



Report 97-204

Restricted-limit charter vessel *Amigo 1*

grounding

Grey Group Islands off Great Barrier Island

12 July 1997

Abstract

At about 0215 on Saturday, 12 July 1997, the restricted-limit charter vessel *Amigo 1* was en route from Auckland to Great Barrier Island when the skipper made a planned starboard turn too early and the vessel grounded on rocks within the Grey Group Islands, broke up and sank. The skipper was drowned and one of the four passengers is missing, presumed drowned. Safety issues identified included: over-reliance on global positioning system navigation, inaccessibility and deterioration of life-saving equipment, breach of regulations and poor very high frequency radio coverage in an area of high commercial and pleasure boat activity.

Safety recommendations were made to the Director of Maritime Safety and the Chief Executive of a safe ship management company to address the above safety concerns.

Table of contents

1.	Factual Information	3
1.1	History of the voyage	3
1.2	Vessel information	8
1.3	GPS navigation systems	9
1.4	Personnel and survey information	10
1.5	Other information	13
1.6	Toxicology	14
2.	Analysis	14
2.1	The accident	14
2.2	Survivability	17
2.3	Communications	18
2.4	Qualifications	19
2.5	Safe ship management	19
3.	Findings	21
4.	Safety Recommendations	22
	Appendix A	27
	Glossary of marine abbreviations and terms	29



Amigo I

Transport Accident Investigation Commission

Marine Accident Report 97-204

Vessel Particulars:

Type:	Restricted-limit fishing charter
Class:	IV (passenger ship not plying beyond extended river limits that has or requires a certificate of survey as a ship plying within restricted limits)
Operating limits:	Tauranga, Whangamata and Auckland Extended River Limits (within Maritime Safety Authority VHF radio limits)
Passenger limit:	12
Length (over all):	12.8 m
Length (registered):	12.14 m
Breadth:	3.81 m
Tonnage (gross):	19.36 t
Construction:	Glass reinforced plastic (GRP)
Built:	In Auckland by Salthouse Brothers in 1976
Propulsion Plant:	One 261 kW GM diesel engine driving a single fixed-pitch propeller
Service Speed:	15 knots
Operator:	Owner
Persons on board:	Crew: 1 Passengers: 4
Injuries:	Crew: 1 fatal Passengers: 1 missing 3 minor
Nature of Damage:	Boat destroyed
Location:	Grey Group Islands, west coast of Great Barrier Island
Date and time:	Saturday, 12 July 1997, at about 0215 ¹
Investigator-in-Charge:	Captain Tim Burfoot

¹ All times in this report are NZST (UTC + 12 hours) and are expressed in 24 hour mode.

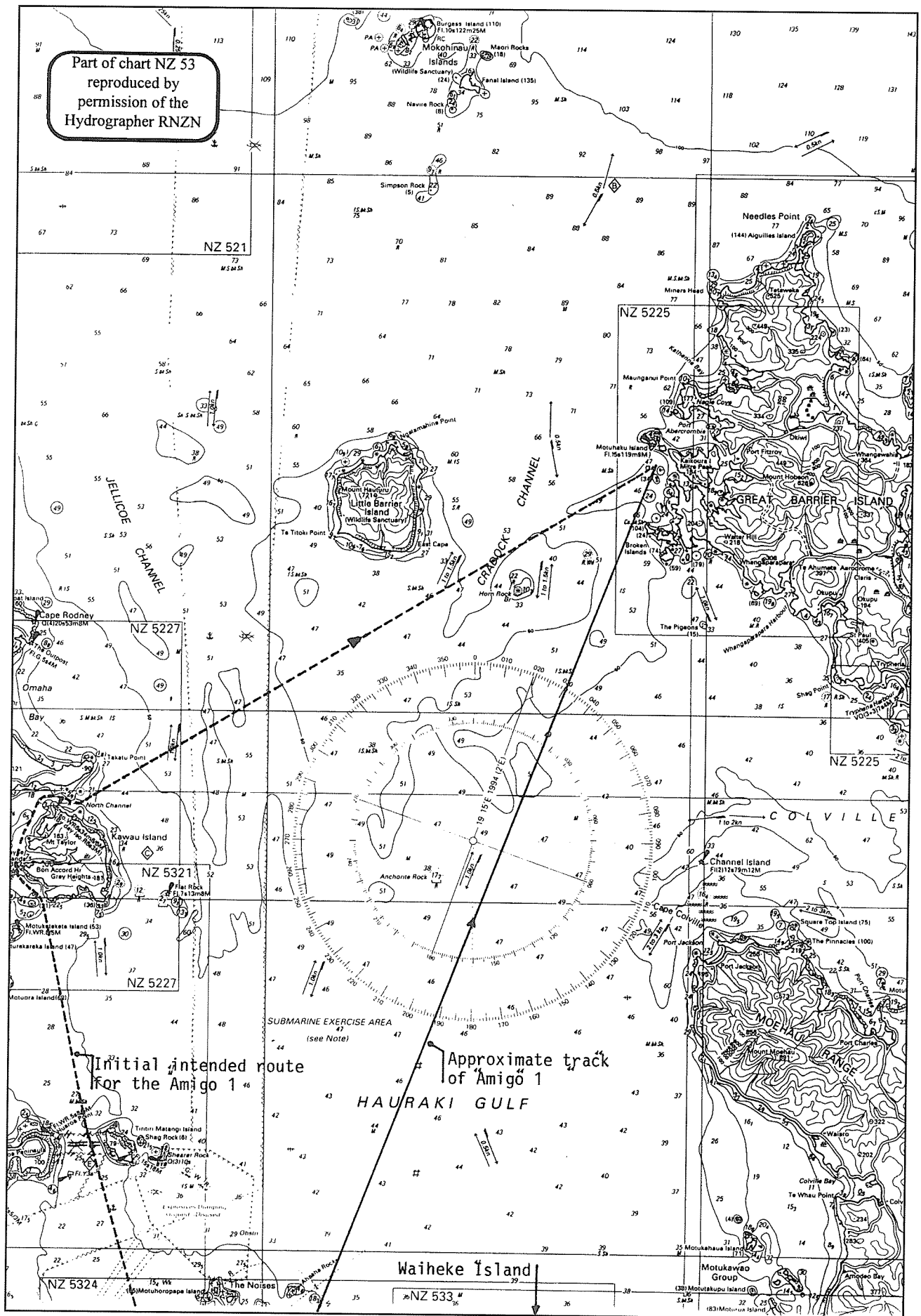


Figure 1
Part of Chart NZ 53 showing initial intended route and approximate track of the *Amigo 1*

1. Factual Information

1.1 History of the voyage

- 1.1.1 At about 1200 on Friday, 11 July 1997, four people met at the Pine Harbour Marina at Beachlands, Auckland. They were members of the Maraetai Yacht Club who had booked the fishing charter launch *Amigo 1* for a weekend fishing trip around the Hauraki Gulf and out to Great Barrier Island. The owner/skipper of the *Amigo 1* was a new member of the Maraetai Yacht Club having relocated the *Amigo 1* from Bluff to Auckland in early May 1997.
- 1.1.2 The plan was to depart Pine Harbour Marina about midday, anchor for the night at Kawau Island and continue to Port Fitzroy on Great Barrier Island the next day, fishing at various locations on the way.
- 1.1.3 The skipper had previously arranged an engineer to repair the engine-driven hydraulic pump which drove the anchor and pot-hauler hydraulic winches; however, when the skipper arrived on board and tested the anchor winch, it did not work. The skipper called the engineer back to the boat and the rest of the afternoon and much of the evening was spent trying to repair the pump.
- 1.1.4 In the early evening the skipper's partner, who had been aware of the problem with the hydraulic pump, visited the boat to see why the *Amigo 1* had still not sailed. The skipper told her that he would probably be home later as it was too late to depart that night. His intention was to leave early the next morning.
- 1.1.5 The passengers were keen to depart that night and one of them, who overheard the conversation between the skipper and his partner, reportedly said words to the effect; "If we get this boat going tonight and you go home, don't expect the boat to be here in the morning when you come back, we will be off on our own".
- 1.1.6 By 2100 the hydraulic pump was still not working so it was disconnected and the passengers asked the skipper if they could continue with the trip anyway, handling the anchor manually. The skipper agreed to their request.
- 1.1.7 At about 2200 the skipper shifted the *Amigo 1* to the fuel jetty, refuelled the vessel and departed the marina at about 2230.
- 1.1.8 While at the fuel jetty one of the passengers listened to a weather broadcast on the VHF radio. He recalled the forecast was for a south-west wind at 20 knots gusting to 30 knots, abating in the morning; reduced visibility in showers. The skipper and passengers decided to by-pass Kawau Island and head direct for Great Barrier Island with the contingency plan of spending the night anchored off the north coast of Waiheke Island if weather conditions were unfavourable. (See Figure 1.)
- 1.1.9 One of the passengers suggested to the skipper that they submit a Trip Report² (TR) to the Coastguard but the skipper reportedly said that it was not necessary. No departure TR for the *Amigo 1* was received by the Coastguard or Auckland Maritime Radio.
- 1.1.10 On clearing Waiheke Island the sea conditions were favourable. One of the passengers used the VHF radio to contact a commercial fisherman who was fishing near Great Barrier Island. The fisherman said that conditions were "Not too bad out there" so the skipper decided to continue to Great Barrier Island that night.

² A report, usually sent by radio, detailing the intended route, ETA at destination and number of persons on board.

