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ATSB TRANSPORT SAFETY INVESTIGATION REPORT  
Marine Occurrence Investigation No. 263  
Preliminary

# Loss of containers from *Pacific Adventurer* off Cape Moreton, Queensland 11 March 2009

## Abstract

At 0312<sup>1</sup> on 11 March 2009, the Hong Kong registered container ship *Pacific Adventurer* lost 31 containers overboard in gale force weather conditions and large swells. The ship was about seven miles east of Cape Moreton, Queensland.

All the containers, carrying ammonium nitrate prills<sup>2</sup>, sank. However, two of the ship's fuel oil bunker tanks were holed as the containers went overboard. In all, *Pacific Adventurer* lost about 270 tonnes of fuel oil into the sea as a result of the damage caused to the bunker tanks.

The ATSB investigation is continuing.

## FACTUAL INFORMATION

The information contained in this preliminary report is derived from the initial investigation of the occurrence. Readers are cautioned that there is the possibility that new evidence may become available during the course of the investigation which may alter the circumstances as depicted in this report.

### *Pacific Adventurer*

*Pacific Adventurer* (Figure 1) is a Hong Kong registered container ship. It is owned by Swire Navigation/Bluewind Shipping, Hong Kong and managed by Swire Navigation, Hong Kong. At the time of the incident, the ship was classed with Lloyd's Register (LR).

*Pacific Adventurer* has an overall length of 184.9 m, a breadth of 27.6 m and a deadweight of 25 561 tonnes at its summer draught of 10.57 m.

Figure 1: *Pacific Adventurer*



## THE INCIDENT

At 0548 on 9 March 2009, *Pacific Adventurer* arrived at Kooragang berth number three in Newcastle, New South Wales (NSW), after a voyage from Port Kembla, NSW. The ship was to load a cargo of approximately 1000 tonnes of ammonium nitrate prills. The cargo was in fifty 20-foot shipping containers, each containing about 19.5 tonnes.

While on the NSW coast section of the voyage, the master had been monitoring the progress of tropical cyclone Hamish as it made its way down the Queensland coast. He was aware from the weather reports the ship received, and from information from a private weather routing company, that the passage to Brisbane, Queensland, the ship's next port, might be affected by the cyclone.

During the day, the master, in consultation with the chief mate, completed the company's risk assessment for the forthcoming voyage and sent it to the ship's managers for their comments. He

- 1 All times referred to in this report are ship's time, Coordinated Universal Time (UTC) +11 and +10 hours.
- 2 The process of 'prilling' is undertaken to make a solid into granules or pellets that flow freely and do not clump together.

received the company's risk assessment response before the ship sailed and implemented the required risk controls. These included proceeding at a reduced speed to Brisbane, a reduction in the ship's GM<sup>3</sup> as far as possible and ensuring that all the lashing of the deck cargo was adequate and secure.

By 1455, all the containers had been loaded, 19 on Bay 5 and 31 on Bay 25. The stevedores lashed the containers in accordance with the chief officer's lashing plan and left the ship shortly afterwards. The ship's departure draughts were 7.74 m forward and 8.04 m aft. All the stability criteria were within the required limits, which gave the ship a GM of 2.68 m.

At 1738, *Pacific Adventurer's* last mooring line was let go and the ship proceeded out of Newcastle. After the harbour pilot departed the ship, the engine speed was set to its minimum sea speed of 75 rpm.

Just after 2000, the wind was from the northeast at force four<sup>4</sup> (between 11 and 16 knots) and the sea and swell were 3 m. In the conditions, the ship was making good a speed of 12.7 knots and rolling moderately.

By 0800 on 10 March, the wind had veered as expected and was coming from the east-southeast, still at force four. The seas and swell had increased to 4 m and the ship continued to roll moderately. It was making good 12.3 knots.

Just after 0800, in preparation for the expected heavy weather and seas from tropical cyclone Hamish, the chief mate ordered that all the deck cargo lashings be checked to ensure that the twistlocks were locked and that the turnbuckles were as tight as they could be. The second mate and several crew carried out this operation. The chief mate also required additional lashings to be put on the containers in an attempt to secure the cargo further.

During the voyage up the northern NSW coast, in an effort to maintain the 0700, 11 March pilot boarding time and to minimise the rolling, the

master varied the main engine's speed between 60 and 70 rpm.

At about 1705, the Australian Bureau of Meteorology (BoM) in Brisbane issued a hurricane force wind warning: at 1600, Severe TC Hamish, with maximum winds of 70 knots, was centred about 251 miles to the north-northeast of *Pacific Adventurer* and moving east-southeast at 8 knots.

At about 1800, as *Pacific Adventurer* passed Cape Byron to port, the ship began to be more affected by the wind, sea and swells generated by cyclone Hamish. As the ship continued north, the master tried steering several different headings in an attempt to minimise the heavy rolling now being experienced but as the ship steadied on each heading, the heavy rolling would resume.

