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Crew fatality and injury while securing anchors



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Crew fatality and injury while securing anchors

At about 1806 on 14 August 2004, three seamen on the forecastle head of the container ship *Aotearoa Chief* were struck by a wave that broke over the ship's port bow. One man was thrown against the windlass and mooring machinery and suffered injuries from which he later died. Another sustained severe lacerations to one leg while the third man was unhurt.

Aotearoa Chief

Aotearoa Chief is a Hong Kong registered container ship engaged in a regular service between New Zealand, Papua New Guinea, Kiribati and Australia. The ship is 129.75 m in length. It has a beam of 22 m and a cargo capacity of 725 TEU¹. *Aotearoa Chief* has a deadweight of 10 556 tonnes at a summer draught of 8.346 m. The ship is owned and operated by China Navigation Company, Hong Kong and is classed with Lloyds Register of Shipping. At the time of the incident, the ship's crew of 27 consisted of British, Chinese and Papua New Guinean nationals.

FIGURE 1: *Aotearoa Chief*



Containers are stowed forward of the accommodation, in holds below the main deck and up to five high on the hatch covers. Forward, at the break of the forecastle head, a large steel breakwater protects the forward-most containers from any damage caused by seas breaking over the ship's bow.

The incident

On 14 August 2004, *Aotearoa Chief* was berthed in Melbourne. That morning, the master received Bureau of Meteorology warnings of heavy weather for the ship's intended voyage to Sydney. Before the ship sailed, the master warned the chief engineer, the mate and the galley crew of the anticipated conditions. The mate passed this information to the bosun and deck crew.

The ship sailed at 1330 that afternoon with draughts of 6.9 m forward and 8.7 m aft. Containers were stacked two and three high on deck. A Port Phillip Sea Pilot was on board for the outward passage.

After departure, the forecastle mooring crew were stood down before the ship reached the Fawcner Beacon, while the ship was still in the Port Melbourne Channel. The anchors were left ready for letting go. During the subsequent transit of Port Phillip Bay, the ship experienced southerly winds estimated at force seven or eight on the Beaufort Scale (28 – 40 knots).

At about 1630, the ship rounded the Hovell Pile beacon and entered the South Channel. At 1728, *Aotearoa Chief* reached The Rip, at the entrance to Port Phillip Bay. The wind had abated slightly and was at about 35 knots. The tide was ebbing in a predicted direction of about 200°(T), at a rate of 1.1 knots. With the wind against the tide, the sea in The Rip was turbulent.

After clearing The Rip, the ship approached the pilot boarding ground. When near the boarding ground, the master brought the ship around to a heading of 340°(T), to make a lee on the starboard side to disembark the pilot. At 1800 the pilot disembarked, in a position 232°(T) by 3.7 miles from Point Lonsdale lighthouse.

1 Twenty Foot Equivalent Units.

Between 1800 and 1810, the wind gauge at Point Lonsdale recorded wind speeds from the south-south-west at between 35 and 40 knots. At about that time, a wave rider buoy located south east of Point Lonsdale recorded significant and maximum wave heights² of 4.7 m and 6.6 m respectively.

After the pilot left the ship, the mate and seaman, who had supervised the pilot's departure returned to the accommodation. Because of the sea conditions, the master gave orders that no crew member was to access the deck to secure the ship for its passage until he gave permission.

When the pilot boat was clear, the master adjusted course to port and the ship steadied on about 245°(T), with the wind about 45 degrees on the port bow. The ship's speed had been up to 12 knots, but reduced to between seven and eight knots during the turn onto the heading of 245°(T).

The master waited for several minutes, during which time *Aotearoa Chief* seemed quite steady with no undue roll or pitch. Using a VHF radio, he instructed the bosun to take some crew members forward to stow the pilot ladder and lash the anchors. In his statement, the master said that he told the crew not to go forward to the forecastle head until instructed.

However, the bosun and other crew members who also heard the master's instructions stated that the master's order was to secure both the ladder and the anchors.

The bosun and four seamen went onto the main deck. The bosun had a handheld radio with him, as did one of the two seamen he instructed to stow the pilot ladder, which was located in the starboard midships position. The bosun and the two remaining seamen then went forward to the forecastle head, to secure the anchors.

On the forecastle head, the bosun went behind the port windlass to fit a canvas cover over the spurling pipe³. The other seamen went to the forward side of the starboard windlass to secure cover plates over the hawse pipe⁴.

At about 1806, the ship's bow pitched into the trough of a large wave. A solid green sea was

shipped over the forecastle head, from the port bow.

FIGURE 2: Forecastle head arrangement – looking aft



The force of the wave washed one of the men working near the hawse pipe onto, and then over the top of, the windlass and mooring equipment and onto the deck behind. When found later, he appeared unconscious but the full extent of his injuries were not readily apparent.

The other man working forward of the starboard windlass was swept onto the starboard side of the forecastle head, past the breakwater and aft to the top of the ladder leading onto the main deck. He suffered severe lacerations.