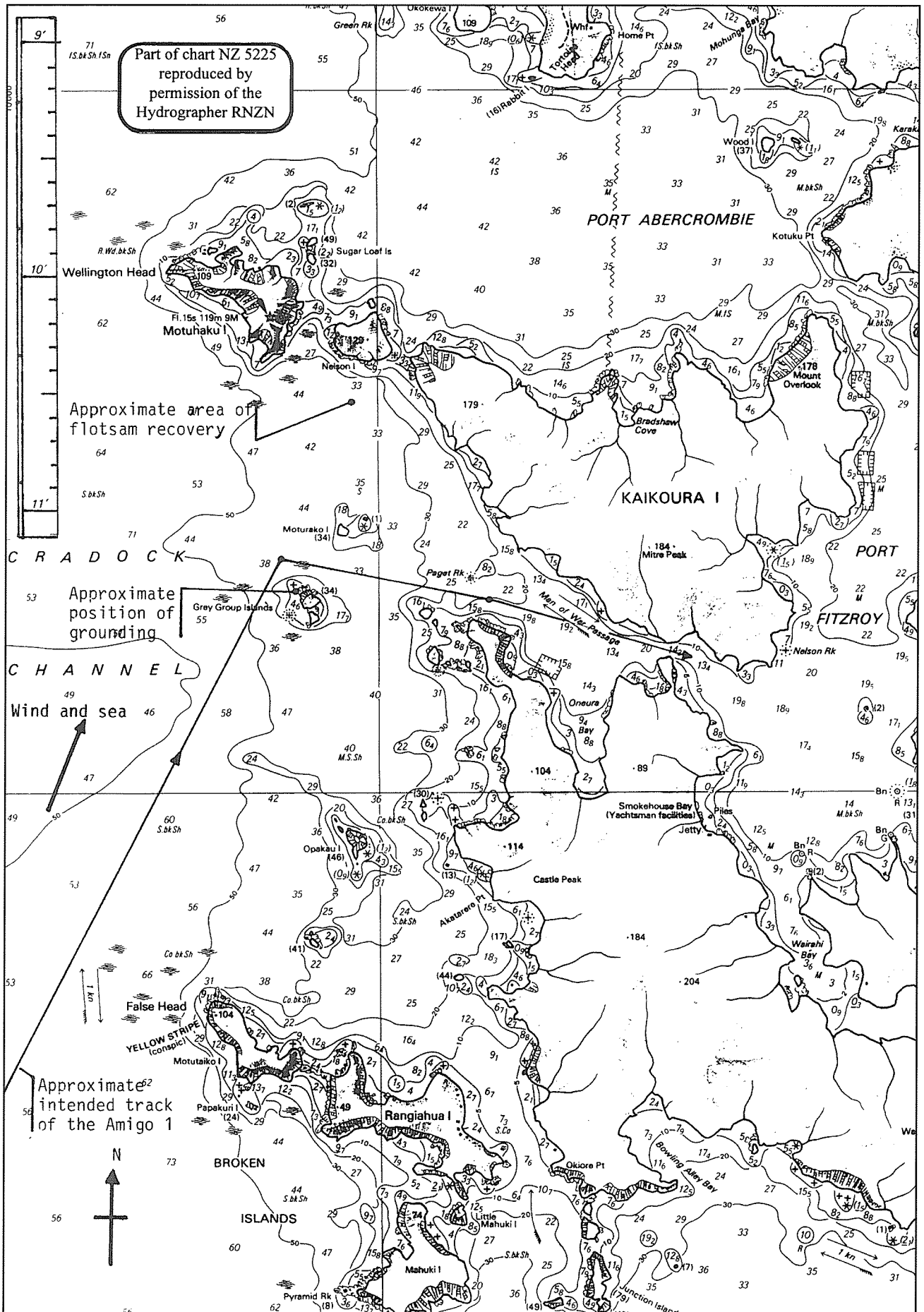


Figure 2
Part of chart NZ 5225, showing key information

- 1.1.11 The sea conditions deteriorated with the increase in fetch³ as the *Amigo 1* tracked out of the Hauraki Gulf. Heavy rain squalls were passing over the vessel. One of the passengers was observing the rain squalls on the radar. He had no experience with electronic navigation equipment and was keen to learn from the skipper how the radar and global positioning system (GPS) could be used. One of the other passengers was also taking an interest in the navigation of the vessel, another was asleep in the accommodation and the fourth dozed on the wheelhouse bunk.
- 1.1.12 The *Amigo 1* made good progress in the following sea. As the vessel crossed Colville Channel a particularly heavy rain squall from the south-west passed over the vessel, during which time the passengers estimated the wind was blowing 30 to 40 knots and the wave height had reached up to three to four metres. Once the squall had passed, the rain cleared but the wind speed and wave height did not abate.
- 1.1.13 The *Amigo 1* was being steered by autopilot and the skipper was monitoring its progress using the GPS and GPS-referenced chart plotter which were mounted on the control console directly in front of him. The radar display was mounted above the chart table behind the conning position, facing aft. To the passengers, the skipper did not appear to be using the radar.
- 1.1.14 The skipper appeared to have planned his route to Port Fitzroy via the Man of War Passage. He had programmed a way-point into the GPS which was about 1.5 cables north-west of the Grey Group Islands. (See Figure 2.)
- 1.1.15 At about 0130, with about 10 miles⁴ to run to the way-point off the Grey Group Islands, one of the passengers commented that he could see two flashing lights forward of the vessel. The other passenger asked the skipper if he wanted him to get the chart out and identify them. The skipper reportedly replied “No, it’s not necessary, we are okay”.
- 1.1.16 To satisfy their own curiosity, the two passengers got the chart out and studied it. They identified the two lights as being the Mokohinau and Motuhaku Islands Lights. After further study of the chart one of the passengers suggested to the skipper that it may be more prudent to enter Fitzroy Harbour via Port Abercrombie, as he was concerned at the narrowness of the Man of War Passage. The skipper reportedly replied “No, we are fine; to go that way is another couple of miles and there is no real need to do so”.
- 1.1.17 The other passenger commented that it might be prudent to call Great Barrier Island Radio to report their position and their estimated time of arrival at Port Fitzroy. The skipper is said to have replied that they (Great Barrier Radio) would be closed down at that time and no-one would hear them.
- 1.1.18 At about 0205, before the *Amigo 1* reached abeam of False Head on the Broken Islands group, the skipper changed the radar range scale for the passengers down from 12 to 3 miles.
- 1.1.19 After the radar was switched to the 3-mile range the passenger monitoring the radar became increasingly concerned about their position in relation to the Grey Group Islands as displayed on the radar. The *Amigo 1* was yawing about 10° either side of its set course and at the extremity of each yaw to starboard he noted that the islands were right ahead of the vessel on the display, yet on the GPS monitor the depicted position of the vessel was to port of the course line (further away from the islands). He pointed this out to the skipper and asked him why this should be. “Should we trust the radar or the GPS?” The skipper reportedly replied “The radar is an old set and may be faulty, we should be trusting the GPS”.

³ The distance up-wind from the point of observation over which the wind blows constantly and uninterrupted over the sea.

⁴ “miles”, where used in this report refers to nautical miles unless otherwise stated.

- 1.1.20 At about 0215 the same passenger looked at the GPS and asked the skipper when he would be heading toward the course line on the GPS. The skipper reportedly replied, “There is no need to do that until we get closer to the way-point”. Shortly after, witnesses heard the skipper say, “We are coming up to the tricky point; the next period of time is going to be tricky”.
- 1.1.21 On hearing the skipper’s comments the passenger who had been dozing on the wheelhouse bunk looked up at the GPS monitor and noticed that there were two lines; one line extending from the direction in which the vessel had come to the way-point off the Grey Group Islands (intended track), and the other was the past track of their vessel. He recalled that the GPS displayed position of the vessel and its past track was “. . . about half an inch outside the intended track”, but he did not know what scale was in use on the chart monitor. (See Figure 4 in Analysis.)
- 1.1.22 The passenger monitoring the radar noticed over the next few minutes that the Grey Group Islands were gradually coming more onto the heading line of the vessel. He was contemplating challenging the skipper again when the passenger who had been dozing on the wheelhouse bunk stood up, looked out, saw “white water” close on the port side of the vessel and exclaimed, “We have got white water on the port side, real close, are we near a surf beach?” Another passenger looked out and recognised the white water as a reef and told the skipper to go full astern. The skipper took a moment to disengage the autopilot and then engaged the engine full astern.
- 1.1.23 The skipper kept the engine astern for about 30 seconds and then engaged the engine ahead and applied full throttle and full starboard helm. As he was asking, “Where is this white water?” the *Amigo 1* struck a rock somewhere in the region of the port bow. The skipper reportedly exclaimed, “Where are we? what’s going on?” and engaged the engine full astern again. About then, a wave picked up the *Amigo 1* and deposited it on the reef that extends out from the north-west side of the main island in the Grey Group Islands.
- 1.1.24 The skipper checked the engine room for damage and made several attempts to reverse off the reef while a passenger sent three Mayday calls on VHF radio Channel 16. The passenger who made the calls was familiar with VHF radio procedures having recently obtained his Restricted Radio Operator Licence. He recalled that the VHF transmit light was illuminating with each call; however, nobody responded to the Mayday calls so the passengers tried using a cellular telephone to report their distress, but failed to make a connection.
- 1.1.25 The passenger who had been asleep in the forward cabin noticed a change in the motion of the boat and felt the engine being operated astern. He was getting dressed when the vessel struck the rocks and, soon after, one of the other passengers came down to grab life-jackets and told him to get out of the cabin.
- 1.1.26 The passengers had difficulties separating the life-jackets from one another because their securing tapes were tangled. As none of them had been shown the life-jackets, and none had seen that type before, they could not figure out in the dark how to secure them properly.
- 1.1.27 The *Amigo 1* was now being pounded by heavy seas and before long the vessel started to break up. The passengers suggested to the skipper, who was still trying to reverse the boat off the reef, that it was time to abandon ship.
- 1.1.28 One of the passengers asked the skipper how to don his life-jacket, but the skipper was too busy to answer him, so he pulled it over his head, tied whatever securing tapes he could find around his waist, ventured out onto the deck and was promptly washed overboard. Sensing where the shore was, he swam around the stern of the vessel, climbed up onto the rocks and called for his colleagues to do the same.

