunsford Marine Limited, in conjunction with Fullers, issued the SSM manual that contained the operating and navigational procedures for the *Quickcat*.

1.8.2 This document defined the responsibilities of the owner, Master and crew, and procedures to be undertaken. It stated, in part:

Section 1 Part 4 Responsibilities

The **Rostered Master** has overriding authority on the vessel during his/her rostered shift and has the authority to make decisions with respect to safety and pollution prevention and may request the companies assistance in such matters as may be necessary. All staff on board the vessel reports directly to the **Rostered Master** in respect to all matters including navigation, safety and pollution prevention...

...The Masters authority will include such things as may be relevant to the safety of the vessel and protection of the environment.

- Observe all the requirements of all Maritime Rules and the Maritime Transport Act...

Section 1 Part 5 Hazard Management

Hazard Identification

The Master and crew must have an effective method to identify and regularly review hazards, be they existing, new or potential. They must determine whether the identified hazards are *significant* hazards and require further action...

Hazard Documentation

All identified existing hazard/s or any potential hazards along with action taken, are to be documented and maintained in a file for future identification and reference.

Section 6 Part 1 Watchkeeping

Fitness for Duty

(1) The Owner and the Master of a vessel must establish and implement procedures to ensure that all crew are fit for duty when keeping a watch.

(2) The crew of a vessel must ensure that they are fit for duty at all times when keeping a watch.

Watchkeeping Standards

- The Owner and the Master of a vessel must establish and implement watchkeeping procedures addressing:

  (a) for navigational watchkeeping
  - (i) the composition of the watch
  - (ii) the fitness for duty of watchkeepers
  - (iii) navigation planning and duties
  - (iv) the use of navigational equipment
  - (v) look-out duties
  - (vi) the notification of the Master of any change in weather conditions
  - (vii) the protection of the marine environment
  - (viii) navigation with pilot on board
  - (ix) keeping an anchor watch
  - (x) radio watchkeeping; and

(2) The crew of a vessel must comply with watchkeeping procedures established under rule 31B.18(1).

AT SEA CHECKS AND DUTIES also include:

- Alert Navigational watch is to be maintained by competent personnel ...

1.8.3 Section 2 “Emergency Preparedness” included procedures to be followed in the event of an emergency; certain standard scenarios were covered by means of flow charts. The flow chart for action to be taken in the event of a collision is included in Appendix 1.

1.8.4 No record could be found in the hazard records of the lack of visibility caused by the crane being identified as a new, existing or potential significant hazard.

Doctor Hook

1.8.5 Plunket and Falconer Limited, in conjunction with Doctor Hook Fishing Adventures, issued the SSM manual that contained the operating and navigational procedures for the *Doctor Hook*.

1.8.6 This document defined the responsibilities of the owner and Master [skipper], and procedures to be undertaken. It stated, in part:

> 1 Ship Safety Policy
>
> The Owner/Operator/Master of the vessel will comply with all regulations in force with due regard to Navigation, Health & Safety and Environmental issues.
>
> 3.2 The Master of the vessel shall:
>
> - be responsible for the safe operation of the vessel
> - be responsible for the safety and well-being of all crew
> - have final authority to control the ship while in command
> - take any action necessary during an emergency or incident and notify the OWNER of those actions and of the emergency situation.
> - comply with all aspects of the International Collision Regulations.
>
> **EMERGENCY PROCEDURES**
>
> 5.11 Collision
>
> - Note vessel’s position (including soundings)
> - If embedded in other vessel or vice versa, consider flooding/seaworthiness of both vessel prior to separation
> - Communicate with other vessel and note details
> - Communicate with Coastguard/Shore authorities/other vessels in area
> - Render assistance to vessel if necessary without endangering own
> - Consider anchoring/beaching/tugs/salvage as situation dictates
> - If considered essential initiate distress signals/procedures for either vessel
> - Retain all pertinent documentation i.e. Logbook/movement book/charts.

1.9 Human factors and fatigue

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[2].

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.

1.9.3 Attention is the capacity to maintain some level of alertness during the activities of the day and is a primary aspect of perceptual functioning. Alertness is the ability to maintain optimal sensitivity to external stimuli. Channelled attention, where an operator starts to focus their attention on one source of information to the exclusion of all others, is an example of load shedding.

1.9.4 Vigilance can be described as the ability to sustain attention on a task for an extended period of time. Research has shown that there is a progressive decline in performance with the time on the task. This progressive decline in performance is termed the "decrement function" or "vigilance decrement". Studies suggest that the vigilance decrement is complete within 20 to 35 minutes after the initiation of the vigil, and at least half of the final loss is completed within the first 15 minutes[3].

