



Australian Government

Australian Transport Safety Bureau

Grounding of *Maersk Garonne*

Fremantle, Western Australia, 28 February 2015

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Marine Occurrence Investigation
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Addendum

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Safety summary

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 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.

What happened

During the morning of 28 February 2015, *Maersk Garonne* was under Fremantle marine pilot guidance on entry to the Port of Fremantle, Western Australia. At 0441 the pilot ordered port helm to bring the ship around to enter the port Inner Harbour entrance channel. During the turning manoeuvre, attempts to delay the ship's arrival at the entrance beacons led to the ship passing south of the channel. At 0448 the ship grounded to the south of channel beacons number 1 and number 2. The ship was refloated at 0824 and taken to anchor.

What the ATSB has found so far

Based on preliminary information provided to the ATSB, it was apparent that the ship's bridge crew had not been directly and actively engaged with the pilotage as it progressed, and were broadly unaware of the pilotage plan. Procedures had not been enacted and actions not taken to ensure the full bridge resources available to the pilot and master were utilised.

Investigation direction

The investigation is ongoing and will focus on:

- pilotage procedures, planning and practices, information exchange and contingency planning for Fremantle pilotage
- the existence, relevance, understanding and implementation of procedures by the pilotage company, port and ship to reduce the risk of grounding
- bridge team dynamics, resource management and personnel engagement during pilotage
- the implementation and effectiveness of bridge resource management training

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The occurrence

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During the early hours of 28 February 2015, the 292 m, 4,318 TEU,¹ fully-cellular container ship *Maersk Garonne* (Figure 1) arrived off the Port of Fremantle, Western Australia after a voyage from Singapore. At 0200,² the master arrived on the navigation bridge and at 0300 he took the conduct of the ship as it approached the Fremantle outer pilot boarding ground. The second mate, as officer of the watch (OOW), remained on the bridge to assist the master when required.

Figure 1: *Maersk Garonne*



Source: ATSB

Just before 0400, the 4–8 third mate³ came onto the bridge and took over the watch from the second mate. He was then directed by the master to go and escort the pilot on board. By 0403, the Fremantle Marine Pilot and an observer⁴ had boarded *Maersk Garonne*, and the pilot launch was clear of the ship.

At 0400, the weather was fine and clear with the wind from the south-southeast at 9 knots.⁵ The forecast was for winds to 15-20 knots from the southeast and the tide was beginning to flood: low water was at 0352 (0.51 m), with high water expected at 1849 (0.97 m).

At 0406, the pilot and observer were welcomed onto the bridge by the master. At the chart table, over the navigational chart, the master and pilot exchanged information and discussed the pilotage. The pilot was informed that the main engine was at half ahead, the engine had been tested astern and that all equipment was working as expected. The thrusters were currently being tested. *Maersk Garonne's* draughts were 12.2 m forward and 12.4 m aft.

The pilot ordered full ahead and adjusted course to direct the ship into the port approach channel. The able seaman at the helm repeated the order and then confirmed when the ship was on the

¹ Twenty-foot Equivalent Unit, a standard shipping container. The nominal size of a ship in TEU refers to the number of standard containers that it can carry.

² All times referred to in this report are local time, Coordinated Universal Time (UTC) + 8 hours.

³ *Maersk Garonne* carried two third mates, one keeping the 4-8 watch and the other the 8-12 watch.

