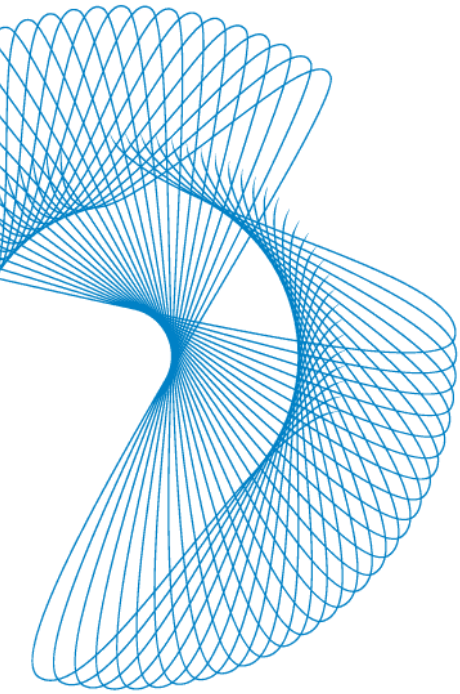
MARITIME NEW ZEALAND



Accident Report

Tobamoray

Swamping & Fatality

Manukau Bar on 5 March 2005

Class A Accident Report

REPORT NO.: 05 1184

VESSEL NAME: TOBAMORAY

Ship Type:	Sea Nymph Hustler
Construction Material:	Glass Reinforced Plastic (GRP)
Length Overall (m):	5
Engine:	90hp Johnson Outboard
Age:	1985
Accident Investigator:	Zoe Brangwin

Tobamoray

SUMMARY

At about 0700 hours, 5 March 2005, the Skipper of *Tobamoray* left Little Huia, Auckland, with two friends. They were heading out of Manukau Harbour for a day's fishing. They crossed the Manukau Bar without any difficulty and anchored for the morning to fish.

At about 1330 hours, they weighed anchor and started back. All three men wore lifejackets.

Before *Tobamoray* reached the bar they encountered three large swells. They negotiated the first two but the third (about 5 metres high), broke over the vessel. *Tobamoray* was swamped and then capsized. All of the occupants were thrown well clear. About ten minutes later the vessel sank and the three men became separated from each other.

At about 1530 hours, the Skipper of the commercial fishing vessel *Green Pastures* found Passenger One deceased and then picked up Passenger Two alive and well. At about the same time a nearby recreational vessel picked up the Skipper, alive and in shock.

The report concludes that:

- *Tobamoray* capsized due to the large wave that broke over the vessel as they attempted to cross the Manukau Bar.

- *Tobamoray* sank due to insufficient reserve buoyancy caused by:

    - Insufficient reserve buoyancy inherent in the design of the boat
    - The likelihood of water ingress into the buoyancy compartment.

- The tragic loss of a life following the sinking was due to the combination of the above, together with other factors, including:

    - Not having access to essential distress signalling equipment following the capsize.
    - The sea state causing waves to break over his head.
    - A possible bang to the head resulting in unconsciousness.

- Post Mortem results showed that Passenger One died of drowning. He also had a mark across his forehead, which may have been the result of a knock to the head.

- Although *Tobamoray* carried a range of safety equipment, this was not available following the capsize. Had the vessel floated and remained level, even when inverted, access to the communications and flares would have been easier and this equipment may have prevented loss of life.

The report recommends that:

- The Skipper of *Tobamoray* sit the New Zealand Coastguard Boat Masters course.

- The Business Development and Communication Division of Maritime New Zealand continue to promote by all possible means the wearing of lifejackets throughout all areas of New Zealand for all recreational boat users.

- The Business Development and Communication Division of Maritime New Zealand, in conjunction with the New Zealand Coastguard prepare a statement on bar crossing that could be transmitted over maritime radio and coastguard radio, especially Channel 21 and repeated from time to time.

- Maritime New Zealand include a copy of this report on its website and in the next edition of the Recreational Accident Report book and that it be circulated as widely as possible throughout the maritime community.