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

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

1.9.6 The Master of the *Quickcat* arrived on the vessel at about 0630 to commence his shift at 0700. Prior to this he had had nearly 3 full days off, his last work shift finishing at about 0200 on Friday 31 December 2004. His roster of work and rest periods for the preceding 6 days were as follows:

Day and date		Hours worked
Wednesday	29/12/2004	0530 – 1330 rostered shift (8 hours)
Thursday	30/12/2004	0530 – 1330 rostered shift (8 hours)
Friday	31/12/2004	1430 – 2400 rostered shift (9.5 hours)
Saturday	01/01/2005	0000 – 0200 rostered shift (2 hours)
Sunday	02/01/2005	Day off (scheduled rest day)
Monday	03/01/2005	Day off (scheduled rest day)

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

[3] H.J. Jerison, Experiments on vigilance: V. The empirical model for human vigilance, Wright Air Development Center Technical Report No. WADC-TR-58-526. Wright-Patterson Air Force base, Ohio: Aero Medical Laboratory, Wright Air Development Center, 1959. W.H. Teichner, The detection of a simple visual signal as a function of time of watch. *Human Factors*, 1974, 16, 339-353.

1.9.7 After the accident the skipper of the *Doctor Hook* provided information as best as he could remember on his work and rest periods as follows:

Day and date		Hours worked
Wednesday	29/12/2004	Day off (bad weather – cancelled trips)
Thursday	30/12/2004	Day off (bad weather – cancelled trips)
Friday	31/12/2004	Day off (scheduled rest day) New Year's Eve
Saturday	01/01/2005	Day off (scheduled rest day) New Year's Day
Sunday	02/01/2005	Day and evening trip (15.25 hours)
Monday	03/01/2005	Day and evening trip (15.25 hours)

The 2 days prior to the accident and the accident day itself were further broken down as follows:

Day	Time	Activity
Sunday	0600 – 0615	arose
	0700 – 0715	arrived OBC
	0730	arrived Westhaven Marina for start of day trip
	1600	arrived Westhaven Marina at end of day trip
	1600 – 1700	Westhaven Marina, rest period
	1700	commenced evening trip
	2130 – 2230	arrived Westhaven Marina at end of evening trip returned boat to OBC and washed down
	2300	arrived back at home
Monday		timings the same as Sunday, give or take 15 minutes
Tuesday	0730	arose
	0800	left home
	0815 – 0830	arrived OBC
	0900	arrived Westhaven Marina
	0945	departed Westhaven Marina on day trip

Some considerable time after the accident the skipper of the *Doctor Hook* provided information that he considered that he had had more than 8 hours' sleep on the Saturday and Monday nights and 7 hours on the Sunday night. However, the accuracy of the sleep information is inherently limited by the fact that subjective reports of sleep duration and timing are not necessarily reliable, and by the fact that the accident and some considerable time had intervened between the sleep episodes and when they were being recalled.

1.9.8 The skipper of the *Doctor Hook* did not indicate what the quality of his sleep was. The restorative value of sleep, in terms of reducing biological sleepiness and improving subsequent waking function, depends not only on the amount of sleep obtained but also on its quality. Sleep that is restless and fragmented by frequent awakenings also leaves a person sleepy and at increased risk of impaired alertness and performance. There are a large number of recognised disorders that can disrupt the quality of sleep.

1.9.9 One of the passengers stated later that when they boarded the *Doctor Hook* the skipper looked tired and they considered him to be extremely tired, and that the skipper had told them that he had had 3 nights of fishing trips prior to the day of the accident.

Fatigue study information

1.9.10 Work-related fatigue has three main causes:

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

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

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

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

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

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

2 Analysis

2.1 The Motuihe Channel was a stretch of water used by different interest groups with differing maritime requirements and training. The mixing of a large number of pleasure and charter craft with high-speed ferries in a relatively constricted waterway can lead to conflict between the users due to their different methods of operation, and thus the possibility of a collision. Voluntary or regulated segregation may provide the best means of ensuring that all users can benefit from the waters of the channel without impinging on the needs of others.

2.2 Under Maritime Rule Part 22 the *Quickcat* and the *Doctor Hook* were power-driven vessels with no special limiting manoeuvring characteristics. The *Quickcat* had the *Doctor Hook* on its own starboard side, and was most likely approaching from more than 2 points [22.5°] abaft the *Doctor Hook*'s beam. The passengers on the *Doctor Hook* recalled seeing the starboard side of the *Quickcat* and that it was coming from nearly astern. The *Quickcat* was therefore probably the overtaking vessel. However, because of the varying course of the *Doctor Hook*, it was possible that as the vessels closed, the *Quickcat* may have at times been approaching at slightly less than 2 points, so possibly changing the overtaking situation to a crossing situation. In either case, the *Quickcat* was the give-way vessel, most likely under Maritime Rule Part 22.13 Overtaking, or if not under Maritime Rule Part 22.15 Crossing Situation. The *Quickcat* should therefore have kept clear of the *Doctor Hook*.