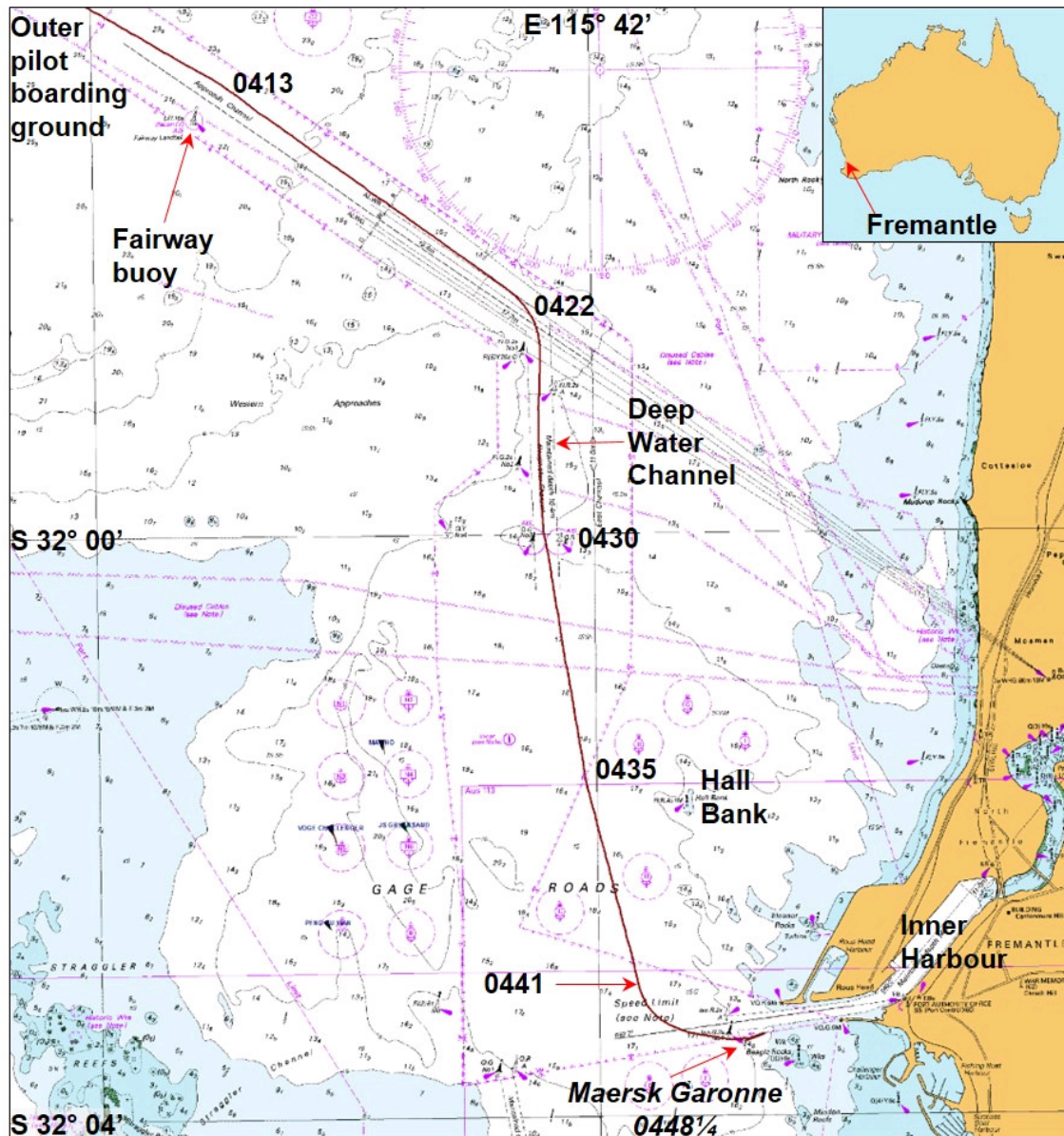
⁴ As part of the Challenger Institute of Technology Advanced Diploma of Maritime Operations (Masters) training programme, students complete a number of pilotages as an observer to gain an understanding of pilotage and ship handling. A student was on board *Maersk Garonne* accompanying the marine pilot on one such observation trip.

⁵ One knot, or one nautical mile per hour, equals 1.852 kilometres per hour.

course. The master positioned himself behind the engine telegraph in preparation for engine manoeuvres and the OOW, the third mate, was at the chart table plotting positions as the transit progressed.

At 0407, the pilot contacted the Port of Fremantle⁶ and spoke with the duty Vessel Traffic Service Officer (VTSO) and advised that *Maersk Garonne* was approaching the fairway buoy. The route for the ship into the port via the Deepwater Channel was confirmed and that there was no outbound traffic. The pilot and master then continued discussing the pilotage, including the information provided on the Fremantle Pilots' Master/Pilot Exchange of Information form. This included the expected track from the pilot boarding ground to the berth, where to expect the tugs, tide and weather conditions and tie-up arrangements.

Figure 2: Section of navigational chart Aus 112 showing the track of *Maersk Garonne*



Source: Australian Hydrographic Service with annotations by ATSB

By 0410, the bridge conversations had moved to more social topics and the pilot and observer were engaged in various discussions with breaks for the pilot to give helm orders to the helmsman as required.

