



Australian Government

Australian Transport Safety Bureau

Contact with wharf by livestock carrier *Angus Express*

Berths 4 and 5, Broome, Western Australia, on 20 April 2018

ATSB Transport Safety Report

Marine Occurrence Investigation

343-MO-2018-006

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Addendum

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Contact with wharf by livestock carrier *Angus Express*

What happened

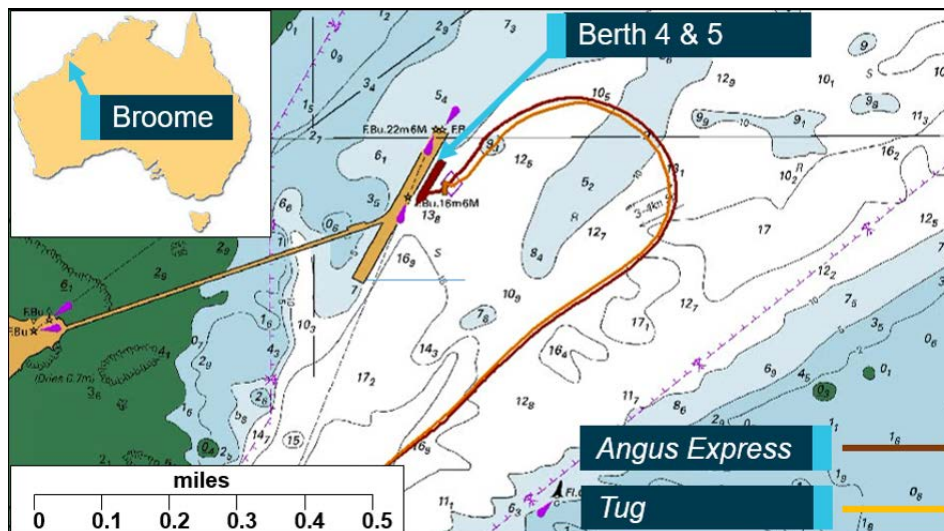
At about 0600 Western Standard Time¹ on 20 April 2018, the 103 m livestock carrier *Angus Express* (Cover) arrived at the Broome, Western Australia, pilot boarding ground. The ship had just completed a voyage from Singapore, and was expected to load cattle at berths 4 and 5.

A pilot boarded *Angus Express* and was escorted to the ship's navigation bridge. The bridge team consisted of the master, chief mate (under supervision as trainee master), and a seaman as the helmsman. The chief mate, master and pilot then commenced the master-pilot information exchange (MPX). During the exchange, they discussed the ship's characteristics, the inward passage and the berthing plan.

When booking the pilotage on 16 April 2018, the master had advised that the ship's bow thruster was inoperable. The port's handbook² recommended that a ship of *Angus Express*'s length with no thruster utilise two tugs for arrival and departure. The tugs were booked in advance, but at about 1845 on 19 April, the pilot became aware that only one of the port's two tugs would be available as the other tug was out of service for a week for repairs. He informed the harbour master who advised that provided there were no strong winds and the ship berthed within an hour or less of slack water,³ the pilot could make the decision whether to continue with the berthing. The pilot then conducted a risk assessment and discussed it with the harbour master. They determined that the ship could berth with the use of only one tug.

The pilot explained the plan to the ship's chief mate and master during the MPX and they agreed with the plan. The pilotage into Broome continued with a tug in attendance from 0636 (Figure 1), and went as planned and without incident.

Figure 1: *Angus Express*'s arrival into Broome and the approach to berth 4 & 5



Source: Australian Hydrographic Service, annotated by ATSB

¹ Western Standard Time (WST): Coordinated Universal Time (UTC) + 8 hours.

² Kimberley Ports Authority, Port of Broome, Port and Terminal Handbook.