- The following recommendations were highlighted after the *Time Out* accident off Oamaru in 2003. These recommendations remain pertinent to this case.

  It is recommended that the Maritime New Zealand in conjunction with the Marine Industries Association (MIA) and Coastguard investigate in conjunction with the boatbuilding industry, the feasibility of ensuring that positive buoyancy is fitted to all new vessels under 8 metres in length and that buoyancy be placed to ensure level flotation after a capsize or swamping.

  It is recommended that the feasibility of fitting level flotation buoyancy to existing small vessels be investigated by the Maritime NZ/MIA and the results of the study should be promulgated to the recreational boating community and industry.

- Maritime New Zealand in conjunction with the Maritime Industries Association and the boat building industry continue to explore the feasibility of the ways in which level flotation can be achieved for vessel up to 8 metres in length.

- A copy of this report be forwarded to the Coroner, the Coastguard Federation, the Marine Industries Association, all Harbourmasters and members of the National Pleasure Boat Safety Forum.

NARRATIVE

Owner/Skipper Details

The Skipper aged 66 years, has owned *Tobamoray* for about six years. He has over 40 years experience owning and driving recreational vessels.

The Skipper took *Tobamoray* out on a regular (monthly) basis throughout the year. The Skipper has spent the majority of the last 40 years taking vessels out of the Manukau Heads.

The Skipper does not hold any boating qualifications. If he had attended a course he would have been exposed to both tuition and texts that would given him precisely the information that he seemed to lack in relation to this accident, in spite of many years of experience.

Passengers

There were two passengers onboard:

- Passenger One had been boating with the Skipper for the past five years. They had gone out fishing together on a regular basis. The Skipper was in the process of teaching him all he knew about boating. He was 47 years of age and was a fit and healthy man of substantial height and build.

- Passenger Two, aged 61 years, was a friend of the Skipper. He had not been on *Tobamoray* before and was not an experienced boater.

Navigation and Safety Equipment

- GPS
- Echo Sounder
- VHF Radio
- Compass
- Anchor
- Spare Lines
- Buckets
- Spare Motor
- Lifejackets
- Cellphones

There were no flares or an Emergency Position-Indicating Radio Beacon (EPIRB) onboard. The Skipper stated that he was going to buy a personal locater beacon the same week of the accident, as he thought it would be important to have one.

There were two cell phones onboard but neither was in a waterproof bag or holder.

Lifejackets

All three men wore RFD Coastal waters lifejackets. They wore these jackets the whole time the vessel was underway, only taking them off when fishing at anchor. The jackets were done up correctly and fitted well.

In commenting on the draft report, Passenger Two stated, *"What saved my life in the first instance was that magnificent RFD coastal water lifejacket and I would hope that every boat taking to the water has the required number of lifejackets to the numbers onboard."*

Manukau Harbour Entrance/Bar

Manukau Harbour is the second largest natural harbour in New Zealand. The entrance to the harbour is between Ohaka Head at the southern end of the Waitakere Ranges and South Head *(See Figure 1)*. The Manukau Bar is a recognised hazard to shipping and recreational vessels. The New Zealand Pilot states that depths on the Bar are subject to frequent change and that passage across it requires constant vigilance.

THE INCIDENT

On Thursday evening, 3 March 2005, the Skipper of *Tobamoray* listened to the weather forecast for Saturday 5 March. The Skipper described the forecast as, "fine with a sea breeze, with a slight 1 to 1½ metre swell". As the weather was looking good for fishing on Saturday he rang his two friends and asked them to join him. Both friends accepted the invitation.

On Friday 4 March, the Skipper prepared his vessel for the fishing trip on Sunday. He checked his lifejackets, the GPS, radio and depth sounder. He also checked that the spare battery was charged.

At 0550 hours, Saturday 5 March, the Skipper of *Tobamoray* listened to the marine weather forecast on VHF channel 21. The forecast was for "slights seas and a metre and a half of swell".

At 0600 hours, the three friends met at the Skipper's house to go fishing for the day off the Manukau Heads. They arrived at the Little Huia boat ramp at about 0645 hours.

