

Final report MO-2016-206: Capsize and foundering of the charter fishing vessel *Francie*
with the loss of eight lives, Kaipara Harbour bar, 26 November 2016

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.

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Final Report

Marine inquiry MO-2016-206

Capsize and foundering of the charter fishing vessel *Francie* with the loss of eight lives

Kaipara Harbour bar

26 November 2016

Approved for publication: May 2018

Transport Accident Investigation Commission

About the Transport Accident Investigation Commission

The Transport Accident Investigation Commission (Commission) is a standing commission of inquiry and an independent Crown entity responsible for inquiring into maritime, aviation and rail accidents and incidents for New Zealand, and co-ordinating and co-operating with other accident investigation organisations overseas. The principal purpose of its inquiries is to determine the circumstances and causes of occurrences with a view to avoiding similar occurrences in the future. Its purpose is not to ascribe blame to any person or agency or to pursue (or to assist an agency to pursue) criminal, civil or regulatory action against a person or agency. The Commission carries out its purpose by informing members of the transport sector and the public, both domestically and internationally, of the lessons that can be learnt from transport accidents and incidents.

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Important notes

Nature of the final report

This final report has not been prepared for the purpose of supporting any criminal, civil or regulatory action against any person or agency. The Transport Accident Investigation Commission Act 1990 makes this final report inadmissible as evidence in any proceedings with the exception of a Coroner's inquest.

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Citations and referencing

Information derived from interviews during the Commission's inquiry into the occurrence is not cited in this final report. Documents that would normally be accessible to industry participants only and not discoverable under the Official Information Act 1982 have been referenced as footnotes only. Other documents referred to during the Commission's inquiry that are publicly available are cited.

Photographs, diagrams, pictures

Unless otherwise specified, photographs, diagrams and pictures included in this final report are provided by, and owned by, the Commission.

Verbal probability expressions

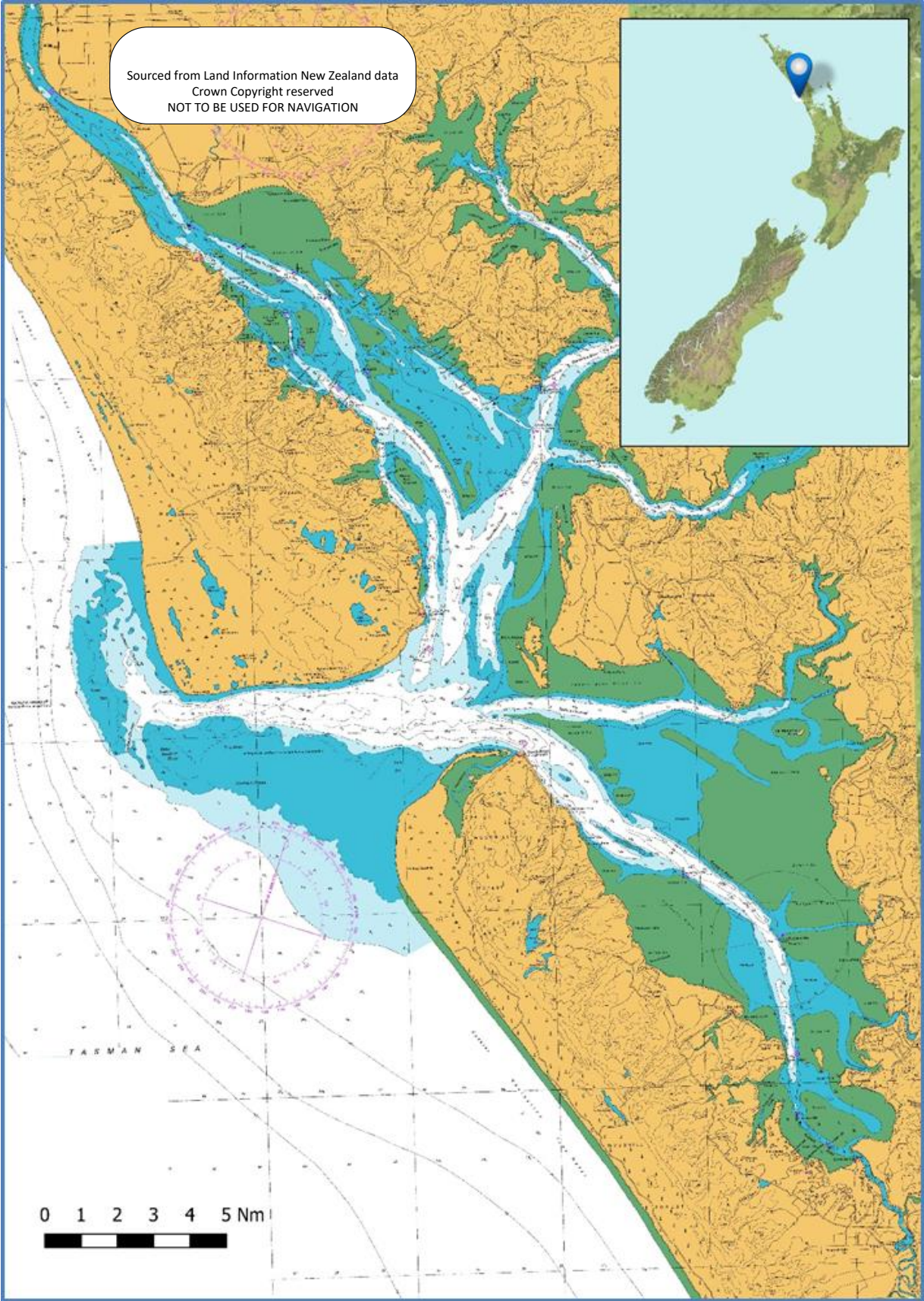
The expressions listed in the following table are used in this report to describe the degree of probability (or likelihood) that an event happened or a condition existed in support of a hypothesis.

Terminology (Adopted from the Intergovernmental Panel on Climate Change)	Likelihood of the occurrence/outcome	Equivalent terms
Virtually certain	> 99% probability of occurrence	Almost certain
Very likely	> 90% probability	Highly likely, very probable
Likely	> 66% probability	Probable
About as likely as not	33% to 66% probability	More or less likely
Unlikely	< 33% probability	Improbable
Very unlikely	< 10% probability	Highly unlikely
Exceptionally unlikely	< 1% probability	



The Francie

(courtesy Stuff)



Location of accident (Kaipara Harbour)

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Abbreviations

Coastguard	Royal New Zealand Coastguard
Commission	Transport Accident Investigation Commission
m	metre(s)
MTOP	Maritime Transport Operator Plan
nm	nautical mile(s)
NZS	New Zealand Standard
VHF	very high frequency

Glossary

bar	an accumulation of sand or silt at the entrance to a river, creek, lake or harbour
bar watch	a monitoring service offered by the Royal New Zealand Coastguard (Coastguard). A vessel's crew informs Coastguard that the vessel is about to cross the bar and Coastguard logs their intention. The two parties agree to a time period for the vessel to cross the bar. If, within that time period, the crew has not informed Coastguard that the vessel has safely crossed the bar, Coastguard begins its follow-up process, potentially leading to search and rescue procedures
ebb tide	the period between high tide and low tide when the water flows away from the shore
newton	a unit of force, in this case used to describe the magnitude of buoyancy provided by a lifejacket
survey	a process conducted by a qualified person to assess, monitor and report on a vessel's condition and compliance with applicable maritime rules

Data summary

Vehicle particulars

Name:	<i>Francie</i>
Type:	passenger vessel
Limits:	restricted limits (inshore)
Length:	11.9 metres
Breadth:	4.2 metres
Built:	2003
Propulsion:	2,819-kilowatt diesel driving a single propeller
Service speed:	9 knots
Owner/Operator:	Kaipara Marine Engineering Limited
Minimum crew:	one

Date and time 26 November 2016¹, approximately 1400

Location entrance to Kaipara Harbour

Persons involved skipper and 10 passengers

Injuries eight persons deceased, three survivors with moderate injuries

Damage vessel foundered and not recovered, location unknown

¹ Times in this report are in New Zealand Daylight Time (Universal Co-ordinated Time + 13 hours) and are expressed in the 24-hour mode.

1. Executive summary

- 1.1. On 26 November 2016 the commercial passenger fishing charter vessel *Francie* was operating a charter out of Kaipara Harbour with the skipper and 10 passengers on board.
- 1.2. The skipper decided to cross the Kaipara Harbour bar and fish in an area of deeper water off the coast. By the time the *Francie* attempted to re-enter Kaipara Harbour, a forecast developing swell and the influence of an ebbing tide had caused the waves over the Kaipara Harbour bar to increase in height, steepen and break from several directions.
- 1.3. The *Francie* was struck from behind by a large breaking wave, then capsized and sank. Eight of the 11 people on board died. Only three people were wearing lifejackets when the *Francie* capsized.
- 1.4. The Transport Accident Investigation Commission (Commission) **found** that the conditions on the Kaipara Harbour bar when the *Francie* attempted to return were predictably unsuitable for the *Francie* to cross, and indications were that the skipper had a propensity for crossing the Kaipara Harbour bar in adverse conditions.
- 1.5. The Commission also **found** that it is virtually certain that everyone on board would have had a better chance of survival if they had been wearing a lifejacket, and virtually certain that more people would have survived had those lifejackets been fitted with crotch straps. The Commission noted that people have a low appreciation of the importance of wearing lifejackets that are well fitted and of types appropriate to the locations and conditions where they will be used.
- 1.6. The Commission identified three key safety issues:
 - Some people are using the accident and incident reporting process to raise safety concerns because there is currently no dedicated, formal process within Maritime New Zealand where members of the public and the maritime community can submit reports on safety and security concerns, including complaints and allegations of suspected breaches of maritime legislation
 - maritime rules that specify the types of lifejacket to be carried on commercial vessels are based only on how far the vessels are permitted to travel from the coast. The rules do not consider environmental factors such as vessels operating out of bar harbours and on exposed coastlines, where higher-specification lifejackets would be more appropriate
 - there are indications that people may not have a sufficient understanding of the design and capability of the various types of lifejacket available, or of the importance of wearing a lifejacket of the correct size and type for any situation where there is a risk of people ending up in the water.
- 1.7. The Commission made four recommendations to Maritime New Zealand to address these issues and noted the actions already being taken to address one of the safety issues.
- 1.8. **Key lessons** arising from this inquiry were:
 - extreme caution must be exercised when crossing bars because sea conditions can change for the worse in a very short time. Waves can come from more than one direction and are usually larger and steeper than surrounding waters and often breaking
 - wearing a lifejacket will significantly improve the chances of survival if a person unexpectedly finds themselves in the water
 - when a person wearing a lifejacket unexpectedly finds themselves in the water, their chances of surviving are significantly improved if the lifejacket is of the appropriate type for the conditions and size of the person, and is fitted with a crotch strap to prevent their losing it when it rides up and over their head

- the Maritime New Zealand website has useful information about selecting a proper lifejacket that best suits a person's maritime activity, and how and when it should be worn
- if a person has concerns about the safety of any maritime activity, they should not hesitate to report them to the appropriate maritime regulator. This could help prevent accidents and save lives in.