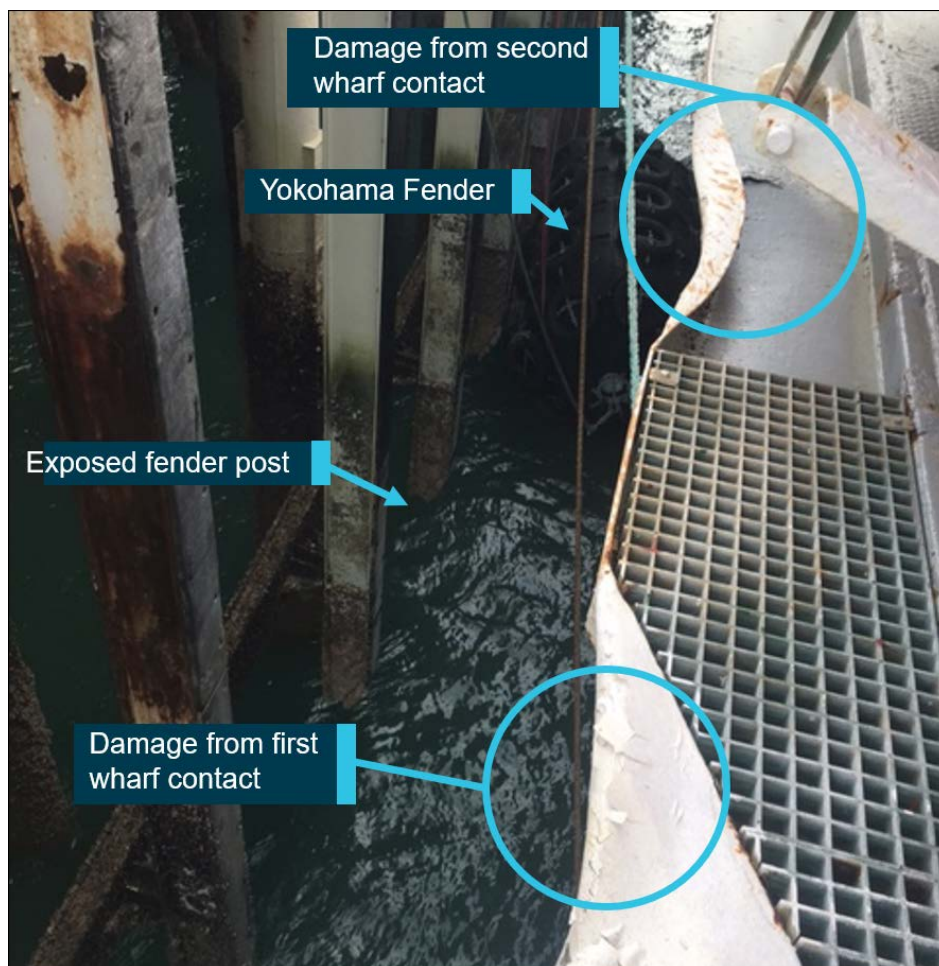
³ The period between a flood stream and ebb stream, when there is little or no flow.

The pilot swung the ship to port and approached the wharf, to berth starboard side alongside. By 0710, the ship was alongside the wharf, with two Yokohama fenders⁴ positioned forward and aft, between the ship and wharf's vertical fender posts (low water was at 0711 (1.55 m)).

The ship was about 8 m aft of its berthing position at berth 4 and 5, when mooring lines were run to the wharf. The pilot then tried to use the mooring winches to heave in the mooring lines to move the ship forward into position. However, by this time, the slack tide was starting to change and the pilot estimated there was a current working against the bow and the mooring winches were ineffective. The pilot then instructed the tug, in position about amidships, to push forwards at a 45° angle using minimum power, to assist repositioning the ship.

At 0712, the weight of the ship against the forward Yokohama fender forced it to pass under the fender posts, which resulted in the ship's bow moving towards the wharf (Figure 2). Shortly after, an overhanging scupper⁵ protrusion made contact with the fender post (about 30 m from the ship's bow).

Figure 2: Damage to the *Angus Express*'s starboard scupper protrusion



Source: Kimberley Ports Authority, annotated by ATSB

The pilot thought that the ship had pivoted on the Yokohama fender and instructed the tug to stop pushing. The ship moved slightly off the fender posts and the fender cleared the post.

