



Australian Government
Australian Transport Safety Bureau

Breakaway of *Grand Pioneer* and *AAL Fremantle*

Port of Fremantle, Western Australia | 17 August 2014



Investigation

ATSB Transport Safety Report
Marine Occurrence Investigation
313-MO-2014-009
Preliminary – 21 October 2014

Cover photo: Fremantle Ports

Released in accordance with section 25 of the *Transport Safety Investigation Act 2003*

Publishing information

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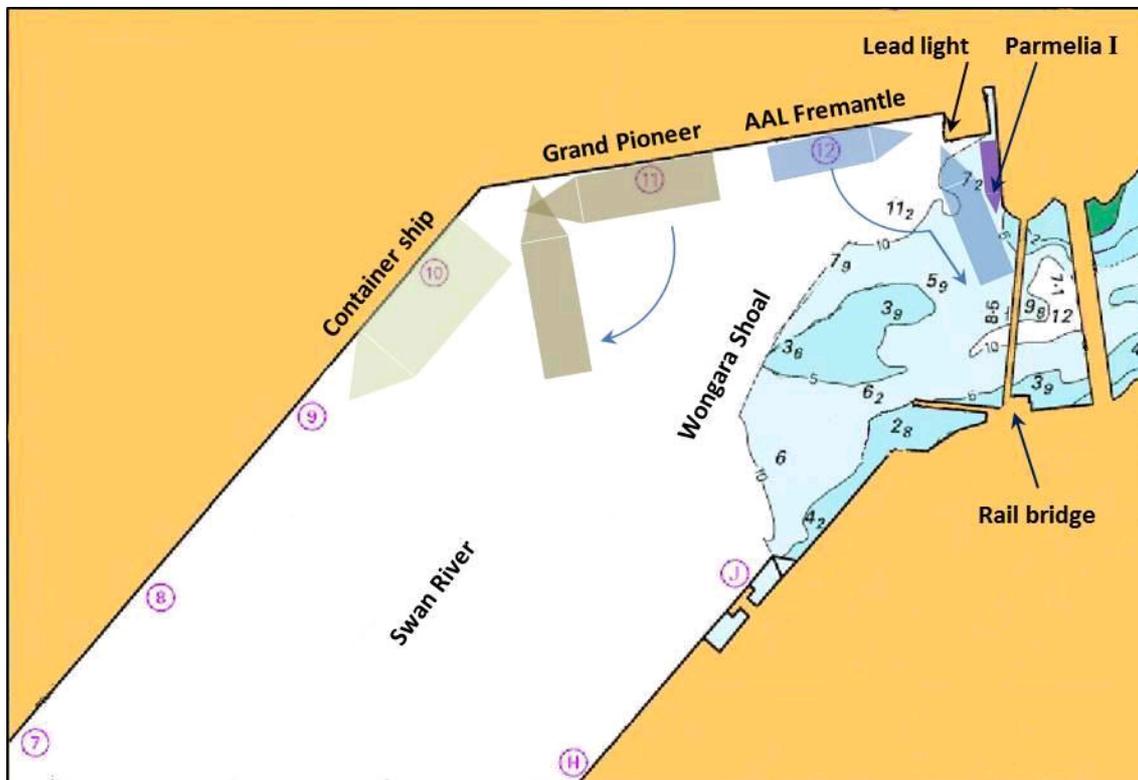
The occurrence

The information contained in this Preliminary report is released in accordance with section 25 of the Transport Safety Investigation Act 2003 and is derived from the initial and ongoing investigation of the occurrence. Readers are cautioned that new evidence will become available as the investigation progresses that will enhance the ATSB's understanding of the accident as outlined in this Preliminary report. As such, no analysis or findings are included in this report.

At 1712¹ on 17 August 2014, the 190 m long car carrier, *Grand Pioneer*, berthed in Fremantle at berth 11 (Figure 1). Berthed astern of the car carrier was the 140 m long general cargo ship, *AAL Fremantle*, loading and unloading cargo using its two, port side mounted cranes.

At the time, a strong wind (26 to 33 knots²) warning³ was in place for local waters, including Fremantle port. The Bureau of Meteorology (BoM) weather forecast that afternoon also noted 'scattered thunderstorms in the late evening, possibly severe with damaging winds'.