2. Conduct of the inquiry

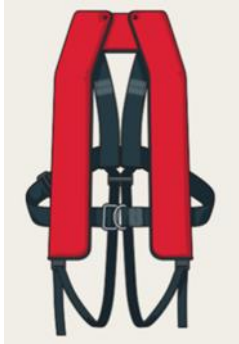

- 2.1. At 1609 on 26 November 2016, the Transport Accident Investigation Commission (Commission) received notification from Maritime New Zealand that a 12-metre (m) fishing vessel with 11 persons on board had capsized and foundered crossing the Kaipara Harbour bar².
- 2.2. The same day the Commission opened an inquiry under section 13(1)b of the Transport Accident Investigation Commission Act 1990, and appointed an investigator in charge.
- 2.3. On 27 November two investigators travelled to Auckland for site investigation.
- 2.4. On 29 November another two investigators joined the investigation team on site. The site investigation team returned to Wellington on Friday 2 December.
- 2.5. On 15 December two investigators travelled to Auckland to conduct an interview and attend a multi-agency debrief into the incident response.
- 2.6. On 17 October 2017 two investigators travelled to Auckland to conduct an interview.
- 2.7. On 21 March 2018 the Commission approved the draft report for circulation to four interested persons.
- 2.8. A submission was received from one of the interested persons and any changes as a result of that submission have been included in this final report.
- 2.9. On 23 May 2018 the Commission approved the final report for publication.

² An accumulation of sand or silt at the entrance to a river, creek, lake or harbour.

3. Factual information

3.1. Background

- 3.1.1. The *Francie* was owned and operated by the skipper on the day of the accident. The skipper did not survive the accident. The following sequence of events and observations are based on interviews with the three surviving passengers, records of the Royal New Zealand Coastguard (Coastguard), and information from other sources as appropriate.
- 3.1.2. This report frequently refers to personal floatation devices and buoyancy aids, and the various types and their use. There are many terms used to describe the various devices, and they are often referred to generically as 'lifejackets'. For clarity, unless stated otherwise, the term 'lifejacket' is used to describe all those safety devices that might otherwise be referred to as personal floatation devices or buoyancy aids.
- 3.1.3. The two types of lifejacket most relevant to this report are the type 401 and type 402 lifejackets. Table 1 gives a description of each type and its use. The type 401 inflatable lifejacket and the type 402 lifejacket are shown with crotch straps, which are designed to prevent the lifejackets riding up and in extreme cases slipping over the heads of the wearers. A description is also given for the type 403 personal floatation device.

Name and type of lifejacket	Example
<p>Open waters type 401 – inflatable</p> <ul style="list-style-type: none"> • Achieves buoyancy by either a: <ul style="list-style-type: none"> ○ water-activated switch, or a ○ manual pull cord • May include a mouthpiece • Designed to keep the wearer vertical during unconsciousness • Comfortable and convenient to wear at all times <p>Must provide 150 newtons³ of buoyancy</p>	
<p>Open waters type 401 – semi-rigid</p> <ul style="list-style-type: none"> • Achieves buoyancy by a semi-rigid foam • Designed to keep the wearer vertical during unconsciousness • Minimum buoyancy rating of 100 newtons (adult size) • Not suitable for continuous wearing on pleasure craft <p>Best suited for emergencies</p>	

³ A newton is a unit of force, in this case used to describe the magnitude of buoyancy provided by a lifejacket.



<p>Inshore waters type 402</p> <ul style="list-style-type: none"> • Must have a buoyant collar • Not designed to keep an unconscious person's face above water • Provides at least 71 newtons of buoyancy (adult size) • Comfortable and convenient to wear at all times • Compatible with a crotch strap • Not suitable for rough conditions 	
<p>Specialist lifejackets and personal floatation devices type 403</p> <ul style="list-style-type: none"> • No collar • Lower buoyancy rating when compared to other lifejackets • Lower levels of support and safety compared to other models • No reflective or bright materials • Necessary for some aquatic sports <p>Must have at least 53 newtons of buoyancy (adult size)</p>	

Table 1
Description of lifejacket types

3.2. Narrative

- 3.2.1. At approximately 0600 on the morning of 26 November 2016, the *Francie* departed its berth in Helensville en route to Parakai wharf (see Figure 1). At about 0630 the *Francie*, crewed solely by the skipper, arrived at Parakai wharf, where 10 passengers boarded.
- 3.2.2. The skipper welcomed the passengers aboard and showed them where the lifejackets and toilet were. Three of the passengers had brought their own lifejackets, which they were wearing as the *Francie* departed the berth. The skipper and the remaining seven passengers were not wearing lifejackets.
- 3.2.3. At about 0645 the skipper used VHF (very high frequency) radio to make a trip report to the Royal New Zealand Coastguard (Coastguard), reporting the number of people on board and that the destination was Kaipara Harbour. Shortly before 0700 the *Francie* departed Parakai wharf bound for Kaipara Harbour with 11 people on board.
- 3.2.4. Kaipara Harbour is a 'bar harbour', which means that across its entrance it has a large and, in this case, complex arrangement of sand bars with channels of deeper water. The skipper's preferred fishing area was in the deeper water outside⁴ the bar.
- 3.2.5. Reaching the skipper's preferred fishing ground on the 'outside' of the harbour required the *Francie* to cross the Kaipara Harbour bar. The decision to cross the bar was dependent on environmental conditions, and the skipper would not have made it until he had observed the conditions on the bar as he approached the entrance to what was locally known as the 'South Channel'. If the skipper had decided against crossing the bar, the intention would have been to fish in an area known locally as 'The Graveyard' and other fishing grounds within Kaipara Harbour (see Figure 1).

⁴ On the ocean side of the harbour bar.

- 3.2.6. At about 0920, as the *Francie* approached the entrance to the South Channel, the state of the tide was about one hour after high water. The skipper considered the sea conditions at the bar acceptable and made the decision to cross and head out towards the favoured fishing grounds.
- 3.2.7. At about 0931 the skipper used the VHF radio to request a bar watch⁵ from Coastguard Radio while he transited the Kaipara Harbour bar.
- 3.2.8. Witnesses described the sea conditions crossing the bar as calm. At about 0957, once safely clear of the bar, the skipper instructed Coastguard using VHF radio to close the bar watch.
- 3.2.9. The *Francie* continued motoring in a westerly direction for about 45 minutes until it reached the 50 m contour line⁶, where it stopped and the passengers began fishing. The sea conditions during this period were described as calm.
- 3.2.10. After 45 minutes' fishing the passengers had caught their quota and the fishing gear was recovered in preparation for returning to Kaipara Harbour to continue fishing for other species.
- 3.2.11. The skipper steered the *Francie* towards the inbound entrance of the South Channel leading across the Kaipara Harbour bar. As the *Francie* neared the bar the wave and swell height increased significantly; survivors described the waves as "monsters". The skipper had difficulty controlling the direction and speed of the vessel, and the *Francie* was pushed to the south of the channel entrance (see Figure 1).
- 3.2.12. After about one hour the skipper abandoned his attempt to reach the South Channel because he had missed the entrance to the channel. He turned the *Francie* around and headed back out to sea. About 45 minutes later, after reaching calmer water again, the skipper turned the *Francie* around and began a second attempt at crossing the bar by using the same South Channel.
- 3.2.13. As the *Francie* approached the bar a passenger suggested to the skipper that he call Coastguard and request a bar watch. At about 1402 the skipper used VHF radio to request a 60-minute bar watch for the Kaipara Harbour bar – South Channel. Coastguard replied but recommended a 30-minute check call, to which the skipper agreed. As he stowed the VHF radio microphone, a breaking wave struck the *Francie* from the port quarter⁷, rolling the vessel heavily to starboard⁸ and causing it to capsize.
- 3.2.14. At the time of the capsize there were three or four people, including the skipper, in the wheelhouse; the remainder of the passengers were outside on the aft⁹ deck.
- 3.2.15. By about 1503 Coastguard had not been able to make contact with the *Francie* to close the bar watch, so it initiated a full search and rescue operation.
- 3.2.16. Of those who were on the aft deck, one was wearing his own type 403 personal floatation device, but he was seen to be struggling to remain afloat and eventually sank. His body was recovered later. A type 403 personal floatation device later recovered from the beach was highly likely his.

⁵ A monitoring service offered by Coastguard. A vessel's crew informs Coastguard that the vessel is about to cross the bar and Coastguard logs their intention. The two parties agree to a time period for the vessel to cross the bar. If, within that time period, the crew has not informed Coastguard that the vessel has safely crossed the bar, Coastguard begins its follow-up process, potentially leading to search and rescue procedures.