2.3 Under Maritime Rules Part 22.17, Action by Stand-On Vessel, the *Doctor Hook* was the stand-on vessel and as such was required to maintain its course and speed. However, as soon as it became apparent that the give-way vessel was not taking appropriate action, the stand-on vessel could have taken action to avoid a collision by its manoeuvre alone. It is unlikely that the skipper of the *Doctor Hook* maintained his course and speed as he was on the telephone and searching for a specific fishing spot. He was probably varying course, speed or both as he neared his intended position. Even though the skipper of the *Doctor Hook* did not see the *Quickcat* until collision could not be avoided by the actions of the give-way vessel alone under Maritime Rule Part 22.17 (3) he was required as the stand-on vessel to take whatever action would best avoid a collision.

2.4 Under the meaning of Maritime Rule Part 22.5 the crew on both vessels were required to maintain a proper lookout by sight and hearing and any other available means such as radar. Given that neither saw the other until collision was imminent indicated that the lookout on both vessels was not proper.

2.5 The Master of the *Quickcat* may have seen the *Doctor Hook* in the distance when he saw the other recreational fishing boats in the area. However, as the *Doctor Hook* was in the same general area as the other fishing boats and was not moving quickly he may have considered that the *Doctor Hook* was either at anchor or about to anchor and not considered the boat a threat.

2.6 From close examination of the photographs taken just after the accident (Figures 2 and 3) and from the information provided by the witnesses on the 2 vessels it is unlikely that the yacht passed between the *Quickcat* and the *Doctor* Hook because:

- the yacht appears to be closer to the photographer than the *Quickcat* or the *Doctor Hook* in Figure 2
- the yacht appears to be paralleling the course of the *Quickcat* and then crossing the bows of the 2 vessels in order to proceed seaward
- neither the passengers on the *Doctor Hook* nor the Master of the *Quickcat* mentioned that they were aware of another vessel passing between them or obscuring the view.

However, had another vessel passed between them it would only have been transitory, briefly obscuring the view. To have remained between them and consistently obscuring the view, the vessel would have had to stay on a steady bearing and would thus have eventually become involved in the collision.

2.7 Under the Auckland Regional Council Navigation Safety Bylaws 2000, 3.2 Speed of Vessels, neither the Master of the *Quickcat* nor the skipper of the *Doctor Hook* should have navigated their vessels at a speed of more than 5 kt when within 50 m of each other. As both of them were unaware of the other vessel's presence, neither of them complied with this bylaw. However, it is unlikely that the *Doctor Hook* was travelling at a speed greater than 5 kt or 6 kt.

2.8 The Master of the *Quickcat* declined the opportunity to have an extra lookout on the bridge before the engineer left the bridge. The service supervisor had left the bridge shortly before; the Master could have enlisted her help in keeping a lookout or requested that another member of the crew be made available to help with lookout duties.