The bosun, working behind the port windlass, was protected from the main force of the water and escaped relatively unscathed.

After the ship hit the wave, the master called the bosun on his radio and asked if the crew were 'OK'. He repeated this several times and finally got an affirmative reply. The master stated that he (thinking he was talking to the

2 Significant wave heights represent the average of the highest one-third of the waves. Some waves will be higher and some lower than the significant wave height. The probable maximum wave height can be up to twice the significant wave height. (Australian Bureau of Meteorology.)

3 A pipe leading from the forecastle head to the chain locker, through which the anchor chain passes.

4 A pipe leading from the forecastle head to the outside of the ship's hull, through which the anchor chain passes.

bosun) again directed the bosun not to go forward until he was given permission. The master was actually talking to the seaman who had just recovered the pilot ladder. The bosun's radio was damaged and inoperable.

Concerned about the unusual amount of Pidgin language on the VHF, which no one on the bridge could understand, the master sent the mate out on deck to find what was going on. Prior to leaving the bridge, the mate answered a call from the bosun, who was using the forecandle telephone. The bosun was incoherent and not able to be fully understood. The mate left the bridge, returning a short time later to report that there had been an accident and two crew were injured. At about 1812, the master went onto the deck, leaving the ship in the charge of the third mate.

While making his way up the starboard side of the main deck, the master saw one man being carried towards him on a stretcher. The man was not moving. A second man was being piggy-backed by another seaman along the deck. Access to the ship's hospital was by a number of ladders, so the master directed that both men be put in the crew mess room. It was then that the master was told by the bosun that the crew had been injured on the forecandle head.

The second mate made ready the ship's resuscitation equipment and tried to revive the seaman on the stretcher. The master returned to the bridge and, at 1826, called the Lonsdale Pilot Station to report the accident. He informed them of his intention to return to Melbourne to land the injured men and he requested a pilot.

At 1827, the crew on the pilot launch told the master that the pilot who had brought the ship from Melbourne would reboard shortly. The pilot boarded *Aotearoa Chief* at 1859 and the vessel began its return to Melbourne. At 2003, once the ship was inside Port Phillip Bay, the pilot was relieved by a colleague.

Paramedics from Geelong Hospital boarded the ship from the pilot launch, with the relieving pilot. They declared one man to be deceased. The other man with the leg injuries was transferred to the pilot launch and taken

to the pilot station at Queenscliff. He was then transferred by ambulance to the Geelong Hospital. *Aotearoa Chief* berthed at Station Pier at 2342, where the deceased man was landed.

Contributing factors

As was the normal practice on board, *Aotearoa Chief's* anchors had been ready for use during the pilotage, in case of engine or steering failure. While the chain stoppers had been on the cable to prevent the cable running out, the wires used to prevent the anchor moving in the hawse pipe were not secured, and the hawse and spurling pipe covers were off.

After disembarking the pilot, it was necessary that the anchors were properly secured for the passage. To do this, the crew had to have access to the forecandle head.

The men working on the forecandle head were experienced seamen and had worked on this class of vessel for many years. The master stated that on 14 August, the crew were working on the forecandle head without the knowledge or direction of anyone on the ship's bridge. The seamen, however, stated that they had received unambiguous instructions to secure the anchors.

The two men working on the hawse pipe were working on an exposed part of the forecandle head and when the wave hit, they were subjected to the full force of the wall of water.

When the vessel pitched heavily, they looked up from what they were doing. They saw a wave about four metres above them immediately before it broke over the forecandle head.

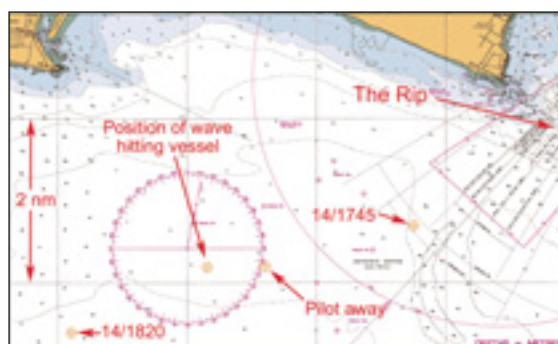
Evidence indicates that during their time on the forecandle head, the crew members did not keep a watch on the sea and weather conditions, i.e. maintain a 'weather eye'. All three men were concentrating on the job at hand.

The marine work environment has particular hazards associated with a moving platform exposed to the elements of wind and sea. *Aotearoa Chief*, with its relatively low

freeboard, is particularly prone to shipping seas in heavy weather. To reduce these hazards, the ship had procedures in place which controlled access to the deck, depending on the weather and sea conditions.

The master was implementing the policy and, being aware of the prevailing sea conditions and the danger posed to any crew member on deck, he ordered that the crew return to the accommodation block and await his clearance before moving forward to secure the ship for the passage.