⁶ A line on a chart that represents a sea depth of 50 m.

⁷ The port quarter is to the rear of the hull on the port side.

⁸ The right-hand side of a vessel when facing forward.

⁹ Towards the stern of the vessel.

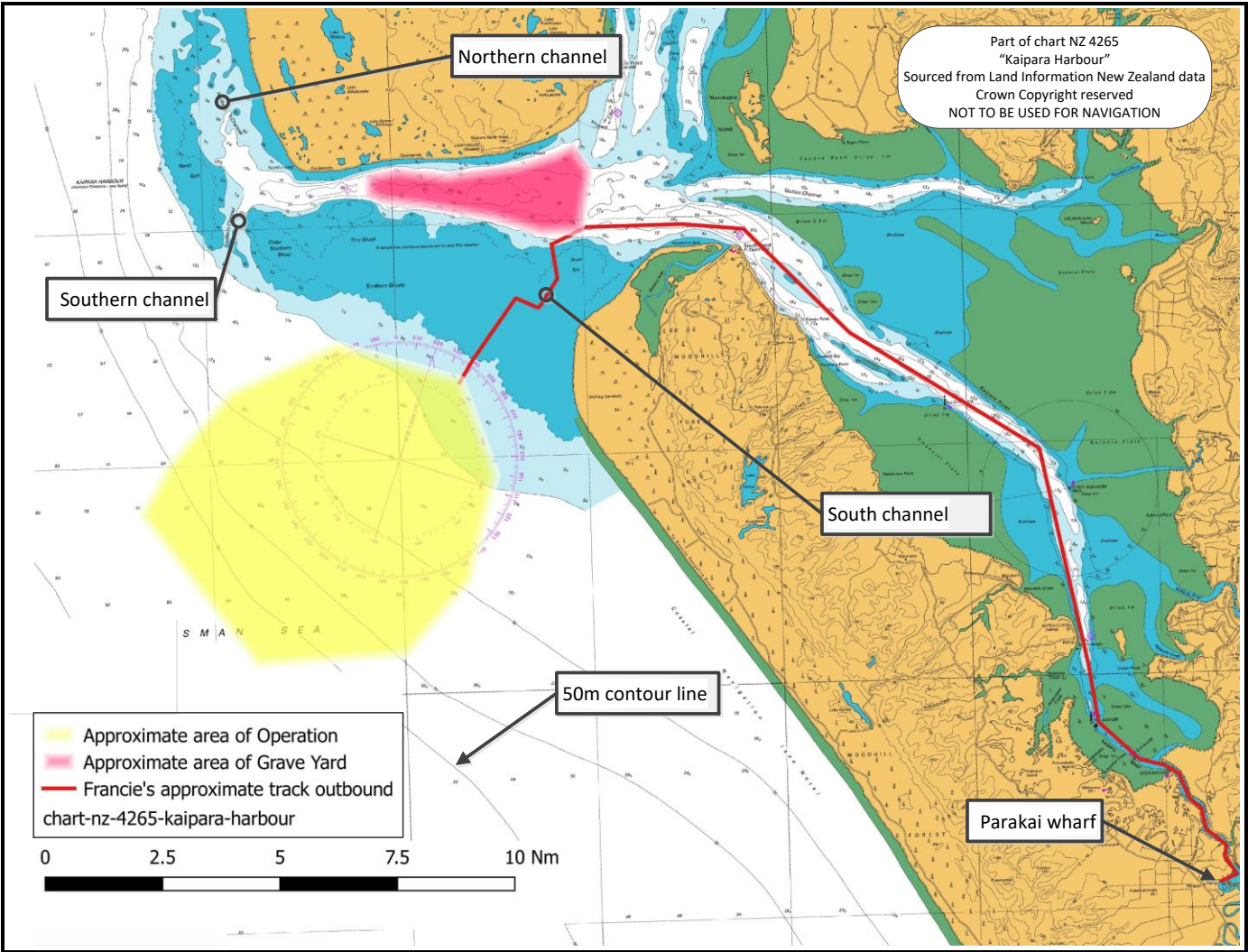


Figure 1
 Extract of chart NZ 4265 showing Kaipara Harbour and the approximate track of the *Francie*

- 3.2.17. One of the three on deck who survived was wearing a lifejacket supplemented with flotsam¹⁰ to help remain afloat. A second survivor used only flotsam to remain afloat while they waited to be rescued. They were both found at about 1603, and airlifted to safety by about 1616.
- 3.2.18. The third survivor was in the wheelhouse at the time of the capsizing. He managed to escape and when he came to the surface he found two of the *Francie's* lifejackets floating nearby, which he used to help keep him afloat. He found that the lifejackets were too small for him to wear, so he placed an arm through each neck hole and used a piece of timber found floating nearby for additional buoyancy before swimming towards the beach. He was found by rescuers at about 1740 as he made his way to dry land.
- 3.2.19. The bodies of the eight deceased were recovered by emergency services over the following nine days. One of those was the third person known to have been wearing a lifejacket. He was wearing an inflatable type 401 lifejacket that was not fitted with a crotch strap. The lifejacket was later found separately from his body, uninflated.

3.3. *The Francie*

- 3.3.1. The *Francie* was an 11.9 m charter fishing vessel constructed in steel and built in New Zealand. It had been launched and commenced operating on the Hauraki Gulf in 2003. In 2010 the vessel had been purchased and transported to Kaipara Harbour where it continued operating as a charter fishing vessel.
- 3.3.2. The skipper owned two companies: Francie Charters Limited, which had purchased the *Francie* in early 2014 and was a fully owned trading subsidiary of Kaipara Marine Engineering Limited, the other business owned solely by the skipper. Francie Charters was based in and operated out of Helensville.
- 3.3.3. The *Francie* had undergone a survey¹¹ comprising an in-water inspection in June 2015, followed by an out-of-water inspection in July. The survey had been completed in early August. A certificate of survey (Fit for Purpose Certificate) had been issued on 17 August 2015 and imposed four conditions:
- vessel to be operated in accordance with any plan approval conditions
 - vessel to be operated with all due care and attention to wind, waves, and weather conditions
 - vessel to be operated over west coast bars in favourable conditions only
 - when operating within west coast limits, this vessel must be operated with a clear weather window for the expected time of the voyage.
- 3.3.4. The Fit for Purpose Certificate also stated that:
- [lifejackets] are to be worn when crossing bars in adverse conditions or any time at the instruction of the skipper.
- 3.3.5. The *Francie* was categorised as a passenger vessel for tourist and charter fishing activities. The maximum number of passengers was 20 and the minimum number of crew was one.
- 3.3.6. The *Francie* was certified to operate within restricted limits (inshore). This meant that the *Francie's* operating area included Kaipara Harbour and from 12 nautical miles (nm) north of Hokianga Harbour heads to 12 nm south of Raglan Harbour heads within 12 nm of the shore (see Figure 2).

¹⁰ Floating wreckage and debris of a vessel or its cargo.

¹¹ A process conducted by a qualified person to assess, monitor and report on a vessel's condition and compliance with applicable maritime rules.