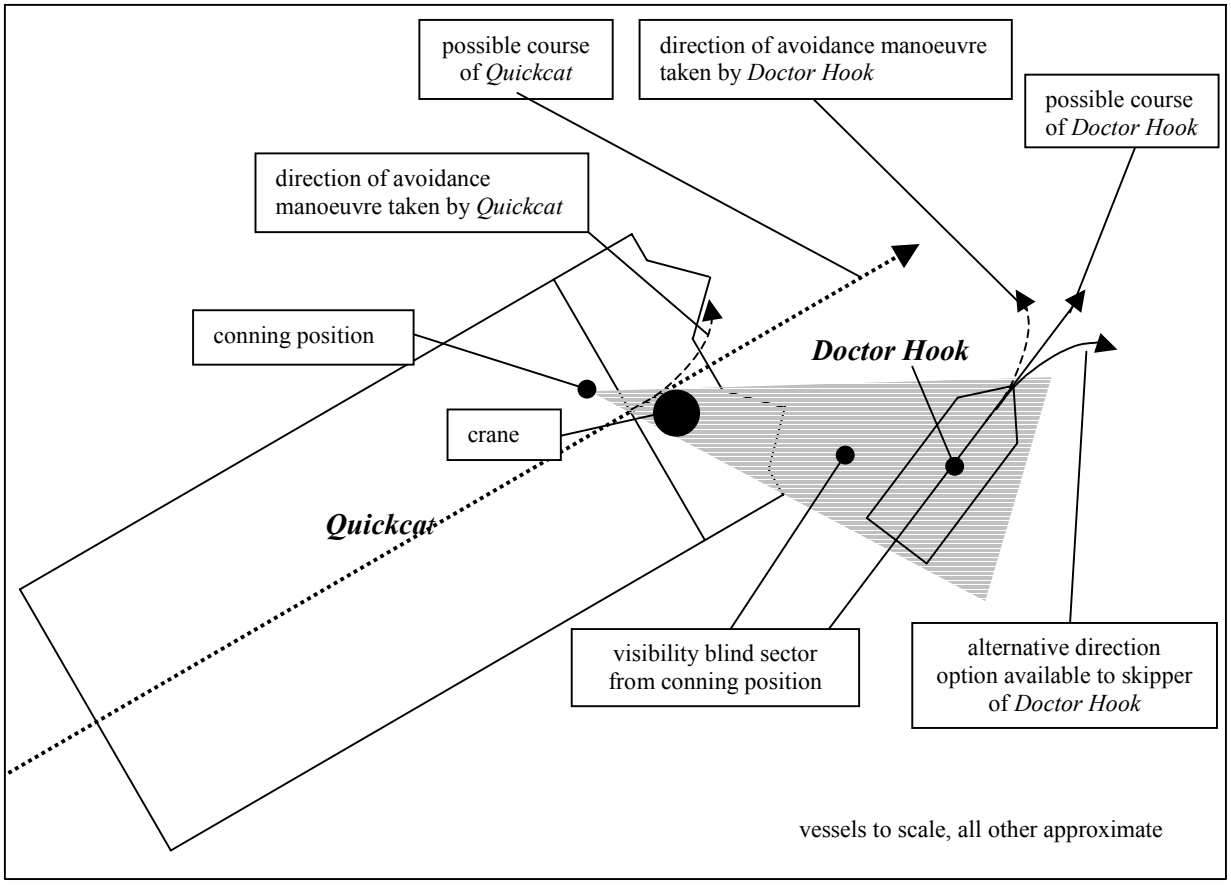


Figure 8
Plan of emergency manoeuvres taken by the *Quickcat* and the *Doctor Hook*

2.9 For the number of passengers on board the *Quickcat* the vessel required a minimum safe crew of 5, 3 fewer than were on board at the time of the accident. Therefore at least one crewmember could have been made available to keep a dedicated lookout.

2.10 It is probable that the angle of closure of the 2 vessels was such that the smaller *Doctor Hook* was masked in the blind spot caused by the freight crane on the foredeck of the *Quickcat* (see Figure 5). As a risk of collision existed, the bearing would have remained steady and the *Doctor Hook* remained hidden behind the crane. The Master would have had to move from the conning position to see around the crane to have seen the *Doctor Hook*.

2.11 As the skipper of the *Doctor Hook* was searching for a fishing spot, he was probably concentrating on the boat's multifunction navigation instrument and the cellphone call for information on a good fishing spot and possibly adjusting course and speed to arrive at his chosen position. He was unaware of the approaching ferry until the very last moment despite the best endeavours of the passengers to warn him.

2.12 Under Maritime Rules Part 31B.9 and 31B.10 the skipper and owner of the *Doctor Hook* had been awarded a minimum crewing level of one. However, Maritime Rule Part 31B.6 required that the vessel not be operated unless there was enough crew on board to operate the vessel safely. The skipper and owner had not considered carefully enough that the skipper's involvement with the equipment to find selected fishing spots and his other duties would have prevented him keeping a proper lookout, and the addition of one extra crew to act as a dedicated lookout may have averted the accident. The skipper also had the opportunity to request one of the passengers to act as a lookout.

2.13 When the passengers first brought the presence of the ferry to the skipper's attention he looked aft, but stated later that he had not seen the ferry because one of the passengers blocked his view, and he returned his attention to the instruments and his cellphone conversation. It would have been prudent of the skipper to have asked the passenger who warned him to show him what he meant, or to have asked the passenger in the way to move, or to have stood up from his seat to get a clear view aft.

2.14 On the *Quickcat,* to move from the conning position to see around the crane obstruction, the Master would have had to divert his attention from his other navigational tasks and as such may have let the intervals, between glances around the obstruction, become too long for safe navigation.

2.15 Although there was no recorded evidence of the poor visibility caused by the crane being a hazard, it may have been aired anecdotally; but this could not be substantiated. However, the restriction in visibility was known about, as unwritten procedures such as leaning to the starboard side or standing on a specially constructed box had evolved to enable the Master to see around the obstruction and maintain his lookout.

2.16 When the Master of the *Quickcat* saw the *Doctor Hook,* he brought his engines back to neutral to reduce his speed and altered course to port, away from the *Doctor Hook*. Although the time between his sighting of the *Doctor Hook* and the collision was not long enough for his actions to have much effect, they may have slightly diminished the force of the collision.