At about 0700 hours, they all donned their lifejackets and departed Little Huia.

At about 0730 hours, they crossed the Manukau Bar. The Skipper described the conditions as "good". with "a little swell, a metre and a half, long swell, the water was glossy on top". Before they crossed the bar they saw about six recreational vessels crossing the bar ahead of them. The tide was ebbing.

At about 0800 hours, they reached their fishing spot and anchored. The weather conditions were described as perfect for fishing. There was no wind, no clouds and the air temperature was in the mid 20's.

At about 1145 hours, they decided to move closer inshore to try and catch some snapper.

At 1330 hours, they finished fishing. They put their lifejackets back on, weighed anchor and headed back. The tide had turned and was now flooding.

At 1330 hours, the commercial fishing vessel *Green Pastures* was on its way back to Auckland via the Manukau Harbour. As they approached the channel, the Skipper noticed that the breakers across the bar were approximately three metres high at certain points. He decided that the conditions were too dangerous and headed back out to sea.

As *Green Pastures* headed back out to sea the Skipper saw a 14-16 foot trailer boat heading south and lining up the channel to cross. He said to his crew, "look at this boat, look at the swells". The Skipper did not see this vessel again and did not witness the accident. (Later in conversation with the Skipper of *Tobamoray* the Skipper of *Green Pastures* said that he had seen the three large waves and thought to himself, "I hope no one gets caught in them".)