Figure 1: Section of chart Aus 113 indicating berthed ships and their later movement



Source: Australian Hydrographic Service, annotated by ATSB.

In response to BoM forecasts, Fremantle Ports had advised the masters of berthed ships of the strong wind warning and asked for precautions to be taken.⁴ As a precaution, *AAL Fremantle's* starboard anchor had been lowered to the seabed.

At 1900, *Grand Pioneer's* cargo unloading started using the vehicle ramp on its starboard quarter. The wind was from the north at 28 to 33 knots which was consistent with the forecast. The ship had been berthed using an additional head line and stern line because of the strong wind warning.

¹ All times referred to in this report are local time, Coordinated Universal Time (UTC) + 8 hours.

² One knot, or one nautical mile per hour, equals 1.852 kilometres per hour.

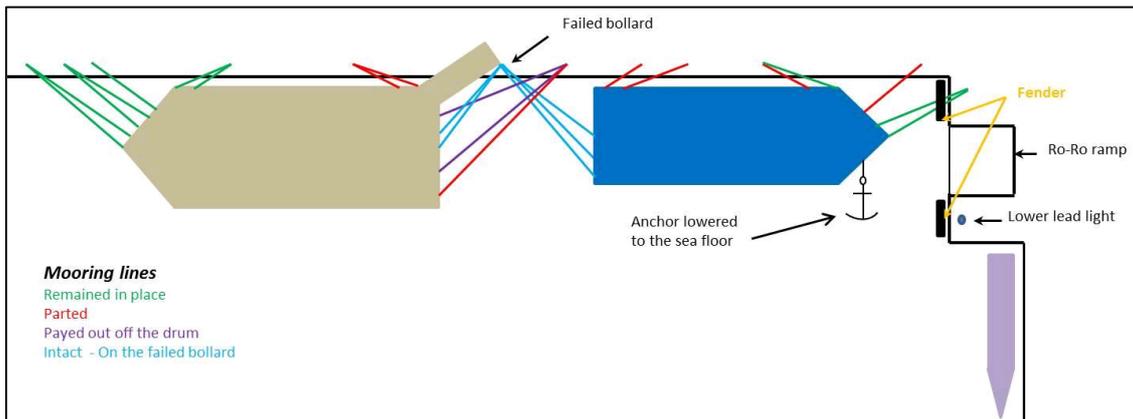
³ Bureau of Meteorology wind warning categories are based on wind speeds.

⁴ Fremantle Ports' standard written weather advice is hand-delivered.

At about 2200, a thunderstorm passed over the port, and over a period of a few minutes, the northerly wind began gusting to about 55 knots. Rain accompanied the sudden and violent weather event.

In his cabin, *AAL Fremantle*'s master heard the sudden rise in wind speed. From the aft facing cabin window, he saw the *Grand Pioneer*'s stern moving away from the wharf and the three stern lines could no longer be seen (Figure 2). Concerned, the master immediately went to the bridge and started preparations to manoeuvre the ship.

Figure 2: Indicative diagram showing mooring arrangements (not to scale)



Source: ATSB

Grand Pioneer's master was on the *Grand Pioneer*'s bridge attending to paperwork when the thunderstorm struck. The anemometer, above the bridge front windows, indicated that the wind had increased to 35 knots. He radioed the duty mate to stop traffic on the vehicle ramp in case the ship moved away from the wharf. He then phoned the *Grand Pioneer*'s agent and requested a tug in case it was needed to keep the ship alongside.

Shortly afterwards, *Grand Pioneer*'s master's wind was now gusting to 55 knots and the ship was moving. Looking aft, he saw the stern moving rapidly away from the wharf and the ramp sliding over its edge. He immediately notified Fremantle vessel traffic service (VTS) and requested immediate assistance. He also updated the agent. The master then instructed the crew to standby at forward and aft mooring stations and the main engine and bow thruster to be prepared for immediate use.