At 0714, the pilot instructed the tug to push minimum forward again, resulting in the forward Yokohama fender once again passing underneath the fender posts. The ship's bow again moved

⁴ Yokohama fenders are pneumatic fenders used to avoid damage to the ship and the wharf, jetty or dock.

⁵ An opening in the side of a ship at or just below the level of the main deck, to allow water to run off.

towards the wharf, and the scupper protrusion again made contact with the fender post (Figure 2). The pilot instructed the tug to stop, and the ship came away from the vertical fender posts.

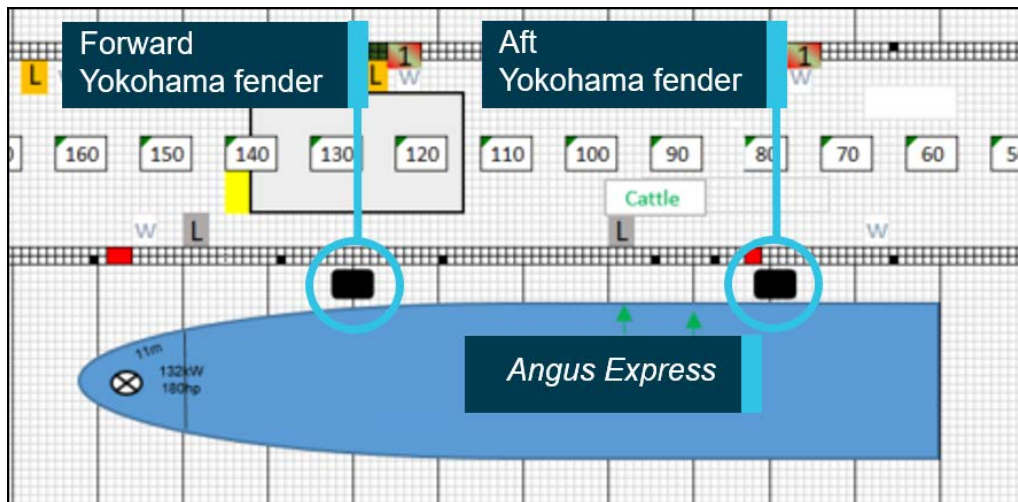
The pilot then advised the master to use the ship's engines to reposition the ship. At 0718, the ship was in position as intended and all fast⁶ with the height of tide now at 1.65 m.

The pilot reported the incident to the harbour master who subsequently attended the ship and found minor damage to the ship's superstructure.

Yokohama fenders in Broome

The Yokohama fender system in the Port of Broome consisted of large floating cylindrical rubber fenders, secured to vertical fender posts, which allowed vertical movement as the tide changed. The tyres fitted with chain to the outside of the fenders for protection also increased their width. The use of fenders kept the ship's side clear of the wharf, protecting both, and allowed longer loading windows (Figure 3). The added clearance from the wharf also reduced the steepness of the gangway in the large tidal range at Broome.

Figure 3: Berthing plan showing the position of the Yokohama fenders at berth 4 & 5



Source: Kimberley Port Authority, annotated by ATSB

After the incident, inquiries by *Angus Express*'s pilot resulted in a pilot who had worked in the port until 2015 providing relevant information about the Yokohama fender system. That pilot's personal pilotage log indicated that a height of tide of less than 2.5 m was considered a significant factor with respect to the fenders at berth 5. When the water level fell below this height, the fenders could be forced under the vertical fender posts by a ship.

Post-incident investigations by Kimberley Ports Authority (KPA) and the pilotage provider, West Coast Pilots (WCP) confirmed that the fender posts at berths 4 and 5 were shorter than at others. No evidence was found to indicate that these shorter posts or the potential for fenders to be forced under them when water levels fell had been documented or otherwise promulgated to pilots through training or instruction.