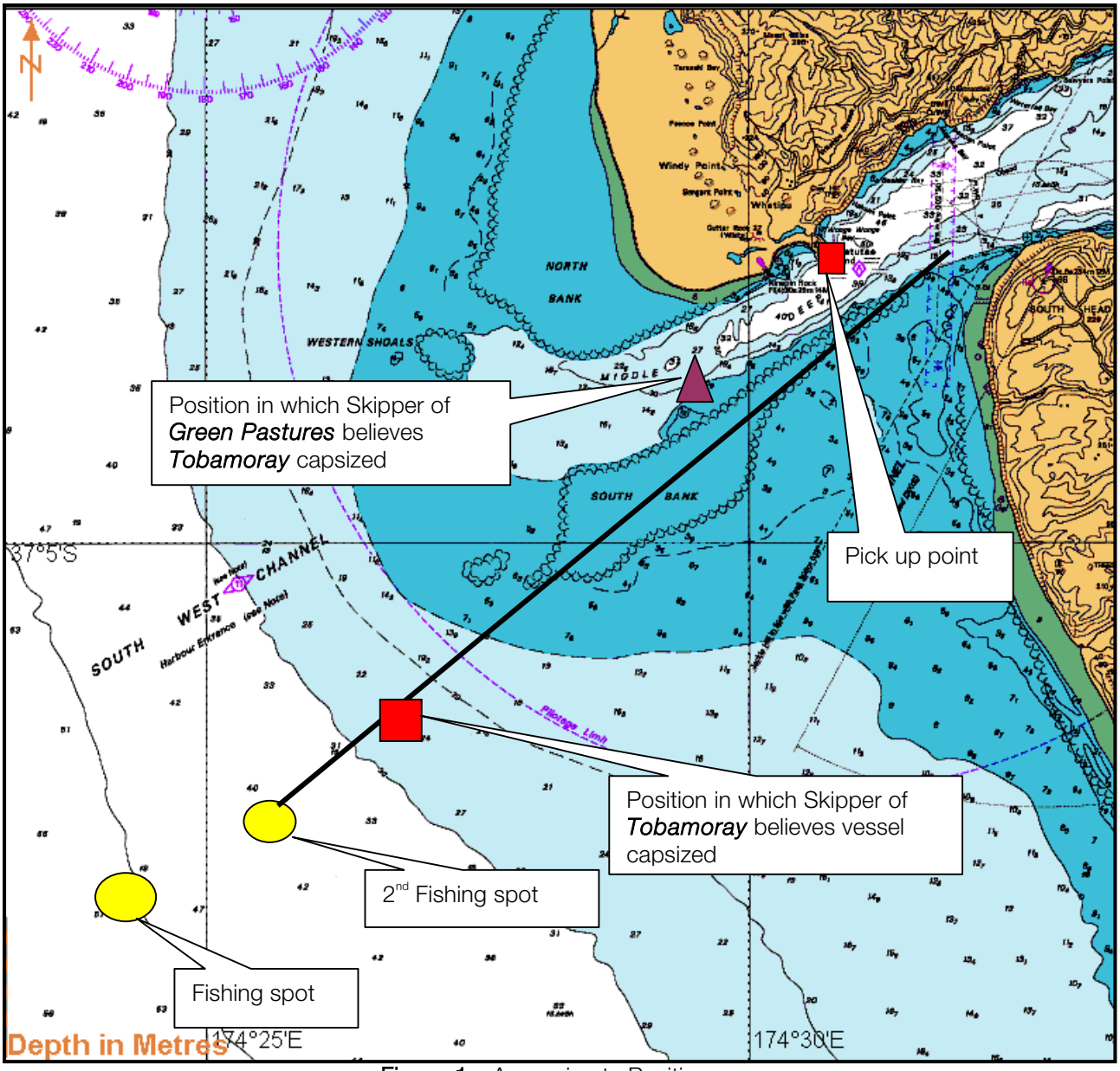


Figure 1 - Approximate Positions

(Note: Depths on the Manukau Bar are subject to constant change. Accordingly this chart may not accurately reflect the position of shallows at the time of the accident)

Before ***Tobamoray*** reached the bar and whilst in approximately 22 metres of water Passenger One saw a large swell coming in behind them. The vessel rode it out. He then saw another large swell behind and told the Skipper. The Skipper opened up the throttle to keep ahead of the swell and it passed beneath them without any problems.

Immediately after, Passenger One saw a huge wave behind (about 5 metres high). The wave broke over the vessel from the stern, swamped it and then capsized the vessel, throwing the occupants well clear.

The three men clung to the upturned hull. They appeared unharmed. About 10-15 minutes later the vessel sank underneath them. They became separated from each other as they drifted further and further apart.

Each man started his own personal battle of survival and tried to swim to shore, whilst being buffeted by waves from every direction. The men spent about two hours in the water before being rescued by two vessels, the trawler ***Green Pastures*** and a recreational vessel.

At about 1500 hours, the Skipper of *Green Pastures* climbed onto the roof of the wheelhouse. He saw that the bar had flattened off and decided it was safe enough to cross.

At about 1530 hours, off Paratutae Island, the Skipper of *Green Pastures* found Passenger One deceased. He then picked up Passenger Two alive and well. At about the same time the nearby recreational vessel picked up the Skipper.

Both men were transferred to a Coastguard vessel and taken to the wharf at Onehunga, where an ambulance met them. They spent the night in hospital under observation and were discharged the next day.

COMMENT & ANALYSIS

Tides

5th of March 2005

0607	3.5m
1231	1.4m
1841	3.4m

The tide was ebbing as *Tobamoray* exited the harbour and flooding as they attempted to enter the harbour.

Weather Forecast

The Skipper listened to the marine weather forecast on VHF Channel 21 (a continuous weather channel) from Meteorological Service of New Zealand Limited (Metservice). The following extracts are from the MetService forecast for that day:

> *"Marine Weather Situation and Forecast for Auckland and Hauraki Gulf area issued at 0439 Saturday 05-Mar-2005 by MetService*
>
> *Wind warning Nil.*
> *Situation:A slow-moving ridge of high pressure covers the North Island.*
>
> *Forecast issued at 0439 Saturday 05-Mar-2005 Valid to midnight Saturday:*
>
> *For the Manukau Harbour: Variable 5 knots becoming southwest 10 knots late morning and tending northeast tonight. Smooth sea becoming slight this afternoon.*
> *Mainly fine but some cloudy periods.*
>
> *For the Waitemata Harbour, the Hauraki Gulf and from Bream Head to Cape Colville: Variable 5 knots tending northeast 10 knots this afternoon. Smooth sea becoming slight this afternoon.*
> *Mainly fine but some cloudy periods.*
> *Outlook until midday Sunday: Northerly rising to 15 knots. Mainly fine.*
>
> *Swell forecast to midnight Saturday:*
> *East Coast: Northeast swell about half a metre.*
> *West Coast: Southwest swell about 2 metres.*
>
> *High tides at Onehunga:*
> *Saturday 0607 3.5 metres*
> *Saturday 1841 3.4 metres"*
>
> *"Marine weather bulletin for New Zealand coastal waters. Forecast issued by meteorological service of New Zealand at 0415hrs 05-mar-2005 valid until midnight tonight 05-Mar-2005*
>
> *Kaipara/Raglan*
>
> *Southwest 10 knots becoming northeast this evening. Sea slight. Southwest swell 2 metres.*
> *Outlook following 12 hours: Northerly 15 knots."*

Observations Manukau Heads

0600 hours, 5 March 2005

- SSW 6 knots visibility 10-15 nautical miles
- Sea slight swell 1 metre

1800 hours, 5 March 2005

- SSW 0.8 knot
- Slight sea low swell

Observations Port Taharoa

Port Taharoa is the nearest wave buoy to Manukau Harbour. It is located 65 miles to the south. The following are the readings from the wave buoy.

Port Taharoa Wave Buoy Data

	Time (NZDT)	Time (UTC)	Wind	Sig (m)	Max (m)	Period(s)
04	1742	040442	280/08	2.6	5.0	13
04	2042	040742	270/09	5.6	4.9	13
04	2342	041042	290/08	2.4	4.5	13
05	0242	041342	140/04	2.3	4.5	12
05	0542	041642	110/04	2.4	4.5	13
05	0842	041942	120/04	2.3	4.4	13
05	1142	042242	270/04	2.2	4.2	13
05	1442	050142	280/06	2.1	4.0	12
05	1742	050442	280/05	2.1	4.0	14
05	2042	050742	990/01	2.4	4.5	13
05	2342	051042	090/04	2.4	4.6	16

Sig is the significant wave height (the average of the highest third of the waves) in metres, and Max is the highest wave measured over a period of 10 minutes, also in metres. Period is the average of the period of the highest third of the waves, in seconds.

Significant wave height is the average of the highest one third (33%) of waves, measured from trough to crest, that occurs in a given period. Significant wave height is a statistical measurement. It does not identify the height of an individual wave. Using significant wave height in wave forecasts has an important advantage, as it is close to the wave height that would be estimated by the human eye.

Generally, the maximum wave height that can be expected is taken to be 1.6 x significant wave height. However, this statistical relationship is based over a period of only 10 minutes. If a period of say, three hours is considered, then a maximum wave height of 2.0 x significant wave height can be expected. Therefore, if the significant wave height at the time of the accident was say, two metres, the vessel could be expected to experience a wave (or swell) over a 10 minute period of 3.2 metres and over three hours a wave of twice the height, four metres.

Observations of Wind from Coastguard Manukau Heads

Date	Time	Direction	Speed	Maximum Wind Gust (knots)
05 Mar 2005	07:00	190	3	5
05 Mar 2005	08:00	180	2	5
05 Mar 2005	09:00	240	1	3
05 Mar 2005	10:00	180	5	10
05 Mar 2005	11:00	180	9	14
05 Mar 2005	12:00	200	8	15
05 Mar 2005	13:00	230	9	13
05 Mar 2005	14:00	230	11	14
05 Mar 2005	15:00	230	10	15
05 Mar 2005	16:00	220	9	14
05 Mar 2005	17:00	220	10	14

Sea Temperature

The sea temperature was approximately 20° Centigrade, 20°C = 68° Fahrenheit. While each person responds differently to loss of core body temperature whilst immersed, at 20° Centigrade, a person in the water can become unconscious within two to seven hours. Death can occur within about two to forty hours. Wearing a lifejacket not only assists the wearer by providing buoyancy and thermal protection, it also allows the person to avoid moving arms and legs to stay afloat. Reducing body movement, especially movement of limbs, considerably extends the time before hypothermia starts to take effect.