Grand Pioneer's third mate was on the vehicle ramp when the thunderstorm struck. He had just checked the aft spring lines when he saw but did not hear due to the noise of the wind and rain the outboard stern line parting and the ship moving away from the wharf. The third mate then noticed that two other stern lines, on a different bollard to the parted line, were slack and in the water (Figure 2). He hurried up the ramp, attempting to stop the cars being driven down the ramp in the event that it fell off the wharf.

By about 2203, *Grand Pioneer*'s master ceased with one car stopped on the ramp after its driver ran back up to the vehicle deck. At 2203½, the *Grand Pioneer* moved out from the wharf to allow the vehicle ramp to fall off the wharf. The free end of a stern line fell onto the ramp after paying out and running off its winch drum as the ship moved. The free end of this line caught under a rear tyre of the stranded car, pulling it down the ramp and turning it about 90 degrees before the line came free and fell into the water.

During the sudden weather event, the bollard that had held all three of *AAL Fremantle*'s and two of *Grand Pioneer*'s stern lines broke away from the wharf and fell into the water. Other mooring lines on both ships had also parted or payed out, resulting in both ships breaking away from the wharf.

By 2207, *AAL Fremantle* lay at about right angles to the wharf and began moving astern. A fender on the wharf fouled the ship's starboard anchor cable, resulting in the anchor being dragged onto the wharf apron. As the anchor was dragged along, its flukes contacted the lower leading light's tower and brought it down.

At 2208½, *AAL Fremantle's* starboard quarter struck a stanchion⁵ on the Fremantle rail bridge and brought it down. Temporary scaffolding on the side and under the bridge was damaged, and the track's alignment was disturbed (Figure 3). Moments later, *AAL Fremantle's* hull, about midships, contacted the starboard shoulder of the bunker barge, *Parmelia I* (Figure 1), and then stopped moving astern. *AAL Fremantle's* two remaining head lines were slack but the remaining forward spring line was still under tension.

By 2209, *AAL Fremantle's* main engine was running at dead slow ahead to maintain the ship's position and avoid putting further weight on the rail bridge.

Figure 3: *AAL Fremantle* near the Fremantle rail bridge during the incident



Source: Fremantle Ports

By 2210, *Grand Pioneer* had swung until its port shoulder was about 15 m from the container ship at berth 10 (Figure 1). *Grand Pioneer's* head lines and forward spring lines had held and its port anchor was let go. The bow thruster and main engine were used to maintain the ship's position.

At 2235, a tug arrived and began assisting *Grand Pioneer*. At 2245, a pilot boarded *AAL Fremantle* and other tugs arrived to assist. At about 2300, a pilot boarded *Grand Pioneer* and a second tug made fast to the ship so that it could be returned to its berth. The weather had started to moderate with the wind speed decreasing to about 40 knots.

At about 0100 on 18 August, *Grand Pioneer* was all fast at its berth and one tug was retained to standby the high sided car carrier in the windy conditions. The wind was from the north-northwest at about 30 knots. At about this time, *AAL Fremantle's* fouled anchor had been cleared from the lower leading light tower.

⁵ A pre-stressed concrete pole that supported the overhead wire for the electrified suburban rail network.

At 0115, two tugs had been made fast to *AAL Fremantle*. As there was insufficient water over Wongara Shoal (Figure 1) for the aft tug to manoeuvre close to the ship, its line was attached to a ship's mooring line.

By 0300, *AAL Fremantle* was all fast at berth H (Figure 1).

Context

Port of Fremantle

Fremantle is the principal commercial port for Western Australia and is situated at the mouth of the Swan River. The port comprises the inner harbour, within the estuary of the Swan River, and an outer harbour with three open roadsteads where ships can anchor.

Amongst the inner harbour berths, numbers 11 and 12 are common user berths providing 429 m of berth space. The wharf aprons are reinforced and there are substantial stacking areas making the wharf suitable for handling general, break bulk and heavy lift cargoes. The wharf also provides suitable space for large numbers of vehicles that are being shipped.

The proximity of Wongara Shoal to berth 12 meant that smaller ships usually berth starboard side alongside and stern in, while larger ships use berth 11 and are berthed stern out. Adjacent to berth 12 and near Fremantle rail bridge is berth 12 A, which is reserved for the bunker barge *Parmelia I* (Figure 1).