- 1.1.29 Meanwhile, on board the vessel, the skipper told a passenger to launch the life-raft then returned to the wheelhouse to look for the emergency position indicating radio beacon (EPIRB). The life-raft was stowed on the roof of the wheelhouse and the passenger had to stand on the bulwarks to reach it. He had difficulty untying the two rope lashings that were securing it.
- 1.1.30 Eventually the passenger managed to untie the life-raft and lift it down onto the deck, only to find that it was stowed inside a waterproof bag which was also tied shut with rope. The remaining two passengers were meanwhile trying to don life-jackets. One of them had donned his own personal buoyancy vest and had slipped one of the *Amigo 1* life-jackets over his head and tied it as best he could. He then assisted the other passenger to don his life-jacket, tying it as best he could behind the back of the passenger using a double overhand knot. This life-jacket was later recovered by rescuers but the wearer is still missing. (See Section 1.5)
- 1.1.31 The skipper came out of the wheelhouse, which was awash, and reportedly said that he could not find the EPIRB. At about this time the *Amigo 1* began to slide backwards off the rocks. Attempts to launch the life-raft were abandoned and the three remaining passengers entered the water; the skipper followed shortly after, grabbing a life-buoy as he went.
- 1.1.32 The three passengers tried to stay together as a group but were separated almost immediately in the rough seas. The passenger who had been trying to launch the life-raft was half swept and half swam towards the voice of the passenger on the island, and climbed up on to the rocks beside him. The skipper briefly caught up with the other two; however, they too were separated. The passenger wearing two life-jackets was swept across the reef by the tide and sea. He made contact with the island twice but was unable to climb up the steep-to rocks and was eventually swept away from the island, drifted across the bay to Moturako Island where he managed to climb out of the water, find a spot sheltered from the wind and wait for first light.
- 1.1.33 The two passengers on the main island of the Grey Group Islands heard someone in the water crying for help. They considered entering the water to assist him but it was “pitch dark” and they concluded that it would be foolhardy to re-enter the water under the circumstances; instead they kept shouting for him to swim toward their voices. The cries for help soon faded and stopped. They thought they also heard the sound of someone retching coming from further around the rocks. One of the passengers later said that the skipper was swimming on his front with the life-buoy around his middle and was swallowing a lot of water. The skipper was not wearing a life-jacket.
- 1.1.34 Of the two passengers who had made it ashore on the Grey Group Islands, the first was by that time shivering violently so the pair climbed the island and found shelter from the wind. The second person ashore then tried to return to the rocks to search for other survivors, but he got no further than 10 feet in the dark when he fell down a hole in the rocks. He extracted himself from the rocks and returned to the shelter where the pair huddled to conserve body heat and waited for first light.
- 1.1.35 At first light the passenger on Moturako Island saw several boats emerging from Man of War Passage. Eventually he was seen by the crew of a local fishing boat and taken on board. Soon after, the other two survivors were seen and picked up from the main island of the Grey Group Islands.
- 1.1.36 The fisherman reported the accident by VHF radio to Great Barrier Radio and started a search of the area for the missing skipper and passenger. The skipper’s body was found attached to the life-buoy in the vicinity of Nelson Island. In spite of an intensive sea and air search the fourth passenger is still missing, presumed drowned.

1.2 Vessel information

- 1.2.1 The *Amigo 1* was built as a 12.8 m crayfish fishing vessel, constructed mainly from GRP. The hull was a Salthouse Corsair design that had been lengthened at building to accommodate a fish hold and large aft working deck.
- 1.2.2 Propulsion was by one 261 kW GM 8V/92 diesel engine driving a single fixed-pitch propeller giving a service speed of about 15 knots.
- 1.2.3 The accommodation was forward with the engine room behind it. The wheelhouse sat on top of these, just forward of midships. The fish hold was set into a large working deck aft which was mostly covered by a protective awning.
- 1.2.4 Access to the forward cabin was down through a companionway under the wheelhouse control console. The engine room was accessed through a hatch under the wheelhouse bunk.
- 1.2.5 Buoyancy apparatus carried consisted of an eight-person life-raft, two life-buoys (providing buoyancy for two persons each) and eight life-jackets equating to life-saving apparatus for 20 persons. The life-raft was stowed inside a nylon bag lashed with two ropes to the top of the wheelhouse. Both life-buoys were stowed in a bracket on top of the wheelhouse. The eight life-jackets were stowed in a locker at the front of the forward cabin.
- 1.2.6 Other safety equipment carried included an EPIRB and flares. Both the EPIRB and flares were stowed in a compartment on the port side of the wheelhouse.
- 1.2.7 Navigation and communication equipment carried included the following:
- one magnetic compass (with autopilot)
 - one Koden 48-mile radar
 - one Cetrek GPS with chart plotter
 - one Koden CVS 8822 echo sounder
 - one VHF radio
 - one AWA TR110H Single Side Band (SSB) radio

A cellular telephone was installed also.

- 1.2.8 The radar had been repaired in Bluff about three months prior to the accident and was reported to have been working satisfactorily over the ensuing months up to the time of the accident.
- 1.2.9 The skipper's partner reported that the autopilot had an intermittent fault where it would sometimes veer off course taking the vessel in a full circle. The intermittent fault occurred more often when trying to engage the autopilot. The fault was listed on the sale agreement when the *Amigo 1* was purchased in 1996. Several technicians had tried to trace the fault but due to its intermittent nature it was not found and was thought to be still present at the time of the accident.
- 1.2.10 The GPS and electronic chart plotter were installed new in 1996, after the skipper purchased the *Amigo 1*.

1.3 GPS navigation systems

- 1.3.1 Since the inception of GPS, the accuracy and reliability of the system has steadily improved, and the cost of installing a GPS has reduced; consequently it has become commonplace on a wide variety of craft.
- 1.3.2 With the increasing popularity of GPS navigation, there has been an increase in what are being termed “GPS assisted” accidents. Many of these accidents have been caused by the user assuming the GPS displayed position was satellite derived, when in fact the receiver had reverted unnoticed to dead-reckoning (DR) mode. Many accidents have been caused simply by the user placing too much reliance and faith in the accuracy of GPS as a position fixing system when navigating in close proximity to navigational hazards.
- 1.3.3 At the time of this accident a constellation of 24 satellites were available for civil use. The following information (caution) on GPS was given in the New Zealand Nautical Almanac 1997:
- Most civilian users of GPS have access only to a degraded version of the system which permits horizontal positional accuracy of 100 metres or better at the 99.5% confidence level or 300 metres or better at the 99.9% level. Degradation is by means of Selective Availability (SA), which is a method of corrupting satellite position and/or clock data contained in the navigational message transmitted from the satellites.
- The above factors affect the integrity of the system, and therefore mariners are advised to use GPS with the same caution they apply to other aids to navigation and to ensure that positions are checked by other available means.
- 1.3.4 To compensate for the irregular shape of the Earth the GPS is referenced to the World Geodetic System 1984 (WGS84) Datum, which relates positions on the Earth’s surface to a mathematically defined spheroid with its origin at the Earth’s centre of mass.
- 1.3.5 Some New Zealand charts use a local datum which differs from the WGS84. Where this is the case the chart will have a “Satellite Derived Positions” note near the chart title which provides latitude and longitude shift values to enable GPS derived positions to be adjusted before plotting on the chart.
- 1.3.6 If users are not plotting positions on the chart, but following the track on an electronic chart plotter, then they need to be aware whether their plotter automatically accounts for the off-set or if they should allow for it manually.
- 1.3.7 The New Zealand charts for the accident area contained a note warning users that satellite derived positions needed to be shifted 0.1 minutes (about 185 metres) to the south to agree with the chart.
- 1.3.8 While searching for survivors in the channel between Nelson and Motuhaku Islands on the day of the accident, it was noted on the Police Launch *Deodar* that the GPS position shown on their electronic chart plotter was 200 to 300 m to the west of their actual position.
- 1.3.9 It is not known whether the GPS chart plotter on the *Amigo I* was compensating for any off-set between actual and satellite derived positions. According to the skipper’s partner, the skipper was aware that a possible discrepancy existed.

1.4 Personnel and survey information

- 1.4.1 The skipper obtained his Local Launchman Licence (LLL) in September 1987 and operated a dual purpose inshore fishing/fishing and scenic charter vessel around Stewart Island in Foveaux Strait for about eight years. He sold the boat in late 1995 but continued to operate it for the following six months on behalf of the new owner.
- 1.4.2 The course syllabus for an LLL included basic navigation only; therefore the holder of an LLL was restricted to operating designated craft of less than 20 m in length, and those craft only in designated areas with which they were familiar. It was a requirement that both the craft and the area of operation were endorsed on the LLL.
- 1.4.3 Before an LLL could be obtained the applicant must first have served at least six months qualifying sea service, at least one month of which must have been served in the area for which the licence was sought. If a holder of an LLL later wanted a licence to be endorsed for additional areas the Principal Examiner would endorse the licence as required but may have first required proof that the holder had knowledge of the new area sufficient to enable safe navigation.
- 1.4.4 The skipper purchased the *Amigo 1* through a Tauranga broker in March 1996 and he and his partner, who had often accompanied him on charter trips around Stewart Island, relocated the vessel to Stewart Island where they continued to operate it as an inshore fishing vessel. He had his LLL endorsed to operate the *Amigo 1* in the Stewart Island area.
- 1.4.5 The *Amigo 1* had been previously issued with a dual Certificate of Survey for a class X, inshore fishing vessel (anywhere within the New Zealand 12 nautical mile territorial limit), and classes IV and V, restricted-limit vessel (within Tauranga and Whangamata River and Extended River Limits), but the previous owner had let the inshore fishing survey lapse in 1995.
- 1.4.6 At the time the skipper purchased the *Amigo 1* the vessel had a Certificate of Survey as a restricted-limit vessel Classes IV and V (within Tauranga and Whangamata River and Extended River Limits). This certificate expired in December 1996.
- 1.4.7 Before operating in the Stewart Island area as a commercial fishing vessel the *Amigo 1* should have been re-surveyed as a Class X, inshore fishing vessel, but as this was not completed the vessel was operating “out of survey” for the period when it was based at Stewart Island.
- 1.4.8 In February 1997 the *Amigo 1* was put on the slip in Bluff for painting, repairs and survey for renewal of its Certificates of Survey. By late April 1997 all work had been completed and on 28 April an Interim Certificate of Survey was issued by the local Marine and Industrial (M&I) surveyor for the *Amigo 1* as a restricted-limit ship, Classes IV and V for Tauranga and Whangamata Extended River Limits, and for a Class X, inshore fishing vessel.
- 1.4.9 A Radiotelephone Installation Survey was completed by a radio surveyor on 23 April 1997 and a Notification of a Radiotelephone Installation Survey form was completed and presented to the M&I surveyor. The form was endorsed with the following comment:
- Plying limit restricted to Maritime Safety Channel 16 VHF coverage areas only.
- 1.4.10 Prior to 1993 vessels such as the *Amigo 1* were allowed to operate outside VHF coverage areas provided they were fitted with SSB radio. However, on 1 October 1993 the Auckland, Wellington and Awarua high frequency (HF) coast radio stations were closed down and replaced with a single HF station which had its antenna located near Taupo {(ZLM) Taupo Maritime Radio}. This required that vessels have SSB radios of sufficient power to transmit over greater distances.