Water Temperature		Expected Time Before Exhaustion or Unconsciousness	Expected Time of Survival
°C	°F		
	Under 32.5	Under 15 minutes	45 minutes
3	32.5-40	15-30 minutes	30-90 minutes
4-10	40-50	30-60 minutes	1-3 hours
10-15½	50-60	1-2 hours	1-6 hours
15½-21	60-70	2-7 hours	2-40 hours
22-27	70-80	3-12 hours	3 hours to indefinite
27+	Over 80	Indefinite	Indefinite

Water Ingress Into the Enclosed Reserve Buoyancy Compartment

After capsizing the vessel was floating bow up with very little of the vessel's hull remaining above the water.

Tobamoray was designed with its reserve buoyancy situated in the floors below the water line, with the result that, in conjunction with a heavy outboard motor at the stern, it adopted a "bow up" attitude following the capsize.

The Skipper had not added any buoyancy to the vessel. Nor had he made any modifications to the vessel.

It is considered likely that water may have entered the enclosed buoyancy compartment. Without the recovery of the boat, no direct evidence exists as to how this might have occurred. However, the likely presence of water in the buoyancy compartment is indicated by the following:

The fact that the boat sank in a relatively short period of time. There was reserve buoyancy provided by a combination of air in the enclosed buoyancy compartment; other minor items of floating equipment aboard and air trapped in pockets in the boat. This should have been sufficient to keep the boat afloat for longer than the 10-15 minutes it took for the boat to sink following its capsize.

The built-in buoyancy alone that was provided by the under-floor enclosed compartment was insufficient to keep the boat afloat.

Tobamoray may have sustained major structural damage at the time the waves impacted; enough to breach the watertight integrity of the vessel.

The Marine Industries Association/Coastguard Compliance Plate Certified (CPC Plate) requires positive buoyancy to be fitted in all new craft from 3.5 to 8 metres in length. This voluntary code came into effect in 2003 and has been adopted by the manufacturers of 75% of small craft built in New Zealand. New boats that comply with the CPC code have positive reserve buoyancy and will therefore remain afloat in the event of a capsize. However, there is no requirement for level floatation and almost invariably, as in this case, boats will adopt a "bow up" attitude following a capsize due to the weight of the outboard motor at the stern.

Inability to Communicate

Following the capsize, the Skipper and crew from *Tobamoray* did not have the ability to signal distress using a means that could have provided assistance. The following equipment, if available, will often result in an appropriate rapid response.

- Flares. Red hand flares are not affected by temporary immersion. They can be fired by a swimmer and are visible to all vessels within about four miles and to larger vessels for a greater distance. Hand flares are most effective by night, but can also be readily seen by day.

- Orange Smoke. A smoke float is designed to be thrown in the water after ignition. It is not effective at night.

- VHF Radio. Waterproof hand-held VHF Radios are available and are the most effective means of signalling distress. A 24-hour listening watch is maintained by Maritime Radio on channel 16, covering 98% of New Zealand coastal waters (including the area of the accident). The whole northern area also has communication with Coastguard radio 24 hours a day. Many recreational boats are more comfortable calling Coastguard rather than Maritime Radio. The Coastguard also have good local knowledge. Either station can be called before crossing the bar and afterwards to signal that they have crossed safely. Before attempting a crossing, effective communication should be established between the Skipper and a shore radio station or if unavailable, another responsible person. Once across the bar, the Skipper should confirm the successful crossing. Other vessels in the vicinity, or private coastal stations will often hear a broadcast on Channel 16. Any hand-held VHF Radio can be kept in a sealed plastic bag and used effectively whilst still in the bag.

- Cell-phone. Coverage in inshore waters is available in many places. Any distress message can be sent by dialling 111, but other vessels and stations in the vicinity may not be aware of the distress unless informed by Police. Cell-phones should always be kept in a sealed plastic bag when on board small vessels. They can be used whilst still in the bag without loss of signal strength or clarity.

- EPIRB. Emergency Position-Indicating Radio Beacon. When activated it sends a signal which alerts rescuers to the emergency and to the location of the parties in distress.

