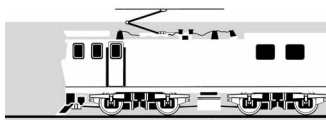
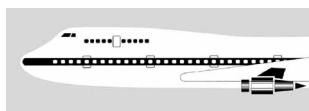


## MARINE OCCURRENCE REPORT

04-207

Fishing vessel *Poseidon*, grounding, north of Manukau Harbour entrance

15 April 2004



TRANSPORT ACCIDENT INVESTIGATION COMMISSION  
NEW ZEALAND

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**Report 04-207**

**fishing vessel  
*Poseidon***

**grounding**

**north of Manukau Harbour entrance**

**15 April 2004**

### **Abstract**

On Thursday 15 April 2004 at about 0215, the fishing vessel *Poseidon* grounded on a beach north of Manukau Heads while on passage from fishing grounds off Kawhia to Onehunga. The skipper was able to transmit a mayday call and the crew were winched off the vessel by rescue helicopter. On the evening of 16 April 2004 a salvage team refloated the *Poseidon*. There were no injuries. The vessel suffered extensive damage to its hull and fitments.

Safety issues identified included:

- the lack of a watchkeeping monitor alarm for a single-handed wheelhouse operation
- the undertaking of navigational watchkeeping and helmsman tasks whilst impaired by the effects of fatigue.

Safety recommendations were made to the Managing Director of Poseidon Fishing Company Limited, and the General Manager, trade and education of the Seafood Industry Council.



**The *Poseidon* aground on the beach north of Manukau Heads**

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## Abbreviations

ACC	Accident Compensation Corporation
CLM	Commercial Launch Master certificate
GPS	global positioning system
IMO	international maritime organization
kt(s)	knot(s)
kW	kilowatt
m	metres
MSA	Maritime Safety Authority
nm	nautical mile
NZST	New Zealand Standard Time (UTC + 12 hours)
SITO	Seafood Industry Training Organization
SSB	single side band
SSM	safe ship management
STCW	international convention on standards of training, certification and watchkeeping
STCW-F	international convention on standards of training, certification and watchkeeping for fishing vessel personnel
UTC	co-ordinated universal time
VHF	very high frequency

## Glossary

conduct conning (con)	in control of the vessel directing the course and speed of a ship
displacement tonnage	weight of liquid displaced by a solid floating or immersed in it
gross tonnage	a measure of the internal capacity of a ship; enclosed spaces are measured in cubic metres and the tonnage derived by formula
knot	one nautical mile per hour
Mayday call	a verbal radio call used to indicate that a ship or aircraft or person is threatened by grave and imminent danger and requires immediate assistance
Pan call	a verbal radio call used to indicate that a ship or aircraft or person has a very urgent message to transmit concerning its safety
relay call	a re-transmission of a distress message made by a ship or coast station to summon further assistance
tidal stream	the periodic movement of water in a horizontal direction, and is due ultimately to the same causes as the tide
transceiver	a combined radio transmitter and receiver

## Data Summary

### Vessel Particulars:

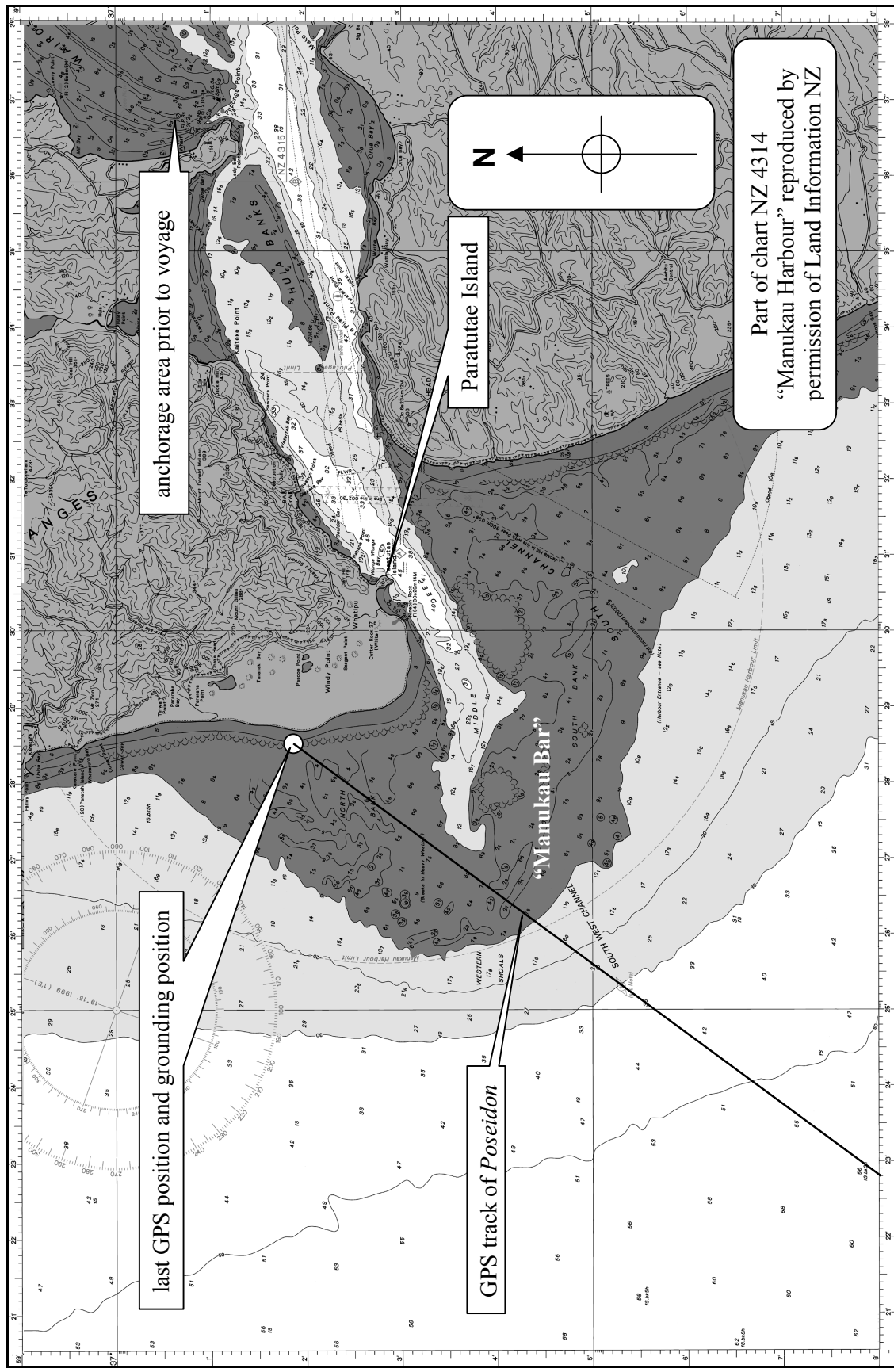
Name:	<i>Poseidon</i>
Type:	wooden fishing, surface long liner
Limits:	Restricted Coastal when skippered by a CLM holder
Length:	14.63 m
Breadth:	4.63 m
Gross tonnage:	26
Built:	1966, Timaru, New Zealand
Propulsion:	a single Gardner 6L3B diesel engine developing 128 kW driving a single fixed pitch propeller through a Gardner 3UC gearbox
Service speed:	8 kts
Owner/operator:	Poseidon Fishing Company Limited
Home Port:	Whitianga
Crew:	3
<b>Date and time:</b>	15 April 2004 at about 0200 <sup>1</sup>
<b>Location:</b>	north of Manukau Harbour entrance
<b>Persons on board:</b>	crew: 3
<b>Injuries:</b>	crew: nil
<b>Damage:</b>	hull planks sprung, caulking damaged, salt-water damage to engine and electrics.
<b>Investigator-in-charge:</b>	Captain I M Hill