Fremantle rail bridge

The Fremantle rail bridge is a 260 m long, single track rail only bridge, which spans the Swan River at the eastern end of the Port of Fremantle. The track is supported by two spans of steel girders, 10 m above the water, which sit on eight concrete piers. It services the electrified⁶ suburban train system and the freight requirements of the Fremantle inner harbour and the Kwinana port areas. The bridge typically caters for 158 suburban and 30 freight movements per day.

The Queen Victoria Street traffic bridge is adjacent to the Fremantle rail bridge on its upriver side.

AAL Fremantle

AAL Fremantle is a 140 m long general cargo ship with two 350 t cranes mounted on the port side. At the time of the incident, the ship was managed by Columbia Ship Management, Singapore, and classed by Det Norske Veritas Germanischer Lloyd.

The ship had a crew of 20 Russian, Ukrainian, Chinese and Philippine nationals. The master first went to sea in 1982 and sailed on different types of ships. He had sailed as master since 2004 and held a Russian master's certificate of competency. He had completed three, four month contracts on board *AAL Fremantle* before the incident.

The ship was tied up with ten, 80 mm diameter, polypropylene eight strand ropes with an individual 95 t breaking load. All ropes were run onto drums and held on the brake.

Grand Pioneer

Grand Pioneer is a 190 m long pure car and truck carrier. The ship has two vehicle ramps on its starboard side, the main ramp on the quarter and a secondary ramp located midships. At the time of the incident, the ship was managed by Cido Shipping, Korea and classed by Korean Register.

The ship had a crew of 20 Philippine nationals. The master first went to sea in 1991 and since then had sailed mainly on car carriers. He held Philippine qualifications for a master and had sailed at that rank since 2010.

⁶ The electrified suburban network uses 25kV AC power. This line runs between Perth and Fremantle.

The ship was tied up with twelve 72 mm diameter, 8 strand polypropylene ropes run onto split drum winches and held on the brake. Each rope had a 97 t breaking load. The two extra lines, one forward and one aft, were of the same type and run onto the winch's drum ends.

Parmelia I

Parmelia I is a 65 m long tanker servicing the bunker requirements of ships in the port of Fremantle and its anchorages. At the time of the incident it was managed by United Maritime and classed with China Classification Society.

As there were no deliveries scheduled for the night of 17 August, the barge was manned overnight by a skeleton crew.

Investigation direction

The investigation is ongoing and will focus on the:

- bollard failure mechanism
- preparedness of the ships leading up to the incident
- port authority procedures to avoid weather related incidents
- effect of weather on water levels in the port and the movement of ships
- risk analysis and management in relation to relevant marine and rail infrastructure
- risk management and emergency response between relevant agencies

General details

Occurrence details

Date and time:	17 November 2014, 2205 Hrs (UTC + 8)	
Occurrence category:	Serious incident	
Primary occurrence type:	Equipment failure	
Location:	Port of Fremantle	
	Latitude: 32°02.4' S	Longitude: 115°45.0' E

Ship details: *AAL Fremantle*

Name:	<i>AAL Fremantle</i>
IMO number:	9521095
Call sign:	9V9011
Flag:	Singapore
Classification society:	DNV GL
Ship type:	General cargo, 2 x 350 t cranes
Builder:	Sekwang Shipbuilding Mokpo, South Korea
Year built:	2011
Owner(s):	AAL Fremantle Shipping
Manager:	Columbia Ship Management, Singapore
Gross tonnage:	14,053
Deadweight (summer):	18,792 t
Summer draught:	9.8 m
Length overall:	140.3 m
Moulded breadth:	23.4 m
Moulded depth:	13.5 m
Main engine(s):	1 x 6RTA48T-B, 2 Stroke
Total power:	MCR: 8,730 kW (11,869 hp) at 127 rpm
Speed:	Max. Speed: 16.00 knots, Service Speed: 14.50 knots
Damage:	Parted mooring lines and minor indentations to ship's shell plating in the starboard shoulder, midships and quarter areas.