By 2000, *Pacific Adventurer* was off Queensland's Gold Coast. The wind, still from the east-southeast, had increased to force seven (27 to 33 knots) and the waves and swell to 5 m. The ship was rolling heavily and occasionally shipping seas on the starboard side of the main deck. The ship was making good 020° (T) at 10.3 knots.

By 2200, the heavy rolling again made conditions on board the ship unacceptable for the crew and the ship's structure. The master reduced the main engine speed to 50 rpm, the equivalent of manoeuvring full ahead.

At about 2330, the BoM in Brisbane issued another hurricane force wind warning: at 2200, Severe TC Hamish, with maximum winds of 70 knots, was centred was about 216 miles to the northeast of *Pacific Adventurer* and moving east at 3 knots.

At about midnight, *Pacific Adventurer* was about five miles off Point Lookout on North Stradbroke Island. The sea and swell had increased to about 6 m and the ship's speed had reduced to about 9 knots. The ship was making good a course of 040° (T). Visibility was quite good but the moon, which was due to set at about 0430, was obscured by cloud. The master was still attempting to put the ship on a course which minimised the rolling.

By this stage, the ship was rolling very heavily, at times as much as 35° to port and starboard in the confused swell. Water was constantly being shipped on the starboard side. None of the off duty crew could sleep and those on the bridge

3 Metacentric height – one of the critical measurements of a ship's stability.

4 The Beaufort scale of wind force, developed in 1805 by Admiral Sir Francis Beaufort, enables sailors to estimate wind speeds through visual observations of sea states.

were unable to stand without holding on to a support.

At 0020, the master told the second mate to steer a course of 000° as the ship needed to head for the pilot boarding ground. After coming to this course, the second mate made slight adjustments to the ship's heading to see if he could reduce the rolling but none of these actions were successful.

At 0200, the wind had increased to about gale force eight (34 to 40 knots). The sea and swell was estimated as now being 7 and 8 m respectively. The ship was now making good 306° (T) and still about 9 knots.

At 0300, the master ordered a new heading of 340° to be steered.

At about 0312, in a position about seven miles to the east of Cape Moreton, the ship rolled violently, estimated to be about 40° by the second mate on watch.

As the ship rolled to port, the second mate saw what he thought was a container in the centre stack on Bay 25, forward of the accommodation, collapse. Seconds later, he saw all the port side containers on Bay 25 move and fall over the side of the ship. He yelled to the master and as the ship rolled violently back to starboard, both he and the master saw the bottom tier of containers on the starboard side of Bay 25 collapse and fall over the side of the ship. In less than a minute, the ship had lost all 31 containers on Bay 25.

At 0313, the master reported the incident, and the closest estimate of the position of the incident, to Brisbane Harbour Control by VHF radio.

At about 0317, Brisbane Harbour Control issued a warning to shipping using VHF channel 67.

At 0335, the Rescue Coordination Centre (RCC Australia) broadcast a sea safety message to shipping in the area, warning of the danger of floating containers.

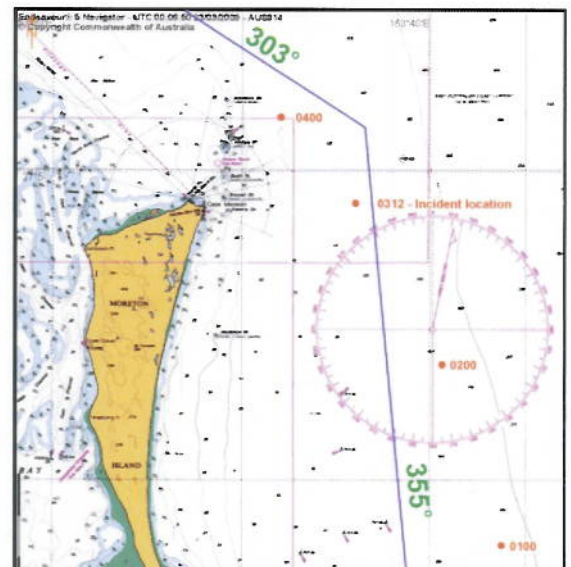
At 0400, the ship was continuing to roll heavily, at times violently, up to 45° each way following the loss of the containers.

The weather at the time the containers were lost overboard prevented any of the crew from going onto the main deck to assess the extent of the damage. However, as the ship passed clear of

Cape Moreton, the seas and swell started to abate. The chief mate and chief engineer were then able to access the ship's cargo holds through the underdeck passage. From there, they began to inspect each cargo hold to ensure that all the steel coils and aluminium ingots stowed in the holds were still secure and not in danger of causing more damage to the ship.

At 0457, Brisbane Harbour Control told the master that the pilot boarding time had been suspended.