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<sup>1</sup> Times in this report are New Zealand Standard Time (UTC + 12 hours) and are expressed in the 24-hour mode







**Figure 1**  
**General area of the accident**

# 1 Factual Information

## 1.1 History of the voyage

- 1.1.1 On Wednesday 7 April 2004 the skipper and 2 crew of the fishing vessel *Poseidon* gathered at the vessel in Onehunga to prepare the vessel for a trip to fish by surface long line off the western coast of North Island.
- 1.1.2 After preparations were completed and ice loaded they departed Onehunga. However, after navigating through the Manukau Harbour, they found that the sea conditions at the Manukau Bar made it unsafe for them to cross, so the skipper took the *Poseidon* to anchor off Cornwallis (see Figure 1).
- 1.1.3 The *Poseidon* remained at anchor for the next 3 days until Sunday 11 April 2004, when the skipper considered it safe to cross the bar. During the time at anchor there were no formalised watchkeeping arrangements. Once clear of the bar they made their way to the south-west to a position chosen by the skipper for starting to fish.
- 1.1.4 Once they had arrived at the fishing ground the skipper and crew commenced a routine of shooting the line, resting and sleeping, hauling the line, processing the fish and stowing them in ice before moving to a new position to repeat the process.
- 1.1.5 Over the next 3 days the skipper and crew shot and hauled the line 3 times. At the completion of the third haul on the evening of 14 April 2004, the skipper decided that they had caught enough fish and set a course on autopilot back towards Manukau Heads about 40 nm away.
- 1.1.6 Before going to bed, the skipper instructed the deckhands to each take a 1½- hour watch after which he was to be called. He estimated that the vessel would be about 5 nm from the Manukau Bar at the time he would be called.
- 1.1.7 The first deckhand stood the first watch while the second went to bed. The first deckhand remembered adjusting the course on the autopilot slightly towards the centre of the bar when the *Poseidon* was about 20 to 30 miles distant from the bar.
- 1.1.8 At the end of his 1½-hour watch the first deckhand left the wheelhouse and went below and tried to wake the second deckhand. Getting a response from the second deckhand, he returned to the wheelhouse and continued his watchkeeping role.
- 1.1.9 The second deckhand had not woken up when the first deckhand called him and never made it to the wheelhouse to take over the watch. Sometime later the first deckhand fell asleep in the wheelhouse chair.
- 1.1.10 The first deckhand was awoken suddenly by an external noise or motion. He looked at the track plotter and saw a displayed message that it had come to the end of the course. He jumped up from the chair and reduced the speed of the engine and then went to wake the skipper and second deckhand. However, his actions were too late and the *Poseidon* grounded almost immediately.
- 1.1.11 The skipper was woken by the first bump as the *Poseidon* grounded. He went to the wheelhouse, and after assessing the situation put the engine into reverse to try and pull the vessel off the beach. At this time the swell was breaking over the boat.
- 1.1.12 After several attempts to free the vessel something, later identified as a rope from the *Poseidon*, fouled the propeller stalling the engine. Reassessing the situation, the skipper decided to make a “Mayday” call.