⁶ Fremantle Ports operates a 24 hour Vessel Traffic Service (VTS), the call sign for which is 'Port of Fremantle'.

At 0413, the ship passed the fairway buoy (Figure 2) and continued in a south-easterly direction at 14 knots, toward the Deepwater Channel, less than 3 miles⁷ distant. At 0422, the pilot ordered 10° of starboard helm and, at 0426, a course of 178°.

At 0430, *Maersk Garonne* exited the Deepwater Channel, at a speed of about 16 knots. The pilot then ordered a course change to 170° to direct the ship more towards the port entrance channel, about 3½ miles further south. Between helm orders, the bridge conversations continued in a marine and social vein, mostly between the pilot and the observer.

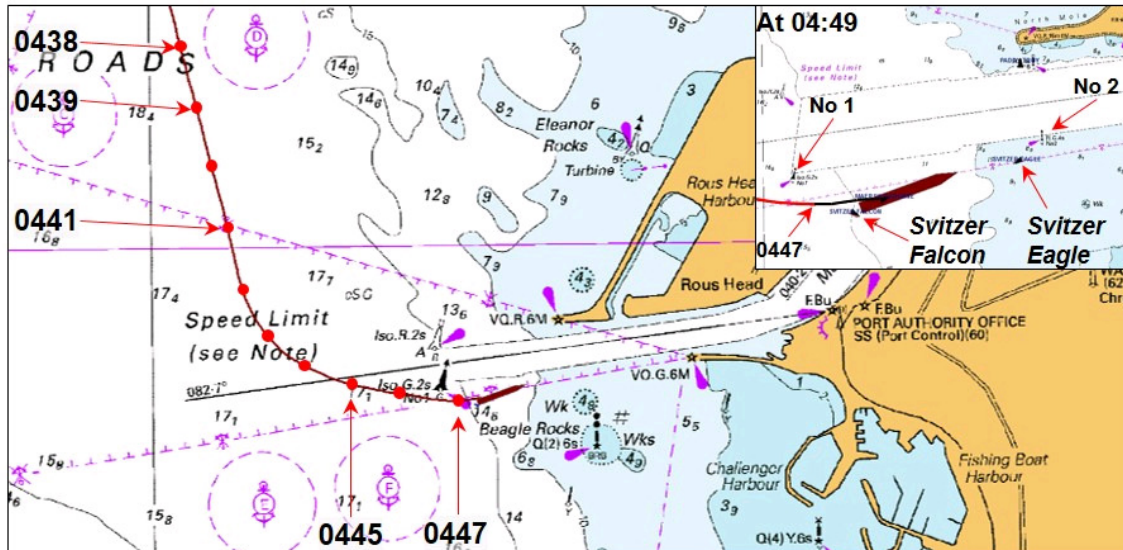
At about this time, the chief mate arrived on the bridge to relieve the third mate as OOW for the arrival. They discussed the situation and exchanged watch information. At 0436, after the third mate had plotted the position on the chart, the chief mate took over the watch. The third mate then left the bridge to take his position on the bow for arrival and berthing.

Meanwhile, at 0435, the pilot contacted the VTS and reported that the ship was passing Hall Bank (Figure 2) and confirmed its berthing arrangements. The VTSO replied that *Maersk Garonne* was all clear to the Inner Harbour and that the tugs were getting underway. The course was then altered to 165° and 2 minutes later, the main engine was reduced to half ahead.

At 0437, the pilot attempted to contact the masters of the two tugs attending the ship. The master of *Svitzer Falcon* responded quickly and the pilot passed the intended berthing arrangements and desired location of the tug on the ship to him. At 0440, the master of *Svitzer Eagle* made contact and similar information was exchanged.

At 0441 the pilot ordered 20° of port helm and slow ahead on the main engine to commence the turn to the entrance channel (Figure 3). Thirty seconds later, the pilot ordered hard port to reduce the ship's speed and not arrive at the entrance beacons before the two tugs were in position.

Figure 3: Section of chart Aus 113 showing *Maersk Garonne's* track



Source: Australian Hydrographic Service with annotations by ATSB

The pilot then advised *Svitzer Falcon's* master's that, in order to further reduce speed, he intended to take the ship south of the entrance channel and continue the turn. The ship would then return to the channel between the starboard channel marker buoys No. 1 and No. 2 (green lights). He advised the master of *Svitzer Falcon* to pass down the port side of *Maersk Garonne*.