- 1.4.11 The AWA110H SSB radio, as fitted on the *Amigo I*, was deemed by the Maritime Safety Authority (MSA) to be not powerful enough. An MSA Circular Letter to surveyors of 9 November 1993 listed the AWA 110H SSB radio as a “not approved type”. Owners had to either purchase a more powerful “approved” type of SSB radio or reduce their operating limits to those where continuous VHF coverage was provided.
- 1.4.12 The Interim Certificate of Survey and Radio Survey declaration was forwarded to the MSA who subsequently issued, on 13 May 1997, an equivalent to a full term Certificate of Survey with expiry date 31 January 1998. Normally the certificate would have been issued for a four-year term; however, with the forth-coming New Zealand Ship Safety Management Code in February 1998, Certificates of Survey were to be withdrawn. Instead, operators would be required to belong to an approved safe ship management system and operate under a Safe Ship Management Certificate. (See Appendix A.)
- 1.4.13 The Certificate of Survey issued by the MSA for the *Amigo I* described the limits of operation as follows:
- As classes IV and V - Tauranga and Whangamata Extended River Limits and all river limits within the Tauranga and Whangamata Extended River Limits.
- As Class X - Inshore Fishing (within the limits of the 12 mile territorial sea of New Zealand).
- Vessel to be operated only within the normal coverage of a New Zealand VHF coast station on Channel 16 (radio telephony).
- 1.4.14 Meanwhile the skipper applied to the MSA for a dispensation to use the *Amigo I* as a pleasure craft. It is assumed that he did this to enable him to relocate the *Amigo I* to Auckland. As a surveyed boat the skipper’s LLL did not permit him to operate the vessel outside the Stewart Island Area. The MSA wrote back to the skipper on 28 April 1997 requesting more updated details of survey, as their records did not then show the results of the latest surveys that had just been done in Bluff.
- 1.4.15 At the time of MSA writing, the skipper and his partner were two days into their voyage from Bluff to Auckland on the *Amigo I*, having already delayed their departure by two days while they waited for a spare part for the radar.
- 1.4.16 The *Amigo I* arrived in Tauranga on 3 May 1997 and stayed there for a number of days before the skipper took it on to Auckland. The skipper and his partner intended to operate a charter business out of Pine Harbour Marina in Auckland.
- 1.4.17 In early June the skipper approached Maritime Management Services (MMS), a quality assured supplier of safe ship management (see Appendix A) and on 10 June 1997 he entered into a contract for MMS to supply, and help install on the *Amigo I*, a safe ship management system that complied with the code.
- 1.4.18 On 11 June 1997 the MSA exempted the *Amigo I* from the requirement to be surveyed and on the same day MMS issued a Safe Ship Management Certificate for the vessel. The new certificate should have reflected the limits as shown on the MSA certificate, but MMS omitted to transfer the VHF coverage clause. The person issuing the new certificate was not aware that such a restriction should have been imposed.

- 1.4.19 On receiving the Safe Ship Management Certificate the skipper realised that it did not include Auckland Extended River Limits in which he intended to operate. At his request a new Safe Ship Management Certificate was issued by MMS which included Auckland Extended River Limits. The new Certificate still did not contain the clause restricting the *Amigo 1* to operating within areas covered by MSA VHF Channel 16.
- 1.4.20 The skipper did not apply to the Principal Examiner to have his LLL endorsed for the Auckland, Whangamata or Tauranga areas as he was required to do. It was not MMS's policy to check the qualifications of skippers under their safe ship management umbrella. It therefore went unnoticed that the skipper of the *Amigo 1* was not qualified to operate in the areas for which his vessel was certified.
- 1.4.21 The skipper had made one charter trip to Great Barrier Island prior to the accident trip. Several members of the Maraetai Boating Club, who were familiar with the Great Barrier Island coast, made the trip and pointed out some of the better fishing spots to the skipper.
- 1.4.22 All of the passage on the familiarisation trip was made in daylight and entry to and departure from Port Fitzroy was via Port Abercrombie. From Port Fitzroy the *Amigo 1* headed north and all but circumnavigated Great Barrier Island to allow the skipper to familiarise himself with the features of the coastline. However, the south-west quadrant of the island, including the Man of War Passage, was not covered due to deteriorating weather conditions.
- 1.4.23 Auckland Extended River Limits included all of the west coast of Great Barrier Island. The charted VHF Channel 16 area covered by Auckland Maritime Radio included the Hauraki Gulf and part of Bream Head to Cape Colville out as far as the southern side of the Broken Islands on the south-west coast of Great Barrier Island. MSA Channel 16 VHF coverage for distress and calling was not guaranteed for the remainder of the west coast of Great Barrier Island, including the area where the accident occurred. (See Figure 3.)
- 1.4.24 Great Barrier Radio was a privately owned and operated VHF station providing VHF coverage around Great Barrier Island. The station monitored VHF Channel 1 from 0700 to 2200 each day, occasionally later at night on specific request.
- 1.4.25 Figure 3 shows part of the MSA/Broadcasting Communications Ltd (BCL) 24 hour VHF coverage areas which are based on an International Maritime Organisation (IMO) formula which allows for mariners transmitting on a typical hand-held VHF with its antenna height at one metre above the water (a typical distress situation). A more powerful VHF set with a greater antenna height may be heard at greater distances. It was not uncommon for small vessels entering Port Fitzroy on Great Barrier Island to lose radio contact in the approaches to Port Fitzroy. For this reason mariners who were familiar with the area often sent their TR to Auckland Maritime Radio before making their approach to the port.
- 1.4.26 It could not be established if the skipper was aware that by taking the *Amigo 1* to Port Fitzroy he was operating outside the limits specified on the superseded MSA Certificate of Survey, or if he was aware that his LLL was not valid for Auckland Extended River Limits.

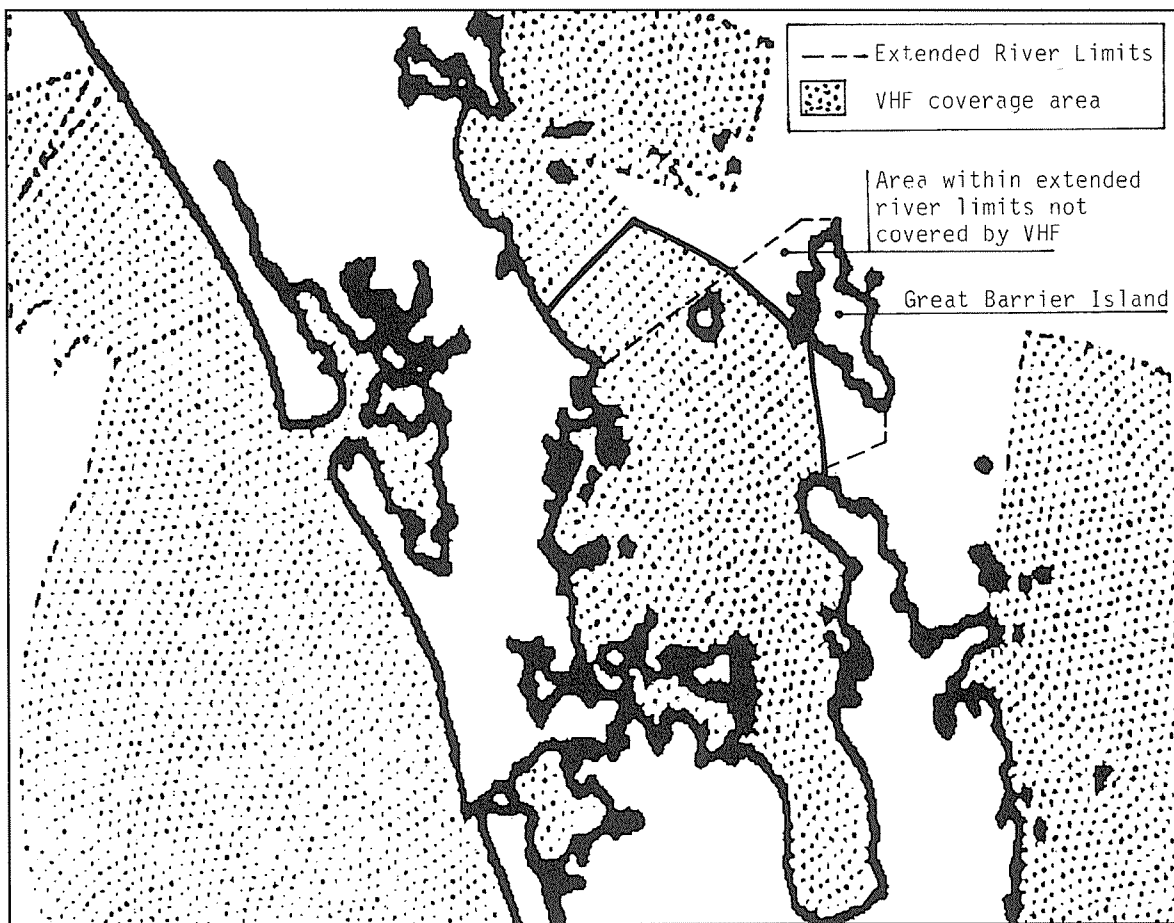


Figure 3
Part of the MSA/BCL 24 hour VHF coverage chart
with Auckland Extended River Limits added