- 1.1.13 While the skipper was making the “Mayday” call on the very high frequency (VHF) radio, the 2 deckhands went onto the roof of the wheelhouse, retrieved the liferaft, inflated it, and tied it to the side of the vessel. However, the waves breaking around and over the boat damaged the liferaft and snapped the painter. The liferaft floated away from the vessel.
- 1.1.14 Auckland/Plenty Maritime Radio acknowledged the “Mayday” call transmitted by the skipper at 0349. At 0350, Auckland/Plenty Maritime Radio issued a distress relay message and advised Police northern communications. At 0351, New Zealand Coastguard acknowledged the distress relay.
- 1.1.15 At 0410, after discussion with the skipper by VHF radio, Auckland/Plenty Maritime Radio cancelled the distress message and an urgency “Pan relay” message was broadcast. At this time both Manukau and Waiuku Coastguard were responding. By 0549 Manukau Coastguard rescue vessel was standing by about 100 m off the *Poseidon* but could get no closer due to the surf and depth of water and they were waiting for a helicopter to lift the crew off.
- 1.1.16 At about 0750, the Westpac rescue helicopter lifted the skipper and 2 crew off the *Poseidon*. The skipper was landed on the beach near the stranded vessel and the 2 crew were taken to the rescue helicopter base in Auckland.
- 1.1.17 During the late evening of the 16 April 2004, the *Poseidon* was re-floated with the aid of a tug after all moveable equipment and the catch had been offloaded ashore at low tide to vehicles on the beach. To assist the salvage a trench was dug in the sand around the vessel and into the surf using a mechanical digger. The *Poseidon* was subsequently taken to Onehunga where it was lifted out of the water for temporary repairs before being re-floated and towed to Nelson for permanent repair.
- 1.1.18 After the salvage, Waitakere Ranges Regional Park rangers carried out a clean up of the tide line on the beach, in the immediate vicinity of where the *Poseidon* beached. Much of the debris collected obviously originated from the *Poseidon*. Also found in the immediate area was a quantity of marijuana [*Cannabis Sativa*]. When questioned about the origin of the marijuana both the skipper and the first deckhand denied any knowledge of the marijuana on the boat.

## **1.2 Vessel information**

- 1.2.1 The *Poseidon* was a 14.6 m trawler that had been converted to a surface long line vessel. It was built in Timaru in 1966 and had a wooden plank hull on wooden frames. The boat had a beam of 4.26 m and a gross tonnage of 26.
- 1.2.2 The *Poseidon* was powered by a 128 kW Gardner 6L3B diesel engine driving a single fixed pitch propeller through a Gardner 3UC gearbox.
- 1.2.3 The wheelhouse was equipped with the standard equipment necessary for navigation and fishing which included:
- a Sestrel magnetic compass
  - a TMQ AP4 autopilot
  - a Furuno FR 711 72M radar
  - a JRC v/1002 depth sounder
  - 2 Global Positioning System (GPS) receivers, 1 Furuno and 1 JRC
  - a GME GX558 very high frequency (VHF) radio transceivers
  - an ICOM IC M710 NZ single side band (SSB) radio transceiver
- 1.2.4 The *Poseidon* was not fitted with a watchkeeping alarm.

1.2.5 The Maritime Safety Authority (MSA) promoted the use of watchkeeping alarms and was developing draft requirements for the fitting of watchkeeping alarms on small fishing vessels operating at night with a single watchkeeper as an aid in developing appropriate fatigue management arrangements.

1.2.6 The MSA had also convened the Fishing Industry Safety and Health Advisory Group (FISHgroup) in mid 2001 as part of the measures to counter the effects of fatigue on fishing vessel crews. One of the recommendations in the FISHgroup's final report, dated June 2003, was:

the fitting and use of watchkeeping alarms (or suitable alternative warning systems) on fishing vessels for night operations with a single watchkeeper (while recognizing the limited benefits of this approach and the need for broader-based countermeasures), and ask that this work also consider the possibility of providing incentives for the use of such systems.

FISHgroup was replaced by fishSAFE with the primary aim of developing and managing an implementation plan to give effect to the recommendations in the FISHgroup report.

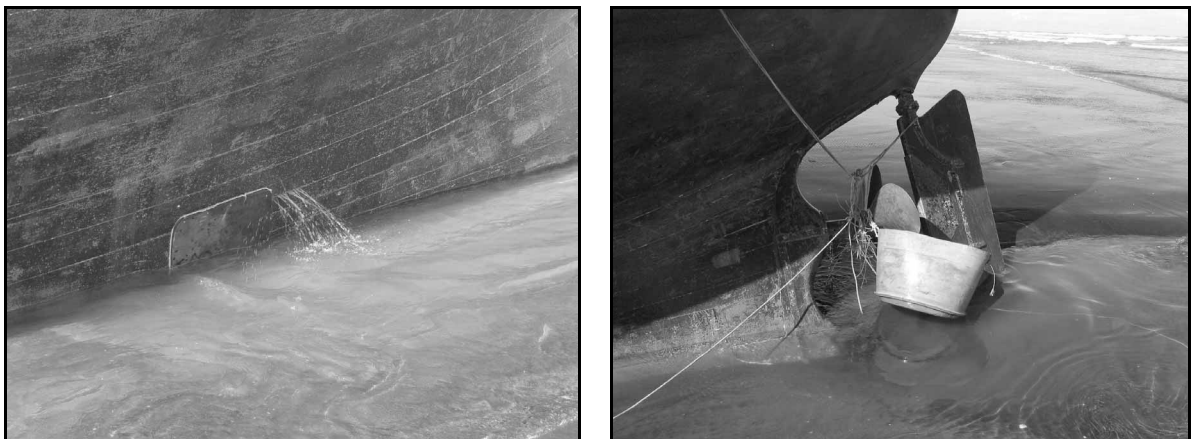
1.2.7 The *Poseidon* was certified to operate in the Offshore Area, as defined in Maritime Rule Part 20, up to 100 nm off the coast with the correctly qualified skipper and crew on board. To operate in this area Maritime Rule Part 31C required the skipper to hold a New Zealand Offshore Master's certificate (NZOM).