Immediately after this exchange, at 0443, *Maersk Garonne's* master queried the pilot and the pilot informed him of the plan to reduce speed and allow more time for the second tug to be in position. The master responded that he understood. At this time, *Svitzer Falcon* was in position just south

⁷ A nautical mile of 1,852 metres.

of the No. 1 entrance beacon and was visible to the pilot. *Svitzer Eagle* was still transiting the Inner Harbour and was not yet visible to the pilot. *Maersk Garonne* continued to slow; at 0443 the ship's speed was 10.8 knots.

At 0444½, the pilot ordered 10° of starboard helm; the ship's speed was 9.2 knots and was still turning to port at a rate of 14° per minute. The ship was on a heading of 102° with the bridge approximately in the middle of the entrance channel. *Svitzer Eagle* was now visible about 1½ miles further up the channel.

Soon after, the chief mate queried the pilot regarding the green beacon (No. 1) being to the port side of the ship's bow and was assured that the ship would pass to starboard of the light. The chief mate then alerted the pilot to the presence of shallow water ahead of the ship. At 0445, the pilot ordered midships helm and, in quick succession, port 20° and hard to port.

At 0446¾, as the No. 1 beacon passed to port of the ship's bridge, the pilot ordered half ahead on the main engine in an attempt to drive the bow to port and bring the ship back into the channel. At this point, the pilot acknowledged the ship was in danger of grounding. The ship had a speed of 7.9 knots with a heading of 82°, approximately parallel to the channel, and was continuing to turn to port.

At 0447¼, the master informed the pilot that the echo sounder was showing 1 m of clearance under the keel. The pilot checked the echo sounder and then ordered full power on the bow thruster to port. The master confirmed the order.

Maersk Garonne's speed was 7.6 knots and over the following 70 seconds the ship slowed and came to a gentle stop as its hull rode up onto the sand and mud bottom to the south of the entrance channel. At 0448¼, the chief mate stated that the ship had no speed and shortly thereafter the pilot ordered the main engine to stop. *Maersk Garonne* was aground in position 32°03.47' S, 115°43.21' E (Figure 3 Inset).

The pilot then attempted several main engine movements, with the assistance of both the bow and stern thrusters and the tugs, but the ship remained fast. The ship's crew checked for damage, inspected the holds and took soundings of tanks and the waters surrounding the ship. No ingress of water was found.

At 0502, the pilot informed the VTSO that the ship had grounded. He requested the assistance of an additional tug and a relief pilot. At 0542, the relief pilot boarded the ship.

During the ensuing hours, the chief mate discharged about 1,000 m³ of seawater ballast from the forward ballast tanks to lighten the ship and assist its refloating. Two additional tugs arrived to assist the ship.

At 0822, with aid of the four tugs and the ship's thrusters and main engine, *Maersk Garonne* began to move. By 0824, the ship was clear of the bottom and the master was directed to take the ship to anchor in Gage Roads while investigations and inspections were conducted. A further check of all tanks and cargo holds showed there to be no water ingress.

On the morning of 1 March, a dive team attended the ship and conducted an inspection of the underwater area of the hull. No breaches were found and observed damage was limited to minor paint scraping. Main engine inspections and trials were conducted during the afternoon.

During that evening, the ship was piloted into Fremantle and was safely alongside at about midnight.

At 1100 on 3 March, after completion of cargo and all other requirements, *Maersk Garonne* departed Fremantle and returned to its scheduled voyage.

Context

Maersk Garonne

At the time of the incident *Maersk Garonne* was registered in Denmark and classed with Bureau Veritas. The ship was owned and managed by A. P. Moller-Maersk, Denmark.

The ship had a multi-national, mostly Filipino, crew of 18. This included an extra third mate, recently added to the complement to assist maintaining deck officer work hours in accordance with the STCW Code.⁸ As a consequence, the chief mate did not keep a watch.

The master had 39 years at sea and held a Romanian master mariner's certificate of competency with Danish recognition. He had sailed as master for 14 years and been with this company for the preceding 7 years. This was his first time on *Maersk Garonne* and he had joined about 2 months before the incident.

The chief mate held a Philippines master mariner certificate of competency obtained in 2007. He had been at sea for 16 years, all on container ships, and 7 years of which had been in the position of chief mate. He had worked with this company for the previous 5 years. This was his first time on *Maersk Garonne* which he had joined about 7 weeks before the incident.