**Figure 2:** Section of navigational chart Aus 814 showing the ship's planned track and actual positions as it approached Cape Moreton



Following the internal inspection of the holds, the chief mate and chief engineer ventured onto the port side of the main deck, just forward of the accommodation.

At 0552, during this inspection, the chief engineer looked over the port side of the ship while it was rolling to port. As the ship rolled back to starboard, the chief engineer saw what looked like fuel oil spouting from the side of the ship. On closer inspection, he realised that the ship had been holed and that it was leaking fuel oil from number one port fuel oil tank into the sea.

He immediately informed the chief officer, who passed this information to the master, saying that they needed to give the ship a starboard list because of the oil seen coming from the ship's side. The chief engineer then went to the engine room control room and began transferring fuel oil

from the holed tank into number two starboard fuel oil tank. This was a slow process as the fuel oil transfer pump capacity was only about 25 m<sup>3</sup> per hour.

At 0604, the master reported the spillage of fuel oil into the sea to Brisbane Harbour Control and the actions being taken on board to reduce the pollution.

Shortly after receiving this information, Maritime Safety Queensland (MSQ) activated Australia's National Plan to Combat Pollution of the Sea by Oil and Other Noxious and Hazardous Substances (the National Plan).

At 0650, the master spoke to the acting Brisbane harbour master and told him that the process of transferring fuel oil out of the holed tank was underway and that the level of oil in the tank had decreased to the point where it only leaked out when the ship rolled to port. The master also expressed concern that he felt that it was unsafe for his ship to remain at sea for an indefinite period of time and requested that the Brisbane pilot board as soon as possible.

By 0710, the flow of fuel oil from the holed tank had stopped and the ship had a starboard list of about 3°. Early estimates by the chief engineer of how much fuel had been lost overboard, based on the amount of fuel oil in the port fuel oil tank at departure from Newcastle and the amount used during the voyage to Brisbane, gave a figure of approximately 31 tonnes. This figure was passed to authorities ashore.

At 0852, a harbour pilot boarded and confirmed to Brisbane Harbour Control that there was no oil leaking from the ship. Following this notification, the passage to a suitable anchorage in Moreton Bay began.

At 1230, *Pacific Adventurer* anchored off Shark Spit on the western side of Moreton Island where an assessment of the ship's condition could be made before the harbour master allowed the ship to berth.

At 1434, representatives from several interested agencies boarded the ship and held a preliminary meeting with the master in connection with the incident. After an assessment of the ship's condition and any potential environmental damage which might occur if the spilt cargo on the

hatch covers was washed overboard, permission was given for the ship to berth the following day.

At 0624 on 12 March, another harbour pilot boarded *Pacific Adventurer*. At 0650, the ship's anchor was weighed and at 0848, *Pacific Adventurer* was all fast port side alongside Fisherman Islands. Its arrival draughts were 7.8 m forward and 8.2 m aft and its GM was calculated to have increased to 3.0 m as a result of the loss of containers and the estimated loss of oil from the port fuel oil tank.

Following a detailed Port State Control inspection of *Pacific Adventurer*, surveyors from the Australian Maritime safety Authority (AMSA) detained the ship as a result of a number of identified deficiencies.

On the morning of 13 March, during an operation to bring the ship upright at a layup berth at Hamilton in Brisbane, more fuel oil leaked into the Brisbane River. The leaks came from previously undetected holes in the underwater part of number one starboard fuel oil tank.

The discovery of holes in the starboard fuel oil tank required that a thorough and accurate set of soundings be taken so that the chief engineer, accompanied by AMSA surveyors, could recalculate the amount of fuel oil remaining on board and therefore the amount lost.


Following the completion of an independent fuel survey, the amount of fuel oil released into the water was calculated to be approximately 270 tonnes.

## INVESTIGATION ACTIVITIES

ATSB investigators boarded *Pacific Adventurer* in Brisbane. Relevant members of the ship's crew were interviewed and each gave his account of the incident. The investigators took copies of relevant documents, records and possession of the removable hard disk from the ship's simplified voyage data recorder (S-VDR).

The ATSB investigators also met with representatives of the manufacturers of the ammonium nitrate prills, Orica.

The ATSB is following the location and salvage efforts surrounding the lost containers to identify any more evidence that may become available.



Additional information has been requested from the managers and operators of *Pacific Adventurer*, Maritime Safety Queensland (MSQ), the Australian Maritime Safety Authority (AMSA) and Orica.

The collection and analysis of a range of evidence is continuing. Based on the initial evidence obtained, the ATSB investigation will be focusing on several areas including:

- The adequacy and condition of the container lashing equipment.
- The Newcastle departure loading condition and the associated ship stability.
- The actions of the crew during the passage to Brisbane.
- The ship's safety management system and other guidance provided to the crew.
- Risk assessment procedures.