1.2.8 To operate in the Coastal Area, as defined in Maritime Rule Part 20, Maritime Rule Part 31C required the skipper to hold a New Zealand Offshore Watchkeeper's certificate (NZOW) endorsed with an Inshore Launch Master's certificate (ILM).

1.2.9 To operate in the Inshore Area, as defined in Maritime Rule Part 20, Maritime Rule Part 31C required the skipper to hold an Inshore Launch Master's certificate.

1.2.10 The skipper of the *Poseidon* at the time of the accident held an Commercial Launch Master's certificate which had equivalency to an Inshore Launch Master's certificate. The skipper was therefore allowed to operate the *Poseidon* in the Inshore Area. However, during the accident voyage the skipper had been operating the *Poseidon* in the Coastal and possibly the Offshore Area in contravention of Maritime Rule Part 31C.

### 1.3 Damage



**Figure 2**  
**One of the many leaks in the sprung planking, and the fouled propeller**

1.3.1 The *Poseidon* was constructed of wood planking on a wooden frame and could withstand a certain amount of flexing in the hull. However, being stranded the planking was flexed to such an extent that a number of fastenings between it and the frames sprung. Caulking between the planks of the hull was also displaced rendering the hull non-watertight (see Figure 2).

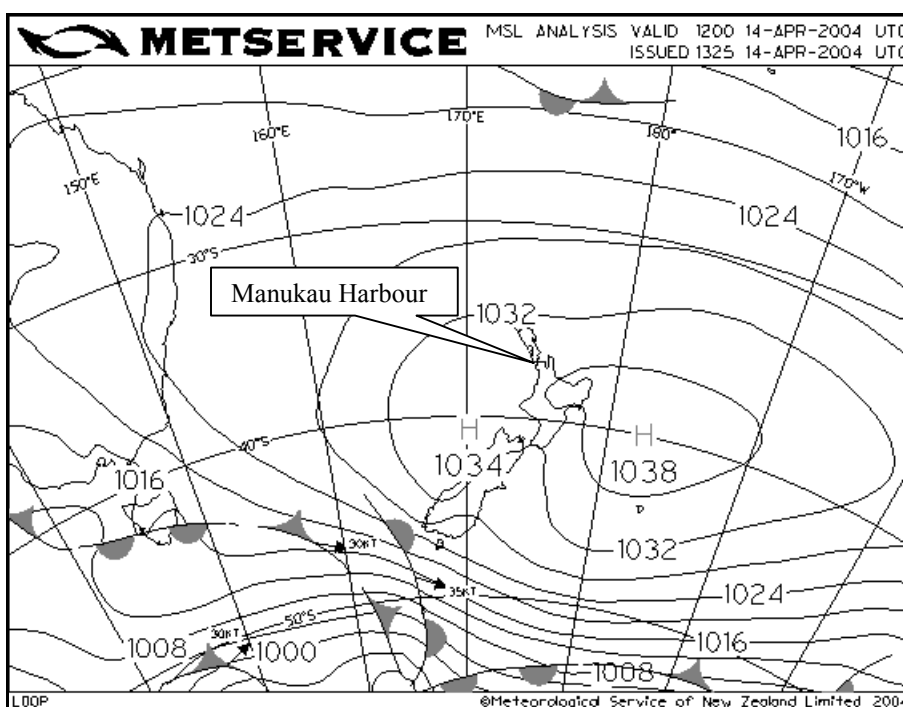
1.3.2 Significant damage occurred to the main engine and other machinery due to immersion in salt water and ingress of salt water into the systems. Damage also occurred to certain electronic and electrical items.

#### 1.4 Climatic and tidal conditions

1.4.1 At the time of the accident a high-pressure system was over New Zealand, but an intense low pressure system had just passed to the south of New Zealand. The associated weather systems caused a swell affecting the western coast of North Island (See Figure 3).

1.4.2 The entrance to Manukau Harbour is situated in the Raglan coastal waters forecast area. The New Zealand Meteorological Service (Metservice) issue coastal waters forecasts at well-documented regular intervals.

1.4.3 Coastal water forecasts are a general indication of average conditions expected in a particular coastal area. The forecasts are for open waters within 60 nm of the coast and do not apply to enclosed areas such as small bays and harbours.



**Figure 3**  
**Mean sea level analysis synoptic chart for 0000 15 April 2004**

1.4.4 The coastal waters forecast issued at 0030 15 April 2004 was as follows:

MARINE WEATHER BULLETIN FOR NEW ZEALAND COASTAL WATERS FORECAST ISSUED BY METEOROLOGICAL SERVICE OF NEW ZEALAND AT 0030HRS 15-APR-2004. VALID UNTIL MIDNIGHT TONIGHT 15-APR-2004.

NORTH ISLAND:

RAGLAN

Northeast 10 knots, becoming variable 10 knots in the evening. Sea slight. Southwest swell 1 metre.

OUTLOOK FOLLOWING 12 HOURS: Southwest 10 knots.

- 1.4.5 The New Zealand Pilot (Admiralty Sailing Directions NP51), states that tidal streams off the (North Island) west coast, as far south as Gannett Island (37°58'S 174°34'E), set south with a rising tide and north with a falling tide, attaining a rate of about 1 kt, 5 nm offshore.
- 1.4.6 The predicted tidal data for Paratutae Island (see Figure 1), a secondary port based on data from Onehunga and the closest secondary port to the Manukau Bar accident site, for 14/15 April 2004, was:

High water		Low water		High water	
14/04/2004 1821	2.55 m	15/04/2004 0024	0.85 m	15/04/2004 0653	2.72 m

The tide at the time of the accident was therefore rising and the vessel would have been on a rising tide for about 2 hours.