1.5 Other information

- 1.5.1 The *Amigo I* was found close to the position where it grounded. The keel had become wedged in a cleft in the rocks and broken off. The boat was a total loss.
- 1.5.2 The life-jacket that was found by rescuers was thought to have been the one worn by the passenger who is still missing, presumed drowned. The tapes were tied in a double overhand knot in a position which would have been behind the wearer's back.
- 1.5.3 On inspection the securing tapes were found to have torn off close to where they were stitched into the bottom of the life-jacket on both sides. The tapes had suffered degradation to a point whereby the tapes could be torn through by a simple hand tear test.
- 1.5.4 In comparison, the other recovered life-jackets appeared to be in newer condition than the damaged life-jacket. Their securing tapes remained intact when subjected to a violent tug or hand tear test.

1.6 Toxicology

- 1.6.1 Some of the passengers were consuming alcohol on the trip from Pine Harbour Marina. The skipper was observed to consume two cans of beer and one glass of wine after leaving the marina on the accident trip. He did not appear to the passengers to be showing any signs of intoxication.
- 1.6.2 Post mortem toxicology recorded the skipper as having a blood alcohol level of 10 milligrams of alcohol per 100 millilitres blood, well below the legal limit for driving a motor vehicle on the road.

2. Analysis

2.1 The accident

- 2.1.1 The skipper did not operate the *Amigo 1* at night if it was avoidable. According to his partner he preferred, as did she, to operate during daylight only. For the accident trip the skipper had planned to make all of the passage during daylight, with the nights spent at safe anchorage.
- 2.1.2 When the plan went awry due to the problem with the hydraulic pump, the skipper's comments to his partner that evening indicate that he would have preferred to delay departure until early the next morning and alter the planned route accordingly. The comments made by the passengers in response to that suggestion indicate that the skipper was under some pressure from them to depart that night.
- 2.1.3 The skipper was described by his partner and those who knew him as "Not the assertive type; he would not have wanted to upset them (the passengers)", so when the passengers suggested that the anchor could be handled manually the skipper appears to have succumbed to their enthusiasm and embarked on the trip at night against his better judgement. The anchor on the *Amigo 1* was heavy and the offer by the passengers to handle it manually was perhaps a measure of their enthusiasm to go fishing.
- 2.1.4 Although the skipper was under some pressure from the passengers, and perhaps somewhat frustrated by the events of the afternoon, he was unwise to embark on the trip against his better judgement.
- 2.1.5 The skipper appeared to have planned the passage from Kawau Island to Port Fitzroy via the Man of War Passage using a way-point off the Grey Group Islands to start his approach. It was to be the skipper's first time passing through the Man of War Passage, a passage he originally planned to make during daylight.
- 2.1.6 On his familiarisation trip to Great Barrier Island three weeks earlier, the skipper was seen to be using predominantly GPS for navigation. It is likely that he had programmed way-points into the GPS for key positions around the Hauraki Gulf and Great Barrier Island. On the accident trip the *Amigo 1* appeared to be following a GPS track from a way-point somewhere north of Waiheke Island to the one off the Grey Group Islands. (See Figure 1.)
- 2.1.7 According to his partner, the skipper knew basically how to operate the GPS, and knew that it had certain limitations of accuracy. In the past the skipper had often relied on his partner to use the GPS; however, in the course of time he had become familiar with its functions. The extent to which the skipper used the GPS on the two trips to Great Barrier Island indicated a confidence in, and reliance on it as his primary means of navigation.

- 2.1.8 The skipper's reported comments to the passengers about the radar set being old and perhaps unreliable were not characteristic of him. According to his partner the skipper often used the radar during the day, and always on the few occasions when circumstances required night navigation. The skipper delayed their departure from Bluff by two days while they waited for spare parts for the radar, and then used the radar extensively and effectively on the trip from Bluff to Auckland.
- 2.1.9 It is possible that the skipper found it difficult to use the radar in the close confines of the wheelhouse while the passengers were huddled around the display taking an interest in its operation. If this was the case, and with his confidence in the GPS, the skipper may have resigned himself to using the GPS alone for navigation. Notwithstanding that, if he intended to use the radar he could have asked the passengers to step aside.
- 2.1.10 It was not established with certainty why the *Amigo 1* turned early and grounded on the Grey Group Islands. It was too dark for the passengers to see what the skipper was doing with the autopilot. The skipper making the comment shortly before the grounding that "The next part is going to be tricky" indicates that his level of alertness was sufficiently high to counter the effects of any fatigue he may have been feeling.
- 2.1.11 According to the passengers the GPS indicated position of the *Amigo 1* was west of the intended course line displayed on the chart plotter as the vessel approached the way-point off the Grey Group Islands. If the GPS position error was similar to that experienced on the *Deodar* later the same day, it is probable that the *Amigo 1* was closer to the intended course line than the skipper thought. This theory is supported by one passenger's description of what he saw on the radar shortly before the grounding.
- 2.1.12 Additionally, if the skipper was making no allowance for the known off-set to the south, the *Amigo 1* would not have been as far along the intended track as he may have imagined.
- 2.1.13 Without having checked the position of the vessel by other means, the two items of possible misinformation from the GPS may have prompted the skipper to make his turn into the Man of War Passage earlier than he should have. (See Figure 4.)
- 2.1.14 The possibility that an autopilot malfunction caused the vessel to veer to starboard unnoticed by the skipper could not be ruled out; however, the skipper's reported comments indicate that he made a deliberate turn to starboard based on misinformation from the GPS plotter.
- 2.1.15 The earlier cue from one of the passengers that the Grey Group Islands were almost ahead on the radar display should have alerted the skipper that something was not quite right. The skipper appears to have ignored the cue and continued with his set plan. It is not uncommon for a person performing a task that demands of them a high degree of concentration to become so fixated on that task that they disregard other cues that are not consistent with their plan.
- 2.1.16 Only when the passengers remarked about the waves breaking over rocks close by the port side of the vessel did the skipper come to realise that the vessel was not where he thought it was.

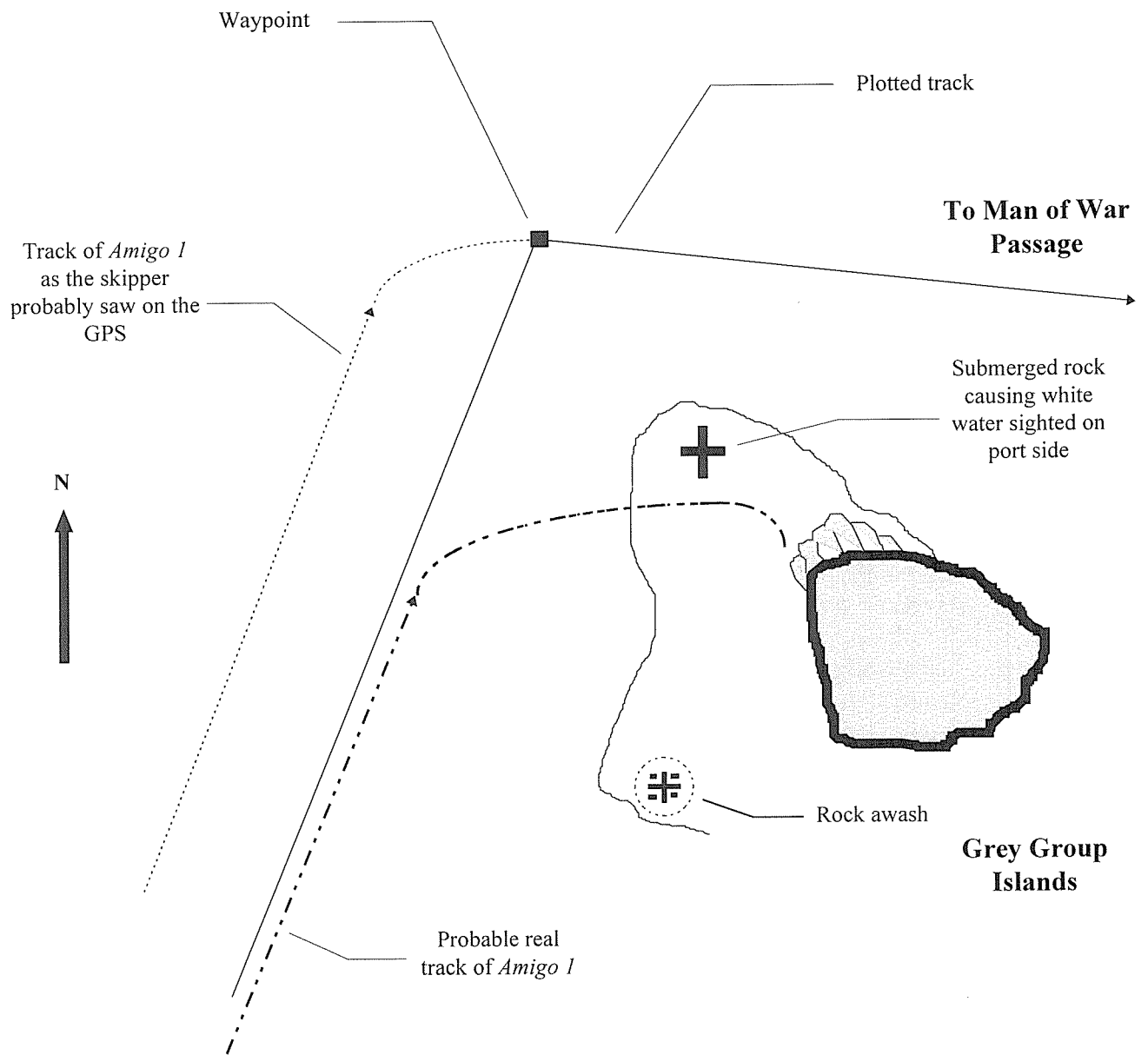


Figure 4
Diagram showing plotted, probable and perceived tracks of the
***Amigo 1* leading up to the grounding (diagram not to scale)**