2.17 When the skipper of the *Doctor Hook* saw the *Quickcat* he turned the *Doctor Hook* slightly to port across the bows of the *Quickcat* and did not alter his speed. It would have been more prudent for the skipper to have accelerated away to starboard, possibly reducing the force of the impact or possibly increasing the time for the helm actions on both vessels to have more effect and possibly avoid collision.

2.18 The Master of the *Quickcat* was on his first shift after nearly 3 full days' rest. Although the exact times of his wake and rest periods during his off-duty time prior to the accident are not known, it is unlikely that he was greatly fatigued.

2.19 At the time of the accident the Master of the *Quickcat* had been on shift for about 3 and a half hours, he had completed one return trip on the service and was part way into the second trip of the day. His performance could be expected to have declined from when he assumed command of the vessel due to vigilance decrement but he should still have been sufficiently alert to have safely navigated the vessel.

2.20 The skipper of the *Doctor Hook* allowed himself scheduled rest days in his trip bookings. However, his work cycle had been disrupted by bad weather and he had had 2 extra days off prior to 2 days' scheduled rest. He had then been back at work for 2 full days before the day of the accident. When the skipper was at work he was on duty for relatively long periods interspersed with irregular short rest periods waiting for his next passengers. He told one of the passengers that he had been working long hours before their trip. The long hours combined with the short nightly rest periods were likely to have induced fatigue in the skipper of the *Doctor Hook*. The quality of the sleep that the skipper obtained would also have affected his level of alertness and performance; the poorer the quality of his sleep the more impaired his levels of alertness and performance.

2.21 The effect of fatigue, which in its early stages may not be evident to the affected person, in reducing the physical and mental capabilities such that the person's strength, speed, reaction time, co-ordination and decision-making may be impaired may have caused the skipper of the *Doctor Hook* to react slower than normal to the warnings the passengers gave.

2.22 At the time of the accident the skipper of the *Doctor Hook* had been on his boat for about 2 and one quarter hours; he had first conned the boat to Westhaven Marina from the OBC and then out to his preferred fishing ground. It could be expected that his performance would have declined from when he assumed command of the vessel due to vigilance decrement. However, he should still have been sufficiently alert to have safely navigated the vessel had he not been fatigued or channelling his attention onto the multifunction display unit and the cellphone conversation in which he was engaged.

2.23 As he approached a fishing spot the skipper of the *Doctor Hook*'s workload increased and he began to channel his attention into the multifunction display and the cellphone conversation in which he was engaged. His attention excluded relevant information from other visual and aural sources, including the passengers.

2.24 Bridge resource management training emphasises the need to recognise "hazardous thoughts" and replace them with opposite "safe thoughts". Three hazardous thoughts and their opposite safe thoughts, as used in bridge resource management concepts, were relevant to both the Master of the *Quickcat* and the skipper of the *Doctor Hook*.

Hazardous thought	Safe thought
I can do it	Why take chances?
It won't happen to me	It could happen to me
We've always done it this way	It's about time we changed

2.25 On the *Quickcat*, it was normal practice for the engineer to inform the Master when he was leaving the bridge, to carry out his rounds of the engine room, and to ask if the Master required another member of the crew to come to the bridge to assist. On this occasion the Master declined the extra help, possibly considering that "he could do it". The Master may also have considered that declining the extra lookout had become standard practice during daylight hours, thus "we've always done it this way".

2.26 The normal practice of the skipper of the *Doctor Hook* was to run the boat on his own, carrying out all the required tasks himself. This may have been partially due to the hazardous thoughts of "we've always done it this way" and "I can do it". His decision on whether to carry extra crew may have been influenced by commercial pressure in that his charter business may not have been commercially viable if he'd had to employ an extra crewmember. He may also have suffered from peer pressure in that others in the charter market may have operated alone and this was the way to do it.

3 Findings

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

3.1 The *Quickcat* collided with the *Doctor Hook* because the crew of both vessels were not keeping an efficient lookout.

3.2 There was no means of segregating the different user groups in the Motuihe Channel so that they did not come into conflict with each other.

3.3 The positioning of a freight crane on the foredeck of the *Quickcat* severely affected the visibility from the main conning position.

3.4 The 2 vessels were probably in an overtaking situation or possibly a crossing situation as laid down in Maritime Rule Part 22. In either case, the *Quickcat* was the give-way vessel and the *Doctor Hook* was the stand-on vessel.

3.5 The Master of the *Quickcat* did not take action early enough to avoid collision.

3.6 The skipper of the *Doctor Hook* did not take action early enough to avoid collision, when the action of the give-way vessel alone was not sufficient to avoid a collision.