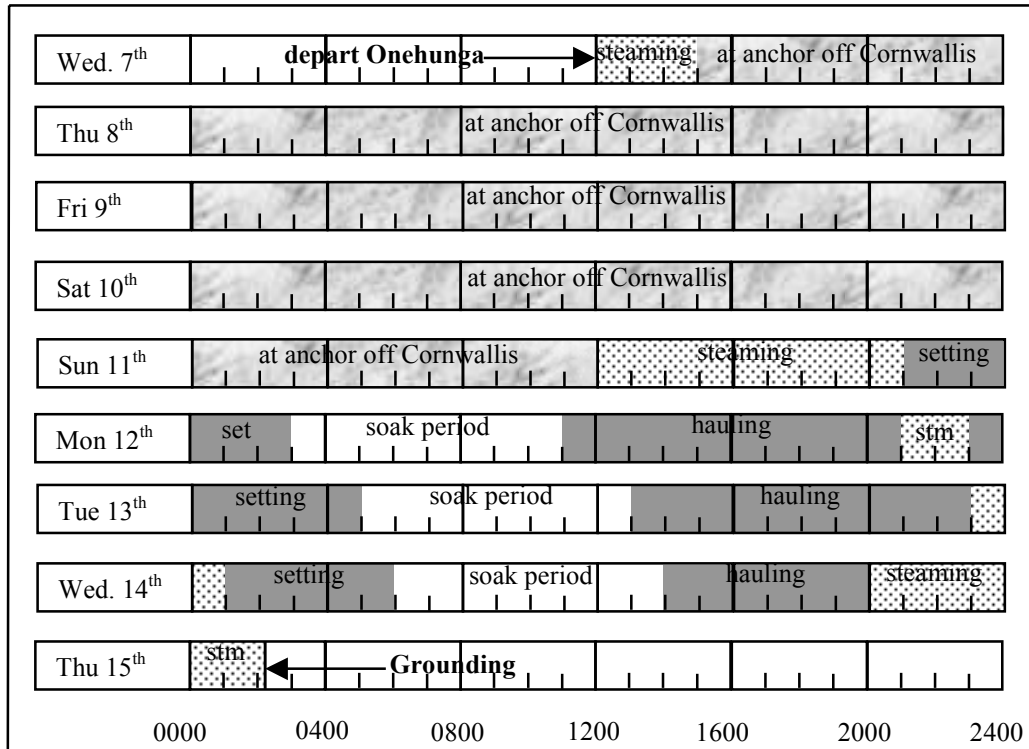
## 1.5 Crew

- 1.5.1 The skipper of the *Poseidon* had grown up around boats and had started commercial fishing in about 1986 at the age of 21. He had a Commercial Launch Master's (CLM) certificate and a 2<sup>nd</sup> Diesel Trawler Engineer's (2DTE) certificate, both of which were issued in 1995. The skipper had fished the *Poseidon* off the coast of New Zealand for the previous 5 years.
- 1.5.2 The first deckhand had gone to polytechnic in 2002 at the age of 16 for a 6-month fishing industry-training course to become a deckhand. He passed the course and was awarded a National Certificate in Seafood Operations (Deckhand, Level 3). After this he worked on several fishing vessels interspersed with working ashore. He had joined the *Poseidon* for the first time at the beginning of the accident trip.
- 1.5.3 The second deckhand had told the skipper that he had 2½ years experience on fishing boats. However, after the accident it was discovered that he had only minimal experience at sea in any guise. The deckhand was unable to be found after the accident and so the veracity of the information could not be tested.

## 1.6 Remuneration and routines

- 1.6.1 The crew of the *Poseidon* were self-employed share fishermen as were the crew on most New Zealand fresh fish vessels. They were not paid wages or salaries but received a percentage share of the catch value. Each person's percentage was dependent on their position on board. Their earnings were therefore directly proportional to the amount of fish caught.
- 1.6.2 Setting the line took about 5 hours, hauling the line and processing the catch took up to 10 hours and was hard work of a physical nature. The period between setting and hauling the line was known as the "soak" period and was usually of about 8 hours duration. Moving to a new position could take several hours depending on the distance travelled.
- 1.6.3 There were no set meal or work times. All the crew worked as required at setting and hauling the line, and processing the catch. Meals and rest were taken in the "soak" period. A lookout was also maintained during this period with the skipper and each deckhand taking an equal watch of about 2½ hours. This left the skipper and each deckhand with a period of about 5½ hours, possibly split into 2 sessions, in which to rest and sleep.
- 1.6.4 The facilities for rest and sleep on board were necessarily cramped on a vessel the size of the *Poseidon*.
- 1.6.5 When the vessel was on passage between fishing grounds and proceeding to or from port the skipper designated who was to steer and keep a lookout.

1.6.6 After the accident the skipper and the first deckhand gave their recollections about their pattern of sleep, wake, rest and work during the voyage prior to the accident (see Figure 4). The accuracy of the information supplied by the skipper and deckhand is inherently limited by the fact that subjective reports of duration and timing are not necessarily reliable, and by the fact that the accident had intervened between the episodes and when they were being recalled. Also, when on the voyage the skipper and crew did not work to set times and did not consciously note the time of their actions.



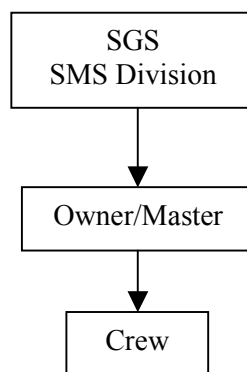
**Figure 4**  
**Sleep/Wake/Work information prior to accident**  
 Times given are approximate only as they are based entirely on the recollections of the skipper and crew member

## 1.7 Safe ship management

1.7.1 The *Poseidon* was under safe ship management (SSM) with SGS M&I. The certificate was issued on 16 August 2002, and subject to periodic audit/inspection of the ship and its management system, was valid until 23 April 2004.