- 2.1.17 The skipper's reported comments, "Where is this white water?" "Where are we?" "What's going on?" were a clear indication that he had lost situational awareness before the grounding. He apparently did not see the white water on the port side of his vessel. Relying on information from the passengers, his engaging the engine astern and turning to starboard would have been an instinctive reaction to stop his vessel proceeding further into a perceived dangerous situation, and to turn away from the reported source of danger.
- 2.1.18 Regardless of what caused the *Amigo 1* to ground on the Grey Group Island, it was unwise for the skipper to have been attempting to enter Port Fitzroy via the Man of War Passage in the dark and in the weather conditions prevailing at the time. Such a transit would have been a challenge even for a skipper who was familiar with the passage.
- 2.1.19 From the time the *Amigo 1* approached the Grey Group Islands the vessel was rarely going to be more than 200 to 300 m from a navigational hazard. The narrowest part of the Man of War Passage was a little over 100 m across and there were no navigational lights or beacons to assist the skipper in his transit through the passage. GPS does not have a sufficient guaranteed level of accuracy to be relied on in such a channel.

2.2 Survivability

- 2.2.1 After the *Amigo 1* ran aground, the need to abandon ship soon became apparent. What also became apparent was that the passengers did not know how to use the various life-saving appliances or, with the exception of the life-jackets, where they were kept.
- 2.2.2 The passengers stated that the skipper had not briefed them on the life-saving and fire-fighting equipment on board the *Amigo 1*. None of the passengers had seen the particular type of life-jacket carried on the vessel before; consequently none knew how to wear them. Not one of the passengers donned a life-jacket in the correct fashion.
- 2.2.3 The life-jackets were stowed together in a locker near the front of the main cabin. Stowage was such that their tapes were tangled, making it difficult to separate them.
- 2.2.4 One of the life-jackets was found with its securing tapes torn through. It is believed to have been the life-jacket worn by the passenger who is missing, presumed drowned. On inspection the securing tapes were found to be degraded to a point where the tapes could be torn through by hand, in spite of having been surveyed about three months before the accident.
- 2.2.5 If the damaged life-jacket was the one worn by the missing passenger, the tapes probably broke as the wearer entered the water, allowing him to slip out through the bottom of the jacket. The wearer may have survived if he had managed to retain his life-jacket, as did the passenger who drifted to Moturako Island.
- 2.2.6 The life-raft was stowed in a position that was difficult to access. Although it was well lashed down there was no quick-release mechanism or knife readily available to sever the ties. Once the passenger had managed to untie the life-raft and lower it to the deck, he still had to release it from the bag which had presumably been put over the valise to protect the raft from the weather. The end result was that the life-raft was unable to be used before the *Amigo 1* sank.
- 2.2.7 It is worth mentioning that the life-raft on the *Amigo 1* formed part of the buoyancy apparatus requirements for a restricted-limit vessel. Because restricted-limit vessels only operate in areas where rescue services are close to hand, and because of the impracticability of some passenger ferries carrying a life-jacket for each passenger, life-rafts or similar apparatus are allowed to make up the total life-saving capacity of the vessel.

- 2.2.8 Where life-rafts or similar apparatus are carried, they should be available for immediate use. If the *Amigo 1* had been carrying its full complement of passengers on the accident trip, without being able to use the life-raft, some of the passengers or crew would have entered the water without the use of a buoyancy aid.
- 2.2.9 According to the skipper's partner, the various life-saving appliances on the *Amigo 1* were stowed in the same place on the night of the accident as they were at the time of its last survey. The accident highlights the need for owners, operators, surveyors and safe ship management companies to take particular notice of the accessibility to such equipment.
- 2.2.10 The EPIRB was not stowed in a readily accessible position. The skipper was aware of its location but probably could not reach it due to the wheelhouse being awash. EPIRBs should be stowed in positions where they can easily be located in an emergency, preferably near the exit from the wheelhouse. It is unlikely that the EPIRB, if activated, would have saved the lives of the skipper and missing passenger; however, it may have resulted in an earlier rescue of the survivors.
- 2.2.11 The value of an EPIRB to survivors is significantly enhanced if the local radio station or Coastguard is aware of a skipper's intended voyage. Valuable time can be lost in establishing what vessels are in an area where an EPIRB has been detected. If the vessel in distress is known to be in the vicinity, is recorded as overdue or cannot be contacted, the initial search area can be significantly reduced thereby increasing the chances of rescue and survival. The skipper of the *Amigo 1* did not report his intended voyage to a radio station in spite of a prompt to do so by one of the passengers.
- 2.2.12 If flares had been available and used, they may have been sighted by persons ashore or on other vessels in the vicinity, even at 0215 in the morning.

2.3 Communications

- 2.3.1 The only approved type of communication equipment on board the *Amigo 1* was the VHF radio. The Safe Ship Management Certificate issued by MMS for the *Amigo 1* implied that the skipper could operate anywhere within Auckland Extended River Limits. No mention was made on the certificate about restricting operation to those areas depicted on the MSA/BCL VHF coverage chart. The accident occurred within the Auckland Extended River Limits but just outside the MSA/BCL VHF coverage area.
- 2.3.2 MMS management were not aware that craft should be fitted with an approved SSB radio to operate around the greater part of Great Barrier Island, and consequently had not endorsed the Safe Ship Management Certificate for the *Amigo 1* with an operating area radio restriction. An endorsement limiting operation of the vessel around Great Barrier Island to times when Great Barrier Radio was on the air would have been a prudent measure.
- 2.3.3 While the *Amigo 1* VHF radio, with its antenna about five metres above the waterline, could reasonably be expected to perform adequately a little further outside the MSA/BCL limits, those limits were set using a typical distress situation where survivors may be using a portable VHF radio from survival craft.
- 2.3.4 Most of the skipper's sea-going career was spent within Stewart Island Extended River Limits, all of which was covered by a coastal VHF radio station. Given that the skipper had no experience of operating in an area where the geographical and VHF limits were not complementary (such as Auckland Extended River Limits), and that he had from MMS a Safe Ship Management Certificate for the *Amigo 1* to operate in Auckland Extended River Limits, it is possible that the skipper was unaware that he was operating the *Amigo 1* outside practicable radio limits.

- 2.3.5 It would have been prudent for the skipper to have called Auckland Maritime Radio and submit a TR; however, this action would not have prevented the accident, and it is questionable whether it would have saved his and the missing passenger's life. Unless the EPIRB was activated it is unlikely that sending a TR would have resulted in earlier rescue either, as overdue arrival TRs are only acted upon if an unidentified distress signal is received for that area.
- 2.3.6 Three Mayday calls were sent from the *Amigo 1*, none of which were heard by Auckland Maritime Radio. It is known that the VHF on *Amigo 1* was functioning prior to the grounding because it had been successfully used earlier to contact the fishermen off Great Barrier Island. Although it could not be ruled out that the VHF or its antenna may have been damaged in the grounding, the likely cause of the failure to make contact with Auckland Maritime Radio was that the grounding occurred in an area of known poor VHF coverage. If the accident had occurred in an area where 24 hour VHF coverage was provided the Mayday calls were likely to have been heard, rescue services would then have been activated and lives may not have been lost.

2.4 Qualifications

- 2.4.1 The skipper's LLL was not valid for Auckland Extended River Limits. MMS, in issuing the *Amigo 1* with a Safe Ship Management Certificate, did not first check if the skipper held the appropriate licence to operate the vessel. The issue of whether Safe Ship Management Companies should be checking personnel qualifications and training standards was raised in connection with another two accidents under investigation by the Commission. At the time of the accident involving *Amigo 1* the issue remained unresolved.
- 2.4.2 The skipper had made only one previous trip to Great Barrier Island and that was to acquaint himself with the area and its potential fishing spots but that trip did not include the Man of War Passage where the accident occurred. That one trip fell short of what was expected as minimum experience to have his LLL endorsed for Auckland Extended River Limits. The skipper's unfamiliarity with the Man of War Passage and its approaches was a factor which contributed to the grounding.

2.5 Safe ship management

- 2.5.1 A brief description on the New Zealand Ship Safety Management Code is given in Appendix A to this report.
- 2.5.2 The New Zealand Ship Safety Management Code, the role of MMS in implementing the code and the role of MSA in monitoring the safe ship management companies and their clients for compliance with the code was under discussion following two other accidents involving a vessel which was also under MMS's safe ship management umbrella.
- 2.5.3 Although the circumstances involving the *Amigo 1* being entered into MMS's safe ship management system differ from those of the other vessel, some of the safety issues are similar.
- 2.5.4 The policy of MMS not to check the qualifications of their client's key operating personnel allowed the *Amigo 1*, a vessel under their Safe Ship Management umbrella, to be operated by a skipper who did not have the appropriate licence required by the Maritime Transport Act for that operation.