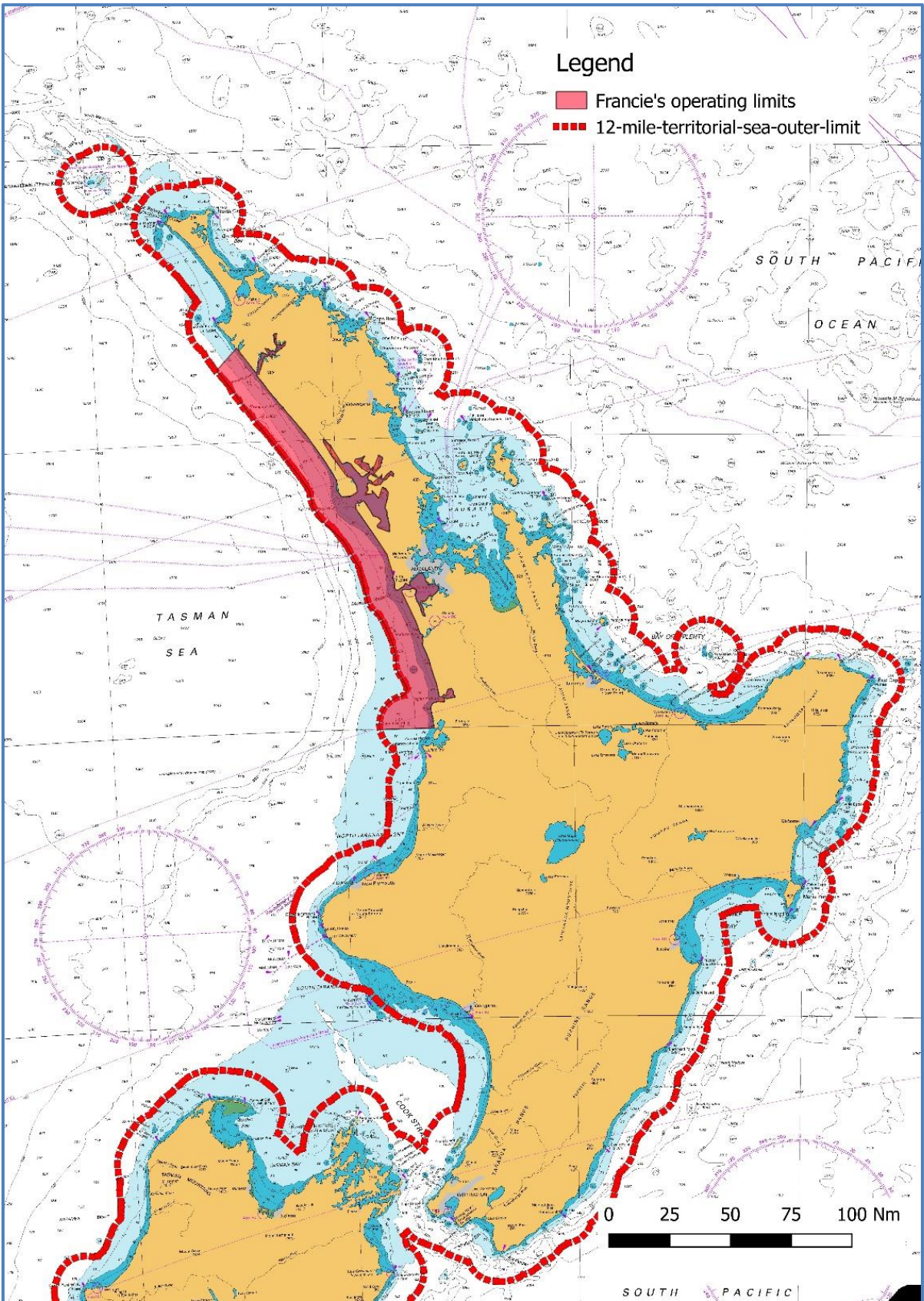


Figure 2
Extract of chart NZ 23 showing the operating limits of the *Francie*

- 3.3.7. Figure 1 shows an excerpt of the Kaipara Harbour chart, with various features pertinent to the *Francie's* operation. Kaipara Harbour is a large estuary, and the bar at its entrance is the largest in New Zealand. The bar is 2-3 nm wide and extends approximately 12 nm across the entrance of Kaipara Harbour to approximately 4 nm offshore.
- 3.3.8. The chart shows two channels at the northern end of the bar: the Northern Channel and the Southern Channel. The Northern Channel is rarely used as it runs predominantly parallel to the swell and can be difficult to navigate. The Southern Channel is more regularly used but is also vulnerable to inclement sea conditions.
- 3.3.9. Another channel crosses the bar farther to the south; it is known locally as the 'South Channel' or the 'Dog-leg'. It is not marked on the chart because its location is prone to movement over time. It is reported to be calmer and easier to use than the other channels, and was the preferred channel for several skippers, including the *Francie's*.

3.4. The *Francie's* Marine Transport Operator Plan

- 3.4.1. Maritime Rules Part 19 Maritime Transport Operator – Certification and Responsibilities requires maritime transport operators to develop and operate in accordance with safety systems that are specific and appropriate to their maritime transport operations. The rule also governs the Maritime Operator Safety System (MOSS), which is regulated by Maritime New Zealand.
- 3.4.2. To enter MOSS, an operator must develop a Maritime Transport Operator Plan (MTOP) and submit it for a desktop review and site visit by Maritime New Zealand. When Maritime New Zealand is satisfied that the MTOP complies with Rules Part 19, it issues a Maritime Transport Operator Certificate to the operator. The Maritime Rules require that the MTOP include provisions to:
- identify and manage the safety risks involved in the maritime transport operation
 - address all reasonably foreseeable hazards associated with the operation.
- 3.4.3. The *Francie's* MTOP included a vessel manual that provided details about operating the *Francie*, including equipment lists, safe operating procedures, emergency procedures, the hazard register, and a section covering records and plans. The MTOP identified that a significant risk for the operation was crossing the Kaipara Harbour bar and fishing on the ocean side.
- 3.4.4. The relevant extracts from the MTOP's safe operating procedures in respect of the *Francie's* operation are provided below.

The safe operating procedures prescribed general operational limits with respect to weather and sea conditions:

- no trip to proceed when wind speed is predicted to be above 30 knots
 - no trip will proceed where there is forecast greater than a 3-metre swell or greater than a 2-metre swell with a 1-metre cross chop. This will be further modified for when there is wind against tide/current and any degree of breaking water
 - fishing in areas where there are conditions of onshore wind and onshore swell is to be avoided where practicable.
- 3.4.5. The safe operating procedures also included a section on 'bar crossing'. The section reflected good practices described in the National Code of Practice for Bar Crossings (see Appendix 1). The opening paragraphs of that section are taken verbatim from the code:

Extreme caution must be exercised when crossing bars. Conditions prevailing on a bar or in river approaches may cause unusually sudden steep and often breaking seas. Conditions change quickly and unpredictably. The skipper's experience and the vessel type should be taken into account when a bar crossing is considered. However, no amount of experience or boat type makes crossing a bar SAFE when

the conditions are marginal or adverse. No situation warrants taking the risk, so if in doubt “STAY OUT”.

The second paragraph states:

Before leaving harbour the skipper must assess conditions on the bar. The skipper must be aware that a rapid change in conditions might prevent a safe return to harbour and if in doubt, should not leave port. Adequate reserve fuel must be available to enable the vessel to divert to another port or safe haven should adverse bar conditions prevail on their return.

3.4.6. The MTOP also states that skippers should be aware that:

- all bars have areas of broken water containing air, which can severely reduce the stability and handling of a vessel
- vessels attempting to cross a bar at or near low water are more likely to experience adverse conditions than at high water.

3.4.7. The bar crossing section of the MTOP provides a list of prompts for skippers to address before crossing a bar:

- check the weather, tide and bar conditions
- contact Coastguard or maritime radio immediately prior to crossing
- ensure adequate stability
- batten down¹²
- make sure lifejackets are worn and everyone on board is alert
- approach at moderate speed
- post a lookout to monitor sea conditions astern
- avoid ebb tide¹³
- if in doubt – don’t cross
- communicate your successful crossing to Coastguard or Maritime Radio.

3.4.8. Additionally, with respect to lifejackets, the vessel’s standing orders stated:

- all passengers and crew must wear lifejackets at all times, unless expressly given permission by the skipper.

3.5. The owner and skipper

3.5.1. The skipper had worked in various roles throughout his career, including as relief crew on sand extraction barges on Kaipara Harbour.

3.5.2. He was also the sole owner of Kaipara Marine Engineering, based in Helensville, which owned the *Francie* and also provided repair and maintenance services for other recreational and commercial vessels.

3.5.3. When the owner purchased the *Francie* he had not held an appropriate skipper’s qualification, so he had employed a licensed skipper. The owner had begun using the *Francie* for charter fishing operations in early 2014. The licensed skipper had subsequently resigned, after which the owner had begun acting as skipper.

3.5.4. On 15 September 2014 Maritime New Zealand had become aware that the owner was not qualified to be skipper of the *Francie*. Maritime New Zealand had issued a notice of

¹² Close and secure all openings through which water could enter the vessel.

¹³ The period between high tide and low tide when the tide is flowing out of the harbour across the bar.

imposition against the vessel that the *Francie* could not be operated commercially unless the person acting as skipper was qualified to do so.

- 3.5.5. The owner had employed another appropriately qualified person to act as skipper for charter fishing trips until he obtained his Skipper Restricted Limits qualification in November 2014, following which he had resumed responsibilities as skipper of the *Francie*. Skipper Restricted Limits is a command certificate that allows a person to perform skipper duties on passenger and non-passenger ships of less than 12 m length overall (the *Francie* was 11.9 m long).
- 3.5.6. The skipper died in the accident and his body was recovered. The post-mortem examination revealed that he had died by drowning. Post-mortem toxicology was carried out, which showed he was free from any performance-impairing substances.

3.6. Environmental conditions

- 3.6.1. MetService is New Zealand's national weather authority; it provides a weather information service. The MetService weather forecast for 26 November 2016 was:

Issued: 26-NOV-2016 04:39 [two hours before the *Francie* left the wharf]

Valid to: 26-NOV-2016 23:59

KAIPARA 6

Northwest 15 knots rising to 25 knots this evening. Sea becoming rough. Southwest swell rising to 3 metres. Northwest swell 2 metres easing. Fair visibility in showers this afternoon and evening.

OUTLOOK FOLLOWING 3 DAYS: Westerly 25 knots with rough sea, easing Monday southwest 15 knots. Southwest swell becoming heavy Sunday, easing Monday.

- 3.6.2. Coastguard broadcasts real-time marine weather information and forecasts. Its forecasts are updated and broadcast every 20 minutes via VHF radio and the Coastguard mobile phone app. On aggregate the forecast for 26 November gave an average wind speed of 10-25 knots with wind gusts of 15-35 knots, and for a southwest swell to rise to 3 m throughout the day.
- 3.6.3. The Coastguard crew attending the rescue reported that the wave height on the bar was between 4 m and 8 m on the afternoon of the accident.
- 3.6.4. For 26 November the National Institute of Water and Atmospheric Research's Tide Forecaster¹⁴ predicted the time of high water for the Kaipara Harbour bar at 0826, and a height of 2.76 m above 'lowest possible tide'. The time of low water was predicted for 1432, with a height of 0.85m above lowest possible tide.
- 3.6.5. The *Francie* entered the South Channel outbound at about 0930, and was clear of the bar at about 1000, having crossed the bar on the ebb tide close to one hour after high water.
- 3.6.6. At about 1200 the *Francie* began its first inbound attempt to reach the South Channel and cross the bar on an ebb tide about 2.5 hours before low water. The second attempt was made at about 1400, 30 minutes before low water.

3.7. Lifejackets

- 3.7.1. It was not possible to establish exactly how many lifejackets were carried on the day of the accident. However, the *Francie* was required to carry at least 22 lifejackets of the 71-newton type 402, and at least three 40-newton child-sized lifejackets.

¹⁴ A utility used to forecast high and low tides anywhere in open coastal and ocean waters around New Zealand.