1.7.2 The SSM manual for the *Poseidon* included the following:

In the implementation of the ship's Safety Management System, the following structure will apply:





The owner will, at all times, employ only appropriately qualified, certified, experienced and medically fit seafarers to man this ship. The only exception to qualifications will be seafarers under training and then only as additional crew to the minimum manning levels required by legislation or regulation.

Ship's Master: Responsibilities:

- The master has the ultimate responsibility for the operation of this ship and is responsible to the owner.
- He/she is responsible for ensuring that the safety and environmental protection policies defined in the Ships Management System are strictly adhered to.
- He/she is responsible for ensuring that all crew are trained in and understand the Ships Management System and observe the requirements.
- He/she is responsible for all instructions and orders given relating to the operation of the ship, that these instructions and orders are simple, clearly understood and followed by all crew or land-based support staff who from time to time report to him/her.
- He/she is responsible for verification that all of the foregoing is observed.
- He/she is responsible for reviewing the Ships Management System and reporting to the Company any improvements identified or deficiencies found.

Authorities

- The master has ultimate authority, while at sea, to decide on and take whatever action he sees fit to maintain the safety of the crew, the environment, the ship, and its cargo
- In conjunction with the owner, the Master has the authority to recruit appropriately qualified and experienced persons to fill crew positions.
- In all other respects he/she has the authorities as detailed in his /her conditions of employment.

1.7.3 The manual did not detail any information with regard to fitness for duty or fatigue.

## **1.8 Fatigue**

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

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

1.8.2 The IMO International Convention on Standards of Training, Certification and Watchkeeping, 1995 (STCW-95) prescribes specific minimum hours of rest for watchkeepers. STCW-95 does not apply to fishing vessels. However, the IMO International Convention on Standards of Training, Certification and Watchkeeping for Fishing Vessel Personnel, 1995 (STCW-F) recommends watchkeeping in the deck department to be arranged so that personnel are not impaired by fatigue, but no minimum hours of rest are prescribed.

1.8.3 On 1 February 2001, Maritime Rule Part 31C, Crewing and Watchkeeping Fishing Vessels, came into force, replacing the Shipping (Manning of Fishing Boat) Regulations 1986. Part 31C took account of STCW-F and introduced new requirements that supported an awareness of fatigue issues and their countermeasures.

1.8.4 Section 4 of Part 31C was entitled Watchkeeping, and stated in part:

**31C.14 Fitness for Duty**

- (1) The owner and master of a fishing vessel must establish and implement procedures in respect of the vessel's crew, taking into account the requirement in 31C.15(1), to ensure that all crew are fit for duty when keeping a watch.
- (2) The crew of a fishing vessel must ensure, taking into account the requirement in rule 31C.15(2), that they are fit for duty at all times when keeping a watch.

**31C.15 Fatigue**

- (1) When the owner and the master of a fishing vessel establish and implement procedures for ensuring a seafarer's fitness for duty, they must take into account that -
  - (a) the level of alertness of a person keeping a navigational or engine-room watch may be affected by fatigue; and
  - (b) whenever alertness is affected by fatigue, performance can be impaired.
- (2) A seafarer on a fishing vessel, when considering his or her fitness for duty, must take into account -
  - (a) the signs, symptoms, and effects of fatigue, and
  - (b) that fatigue will affect his or her level of alertness, and
  - (c) that the performance of any person whose alertness is affected by fatigue can be impaired.

**31C.16 Watchkeeping Standards**

- (1) The owner and the master of a fishing vessel must establish and implement watchkeeping procedures addressing -
  - (a) for navigational watchkeeping -
    - (i) the composition of the watch; and
    - (ii) the fitness of duty of the watchkeepers; and
    - (iii) navigation planning and duties; and
    - (iv) the use of navigational equipment; and
    - (v) look-out duties; and...
- (2) The crew of a fishing vessel must comply with watchkeeping procedures established under rule 31C.16(1).

1.8.5 The advisory circular that accompanied Part 31C stated that owing to the diverse range of vessels covered by the rule, actual hours of work or rest could not be prescribed. However, it had a table of the signs and symptoms of fatigue and a section titled Fitness for Duty, which stated:

The watch system should be such that the efficiency of watchkeeping personnel is not impaired by fatigue. Duties should be so organised that the first watch at the commencement of a voyage and the subsequent relieving watches are sufficiently rested and otherwise fit for duty.

1.8.6 FISHgroup's final report identified that fatigue was a significant causal factor that led to fatalities and injuries in the fishing industry. FishSAFE, which replaced FISHgroup, was formed with the aim of developing and managing an implementation plan to give effect to the recommendations in the FISHgroup report.

1.8.7 FishSAFE had its inaugural meeting on 21 May 2004; the group comprised representatives from the MSA, Seafood Industry Training Organisation (SITO), Accident Compensation Corporation (ACC) and a wide spectrum of the fishing industry.

1.8.8 Under the umbrella of FishSAFE the MSA was undertaking 2 projects relating to fatigue management:

1. development of a safe code of working practice for commercial fishers, focusing primarily on the owner/operator end of the commercial sector. The fitting and use of watchkeeping alarms would be covered in this code.
2. development of practical fatigue management guidelines in consultation with industry and to use these as the basis for the development of fatigue management training and education throughout the maritime industry with the following objectives:
  - raise awareness of the importance of fatigue management among workers in the maritime industry
  - develop practical methods of managing fatigue
  - provide training in fatigue management techniques to both employers and employees within the maritime industry.