- 2.5.5 Because the *Amigo 1* did not have an approved SSB radio, the vessel could not legally operate around Great Barrier Island, most of which was outside the VHF coverage area of Auckland Maritime Radio. MMS management were not aware that vessels trading to Great Barrier Island were required to be fitted with SSB radio, consequently they issued the *Amigo 1* with a Safe Ship Management Certificate to operate outside the limits allowed under the Maritime Transport Act for that vessel.
- 2.5.6 The potential for both of the above breaches of the Act was always there in spite of MMS having been accredited to ISO 9001 standards by Standards New Zealand and being audited by the MSA.
- 2.5.7 Reference was made in the MMS Quality Assurance Manual to the relevant radio regulations and to the MSA Circular withdrawing approval for the type of SSB radio fitted to the *Amigo 1*. It appears that lack of reference to these two important pieces of legislation when awarding the *Amigo 1* Auckland Extended River Limits on its Safe Ship Management Certificate was a case of non-conformance within MMS's own quality assurance system.
- 2.5.8 The skipper was able to obtain a Safe Ship Management Certificate for the *Amigo 1* within one week of approaching MMS. A passenger on the *Amigo 1* could sight that certificate and assume that the operation of the *Amigo 1* met all of the requirements of the New Zealand Ship Safety Management Code, which was not technically possible. None of the necessary documentation and systems were fully in place at the time of the accident.
- 2.5.9 Recognising that it would not be commercially desirable for operators to have their vessel(s) out of service awaiting implementation of a safe ship management system, and that a ship operation cannot be properly audited for compliance with the code until it has been in operation for some time, a two-tier approach to entering ships into the system is desirable.
- 2.5.10 Ships could be surveyed/inspected and the qualifications of operating crew checked by the safe ship management company to ensure that the vessel and its crew meet at least the same minimum standards that they had to under the Certificate of Survey system. The ship could then operate under a **Provisional** Safe Ship Management Certificate for a period specified on the certificate. Prior to expiry of the provisional certificate operators must have fully implemented a safe ship management system to the satisfaction of the safe ship management company and/or certifying organisation.
- 2.5.11 Failure of an operator to effectively install a safe ship management system by the expiry date on the Provisional Certificate should result in the withdrawal from service of the vessel(s) until any non-conformance has been rectified.
- 2.5.12 The issuing of a Provisional Safe Ship Management Certificate to all new entrants into the system may go some way to alleviating the inevitable congestion and smooth the path into compulsory compliance with the code in February 1998.

3. Findings

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

- 3.1 The *Amigo 1* grounded on the Grey Group Islands when a starboard turn to enter the Man of War Passage was made too early.
- 3.2 The early turn to starboard was the result of the skipper losing situational awareness when he placed too much faith in the accuracy of the GPS and did not verify the position of his vessel by other available means.
- 3.3 It was not safe to have been navigating the *Amigo 1* by GPS alone when in close proximity to navigational hazards.
- 3.4 It was not safe for the *Amigo 1* to be entering Port Fitzroy via the Man of War Passage in the dark, in the sea and weather conditions on the night of the accident.
- 3.5 It was not characteristic of the skipper to attempt such a narrow passage at night and to use only GPS for navigation.
- 3.6 Pressure from the passengers to depart at night against the skipper's better judgement and, once under way, his fixation on reaching his destination as quickly as possible were probable factors influencing the skipper's uncharacteristic decisions.
- 3.7 The skipper was not licensed to operate the *Amigo 1* in Auckland Extended River Limits.
- 3.8 If the skipper had been familiar with the Man of War Passage and its approaches, as he should have been had he obtained his LLL endorsement for the area, he may not have attempted to enter the passage on the night of the accident.
- 3.9 The *Amigo 1* should not have been operated outside the MSA VHF coverage area at a time when alternative VHF coverage was not available, and should not have been granted a Safe Ship Management Certificate by MMS to operate unrestricted in Auckland Extended River Limits.
- 3.10 By operating outside the VHF coverage area the safety of the passengers and the vessel was compromised when the vessel grounded and was unable to summon assistance using VHF radio.
- 3.11 The passengers not being briefed on the location and use of all the life-saving apparatus on the *Amigo 1* added to their inherent danger when abandoning ship.
- 3.12 The inaccessibility of the life-raft, EPIRB and flares on board the *Amigo 1* meant that those items could not be used for saving life on the night of the accident.
- 3.13 Had all of the life-saving and signalling apparatus been in good condition and available for immediate use, lives may not have been lost, and rescue would have been sooner.
- 3.14 The poor condition of the life-jacket thought to have been worn by the missing passenger is likely to have contributed to his drowning.
- 3.15 The *Amigo 1* did not comply with the New Zealand Ship Safety Management Code in spite of it having been issued with a Safe Ship Management Certificate by MMS.

4. Safety Recommendations

4.1 It was recommended to the Chief Executive of Maritime Management Services that MMS:

- 4.1.1 Consider the VHF coverage guidelines provided by the MSA/BCL chart, and the availability of VHF coverage from other stations (with regard to both area, and times of operation), when assigning operating limits to vessels, (083/97); and
- 4.1.2 Review the operating limits given to existing vessels under its safe ship management umbrella and ensure their assigned limits are compatible with the radio equipment carried. (084/97)

4.2 The Chief Executive of Maritime Management Services responded as follows:

- 4.2.1 It is our intention to accept your recommendations and would comment as follows:
- 4.2.2 In doing so we trust that these recommendations are similarly put to other Safe Ship Management Companies and that the MSA is in agreement with the course of action proposed.
- 4.2.3 **083/97.** Maritime Management Services Ltd will be considering VHF coverage from other stations with regard to both area and times of operation when assigning operating limits to vessels based on the guidelines provided by the MSA/BCL chart.
- 4.2.4 **084/97.** Maritime Management Services Ltd will review the operating limits given to existing vessels in its Safe Ship Management System and ensure their assigned limits are compatible with the radio equipment carried.
- 4.2.5 It is our intention to make the review immediately and expect that it would be implemented within six weeks.

4.3 It was recommended to the Director of Maritime Safety that:

- 4.3.1 Due to the high level of commercial and pleasure boating activity in the Great Barrier Island and Eastern Coromandel areas, as part of MSA's upgrading of coastal VHF coverage, he give priority to extending VHF coverage in those areas, (085/97); and
- 4.3.2 He produce a Marine Notice (Boats) and an MSA Circular Letter to surveyors reminding mariners and surveyors of the importance of checking and maintaining the quality and accessibility of life-saving and signalling appliances on all boats at all times, and that this be included as a requirement in the relevant rules, (086/97); and
- 4.3.3 He introduce a mandatory system of two-tier entry into safe ship management where operators are issued with Provisional Safe Ship Management Certificates pending full compliance with the New Zealand Ship Safety Management Code. Provisional Certificates should only be issued for a specified period and for ships where:
 - the requirements under the present Certificate of Survey system are met or exceeded; and
 - operating crew hold qualifications required by the relevant manning regulations.

Prior to the expiry of each Provisional Certificate operators must have fully complied with the Code in order to be issued with a "Full Term" Certificate. Failure to do so should result in withdrawal of their Maritime Document. (087/97)

4.4 The Director of Maritime Safety responded as follows:

4.4.1 **085/97.** Over the last three years, the MSA has sought to develop a VHF radio network covering all areas of the New Zealand coast.

By early 1998, this service will extend to over 90% of all coastal areas of New Zealand. Inevitably, as a line of sight operation, a small number of unserved areas will remain. It is MSA's intention to continue to review this matter, including the undertaking of a detailed financial and cost benefit assessment of expansion to provide 100% coverage over the next two years. In this context, the area around Great Barrier Islands would be one of two remaining priority areas for study.

4.4.2 **086/97.** MSA intends to adopt your safety recommendation 086/97 and will shortly be compiling a Marine Boat Notice as a result of its own investigation into the accident. The points which will be covered are as follows:

- An over reliance on GPS plotter information without transferring it to the chart for land referencing can be dangerous.
- The largest scale chart available should be in use and the vessel's position should be monitored at frequent, regular intervals.
- A course should be laid off with a sufficient safety margin for appropriate action in the event of an emergency.
- All navigational equipment should be operational before the vessel leaves port.
- All liferafts which are stowed in a soft valise should not be put where they are exposed to the weather, but stowed in a place where they are readily accessible and sheltered.
- Where a velcro flap is fitted to a soft valise it should be overlaid with reflective tape to enable it to be easily identified in the dark.
- The EPIRB should be capable of being tracked by a satellite and it should be kept readily accessible, e.g. close to the wheelhouse entrance.
- Lifejackets should be kept in a readily accessible place and identified.
- The position, status and operation of all safety equipment should be carefully and regularly checked.

A circular letter to Safe Ship Management companies bringing their attention to these points and the need for them to encompass all the requirements of the code when they conduct an initial audit or inspection of a vessel, will also be compiled and distributed.

4.4.3 **087/97.** The proposal, if adopted, would currently be in breach of the approved Rule 21 - Safe Ship Management Systems and hence be illegal under current law. However, the principle being suggested is noted and could be seen to have merit. The matter will be subject to further evaluation, including discussion with Safe Ship Management companies as a matter of some priority.