- 3.7.2. The Maritime Rules required that the lifejackets comply with New Zealand Standard (NZS) 5823 (amended in 1989, 2001 and 2005). NZS 5823 defines the specifications for lifejackets and marine safety harnesses.
- 3.7.3. NZS 5823 required that lifejackets carry appropriate warnings. The warning required by NZS 5823 for type 402 lifejackets was:
- when worn, this PFD [personal floatation device] will improve a wearer's chances of survival, but its use does not guarantee [the] safety and ultimate rescue of the wearer, but will afford support in the water for an extended period
 - the use of this PFD may not hold your head above water if unconscious
 - the effectiveness of your PFD is greatly increased if a crotch strap is fitted to prevent it riding up over your head
 - the effectiveness of a personal floatation device is considerably reduced in rough water, breaking seas, and surf.

4. Analysis

4.1. Introduction

- 4.1.1. Crossing a sand bar is a high-risk activity, so much so that Maritime New Zealand has produced a National Code for Bar Crossings (see Appendix 1). Crossing a bar is dangerous because the sea conditions can change quickly and unpredictably, resulting in unusually large and steep, and often confused, breaking waves.
- 4.1.2. Sand bars form at the entrance to a harbour when debris from the inner harbour and its tributaries is carried out by fast-flowing currents and tides to be deposited near the harbour entrance. Just like on a beach, ocean waves increase in height and steepness as they move into shallower water over the sand bar.
- 4.1.3. There is often a complex system of deeper channels carved out through a sand bar by the significant tidal flows into and out of the harbour. These tidal flows can further amplify the already rising steep waves and even confuse their direction. This effect is accentuated when the tidal flow is acting in the opposite direction to the ocean waves and wind, especially around low tide when the depth of water over the bar is less than at any other time.
- 4.1.4. The following analysis discusses what happened to the *Francie* and how it came to be outside the Kaipara Harbour bar in adverse conditions.
- 4.1.5. The analysis also discusses three safety issues:
 - some people are using the accident and incident reporting process to raise safety concerns because there is currently no dedicated, formal process within Maritime New Zealand where members of the public and the maritime community can submit reports on safety and security concerns, including complaints and allegations of suspected breaches of maritime legislation
 - maritime rules that specify the types of lifejacket to be carried on commercial vessels are based only on how far the vessels are permitted to travel from the coast. The rules do not consider environmental factors such as vessels operating out of bar harbours and on exposed coastlines, where higher-specification lifejackets would be more appropriate
 - there are indications that people may not have a sufficient understanding of the design and capability of the various types of lifejacket available, or of the importance of wearing a lifejacket of the correct size and type for any situation where there is a risk of people ending up in the water.

4.2. What happened

- 4.2.1. The skipper's preferred fishing ground was in the deeper water seaward of the Kaipara Harbour bar, which meant leaving the shelter of the harbour and crossing the bar, and having to cross the bar again to re-enter the harbour. When the *Francie* reached the entrance to the South Channel the sea conditions over the bar were reasonably calm. However, it was close to high tide and the tide had only just begun to ebb. Based on what he observed, the skipper decided to cross the bar.
- 4.2.2. By the time the *Francie* approached the bar on the return journey, the predicted southwest swell had likely increased and was interacting with the already present low northwest swell. The tide was much lower, meaning the depth of water over the bar had decreased. A predicted increase in wind speed from the northwest may also have contributed to the state of the sea over the bar.
- 4.2.3. Eye witnesses and Coastguard crew who took part in the search and rescue operation estimated that the wave heights were between 4 m and 8 m.
- 4.2.4. Having decided to make a second attempt to cross the bar, the skipper was no more prepared than he had been for the first attempt. From interviews with the survivors, it appears likely that only three of the 11 people on board were wearing lifejackets. It was reported that the skipper only registered a bar watch with Coastguard when prompted by one

of the passengers. The National Code of Practice for Bar Crossings refers to the importance of posting a watch behind to warn the helmsman of dangerous waves. The skipper was reportedly distracted with registering the bar watch when the *Francie* was struck from behind by the large breaking wave that caused the vessel to capsize.

4.3. Decision to cross the Kaipara Harbour bar

- 4.3.1. The wave conditions that developed over the Kaipara Harbour bar while the *Francie* fished in deeper water were entirely predictable given the forecast conditions and the change in the tide.
- 4.3.2. The MetService forecast was for northwest wind 15 knots rising to 25 knots in the evening, with the sea becoming rough. A southwest swell was predicted to develop and rise to 3 m. The prevailing 2 m northwest swell was predicted to ease. Conditions were predicted to worsen in the following few days.
- 4.3.3. The skipper was known to check weather forecasts routinely and had cancelled charter fishing trips due to adverse forecasts before. It could not be established whether he had obtained the weather forecast on this occasion, but it is about as likely as not that he had.
- 4.3.4. The *Francie*'s MTOP acknowledged that "Extreme caution must be exercised when crossing bars" and that "Before leaving harbour the skipper must assess conditions on the bar [and] be aware that a rapid change in conditions might prevent a safe return to harbour and if in doubt, should not leave port".
- 4.3.5. The MTOP also stated:
 - ... no trip [across the bar] will proceed where the wind speed is predicted (taking into account meteorological surface pressure maps) to be above 30 knots
 - ... no trip will proceed where there is forecast greater than a 3 metre swell or greater than a 2-metre swell with a one-metre cross chop. This will be further modified for when there is wind against tide/current and any degree of breaking water.
- 4.3.6. The National Code of Practice for Bar Crossings gives some learned advice that "no amount of experience or boat type makes crossing a bar SAFE when the conditions are marginal or adverse. No situation warrants taking the risk, so if in doubt 'STAY OUT'", and "adequate reserve fuel must be available to enable the vessel to divert to another port or safe haven should adverse bar conditions prevail on their return". This advice was included in the *Francie*'s MTOP.
- 4.3.7. There was feasibly no viable alternative for the *Francie* to enter a safe harbour. There were other harbours to the south and north, but these would have taken some time to reach and they too were both bar harbours, likely with wave conditions similar to those encountered over the Kaipara Harbour bar.
- 4.3.8. The *Francie* was set up for day charters only, so the option of staying outside the bar overnight, with 10 passengers on board and with inclement weather forecast, would have been a difficult decision for the skipper to make.
- 4.3.9. His decision to persevere with a second attempt at entering over the bar, in spite of the difficulties encountered with the first attempt, was possibly a result of this lack of alternatives.
- 4.3.10. This accident highlights the importance of fully understanding the risks involved with crossing harbour bars and the various factors that can make them so unpredictable and subject to rapidly changing sea conditions. For an operation such as the *Francie* fishing charters, a trip begins and ends inside Kaipara Harbour. Because of the limited options once out over the bar, the biggest risk is more about what factors are going to affect the ability to get back in.

- 4.3.11. In this case, indications are that the skipper was deceived by the relatively benign conditions for the outbound bar crossing and either did not consider that they would likely change for the inward journey or did not fully appreciate the risks involved. This latter point is discussed in the following section.

Findings

1. The forecast weather conditions, in combination with the state of the tide, were not suitable for the *Francie* to head out over the Kaipara Harbour bar and make a safe return.
2. The *Francie* capsized when it was struck by a large breaking wave from behind while the skipper was distracted by making a radio call.

4.4. Risk

- 4.4.1. When the skipper first purchased the *Francie* he had engaged a surveyor to inspect the vessel and issue a Fit for Purpose Certificate. The surveyor confirmed that the skipper had conducted all of the work on the vessel that he had advised, and that he had been careful to do as the surveyor requested with respect to systems and equipment. Engineering systems were the skipper's area of expertise.
- 4.4.2. Regarding marine operations, the skipper demonstrated repeated non-compliance with the Maritime Rules. One reason for this could have been his low experience. Another reason could have been his having a too high acceptance of risk.
- 4.4.3. The Commission compared the *Francie*'s MTOP to those of other charter fishing vessels and found that its written procedures around operational limits and bar crossings were exemplary. The skipper himself had researched and written the MTOP, and it reflected the best practice described by aforementioned authorities on bar crossings. On paper he demonstrated an understanding of the dangers of bar crossing.
- 4.4.4. But the skipper's decision to cross the bar in the forecast weather conditions is an indication that either he did not understand the risk he was taking or that the risk had become normalised over time and therefore not considered to be high. Other people who had previously sailed on the *Francie* described the skipper as being 'comfortable' crossing the bar in adverse conditions.
- 4.4.5. The person who had first skippered the *Francie* had been hired by the owner to operate the *Francie* and provide some training for when the owner obtained his own skipper's certificate. After about one month the employed skipper had resigned because the *Francie*'s owner would reportedly not listen to his advice or take instruction.
- 4.4.6. The comments made by the two other skippers are supported by other data. The Commission obtained all of the trip and bar reports made to Coastguard for the previous two years and obtained historical weather forecast data for the same period. An analysis of this data revealed that the *Francie* had often crossed the Kaipara Harbour bar in forecast poor weather conditions, when other commercial operators remained fishing within Kaipara Harbour.
- 4.4.7. When compared to all other operators, the *Francie*'s stood out as one of two operators who routinely crossed the Kaipara Harbour bar in adverse weather conditions.
- 4.4.8. After his skipper had resigned, the *Francie*'s owner had acted as skipper even though he did not possess the required qualification. It is highly likely that the owner had been aware that he was not complying with the Maritime Rules in doing so.
- 4.4.9. An identified complainant had notified Maritime New Zealand that the owner was acting as skipper without the required qualification. Maritime New Zealand subsequently conducted

an inspection of the *Francie* and found that the unqualified owner had acted as skipper. It issued a Notice of Imposition of Conditions against the vessel, which stated that the *Francie* was “not to be operated commercially unless the master is the holder of a Skipper Restricted Limits certificate”.