FIGURE 3: Portion of chart Aus 144 – area of incident



After the pilot disembarked, the master was attempting to position the ship to afford the best possible protection for the crew, in accordance with the practice of good seamanship. Only when he was satisfied that it was safe to do so, was he going to authorise the bosun to secure the anchors.

This may have been achieved safely had the ship been maintained on the heading of 340°(T), keeping the wind and sea on the port quarter. However, the master was aware of the proximity of the coastline and shoaling water, about three nautical miles ahead.

The master ordered a course of about 245°(T) and waited a few minutes to see how the ship behaved on this heading. His evidence is that the ship was fairly steady. The wind was about 45 degrees on the port bow and no seas were breaking on deck. When satisfied that the situation looked safe, he authorised the bosun to access the deck, but he claimed initially only to stow the pilot ladder.

Had the crew been working at the pilot ladder, in accordance with the master's intentions, no

one would have been on the forecastle head when the wave broke. It is likely that, after the wave hit the ship, the master may have taken additional measures to improve the safety of those crew he wished to secure the anchors.

These additional measures may have included a change in the ship's heading and/or a reduction in speed.

All orders given by the English master to the Papuan bosun were in English. The bosun had a very good understanding of English, and it is probable that he did not misunderstand the directions the master had given to him.

While the wording of the master's instruction to secure the pilot ladder and anchors appear to be unambiguous to those who heard it, the instruction did not convey the master's claimed intent not to secure the anchors until he instructed.

There is conflict between the evidence of the crew and the master over the precise order given to secure the ship. This conflict cannot be resolved.

The forward deck area and the forecastle head was obscured by containers and the breakwater. Those on the bridge were unable to monitor the crew as they carried out their assigned tasks.

Aotearoa Chief is a small container ship. It has a pronounced flare at the bow to minimise seas breaking over the forecastle and the container deck. On 14 August, the deck of the forecastle head was about 6.5 m above the waterline with a bulwark extending about 1.5 m above the deck.

In the prevailing conditions, a freeboard of 8 m was insufficient to prevent green seas being shipped over the forecastle head, particularly with the ship pitching and its heading at the time.

At the time of the incident, *Aotearoa Chief* was in shoaling water, which was still under the influence of the strong ebb tidal stream from Port Phillip Bay and the opposing southerly sea and wind.

The wave that broke over the forecastle head was a 'one off'. The vessel, while maintaining a heading of 245°(T), did not experience a comparable wave before or after it.

It is therefore possible that the wave that broke over the forecastle head was what is known as an 'abnormal wave'. The Mariner's Handbook (NP 100, p.71) describes an 'abnormal wave' as likely 'when waves are distorted by meeting shoal water, a strong opposing tidal stream or current, or another wave system'. This type of wave is different from normal sea waves in that they are abnormally steep-fronted, higher and occur in a small geographical area.

The 'abnormal wave' phenomenon is well known and documented. Mariners should be aware of the existence of such waves when navigating in or near areas described in the Mariner's Handbook above.

Conclusions

Based on the evidence available, the following factors are considered to have contributed to the incident:

- The two men were injured, one fatally, when a large wave broke over the forecastle head, throwing them against ship machinery and structure.

- The instruction given by the master to secure the pilot ladder and anchors did not convey his claimed intent for the crew not to secure the anchors until he further instructed.
- A strong southerly wind, combined with an opposing ebb tide and shoaling waters, probably caused an 'abnormal wave' which was larger than ones either preceding or succeeding it.

Recommendations

MR20050013

All seafarers should remain actively cognisant of the prevailing weather and sea conditions when working in exposed areas.

MR20050014

Masters should carefully plan the course, speed and/or position of their vessel to minimise the risks to crew members working on exposed decks.



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Media Release

Seaman dies after a large wave broke over ship's bow

One seaman died and another was severely injured when a large wave broke over the bow of the container vessel *Aotearoa Chief* on 14 August 2004, according to an Australian Transport Safety Bureau (ATSB) investigation report released today.

The ATSB report into the incident states that the Hong Kong registered *Aotearoa Chief* disembarked its harbour pilot at about 6 pm, shortly after the ship had cleared the entrance to Melbourne's Port Phillip Bay. The master then ordered an alteration of course to take the ship away from the coast. While on this new course, an abnormal wave broke over the forecastle head, where three crew members were working to secure the ship's anchors for the intended voyage to Sydney. One man was thrown against the mooring machinery and suffered injuries from which he later died. Another sustained severe lacerations to one leg while the third man was unhurt.

The report concludes that the instructions given to the crew members by the master were not clear and did not convey his intent for the crew to wait until he felt it was safe to go forward to secure the anchors.

The report also concludes that a strong southerly wind, combined with an opposing ebb tide and shoaling waters, probably caused an 'abnormal wave' which was larger than ones either preceding or following it.

Copies of the report can be downloaded from the ATSB's internet site at www.atsb.gov.au, or obtained from the ATSB by telephoning (02) 6274 6478 or 1800 020 616.

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