Safety analysis

Yokohama Fenders

The height of tide at the time of the incident was 1.62 m, which was low enough to expose the base of the fender posts (Figure 3). When the pilot attempted to manoeuvre *Angus Express* forward using the tug, the force exerted on the Yokohama fender by the ship, allowed it squash and roll under the fender post. Consequently, the ship moved closer to the wharf and the scupper protrusion contacted the post.

⁶ The running of three head and stern lines and two forward and aft spring lines, to hold the ship alongside the wharf.

Risk assessment

The reason for changing *Angus Express*'s berthing plan was a possible 1-week delay due to tug unavailability. Such a delay could have resulted in stranding a large number of cattle in holding yards for a long period with only about 8 hours of loading fodder available. Therefore, the reason to change the berthing plan (subject to a risk assessment) were valid.

However, at that time, neither the pilot nor the management of both WCP and KPA were aware of the shorter fender posts at berths 4 and 5, and the potential for Yokohama fenders to be forced under them. Had this information been known and effectively disseminated, it would have been considered during the risk assessment and the incident could have been avoided.

Findings

These findings should not be read as apportioning blame or liability to any particular organisation or individual.

- The height of tide when *Angus Express* was berthing was low enough to expose the base of the wharf's fender posts. Consequently, when the tug pushed to move the ship, the forward Yokohama fender was forced under the post, which allowed the ship's starboard scupper protrusion to contact the post with resulting damage.
- The harbour master and pilot were unaware of any height of tide limitations associated with berthing ships alongside Yokohama fenders at berths 4 and 5. Therefore, the risk assessment did not include any mitigating factors for berthing alongside at a height of tide less than 2.5 m.

Safety action

Whether or not the ATSB identifies safety issues in the course of an investigation, relevant organisations may proactively initiate safety action in order to reduce their safety risk. The ATSB has been advised of the following proactive safety action in response to this occurrence.

Kimberley Ports Authority

As a result of this occurrence Kimberley Ports Authority advised the ATSB that it had taken the following actions.

Berthing with Yokohama style fenders

Guidelines for berthing and being alongside when using Yokohama style fenders have been implemented for times of limiting low water levels. Also, the risk evaluation process between harbour master and pilot has been extended to include focussed quick risk assessment for circumstances such as tug shortages, vessel manoeuvring issues and tidal levels.

A memorandum has been issued to all pilots and port users advising of these changes.

Safety message

This incident highlights the fact that marine pilots may encounter operational parameters outside normal limits. Whenever this occurs and learning opportunities are identified, it is important to ensure these are captured through proper reporting processes. This information can then be shared through training and awareness to reduce risk and avoid incidents.

The ATSB [SafetyWatch](#) highlights the broad safety concerns that come out of our investigation findings and from the occurrence data reported to us by industry. Marine pilotage is one of the safety concerns, with further information available from the ATSB's website.



General details

Occurrence details

Date and time:	20 April 2018 – 0712 WST (UTC + 8)	
Occurrence category:	Accident	
Primary occurrence type:	Contact with wharf	
Location:	Alongside berth 4 and 5, Broome, Western Australia	
	Latitude: 18° 00.390' S	Longitude: 122° 13.120' E

Ship details

Name:	<i>Angus Express</i>
IMO number:	9167057
Flag State:	Luxembourg
Classification society:	Registro Italiano Navale (RINA)
Owner(s):	Motorschip Zebu Express, The Netherlands
Manager:	Livestock Express, The Netherlands
Year built:	1996
Gross tonnage:	4752
Length overall:	103.10 m
Moulded breadth:	16.80 m
Summer draught:	6.25 m
Main engine(s):	Wartsila 6L38

About the ATSB

The 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; and 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 operations involving the travelling public.

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.

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

About this report

Decisions regarding whether to conduct an investigation, and the scope of an investigation, are based on many factors, including the level of safety benefit likely to be obtained from an investigation. For this occurrence, a limited-scope, fact-gathering investigation was conducted in order to produce a short summary report, and allow for greater industry awareness of potential safety issues and possible safety actions.