- 4.4.10. The process of bringing the vessel into survey had taken around 18 months; however, during that time the surveyor had come to feel that the *Francie*'s owner did not appreciate the high level of risk involved in crossing the Kaipara Harbour bar. As a result the surveyor had imposed conditions on the vessel's Fit for Purpose Certificate in an attempt to ensure that the *Francie* was operated safely:
- vessel to be operated with all due care and attention to wind, waves, and weather conditions
 - vessel to be operated over west coast bars in favourable conditions only
 - when operating within west coast limits, this vessel must be operated with a clear weather window for the expected time of the voyage.
- 4.4.11. The evidence suggests that the skipper had a tendency to not adhere strictly to the rules. This was also demonstrated on the day of the accident, when he decided to cross the bar when the forecast weather conditions would have prevented him doing so had he been complying strictly with the requirements of his Maritime Transport Operator Certificate and the associated MTOP, which he had written.

4.5. Reporting safety related concerns

Safety issue – Some people are using the accident and incident reporting process to raise safety concerns because there is currently no dedicated, formal process within Maritime New Zealand where members of the public and the maritime community can submit reports on safety and security concerns, including complaints and allegations of suspected breaches of maritime legislation.

- 4.5.1. Anecdotal evidence received by the Commission indicated that some members of the maritime community recognised the danger posed by the skipper's risk-taking behaviour.
- 4.5.2. Maritime New Zealand received four notifications regarding the *Francie* from three people, which included operating without an appropriately qualified skipper. Maritime New Zealand's response was to intervene, audit the operation, and ensure that the offence was not repeated.
- 4.5.3. Although Maritime New Zealand does have a formal accident and incident notification system, it is intended for use by operators or vessels' crew for notifying Maritime New Zealand of accidents and incidents involving vessels.
- 4.5.4. The Civil Aviation Authority has a dedicated process for anyone to report an aviation safety or security concern, which may include complaints or allegations of suspected breaches of civil aviation legislation. The first point of contact with the regulator is a dedicated phone number and email address, and any issue raised automatically triggers a follow-up.
- 4.5.5. Maritime New Zealand does receive some information via its general enquiries contact point and also via its maritime officers' engagement with the community. However, there would be some added benefit if there were a similar process to that operated by the Civil Aviation Authority for people to report safety and security concerns.
- 4.5.6. The Commission has made a recommendation to the Director of Maritime New Zealand that he consider providing and promoting a process for members of the public and the maritime community to report safety and security concerns, including complaints and allegations of suspected breaches of maritime legislation.

Findings

3. Indications are that the skipper had a propensity to accept a high level of risk when deciding whether to cross the Kaipara Harbour bar.
4. The skipper had a propensity for crossing the Kaipara Harbour bar in high-risk conditions, which was known to but not reported by others in the industry and community.
5. A system is needed for people to make reports of safety-related concerns to Maritime New Zealand to provide the regulator with more opportunity to intervene before accidents happen.

4.6. Survivability

Lifejackets on board the *Francie*

- 4.6.1. Post-mortem examinations were conducted of five of the recovered bodies. The cause of death was not ascertained for one of them. For the other four, drowning was identified as the very likely cause of death.
- 4.6.2. In a capsized situation, wearing a lifejacket is no guarantee of survival. People trapped inside a capsized vessel can sustain injuries that prevent their escape, regardless of whether lifejackets are worn.
- 4.6.3. Of the 11 people aboard the *Francie*, it is very likely that only three of the passengers were wearing lifejackets of some type, and these were their own personal lifejackets. Two of the three passengers who were wearing their own lifejackets died. One of the deceased had been wearing a type 401 inflatable lifejacket, but it was later recovered uninflated and separate from his body.
- 4.6.4. Another was wearing a lifejacket¹⁵ but he was seen to struggle with staying afloat. This lifejacket was also later recovered separately from his body. This shows that wearing a lifejacket will not automatically guarantee survival for people who are thrown clear into the water. There are other factors to be considered, such as the lifejacket being of the correct size and type for the situation, and properly fitted. These factors are considered further below.
- 4.6.5. Neither of the lifejackets referred to above was fitted with a crotch strap. A crotch strap can be attached to a lifejacket to prevent the lifejacket riding up over the head of the survivor and potentially being lost. The crotch strap is attached at the back of the lifejacket and it passes between the wearer's legs to attach at the front, as shown in Figure 3.

¹⁵ Later found to be a buoyancy aid.



Figure 3
Type 402 lifejacket showing crotch strap

- 4.6.6. In the case of the passenger wearing his own type 401 inflatable lifejacket, if that had been fitted with a crotch strap it very likely would have saved his life. The other deceased passenger was wearing a personal floatation device that was not specifically suitable for supporting a person in rough breaking waters. This was the passenger seen by survivors to be struggling to stay afloat in spite of his wearing such a device. It is likely that he eventually slipped out of the personal floatation device, which would not have happened had it been fitted with a crotch strap. In his case his chances of survival would have increased if a crotch strap had been fitted.
- 4.6.7. Although Maritime New Zealand recommends the use of crotch straps, it does not require them to be fitted other than to children’s lifejackets.
- 4.6.8. Notwithstanding the limitations of lifejackets, there is no doubt that wearing one will increase the chances of someone surviving in the water. It is likely that more people would have survived this accident had everyone been wearing a suitable lifejacket. This is a key lesson arising from this inquiry.
- 4.6.9. Maritime Rules 40A prescribes the type and number of lifejackets that a commercial vessel such as the *Francie* should carry, but does not prescribe when they should be worn. The actual use of the lifejackets is subject to the operator’s risk assessment process and resultant procedures covered in their MTO.
- 4.6.10. The *Francie*’s MTO reflected the good practice of having all aboard wear lifejackets when crossing the Kaipara Harbour bar. The section on bar crossing required lifejackets to be worn, and the standing orders stated: “All passengers and crew must wear lifejackets at all times, unless expressly given permission by the skipper”.
- 4.6.11. However, according to survivors the skipper did not require everyone on board to wear a lifejacket when crossing the bar. He was not wearing one himself.
- 4.6.12. A survey of the other vessels operating fishing charters on Kaipara Harbour revealed that the practice of skippers not requiring people to wear lifejackets was not unusual. This issue is discussed further in the following section.

Use of suitable lifejackets

Safety issue – There are indications that people may not have a sufficient understanding of the design and capability of the various types of lifejacket available, or of the importance of wearing a lifejacket of the correct size and type for any situation where there is a risk of people ending up in the water.

- 4.6.13. There is a broader cultural issue underlying the failure of the people aboard the *Francie* to wear lifejackets. Survivors described a reluctance themselves to wear lifejackets and described this as their normal behaviour.
- 4.6.14. During an interview the survivor who described his friend struggling to stay afloat diminished the importance of lifejackets by saying, “He was wearing a lifejacket and he died anyway”.
- 4.6.15. However, the deceased person was not wearing a ‘lifejacket’ as described by NZS 5823; he was wearing a personal floatation device and there is a substantial difference in performance. The survivor was unable to differentiate between the various types of lifejacket. To him they were basically all the same.
- 4.6.16. Recognised recreational boating practices can be used as an indication of how the broader public treats the issue of wearing lifejackets. The New Zealand Safer Boating Forum¹⁶ has identified that a failure to wear lifejackets is overrepresented in fatalities.
- 4.6.17. Maritime New Zealand has recognised the failure to wear lifejackets as a safety issue. It has conducted policy work for smaller craft, and a significant educational campaign to increase the wearing of lifejackets. Its programme also targets communities where the message about the importance of wearing lifejackets has not had a good response.
- 4.6.18. ‘Lifejacket’ has a specific technical meaning, but it is widely used by the public as a generic term to describe any safety device worn by an individual to help them float when they are in the water. There are other generic terms such as ‘personal floatation device’ and ‘buoyancy aid’ that tend to be used to describe the same thing.
- 4.6.19. Similarly, there are many types of lifejacket within those generic terms. The primary differences are their size, the performance of the buoyancy they provide, and their intended use.
- 4.6.20. A Commission survey of the Kaipara Harbour fishing charter fleet showed some lack of awareness of the types and names of lifejackets. However, that lack of awareness is indicative of a broader misunderstanding of the types and names of lifejackets in New Zealand. This confusion was recognised as an issue in NZS 5823:2005, which stated in its foreword:
- This revision was initiated in response to concerns being raised in the sector that existing lifejackets were not always accompanied by enough information to ensure the purchasers were able to select the most appropriate device for their intended use.
- 4.6.21. In New Zealand, a primary source of information on lifejackets is Maritime New Zealand. The Maritime New Zealand website contains a section titled ‘Lifejackets’, which provides educational material on lifejackets, including a summary of each type and an example image (see Appendix 2 for full details). The following is a list of their names and types:
- open waters type 401 – inflatable
 - open waters type 401 – semi-rigid
 - inshore waters type 402 (a semi-rigid was the type carried on the *Francie*)

¹⁶ The New Zealand Safer Boating Forum was established to co-ordinate and implement recreational boating safety initiatives. It is made up of government agencies, local government, water safety and recreational organisations, and the marine industry.

- specialist lifejackets and personal floatation devices type 403
- buoyancy aid and wetsuit type 404
- buoyancy garment type 405
- specialist personal floatation device type 406.

4.6.22. The webpage also includes a video that gives a comprehensive overview of lifejackets, including the types and their uses. It also encourages users to understand the differences and choose their lifejackets carefully.

4.6.23. Some of the differences between the types of lifejacket are subtle, but some describe critical differences in performance. In particular, a type 401 lifejacket (as initially worn by one of the deceased) has significantly more buoyancy than other types and will maintain an unconscious person's face above water. NZS 5823:2005 makes a distinction between a type 401 lifejacket and all the other types for that reason.

4.6.24. Given the circumstances of this accident, which indicate that not even some commercial operators have got the message about lifejackets; the comments from the survivors of this accident; and the general boating fatality statistics it is clear that the general public and the boating community have some way to go before they fulfil their responsibility to their clients, families and friends to resolve this safety issue. The information is there to be found and the message is clear from the maritime regulators. Normally the Commission would make a recommendation to address such a safety issue, but the efforts of Maritime New Zealand and other boating forums arguably go far enough to address the issue in the long term.