- 4.5 Recommendations relating to compliance with the New Zealand Ship Safety Management Code were made to the Chief Executive of MMS and the Director of Maritime Safety in the Commission's Marine Accident Report 97-202/203, some of which were relevant to this accident report. The relevant recommendations follow.
- 4.6 It was recommended to the Director of Maritime Safety that he:
- 4.6.1 Ensures Maritime Management Services are fulfilling the requirements of a safe ship management provider under the New Zealand Ship Safety Management Code, (071/97); and
 - 4.6.2 Ensures that all safe ship management providers meet or exceed the same minimum standards. (072/97)
- 4.7 The Director of Maritime Safety responded as follows:
- 4.7.1 **071/97** - The Maritime Safety Authority (MSA) will ensure that Maritime Management Services (MMS) are fulfilling the requirements of a safe ship management provider immediately. An audit of MMS has been conducted under section 54 of the Maritime Transport Act 1994. Final approval of MMS as a safe ship management provider has not yet been granted. The company is presently restricted to the level of 'recognition' by the MSA within our approval process. The MSA will proceed further with approval of this Safe Ship Management company under the requirements of Part 21 of the Maritime Rules if they satisfactorily address our audit findings and recommendations and close out any non-conformance reports that may be received from a scheduled audit of their ISO system by Standards New Zealand in November.
 - 4.7.2 **072/97** - Maritime Rule 21.12 (Safe Ship Management Systems) requires that, from 1 February 1998, safe ship management providers have a valid certificate issued by a recognised accreditation body. This indicates that they have implemented a quality assurance system. In addition, safe ship management providers must meet or exceed the minimum standard by acquiring an assured supplier status in terms of AS/NZS ISO 9001 or 9002 as appropriate. It is by closely administering this rule and by conducting audits under section 54 of the Maritime Transport Act that the Maritime Safety Authority intends to ensure that the safe ship management providers meet the minimum standard.
- 4.8 It was recommended to the Chief Executive of Maritime Management Services that he:
- 4.8.1 Liaise with an [operator of the vessel in accident report 97-202/203] and review the Safety Management Policy Manual for their vessel critically and ensure it contains the relevant operational and safety instruction necessary to comply with the New Zealand Ship Safety Management Code, (066/97); and
 - 4.8.2 Ensure that the Safety Management Policy Manual for each vessel under MMS's safe ship umbrella, together with any other manuals, contains all relevant operational and safety instruction necessary to comply with the New Zealand Ship Safety Management Code, (067/97); and
 - 4.8.3 Review MMS's role in the safe ship management critically and, where necessary, change MMS's policy and practice to ensure each of its clients operate under an effective safe ship management system, (068/97); and

- 4.8.4 Change MMS's policy and procedures to ensure that when a client is a new operator, or an existing operator whose situation changes significantly, a systems audit be conducted on the vessel and any unsatisfactory feature corrected before MMS issues a Safe Ship Management Certificate, (069/97); and
- 4.8.5 Ensure MMS's resources are adequate for present and predicted workloads. (070/97)
- 4.9 The Chief Executive for Maritime Management Services responded in part as follows:
- 4.9.1 **066/97** - We have been working closely with the [operator of the vessel in accident report 97-202/203] since their accident, and our suspension of their Safe Ship Management Certificate, to reformulate their Safety Management Policy Manual and help them to develop their Operational and Safety Procedures Manual to fully cover the requirements of the Code. The lifting of their Safe Ship Management Certificate Suspension will not be made until we, and the MSA, are satisfied that their systems are fully in place and that the vessel is "Fit for Purpose". We expect this to be completed somewhere around the beginning of October 1997.
- 4.9.2 **067/97** - A draft Safety Management Policy Manual including all changes agreed with the MSA and a new Draft Operations Manual, for every vessel in our system is currently being presented to all owners. Both manuals have guidelines for completion as attachments. We anticipate that the revisions should be completed and signed off by MMS within four months.
- 4.9.3 **068/97** - MMS has reviewed its role in safe ship management in light of your recommendations in consultation with the MSA. We believe that with the expansion of the Safety Management Policy Manual, the appropriate guidelines and instructions and subsequent systems audits of the vessels, a step forward in safe ship management will be taken.
- 4.9.4 **069/97** - MMS's policy for the future in issuing Safe Ship Management Certificates will be to consider, prior to entry into our system, the operating intentions, parameters and safety procedures of any new operator, or those whose situation alters significantly. This will embrace any vessel whose ownership and land based designated person changes.
- 4.9.5 **070/97** - MMS has, as a matter of policy, had a continuing review of its resources and no change is envisaged. As an outcome of these reviews the company has isolated those areas where sufficient resource is available and has restricted its operations to them. At no time has the company's policy been to be "all things to all people". For this reason, and whilst it wishes to expand and assist the MSA to bring vessels into safe ship management, it will do so only as it is able.

Appendix A

The MSA New Zealand Ship Safety Management Code (the code) will become mandatory on 1 February 1998. The code was established in an attempt to move away from the tradition of the authority setting the standards and then inspecting the participants in the industry for compliance on an annual basis.

The code was designed to place a greater responsibility on the operator to conform to such standards on an on-going basis. An annual survey allowed those standards to be relaxed by the ship owner until the next survey was due.

In recognising that no two shipping companies or ship owners are the same; and that ships operate a wide range of services under different conditions; the code is based on general principles and objectives which are as applicable to a single small ship organisation as to a ship owner with a fleet of large ships.

The code states that:

The safety management objectives of the company should include:

- providing for safe practices in ship operation and a safe working environment,
- establishing safeguards against all identified risks, and
- continuously improving safety management skills of personnel ashore and aboard ships, including preparing for emergencies related to both safety and environmental protection.

The safety management system should ensure:

- compliance with mandatory rules and regulations, and
- applicable codes and standards prescribed or recommended by the MSA are taken into account.

The code applies to, among others, restricted-limit vessels such as the *Amigo 1*.

The MSA exempted vessels from being under survey prior to 1998 if they were operating satisfactorily under an approved safe ship management system.

An operator could provide their own safe ship management system or they could enter into a contract with a safe ship management provider company. The operator or the safe ship management company had to be certified to International Standards Organisation (ISO) standards by a body recognised by the MSA. Certification had to be ISO 9002 if the company owned the vessels, or to ISO 9001 if the company managed the vessels.

ISO certification was to ensure that the operator or safe ship management company had appropriate management systems in place, and that they were aware of any rules, standards or other legislation to which their end product (Safe Ship Management) had to conform. ISO certification did not monitor the quality of the end product. This was the role of the MSA.

To achieve ISO certification, a safe ship management company configured its system to conform with the standards and requirements set out in the code. It was then audited by the MSA to gain approval as a safe ship management provider.

Once approved the safe ship management company could enter into contracts with operators who were required to install a safe ship management system. Once the operator complied, the safe ship management company would issue to each vessel under its safe ship management umbrella, a maritime document. The code stated that “this maritime document should be accepted as evidence that the operating company and its shipboard management operate in accordance with the approved safety management system”.

At random intervals not exceeding one year, the code intended that safe ship management companies would conduct safety and systems audits on their clients’ safe ship management system. The safe ship management company was intended to report back to MSA with a “risk factor” for each of its clients so that MSA could monitor safety trends for any operator. MSA could withdraw any operators’ maritime document if the risk factor level became unacceptable and showed no trend of improvement. The reporting system was to be computer based; however, it was not operating at the time of the accident involving the *Amigo I*.

One safe ship management company was MMS, a quality assured supplier certified to ISO 9001 in late 1993. MMS had been audited by its ISO certifying body (Standards New Zealand) every six months for compliance with its own Quality Assurance Manual, the last audit being completed in February 1997. In addition, under the auspices of the MSA they became an “MSA approved” safe ship management provider. MMS was contracted by a number of small ship operators (clients) to design and help implement safe ship management systems for their ships. One such operator was the skipper of the *Amigo I*.

MMS objectives were listed as follows:

- To provide assurance to the MSA of client compliance with the new legislation (the code),
- to provide Land Based Safety Management for client vessel operations,
- to implement the New Zealand Ship Safety Management Code to client vessels,
- to monitor and record maintenance and safety practices,
- to provide Quality/Safety Management Policy Manuals and a Safe Ship Management Certificate for client vessels and thereby satisfy the requirements of the law, and
- to conduct normal Safety/Quality inspections.

MMS had a number of safety and quality officers for each area in New Zealand where their clients were based. The area safety officers, or in some cases a competent person⁵, conducted inspections similar to those which would normally have been required for an annual survey. The quality officers conducted systems audits to ensure each vessel was being operated in accordance with its “Safety Management Policy Manual”.

⁵ A person recognised by the MSA to conduct surveys of ships

Glossary of marine abbreviations and terms

AC	alternating current
aft	rear of the vessel
beam	width of a vessel
bilge	space for the collection of surplus liquid
bridge	structure from where a vessel is navigated and directed
bulkhead	nautical term for wall
bus	an arrangement of copper conductors (Bus bars) within a switchboard, from which the circuits are supplied
cable	0.1 of a nautical mile
chart datum	zero height referred to on a marine chart
command	take over-all responsibility for the vessel
conduct	in control of the vessel
conning	another term for “has conduct” or “in control”
DC	direct current
deckhead	nautical term for ceiling
dog	cleat or device for securing water-tight openings
draught	depth of the vessel in the water
EPIRB	emergency position indicating radio beacon
even keel	draught forward equals the draught aft
freeboard	distance from the waterline to the deck edge
free surface	effect where liquids are free to flow within its compartment
freshet	term used to describe an increase of water level in the river due to rain in the mountains
focsle	forecastle (raised structure on the bow of a vessel)
GM	metacentric height (measure of a vessel’s static stability)
GoM	fluid metacentric height (taking account the effect of free surface)
GPS	global positioning system
GS	general service
heel	angle of tilt caused by external forces
hove-to	when a vessel is slowed or stopped and lying at an angle to the sea which affords the safest and most comfortable ride
Hz	hertz (cycles)
IMO	International Maritime Organisation
ISO	International Standards Organisation
kW	kilowatt
list	angle of tilt caused by internal distribution of weights
m	metres
MSA	Maritime Safety Authority
NRCC	National Rescue Co-ordination Centre

point	measure of direction (one point = 1¼ degrees of arc)
press	force a tank to overflow by using a pump
SAR	Search and rescue
SOLAS	Safety Of Life At Sea convention
sounding	measure of the depth of a liquid
SSB	single-side-band radio
statical stability	measure of a vessel's stability in still water
supernumerary	non-fare-paying passenger
telegraph	device used to relay engine commands from bridge to engine room
ullage	distance from the top of a tank to the surface of the liquid in the tank
V	volts
VHF	very high frequency
windlass	winch used to raise a vessels anchor