The helmsman at the time of the incident was an able seaman and had 28 years of seagoing experience, 22 years of which had been on container ships and 15 years with this company. He had acted as helmsman on numerous occasions in many of the ships in which he had served. He had been on board for 2 weeks.

Port of Fremantle

The Port of Fremantle is Western Australia's principal national and international sea gateway for container and general cargo trades.⁹ Fremantle is a sheltered, all-weather port situated on the west coast about 20 km from the State capital, Perth. The port operates from two locations: the Inner Harbour is located at the entrance to the Swan River and the Outer Harbour is about 20 km to the south at Kwinana-Cockburn Sound. The port had 2,277 ship visits in the 2013-14 financial year.¹⁰

The Inner Harbour at Fremantle handles almost all of the container trade for Western Australia. In 2013-14 the port handled more than 700,000 containers (twenty-foot equivalent units).¹¹

The Fremantle Port Authority operating under the name Fremantle Ports is the port's strategic manager. Fremantle Ports publishes, and makes available online,¹² a Port Information Guide which provides relevant port and related nautical information for port users. This document includes information relating to communications, pilotage, arrival and departure requirements, port navigation, security and safety.

Within port limits, all vessels over 150 GRT require a pilot unless exempt. Pilotage services are supplied under contract by Fremantle Pilots.

⁸ International Maritime Organization (IMO), London, 2011, Standards of Training, Certification and Watchkeeping for Seafarers (STCW) Code, as amended.

⁹ Fremantle Ports, n.d., *Western Gateway to World Trade*, viewed 16 April 2015, <<http://www.fremantleports.com.au>>

¹⁰ Fremantle Ports Annual Report 2014.

¹¹ Fremantle Ports Annual Report 2014.

¹² www.fremantleports.com.au

Pilot

The marine pilot who attended *Maersk Garonne* had worked in the offshore oil and gas industry and been a master of merchant ships prior to becoming a pilot in 1999. He held an unrestricted pilotage licence for the Port of Fremantle and had worked for Fremantle Pilots since 2004.

Investigation direction

The investigation is ongoing and will focus on:

- pilotage procedures, planning and practices, information exchange and contingency planning for Fremantle pilotage
- the existence, relevance, understanding and implementation of procedures by the pilotage company, port and ship to reduce the risk of grounding
- bridge team dynamics, resource management and personnel engagement during pilotage
- the implementation and effectiveness of bridge resource management training

Sources and submissions

Sources of information

On 2 March 2015, investigators from the Australian Transport Safety Bureau (ATSB) attended *Maersk Garonne* after the ship had berthed in Fremantle, Western Australia. The master and directly involved crewmembers were interviewed and each provided their account of the incident. Photographs of the ship and copies of relevant documents were obtained including log books, statutory certificates, reports, manuals and procedures.

The marine pilot on board the ship at the time of the grounding was interviewed and copies of relevant information was obtained.

Further information was obtained from Fremantle Ports, A. P. Moller - Maersk and Bureau Veritas.

General details

Occurrence details

Date and time:	28 February 2015 – 0447 hours (Local time = UTC + 8 hours)	
Occurrence category:	Incident	
Damage:	Minimal marking of hull paintwork, no structural damage	
Primary occurrence type:	Grounding	
Location:	Entrance channel, Port of Fremantle, Fremantle, Western Australia	
	Latitude: 32° 03.47' S	Longitude: 115° 43.21' E

Ship details

Name:	<i>Maersk Garonne</i>
IMO number:	9235579
Call sign:	OUTK2
Flag:	Denmark
Classification society:	Bureau Veritas
Ship type:	Fully cellular container ship
Builder:	Hyundai Heavy Industries Co Ltd – Ulsan, Republic of Korea
Year built:	2003
Owner(s):	A. P. Moller – Maersk
Manager:	A. P. Moller - Maersk
Gross tonnage:	50,757
Deadweight (summer):	61,608 t (4,318 TEU)
Summer draught:	13.522 m
Length overall:	292.13 m
Moulded breadth:	32.25 m
Moulded depth:	21.70 m
Main engine(s):	Hyundai MAN B&W 10K90MC-C
Total power:	42,100 kW, 104 rpm (MCR)
Speed:	24.2 knots

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.