3.7 The number of crew on board the *Quickcat* was above the stipulated minimum crewing level.

3.8 The number of crew on board the *Doctor Hook* complied with the minimum stipulated crewing level. However, the way the owner/operator organised his duties meant that there was not enough crew to navigate the vessel safely.

3.9 The skipper of the *Doctor Hook* may have been suffering from the latent effects of fatigue.

3.10 Using a cellphone while navigating a vessel probably distracted the skipper of the *Doctor Hook*.

3.11 Both vessels were correctly certificated at the time of the accident.

3.12 The actions of both crews after the accident were correct.

3.13 The timely arrival of the rescue services and the help given by passengers with medical training on board the *Quickcat* ensured that the injured were efficiently cared for and transported to hospital.

4 Safety actions

4.1 Prior to the accident, Fullers had entered into a contract for the supply of a new crane for the foredeck of the *Quickcat* as the old crane needed renewing. The crane chosen was a Palfinger PK10000M short post marine crane and had a stowed height of 1500 mm. One of the reasons for choice was that it would not obscure the view from the Master's conning position through the navigating bridge windows. Due to ordering and delivery times this crane was to be fitted in July 2005 when the vessel was undergoing its annual survey.

4.2 After the accident, Fullers implemented the following action:

- Issued a standing order for inclusion in the *Quickcat*'s Safe Ship Management manual requiring 2 persons to be on the bridge at all times when under way until the "old" crane was removed from the vessel.

4.3 In view of the safety actions taken by Fullers, no further safety recommendations covering these aspects have been made to Fullers.

4.4 After the accident, the Auckland Regional Council Harbourmaster undertook a review of the area of the accident. After the review and consultation with interested parties, he issued the Harbourmaster's Direction 1-05. It stated, in part:

> ... it was concluded that the southern side of the channel was preferred by recreational fisherman and the northern side by vessels passing through the channel, large commercial vessels seldom use the channel.
>
> In order to aid this separation of vessels an access lane is to be enacted as described in this direction. The aim of this lane is to allow a passage for Fast Passenger Ferries passing through this channel that is unimpeded by anchored vessels or vessels fishing. It further allows passage to all other vessels passing through this channel.
>
> **1) Preamble**
>
> These directions are issued under section 650C(3)(a) of the Local Government Act 1974. They:
>
> Define the limits of the "Motuihe Channel Fast Passenger Ferry Lane".
> Prescribe the manner in which vessels must navigate within this lane.
> Prescribe activities, which are prohibited within this lane...

4.5 In view of the safety actions taken by Auckland Regional Council, no safety recommendations covering these aspects have been made to Auckland Regional Council.