While any one of the above means of communication may be effective, the importance of having available more than one means of signalling distress in emergency situations cannot be over-stressed. To be always available, cellphones can be kept in a person's pocket. Other emergency equipment should be stored in a container or grab-bag that is stowed where it will be readily available following any emergency, no matter how sudden or unexpected.

The Skipper of *Tobamoray* could have called Auckland Harbour Radio and informed them that he was about to cross the bar. Then, if they received no response from *Tobamoray* within an appropriate time frame they could have raised the alarm.

Rogue or Freak Waves

The Skipper of *Tobamoray* claims he was hit by three freak waves. There has long since been debate over the existence of "freak waves" and what causes them. A British Broadcasting Corporation (BBC) programme on freak waves described them as follows:

"Freak waves occur in bad weather conditions when the average wave height is high and several big waves come together to create a monster. Technically this could happen when the wave size is small, but as the result is small no one notices. Waves can come together for four main reasons:

1. *when wind pushes against a strong current (eg in South Africa)*
2. *when a shallow sea bottom focuses waves to one spot (eg in Norway)*
3. *by chance (hence the 1 in 10,000 year statistic)*
4. *when waves become unstable and start to self-focus"*

Although there was a possibility of *Tobamoray* being struck by a freak wave, it is more likely that the swell was the same height as the predicted maximum wave height (4.2 metres).

The Skipper of *Green Pastures* stated that the height of the waves on the bar at the time of the accident was about 2 metres to seaward of the bar and 4 metres on the bar and that this was higher than forecast.

Code of Practice

In 2001, Maritime New Zealand released the National Code of Practice for Bar Crossings. The code provides clear guidelines to the skipper and crew of all vessels regarding safe and prudent practice when attempting to cross any bar or river entrance.

NATIONAL CODE OF PRACTICE FOR BAR CROSSINGS

This code addresses widespread concerns over fatalities, mainly to the crew of fishing vessels, on bar harbours. A group comprising bar harbour Harbourmasters, fishing industry representatives and the Maritime Safety Authority has developed the code after extensive consultation with all sectors of the maritime industry.

1.0 PURPOSE

1.1 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.

2.0 CAUTIONS

2.1 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”.

2.2 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.

2.3 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 statical stability should have been calculated after such alterations.
- The movement of weights within the vessel including people.

2.4 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.

3.0 PRUDENT PRACTICE

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

3.2 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.

3.3 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".

3.4 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.

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

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

3.7 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.

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

3.9 In the interests of safety and maneuverability the skipper should ensure the preceding vessel is well clear of the bar before preceding.

3.10 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 SKIPPERS RESPONSIBILITY TO DETERMINE WHETHER OR NOT TO CROSS A BAR

CONCLUSIONS

N.B. These are not listed in order of importance

It was the opinion of the Skipper of *Green Pastures* that *Tobamoray* "should not have been out there in those conditions, they should have waited for the conditions to ease up."

The Skipper was adamant that they encountered the large waves before they reached the bar. These waves were described as freak/rogue waves. Although there was a possibility of *Tobamoray* being struck by a freak wave, it is more likely that the swell was the same height as the predicted maximum wave height (4.2 metres).

Passenger Two heard the Skipper and Passenger One discuss the bar on the way back in saying, " it doesn't look good". Passenger two stated that he clearly heard this as he was at this point very concerned. The Skipper disputes that he said this and said that the bar crossing looked fine.

Tobamoray capsized due to the large wave that broke over the vessel as they attempted to cross the Manukau Channel.

Tobamoray sank due to insufficient reserve buoyancy caused by:

- Insufficient reserve buoyancy inherent in the design of the boat
- The likelihood of water ingress into the buoyancy compartment.

The tragic loss of a life following the sinking was due to the combination of the above, together with a number of other factors, including:

- Not having access to essential distress signalling equipment following the capsize.
- The sea state causing waves to break over his head.
- A possible bang to the head resulting in unconsciousness.