4.7. Vessel operating limits and required lifejackets

Safety issue – Maritime rules that specify the types of lifejacket to be carried on commercial vessels are based only on how far the vessels are permitted to travel from the coast. The rules do not consider environmental factors such as vessels operating out of bar harbours and on exposed coastlines, where higher-specification lifejackets would be more appropriate.

4.7.1. It is almost certain that the lifejackets required to be provided on board the *Francie* were not being worn by anyone on board while the *Francie* crossed the Kaipara Harbour bar. Notwithstanding this, the Commission considered whether the types of lifejacket provided on board were suitable for the conditions on the Kaipara Harbour bar that day.

4.7.2. The *Francie* had been surveyed and approved to operate within restricted limits (inshore). In practice this meant that the *Francie*'s operating area included Kaipara Harbour, outside the harbour up to 12 nm from the shore, and to designated north and south limits (shown in Figure 2). The operating area included the Kaipara Harbour bar, therefore the *Francie* was approved to cross the bar as part of its normal operations.

4.7.3. The Maritime Rules require a restricted-limits vessel to carry type 402 lifejackets for its passengers and crew. NZS 5823 classes type 402 lifejackets as "in-shore waters personal floatation devices" and states that lifejackets are "anticipated for use on inshore waters where early rescue may be expected". The presence of Coastguard, with its reporting and search and rescue systems, does increase the chance of early rescue, but only provided the reporting systems are used and a distress message is able to be made.

4.7.4. Also, this accident demonstrates how quickly people can succumb in rough breaking seas over a sand bar, which arguably is where an emergency is most likely to occur. Although the available type 402 lifejackets would have increased the chances of people surviving in breaking seas, they were not the type recommended for those conditions. Wearers would not have been provided with the full 71 newtons of buoyancy that the lifejackets were capable of in calm water, due to the breaking aerated water over the bar at the time.

4.7.5. Additionally, the lifejackets were not, and not required to be, fitted with crotch straps. Even the higher-specification type 401 lifejackets are not required to be fitted with crotch straps.

One of the passengers who died in this accident was wearing his own inflatable type 401 lifejacket, but it was not fitted with a crotch strap. It is highly likely that upon entering the water he slipped straight out of his lifejacket before he could inflate it. His lifejacket was later found uninflated.

- 4.7.6. The Commission is of the view that for commercial operations in exposed open waters, particularly when vessels are approved to operate out of bar harbours, the minimum requirement should be a type 401 lifejacket, and it should be required to have a crotch strap fitted. For the same reasons, Maritime New Zealand should place some emphasis in its safety campaigns on recommending that recreational users adopt a similar standard when intending to cross bar harbours or venture into exposed coastal waters.
- 4.7.7. A recommendation has been made to the Director of Maritime New Zealand to address this safety issue.

Findings

6. It is very likely that only three of the 11 people on board the *Francie* were wearing lifejackets of some description when the *Francie* capsized while crossing the Kaipara Harbour bar. No-one was wearing a lifejacket provided on board in accordance with the Maritime Rules.
7. It is virtually certain that everyone on board would have had a better chance of survival if they had been wearing a lifejacket, and virtually certain that more people would have survived had the lifejackets been fitted with crotch straps.
8. People have a low appreciation of the importance of wearing a lifejacket that is well fitted and of a type appropriate to the location and conditions where it will be used.
9. The lifejackets on board the *Francie* that were approved for use under the Maritime Rules were not of a type appropriate for the nature of the *Francie* operation, which included crossing the Kaipara Harbour bar and operating off an exposed coastline.

5. Findings

- 5.1. The forecast weather conditions, in combination with the state of the tide, were not suitable for the *Francie* to head out over the Kaipara Harbour bar and make a safe return.
- 5.2. The *Francie* capsized when it was struck by a large breaking wave from behind while the skipper was distracted by making a radio call.
- 5.3. Indications are that the skipper had a propensity to accept a high level of risk when deciding whether to cross the Kaipara Harbour bar.
- 5.4. The skipper had a propensity for crossing the Kaipara Harbour bar in high-risk conditions, which was known to but not reported by others in the industry and community.
- 5.5. A system is needed for people to make reports on safety-related concerns to Maritime New Zealand to provide the regulator with more opportunity to intervene before accidents happen.
- 5.6. It is very likely that only three of the 11 people on board the *Francie* were wearing lifejackets of some description when the *Francie* capsized while crossing the Kaipara Harbour bar. No-one was wearing a lifejacket provided on board in accordance with the Maritime Rules.
- 5.7. It is virtually certain that everyone on board would have had a better chance of survival if they had been wearing a lifejacket, and virtually certain that more people would have survived had the lifejackets been fitted with crotch straps.
- 5.8. People have a low appreciation of the importance of wearing a lifejacket that is well fitted and of a type appropriate to the location and conditions where it will be used.
- 5.9. The lifejackets on board the *Francie* that were approved for use under the Maritime Rules were not of a type appropriate for the nature of the *Francie* operation, which included crossing the Kaipara Harbour bar and operating off an exposed coastline.

6. Safety issues

- 6.1. Some people are using the accident and incident reporting process to raise safety concerns because there is currently no dedicated, formal process within Maritime New Zealand where members of the public and the maritime community can submit reports on safety and security concerns, including complaints and allegations of suspected breaches of maritime legislation.
- 6.2. Maritime rules that specify the types of lifejacket to be carried on commercial vessels are based only on how far the vessels are permitted to travel from the coast. The rules do not consider environmental factors such as vessels operating out of bar harbours and on exposed coastlines, where higher-specification lifejackets would be more appropriate.
- 6.3. There are indications that people may not have a sufficient understanding of the design and capability of the various types of lifejacket available, or of the importance of wearing a lifejacket of the correct size and type for any situation where there is a risk of people ending up in the water.

7. Safety actions

7.1. General

7.1.1. The Commission classifies safety actions by two types:

- (a) safety actions taken by the regulator or an operator to address safety issues identified by the Commission during an inquiry that would otherwise result in the Commission issuing a recommendation
- (b) safety actions taken by the regulator or an operator to address other safety issues that would not normally result in the Commission issuing a recommendation.

7.2. Safety actions addressing safety issues identified during an inquiry

- 7.2.1. Maritime New Zealand provides comprehensive advice, guidance and videos aimed at both commercial and recreational skippers on crossing bars, wearing lifejackets and being a safe skipper. It also uses the Maritime New Zealand and Safer Boating Facebook pages and Twitter.
- 7.2.2. Maritime New Zealand provided funding for, and advertises on, MetService's marine weather app, on which both commercial and recreational skippers use to check the weather. The app has 200,000 users a month and includes advertisements that remind boaties to wear lifejackets and take VHF radios.
- 7.2.3. Maritime New Zealand's lifejacket campaign has run on television and in print and digital media since 2011. The campaign has increased the number of boaties who say they carry lifejackets to more than 90%, and those who say they wear lifejackets all or most of the time to 76%.

7.3. Safety actions addressing other safety issues

- 7.3.1. Shortly after the *Francie* accident, Maritime New Zealand officers engaged personally with the eight commercial operators known to cross the Kaipara Harbour bar. Included in that direct engagement were discussions about each operator's procedures and processes to ensure they met best practices on bar crossings.

8. Recommendations

8.1. General

- 8.1.1. The Commission may issue, or give notice of, recommendations to any person or organisation that it considers the most appropriate to address the identified safety issues, depending on whether these safety issues are applicable to a single operator only or to the wider transport sector. In this case, recommendations have been issued to Maritime New Zealand.
- 8.1.2. In the interests of transport safety, it is important that these recommendations are implemented without delay to help prevent similar accidents or incidents occurring in the future.

8.2. Recommendations

- 8.2.1. Maritime New Zealand receives some information via its general enquiries contact point and also via its maritime officers' engagement with the community. However, there would be some added benefit if there were a similar process to that operated by the Civil Aviation Authority for people to report safety and security concerns.

On 23 May 2018 the Commission recommended that the Director of Maritime New Zealand develop, implement and advertise a process where members of the public and the maritime community can submit reports on maritime-safety-related concerns. (012/18)

On 18 June 2018 Maritime New Zealand replied:

Maritime NZ already has a system in place to receive, record and act upon reports relating to maritime-safety-related concerns from various public sources. We also receive some information via our maritime officers' engagement with the community. Information so received, and its sources, are protected as far as possible, subject to the requirements of the Privacy Act and Official Information Act. As previously noted, without the appropriate legal provisions Maritime NZ's ability to operate a confidential reporting process similar to that operated by the Civil Aviation Authority is constrained.

However, Maritime NZ is committed to continuing to implement and advertise its existing process where members of the public and the maritime community can submit reports on maritime-safety-related concerns. We will actively promote the availability of this reporting process and look for opportunities to improve it where possible.

- 8.2.2. The Commission is of the view that for commercial operations in exposed open waters, particularly when vessels are approved to operate out of bar harbours, the minimum requirement should be a type 401 lifejacket, and it should be required to have a crotch strap fitted. For the same reasons, Maritime New Zealand should place some emphasis in its safety campaigns on recommending that recreational users adopt a similar standard when intending to cross bar harbours or venture into exposed coastal waters.

On 23 May 2018 the Commission recommended that the Director of Maritime New Zealand review the current requirements for the carriage of lifejackets on commercial restricted-limit vessels, and use an appropriate mechanism to ensure that the required lifejackets are of an appropriate type for the type and place of operation. (013/18)

On 18 June 2018, Maritime New Zealand replied:

I can confirm that Maritime NZ is prepared to undertake a review of the current requirements for the carriage of lifejackets on commercial restricted-limit vessels, to ensure that these produce the best safety outcomes. This work will need to be prioritised against other work streams underway to improve boating safety, including ongoing efforts to promote the wearing of lifejackets of an appropriate size and type by recreational and commercial boat users. This will continue to be a focus of Maritime NZ's work.