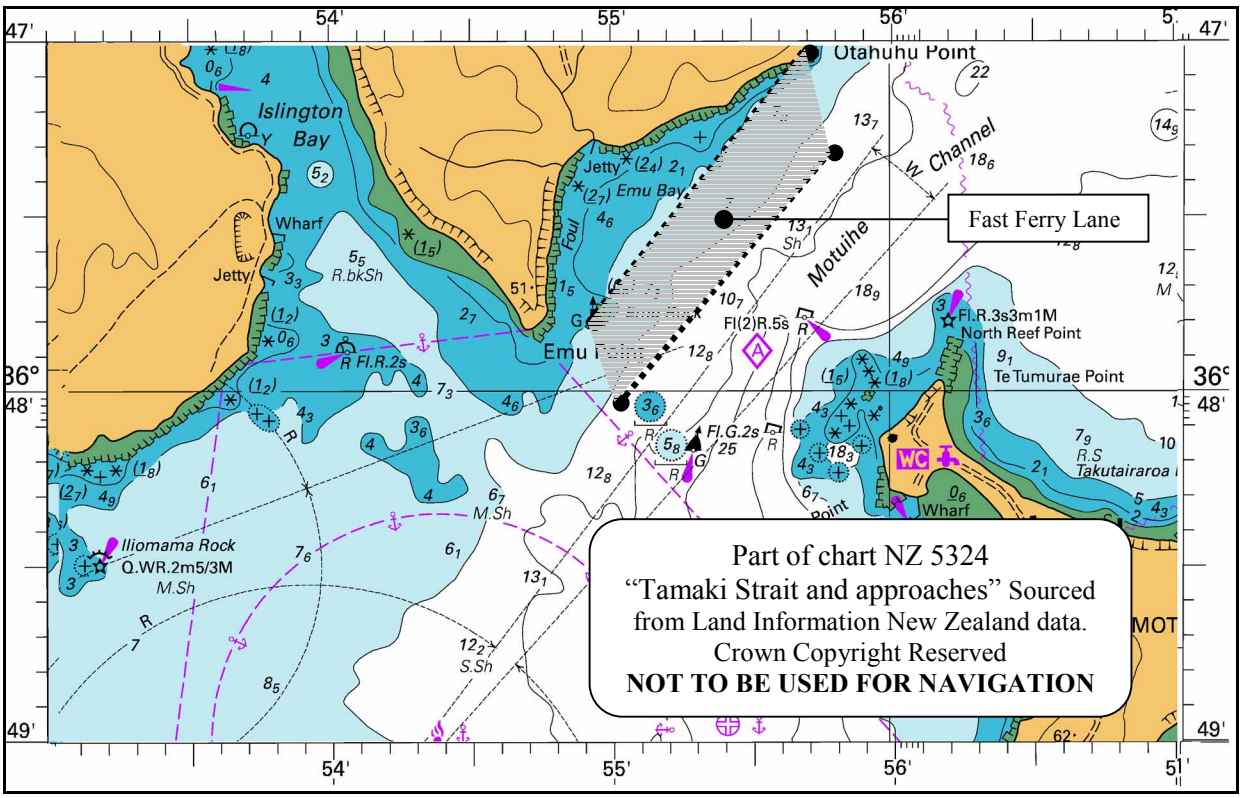


Figure 9
Chart showing Fast Ferry Lane as directed by the Auckland Regional Harbourmaster

4.6 On 10 June 2005, NZ Notices to Mariners, Edition 12 included the following preliminary notice:

NZ 120(P)/05 NEW ZEALAND – North Island – Hauraki Gulf – Motuihe Channel – Fast Ferry Zone.

1. A Fast Ferry Zone has been established within an area bounded by a line joining positions:

   (a) 36° 47'.04S 174°55'.74E (Otahuhu Point)

   (b) 36° 47'.32S 174°55'.80E

   (c) 36° 48'.04S 174°55'.03E

   (d) 36° 47'.83S 174°55'.97E

   (e) 36° 47'.04S 174°55'.74E (Otahuhu Point)

2 No vessel may impede the passage of a Fast Passenger Ferry (identified by an orange flashing light) within this zone

3 Anchoring and fishing are prohibited within the Fast Ferry Zone

4 Mariners are advised to navigate with caution within this area

5 Charts will be amended as appropriate in due course

Charts affected – NZ53 – NZ532 – NZ5324

Auckland Regional Council

NI 97/2005

5 Safety Recommendation

5.1 On 25 July 2005 the Commission recommended to the owner/operator of Doctor Hook Fishing Adventures that he:

5.1.1 Carry out a crewing assessment in accordance with Maritime Rules 31B.6 and 31B.8 to ensure that any vessel that he owns or operates has on board the number of crew necessary to operate the vessel safely in any circumstances. (067/05)

5.2 On 8 August 2005 the solicitor for Doctor Hook Fishing Adventures replied on its behalf. That reply, in part, was:

> Our client has arranged for a new vessel to be built. At this stage, the final completion date of the new vessel is uncertain. (It is estimated to be some months away). We are instructed that our client will implement the safety recommendation as soon as possible once the new vessel is built and before it is launched.