Ship details: *Grand Pioneer*

Name:	<i>Grand Pioneer</i>
IMO number:	9247572
Call sign:	HOBN
Flag:	Panama
Classification society:	Korean Register
Ship type:	Pure Car (Truck) Carrier
Builder:	Shin Kurushima Dockyard, Tokyo , Japan
Year built:	2002
Owner(s):	Dynamic Carrier Shipping

Manager:	Cido Shipping Korea
Gross tonnage:	58,947
Deadweight (summer):	19,120 t
Summer draught:	9.6 m
Length overall:	190 m
Moulded breadth:	32.26 m
Moulded depth:	14.6 m
Main engine(s):	1 x 8UEC60LS, 2 Stroke
Total power:	MCR: 14,162 kW (19,255 hp) at 100 rpm
Speed:	20.00 knots
Damage:	Parted mooring lines, failed winch brake lining and minor damage to the stern ramp.

Ship details: *Parmelia I*

Name:	<i>Parmelia I</i>
IMO number:	9565168
Call sign:	VHMM
Flag:	Australia
Classification society:	China Classification Society
Ship type:	Tanker
Builder:	Yamen Shipyard Ltd (Jiangmen, Guangdong, China)
Year built:	2009
Owner(s):	Sino Tankers Pte Ltd
Manager:	United Maritime Pte Ltd
Gross tonnage:	1,564
Deadweight (summer):	1,639 t
Summer draught:	3.5 m
Length overall:	65 m
Moulded breadth:	15 m
Moulded depth:	5.2 m
Main engine(s):	2 x KT-38-M
Total power:	MCR 1,176kW (1,598hp)
Speed:	10.00 knots
Damage:	Nil known

Australian Transport Safety Bureau

The Australian Transport Safety Bureau (ATSB) is an independent Commonwealth Government statutory agency. The ATSB is governed by a Commission and is entirely separate from transport regulators, policy makers and service providers. The ATSB's function is to improve safety and public confidence in the aviation, marine and rail modes of transport through excellence in: independent investigation of transport accidents and other safety occurrences; safety data recording, analysis and research; fostering safety awareness, knowledge and action.

The ATSB is responsible for investigating accidents and other transport safety matters involving civil aviation, marine and rail operations in Australia that fall within Commonwealth jurisdiction, as well as participating in overseas investigations involving Australian registered aircraft and ships. A primary concern is the safety of commercial transport, with particular regard to fare-paying passenger operations.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and Regulations and, where applicable, relevant international agreements.

Purpose of safety investigations

The object of a safety investigation is to identify and reduce safety-related risk. ATSB investigations determine and communicate the factors related to the transport safety matter being investigated.

It is not a function of the ATSB to apportion blame or determine liability. At the same time, an investigation report must include factual material of sufficient weight to support the analysis and findings. At all times the ATSB endeavours to balance the use of material that could imply adverse comment with the need to properly explain what happened, and why, in a fair and unbiased manner.

Developing safety action

Central to the ATSB's investigation of transport safety matters is the early identification of safety issues in the transport environment. The ATSB prefers to encourage the relevant organisation(s) to initiate proactive safety action that addresses safety issues. Nevertheless, the ATSB may use its power to make a formal safety recommendation either during or at the end of an investigation, depending on the level of risk associated with a safety issue and the extent of corrective action undertaken by the relevant organisation.

When safety recommendations are issued, they focus on clearly describing the safety issue of concern, rather than providing instructions or opinions on a preferred method of corrective action. As with equivalent overseas organisations, the ATSB has no power to enforce the implementation of its recommendations. It is a matter for the body to which an ATSB recommendation is directed to assess the costs and benefits of any particular means of addressing a safety issue.

When the ATSB issues a safety recommendation to a person, organisation or agency, they must provide a written response within 90 days. That response must indicate whether they accept the recommendation, any reasons for not accepting part or all of the recommendation, and details of any proposed safety action to give effect to the recommendation.

The ATSB can also issue safety advisory notices suggesting that an organisation or an industry sector consider a safety issue and take action where it believes it appropriate. There is no requirement for a formal response to an advisory notice, although the ATSB will publish any response it receives.

Investigation

ATSB Transport Safety Report Marine Occurrence Investigation

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Port of Fremantle, Western Australia, 17 August 2014

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