1.8.9 When hauling and setting the long line, the skipper required all the crew to be either handling the long line equipment or stowing the fish. Such a system did not allow him to have a spare deckhand resting while fishing operations were in progress.

### **Fatigue study information**

1.8.10 Work-related fatigue has three main causes:

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

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

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

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

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

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<sup>3</sup> The inherent pattern of physical and mental characteristics related to a 23 - to 25-hour internal central nervous system activity cycle.

- 1.8.15 Not only the amount of sleep but also the quality of sleep can have important effects on wake-time functioning. Sleep that is restless and fragmented by frequent awakenings leaves a person sleepy and at increased risk of making errors. Sleep can be disrupted by a wide variety of factors, including physical sleep disorders and other health problems, changing work and rest schedules, poor sleep habits, and ill-informed attitudes about increasing wake-time activities by cutting back on sleep.
- 1.8.16 Environmental factors can have an important effect on sleep quality. For crew sleeping on board, such factors as noisy or cramped quarters and rough sea conditions can be expected to reduce sleep quality.

## **1.9 Previous occurrences**

- 1.9.1 On Friday 26 March 2004 at about 0215, the fishing boat *Bronny G* grounded on rocks at Steep Head on Banks Peninsula while the boat was on passage back from fishing grounds to Lyttelton Harbour (TAIC Marine Occurrence report 04-205). Safety issues identified included:
- the lack of a working watchkeeping monitor alarm for a single-handed wheelhouse operation
  - the undertaking of navigational watchkeeping and helmsman tasks whilst suffering from the effects of fatigue

## **1.10 Substance Abuse**

- 1.10.1 Both the Seafood Industry Council and the New Zealand Marine Transport Association had policies of endorsing and promoting zero tolerance of the use of drugs amongst seafarers at sea. The Commission supports these policies and encourages the Seafood Industry Council and the New Zealand Marine Transport Association to continue these policies with the New Zealand fishing fleet.

## **2 Analysis**

- 2.1 The *Poseidon* stranded on a stretch of coast that, although in close proximity to the largest city in New Zealand, was remote and difficult to access for the rescue and salvage operation. The skipper was able to use his VHF radio to call for help and the rescue services responded quickly. The rescue services were helped in locating the vessel in a timely manner by the position given to them by the skipper from the vessel's GPS receiver.
- 2.2 Owing to the inherently irregular and prolonged nature of work during fishing operations and the harsh, uncomfortable and noisy conditions often experienced aboard fishing boats, fatigue is common amongst fishing boat crews. This fact has been recognised and legislation requires the owner, skipper and crew to take responsibility for recognizing and managing the problem.
- 2.3 The unpredictable working hours while fishing meant that the skipper and crew could not plan a regular work/sleep pattern. Continuous work periods were long with inadequate rest periods between.
- 2.4 When working a regular shift, an individual's circadian rhythm and ability to sleep may adjust to changed sleep patterns after a period of time, but continually changing hours of work and rest accentuates the problem. The skipper and crew had recently rejoined the boat after a period ashore and initially had to adjust to a different sleep/wake pattern while at anchor waiting for the sea state to subside on the bar, and then adjust again to a different sleep/wake pattern when they crossed the bar and started fishing.

- 2.5 In each 24-hour period prior to starting the voyage back to port the skipper and the 2 deckhands all had a period of about 5½ hours, possibly split by their lookout duties, available for sleep. A maximum of 5½ hours sleep in each 24 coupled with the conditions under which they were living, which were not conducive to good rest, would not be considered adequate to prevent fatigue and the onset of chronic fatigue. At the time of the accident, the first deckhand had been on watch for a further 6 hours, albeit some of which he had been asleep for, increasing the level of his fatigue. The hard physical nature of hauling the line and processing the catch for up to 10 hours on the unsteady platform formed by the deck of the *Poseidon* in a seaway, would also add to the fatigue of the skipper and crew.
- 2.6 The skipper's actions in allotting the crew a watch each so they could all be rested to a degree when the vessel approached the bar were correct. The skipper would have been the most rested and ready to navigate the vessel over the bar and through the harbour, the most demanding part of the return voyage. However, at the start of the voyage back to port neither the skipper nor the 2 crew of the *Poseidon* could be considered sufficiently rested to undertake the navigational watch.
- 2.7 Having thought he had woken his relief, the deckhand probably relaxed and his level of alertness dropped and he fell asleep. Falling asleep at this point in the voyage indicated that the deckhand was fatigued. In the case of chronic fatigue it is likely that micro sleeps or unplanned longer sleeps might occur after prolonged hours of work.
- 2.8 The deckhand fell asleep before the designated time for calling the skipper and before the vessel came close to the dangerous bar, either of which may have heightened his level of awareness. However, as his relief did not arrive it would have been prudent for the deckhand to try again to wake him or to have called the skipper.
- 2.9 The manning level of the *Poseidon* was above the minimum legislative requirements for the area in which the vessel was certified to operate. However, the master was only certified to operate in the Inshore Area. During the voyage prior to the accident the master operated the *Poseidon* not only in the Inshore Area but also in the Coastal and possibly the Offshore Area, but this did not contribute to the accident.
- 2.10 As all the crew were required to haul the line and process the fish there was no deckhand available to be rested to watchkeep on the journey back to port.
- 2.11 Had the Safe Ship Management manual contained procedures and guidelines regarding fitness for duty and fatigue, and the owner's, operator's and crew's requirements to ensure that they implemented the contents of Maritime Rule Part 31C, the crew might have been better informed. Had they undertaken the required measures, the owner, operator and crew would have been more aware of the symptoms and dangers of fatigue and could have taken appropriate measures to manage it and avert the grounding.
- 2.12 Although unable to determine the ownership of the marijuana discovered amongst the other detritus washed ashore from the *Poseidon*, it is probable, given the otherwise general cleanliness of the beach in the vicinity, that the marijuana came from the vessel. Whether the drug was taken on board the vessel with the knowledge of the owner and skipper could not be confirmed, and whether it had any bearing on the accident also could not be confirmed.
- 2.13 The deckhand who was due to carry out the second of the navigational watches back to port could not be woken despite the attempts of the deckhand on watch.