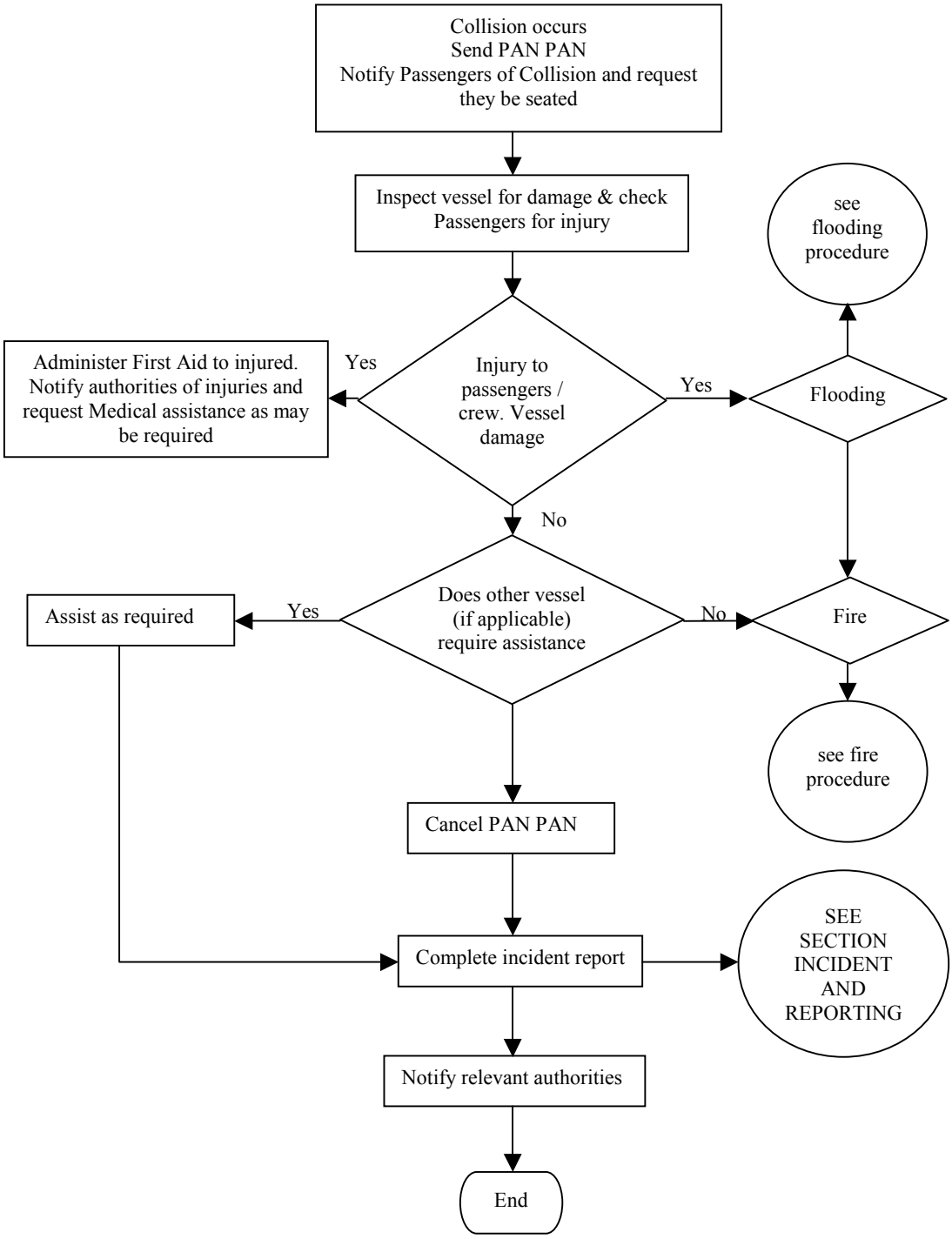
Approved on 18 August 2005 for publication

Hon W P Jeffries
Chief Commissioner

Appendix 1

COLLISION RESPONSE PROCEDURE

The following procedure requires reference to specific emergency procedures outlined in this document (QP4-51), in the event of a collision.



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05-201	Report 05-201, passenger ferry *Quickcat* and restricted passenger vessel *Doctor Hook*, collision, Motuihe Channel, 4 January 2005
04-217	fishing vessel *San Rochelle*, fire and foundering, about 96 nm north north west of Cape Reinga, 27 October 2004
04-203	coastal passenger and freight ferry *Arahura*, heavy weather incident, Cook Strait, 15 February 2004
04-202	restricted limit passenger vessel *Queenstown Princess*, grounding, Lake Wakatipu, 13 February 2004
03-211	oil tanker, *Eastern Honor*, grounding, Whangarei Harbour, 27 July 2003
03-210	passenger freight ferry *Aratere*, collision with moored fishing vessel *San Domenico*, Wellington Harbour, 5 July 2003
03-209	container vessel *Bunga Teratai 4* and fishing vessel *Mako*, collision, Tasman Bay, 4 July 2003
03-207	fishing vessel *Solander Kariqa*, fire, 300 nautical miles west of Suva, Fiji, 5 May 2003
03-206	tanker *Capella Voyager*, grounding, Whangarei, 16 April 2003
03-204	restricted limit passenger vessel *Tiger III*, passenger injury, Cape Brett, 18 March 2003
03-203	jet boats *Wilderness Jet 3* and *un-named private jet boat,* collision, Dart River, Glenorchy, Queenstown, New Zealand, 2 February 2003
03-202	launch *Barossa* and trimaran *Triptych*, collision, Hauraki Gulf, 18 February 2003
03-201	passenger ferry *Harbour Cat*, engine room fire, Auckland Harbour, 16 January 2002
02-208	bulk cement carrier *Westport*, collision with old Mangere Bridge, Onehunga, 21 November 2002
02-206	bulk carrier, *Tai Ping*, grounding, Bluff Harbour, 8 October 2002
02-201	bulk log carrier, *Jody F Millenium*, grounding, Gisborne, 6 February 2002
02-204	coastal cargo ship *Kent*, collision and flooding, Wellington Harbour, 14 July 2002
02-203	tug *Purau* grounding, Lyttleton Harbour, 1 March 2002

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