Post Mortem results showed that Passenger One died of drowning. He also had a mark across his forehead, which may have been the result of a bump to the head.

Although *Tobamoray* carried a range of safety equipment, this was not available following the capsize. Had the boat floated and remained level, even when inverted, access to the communications and flares would have been easier and this equipment would almost certainly have prevented loss of life.

- VHF Radio. This was installed and became unusable as soon as *Tobamoray* capsized. Waterproof hand held VHF radios are available. Any hand held VHF radio can be kept sealed in an inexpensive sealable plastic bag and used to send a distress message after a capsize or swamping, provided it is kept accessible. It is not necessary to remove the radio from the plastic bag to transmit or receive messages.

- Effective communication should be established before attempting a crossing between the Skipper and a shore radio station or if unavailable, another responsible person. Once across the bar, the Skipper should confirm the successful crossing. If they had informed a shore station, the station would have been alerted of a possible situation when the vessel did not call to confirm they had made a safe crossing.

- Flares. There were no flares onboard. Flares approved for use in maritime distress situations are not affected by immersion and can therefore be used if accessible.

- Cellphones. These are carried by most people and at least one was on board *Tobamoray.* While they fall a long way short of a VHF Radio in terms of safety, they are, if kept sealed in a plastic bag, able to be used to call for assistance.

- EPIRB. There was no EPIRB onboard.

In commenting on the draft report, Passenger Two stated, "*EPRIB in as short a time frame as possible be a compulsory part of the safety checklist requirement."*

Passenger Two also stated that, *"It should be an absolute requirement that all Skippers notify the appropriate authorities prior to leaving the harbour when crossing the bar and informing of same when returning, there should under no circumstances be any exceptions to this rule."*

SAFETY RECOMMENDATIONS

1. It is recommended that the Skipper of *Tobamoray* attend the New Zealand Coastguard Boat Masters course.

2. It is recommended that the Business Development and Communication Division of Maritime New Zealand continue to promote by all possible means the wearing of lifejackets throughout all areas of New Zealand for all recreational boat users.

3. It is recommended that the Business Development and Communication Division in conjunction with the New Zealand Coastguard prepare a statement on bar crossing that could be transmitted over maritime radio and coastguard radio, especially Channel 21 and repeated from time to time.

4. It is recommended that Maritime New Zealand include a copy of this report on its website and in the next edition of the Recreational Accident Report book and that it be circulated as widely as possible throughout the maritime community.

5. The following recommendations were highlighted after the *Time Out* accident off Oamaru in 2003. These recommendations remain pertinent to this case.

    - *The Marine Industries Association/Coastguard Compliance Plate Certified (CPC plate) requires positive buoyancy to be fitted in all new craft from 3.5 to 8 metres in length. This voluntary code came into effect in 2003 and has been adopted by the manufacturers of 75% of small craft built in NZ. New boats that comply with the CPC code have positive reserve buoyancy and will therefore remain afloat in the event of a capsize. However, there is no requirement for level flotation and almost invariably boats will adopt a "bow up" attitude following a capsize due to the weight of the outbound motor at the stern.*

    - *It is recommended that Maritime New Zealand in conjunction with the Marine Industries Association (MIA) and Coastguard investigate in conjunction with the boatbuilding industry, the feasibility of ensuring that positive buoyancy is fitted to all new vessels under 8 metres in length and that buoyancy be placed to ensure level flotation after a capsize or swamping. Since that recommendation was made, all new dinghies manufactured by Fyran have been constructed so as to float level in the event of a capsize/swamping.*

    - *It is recommended that the feasibility of fitting level flotation buoyancy to existing small vessels be investigated by the Maritime NZ/MIA and the results of the study should be promulgated to the recreational boating community and industry.*

6. It is recommended that Maritime New Zealand in conjunction with the Maritime Industries Association and the boat building industry continue to explore the feasibility of the ways in which level flotation can be achieved for vessel up to 8 metres in length.

7. That a copy of this report be forwarded to the Coroner, the Coastguard Federation, the Marine Industries Association, all Harbourmasters and members of the National Pleasure Boat Safety Forum.