### 3 Findings

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

- 3.1 The investigation was hampered by the inability to make any contact with the second deckhand.
- 3.2 The *Poseidon* stranded on the beach to the north of Manukau Harbour entrance because there was nobody monitoring its progress. The deckhand who was in the wheelhouse fell asleep because he was probably suffering from the effects of fatigue.
- 3.3 The number of crew aboard the *Poseidon* exceeded the stipulated minimum crewing level. However, the way the fishing operation was organized meant that there were not enough crew to work the vessel and still have a well-rested person available to navigate the vessel back to port.
- 3.4 The Safe Ship Management system under which the *Poseidon* was operating did not adequately address the responsibilities for preventing fatigue on board as required by Maritime Rule Part 31C.
- 3.5 Had a watchkeeping alarm system been fitted and working then it is probable that the accident would have been averted.
- 3.6 Whether the marijuana found originated from the vessel or had any bearing on the accident could not be proved.

### 4 Previous Safety Recommendations

- 4.1 Following the grounding of another fishing vessel (Marine Occurrence Report 04-205) the Commission recommended on 2 August 2004 to the General Manager of SGS M&I Ships Management Systems, that he:

Implement the requirements of Maritime Rule Part 31C Section 4 for all vessels under the SGS M&I Safe Ship Management system (042/04).  
Include a section in the SGS M&I Safe Ship Management manual on the signs, symptoms and effects of fatigue and practical methods of managing fatigue (043/04).

On 22 July 2004, the General Manager of SGS M&I Ships Management Systems responded to the preliminary safety recommendations, which were subsequently adopted unchanged as the Commission's final safety recommendations. That response stated, in part, the following:

- We will be pleased to adopt your recommendations that we include more detail in our manual regarding fatigue. This will include, as we have done for hazard recognition, a simple document that can be displayed on the vessel for all to see, which highlights symptoms of fatigue and its causes, as well as including an appropriate section within the manual.
- As an observation we strongly believe that the curriculum for the training of seafarers should be reviewed and amended to include an appropriate module to cover the requirements of Safe Ship Management, and "man management" with respect to recruitment and manning with appropriately qualified persons, and Alcohol, Drug, and Fatigue management. This we believe should be mandatory for ILM and above qualifications.

The safety recommendations are equally applicable in this case so, no further recommendations relating to the requirements of Maritime Rule Part 31C Section 4 or fatigue management have been made to SGS M&I Ships Management Systems.

- 4.2 Following the grounding of another fishing vessel (Marine Occurrence Report 04-205) the Commission recommended on 20 August 2004 to the Director of Maritime Safety that he:

develop with industry a communication and education strategy to implement fatigue management guidelines taking into account the outcomes and recommendations from the fatigue management study currently being conducted by the MSA. (052/04)

On 23 August 2004 the Director of Maritime Safety replied, in part:

This recommendation is acceptable to the Maritime Safety Authority, and we will be implementing it over the next 12 months as our fatigue management study is completed.

The safety recommendation is equally applicable in this case, so no further recommendations relating to developing with industry a communication and education strategy to implement fatigue management guidelines have been made to the Director of Maritime Safety.

## 5 Safety Recommendations

Safety recommendations are listed in order of development, not in order of priority.

- 5.1 On 31 August 2004, the Commission recommended to the Managing Director of Poseidon Fishing Company Limited that he:
- 5.1.1 in conjunction with the Safe Ship Management Company implement the requirements of Maritime Rule Part 31C for all vessels operated by his company and update the safe ship management manuals as necessary (062/04).
  - 5.1.2 in conjunction with the Safe Ship Management Company include a section in the Safe Ship Management manual on the signs, symptoms and effects of fatigue and practical methods of managing fatigue (063/04).
  - 5.1.3 fit watchkeeping alarms independent of all other equipment in the wheelhouse of all vessels operated by his company and put in place a procedure to ensure that the watchkeeping alarms are operated whenever a navigational watch is undertaken (064/04).
- 5.2 On 7 September 2004 the Managing Director of Poseidon Fishing Company Limited replied:
- Poseidon Fishing Company Ltd (PFC) has recently settled with the Insurance Company and now does not own the vessel, and is unlikely to own one in the foreseeable future, therefore we cannot implement the recommendations as stipulated in your Letter. However if the Company does own a vessel in the future we will implement your recommendations.
- 5.3 Due to the *Poseidon* being further damaged while slipped undergoing repairs resulting from the accident and subsequently being written off by the insurance company, and the response by the Poseidon Fishing Company as stated above, the safety recommendations were closed – cancelled on 7 September 2004.

- 5.4 On 31 August 2004, the Commission recommended to the General Manager, Trade and Information of the Seafood Industry Council that he:
- 5.4.1 include an article in the Seafood New Zealand magazine featuring this report, the intent of Maritime Rule Part 31C together with its advisory circular and the work of the Maritime Safety Authority convened FISHgroup and fishSAFE initiatives (065/04).
- 5.5 On 30 August 2004, the Communications Manager of the Seafood Industry Council replied:
- we intend publishing a summary of the 04-207 and 04-209 reports in the October and November issues of Seafood NZ magazine.

Approved on 22 September 2004 for publication

Hon W P Jeffries  
**Chief Commissioner**









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