I am in the process of assigning responsibility for the review to an appropriate Maritime NZ work programme. Once this has been done, the first step will be a scoping exercise for the review, which I anticipate will take about a year to complete.

On 23 May 2018 the Commission recommended that the Director of Maritime New Zealand use an appropriate mechanism to make it mandatory for crotch straps to be fitted to lifejackets required on board commercial vessels that operate out of bar harbours and off exposed coastlines, (014/18)

On 18 June 2018, Maritime New Zealand replied:

Maritime NZ will undertake a review of the current requirements for the carriage of lifejackets on commercial restricted-limits vessels. This review will include analysis of the advantages and disadvantages, in terms of safety outcomes, of wearing lifejackets fitted with crotch straps. Various issues to be considered relating to the use of crotch straps attached to lifejackets are canvassed in my letter of 9 May.

Pending the outcome of the review, Maritime NZ is not in a position to indicate a timeframe for further action regarding the mandatory fitting of crotch straps.

Should the review ultimately conclude that crotch straps on lifejackets will improve safety outcomes, consideration could be given to making this a mandatory requirement. This would require legislative change and would be a decision for Ministers. A recommendation to Ministers would need to be pursued through the Ministry of Transport.

Meanwhile, Maritime NZ will continue to actively promote its safety messages to skippers of commercial vessels advocating the wearing of lifejackets of an appropriate type by every person on board during bar crossings.

On 23 May 2018 the Commission recommended that the Director of Maritime New Zealand continues to emphasise to recreational boat users the benefits of having crotch straps fitted to their lifejackets. (015/18)

On 18 June 2018, Maritime New Zealand replied:

Maritime NZ confirms that it will continue to emphasise to recreational boat users the benefits of having crotch straps fitted to their lifejackets. Promoting the use of lifejackets appropriate to the type and place of operation is one of the key safety messages of Maritime NZ's public boating safety campaign. As noted in my 9 May letter, the *Lifejackets Fact Sheet* available on the Maritime NZ website recommends the use of crotch straps to stop lifejackets riding up for situations other than very calm water, and points out that crotch straps are mandatory of all lifejackets worn by children. We will continue to draw attention to this important safety message.

9. Key lessons

- 9.1 Extreme caution must be exercised when crossing bars because sea conditions can change for the worse in a very short time. Waves can come from more than one direction and are usually larger and steeper than surrounding waters and often breaking.
- 9.2 Wearing a lifejacket will significantly improve the chances of survival if a person unexpectedly finds themselves in the water.
- 9.3 When a person wearing a lifejacket unexpectedly finds themselves in the water, their chances of surviving are significantly improved if the lifejacket is of the appropriate type for the conditions and size of the person, and is fitted with a crotch strap to prevent their losing it when it rides up and over their head.
- 9.4 The Maritime New Zealand website has useful information about selecting a proper lifejacket that best suits a person's maritime activity, and how and when it should be worn.
- 9.5 If a person has concerns about the safety of any maritime activity, they should not hesitate to report them to the appropriate maritime regulator. This could help prevent accidents and save lives.

Appendix 1: National Code of Practice for Bar Crossings

The purpose of the 'national code of practice' is to provide clear guidelines to the skipper and crew of all vessels regarding safe and prudent practice when attempting to cross any bar or river entrance.

Cautions

Extreme caution must be exercised when crossing bars. Conditions prevailing on a bar or in river approaches may cause unusually sudden steep and often breaking seas. Conditions change quickly and unpredictably. The skipper's experience and the vessel type should be taken into account when a bar crossing is considered. However, no amount of experience or boat type makes crossing a bar SAFE when the conditions are marginal or adverse. No situation warrants taking the risk, so if in doubt "STAY OUT".

Before leaving harbour, a skipper must assess conditions on the bar. Skippers must be aware that a rapid change in conditions might prevent a safe return to harbour. Craft unable to weather adverse seas outside the bar should not leave port. Those vessels leaving for longer trips should ensure they have adequate reserve fuel and provisions to enable the vessel to remain at sea and/or divert to another port should adverse bar conditions prevail on their return.

Ensure that your vessel has sufficient stability. All vessels must be in a stable condition.

Skippers should be aware of all the factors that determine a vessel's stability including:

- ♦ the free surface effect of liquids and loose fish
- ♦ additional weights on deck, including portable ice slurry bins and fuel containers
- ♦ the loss of stability that occurs if deck enclosures or bins suddenly fill with water
- ♦ modifications to a vessel may be detrimental to its stability. The vessel's static stability should have been calculated after such alterations
- ♦ the movement of weights within the vessel, including people.

Skippers should be aware that:

All bars have areas of broken water containing air, which can severely reduce the stability and handling of a vessel:

- ♦ in marginal conditions, night time crossings are more hazardous; and
- ♦ vessels attempting to cross a bar at or near low water are more likely to experience adverse conditions than at high water. See Boat Notice BN 10/2001 November (superseding Boats Notice 02/2000)

Prudent practice

Effective communication must be established before attempting a crossing between the skipper and the harbourmaster or if unavailable, another responsible person.

All skippers operating to and from bar harbours should obtain relevant up to date information and a weather report pertinent to the area before crossing the bar, and take into account that information.

Stay at a safe distance offshore until a report on the prevailing bar conditions has been obtained from the harbourmaster or, if unavailable, another responsible person inside the harbour. If in doubt "STAY OUT".

Skippers should ensure that all deck openings, hatches and doors are securely battened down or closed, particularly off-centre line hatchways. Freeing ports should be checked that they are clear and operating. Loose gear on deck including ice-slurry bins and their lids should be secured.

Before crossing any bar entrance, skippers should ensure that everyone on board is awake and dressed.

Ensure lifesaving equipment is easily accessible and ready for immediate use. Every person should wear a lifejacket or personal flotation device (PFD) of an appropriate size, particularly children. There are many approved inflatable lifejackets that are easy and comfortable to wear.

Approaches should be made at a moderate speed in order that a skipper might increase or slacken speed in order to steer out of trouble.


A lookout watching astern should be posted to keep the helmsman informed of the approach of dangerous building swells.

In the interests of safety and manoeuvrability, the skipper should ensure the preceding vessel is well clear of the bar before proceeding.

Once across the bar, the skipper should confirm successful crossing with the harbourmaster or, if unavailable, another responsible person.

A "responsible person" is a person with relevant experience and/or expertise, in whom the skipper has confidence, who is accountable for the provision of advice regarding local bar conditions and/or prudent practice to skippers intending to cross the bar.

⚠ It is ultimately the skipper's responsibility to determine whether or not to cross a bar



BEFORE YOU CROSS A BAR

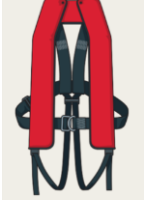


10 IMPORTANT SAFETY TIPS FOR CROSSING A BAR

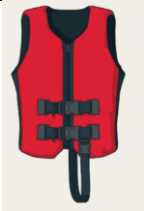


- 1 Check the weather, tide and bar conditions
- 2 Contact skipper(s) to receive radio forecast prior to crossing
- 3 Ensure adequate stability
- 4 Ballast down
- 5 Lifejackets must be worn and all crew must be trained
- 6 Approach at maximum speed
- 7 Post a lookout to monitor sea conditions
- 8 Cross waves at an angle to reduce the risk of capsizing
- 9 If in doubt – don't cross
- 10 Avoid lee side

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Appendix 2: Description of lifejacket types

Name and type of lifejacket	Example:
<p>Open waters type 401 – <i>inflatable</i></p> <ul style="list-style-type: none"> • Achieves buoyancy by either a: <ul style="list-style-type: none"> ○ water-activated switch, or a ○ manual pull cord • May include a mouthpiece • Designed to keep the wearer vertical during unconsciousness • Comfortable and convenient to wear at all times • Must provide 150 newtons of buoyancy 	
<p>Open waters type 401 – <i>semi-rigid</i></p> <ul style="list-style-type: none"> • Achieves buoyancy by a semi-rigid foam • Designed to keep the wearer vertical during unconsciousness • Minimum buoyancy rating of 100 newtons (adult size) • Not suitable for continuous wearing on pleasure craft • Best suited for emergencies 	
<p>Inshore waters type 402</p> <ul style="list-style-type: none"> • Must have a buoyant collar • Not designed to keep an unconscious person's face above water • Provides at least 71 newtons of buoyancy (adult size) • Comfortable and convenient to wear at all times • Compatible with a crotch strap • Not suitable for rough conditions 	

<p>Specialist lifejackets and personal floatation devices type 403</p> <ul style="list-style-type: none"> • No collar • Lower buoyancy rating compared with other lifejackets • Lower levels of support and safety compared with other models • No reflective or bright materials • Necessary for some aquatic sports • Must have at least 53 newtons of buoyancy (adult size) 	
<p>Buoyancy aid and wetsuit type 404</p> <ul style="list-style-type: none"> • A wetsuit with added buoyancy in specific areas. These are very expensive and suitable for some sporting activities 	
<p>Buoyancy garment type 405</p> <ul style="list-style-type: none"> • No collar • Lower buoyancy rating compared with other lifejackets • Lower levels of support and safety compared with other models • Necessary for some aquatic sports • Has reflective material in bright colours 	
<p>Specialist personal floatation device type 406</p> <ul style="list-style-type: none"> • May be fitted with a collar • Not intended for use at night • May not be suitable for all conditions 	



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09-210	Bulk carrier, <i>Taharoa Express</i> , cargo shift, Port Taharoa, 16 December 2009
10-204	Inquiry 10-204: Bulk carrier <i>Hanjin Bombay</i> , grounding, Mount Maunganui, 21 June 2010

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