Australian Government
Australian Transport Safety Bureau

Loss of propulsion of *FMG Nicola*

Port Hedland, Western Australia, on 7 February 2025

ATSB Transport Safety Report
Marine Occurrence Investigation
MO-2025-007
Interim – 9 October 2025

Cover photo: Pilbara Ports Authority

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Postal address: GPO Box 321, Canberra, ACT 2601
Office: 12 Moore Street, Canberra, ACT 2601
Telephone: 1800 020 616, from overseas +61 2 6257 2463
Accident and incident notification: 1800 011 034 (24 hours)
Email: atsbinfo@atsb.gov.au
Website: atsb.gov.au

Acknowledgement of Country and Traditional Owners

The Australian Transport Safety Bureau acknowledges the traditional owners of country throughout Australia, and their continuing connection to land, sea and community. We pay our respects to them and their cultures, and to elders both past and present.

Interim report

This interim report details factual information established in the investigation's early evidence collection phase and has been prepared to provide timely information to the industry and public. Interim reports contain no analysis or findings, which will be detailed in the investigation's final report. The information contained in this interim report is released in accordance with section 25 of the *Transport Safety Investigation Act 2003*.

The occurrence

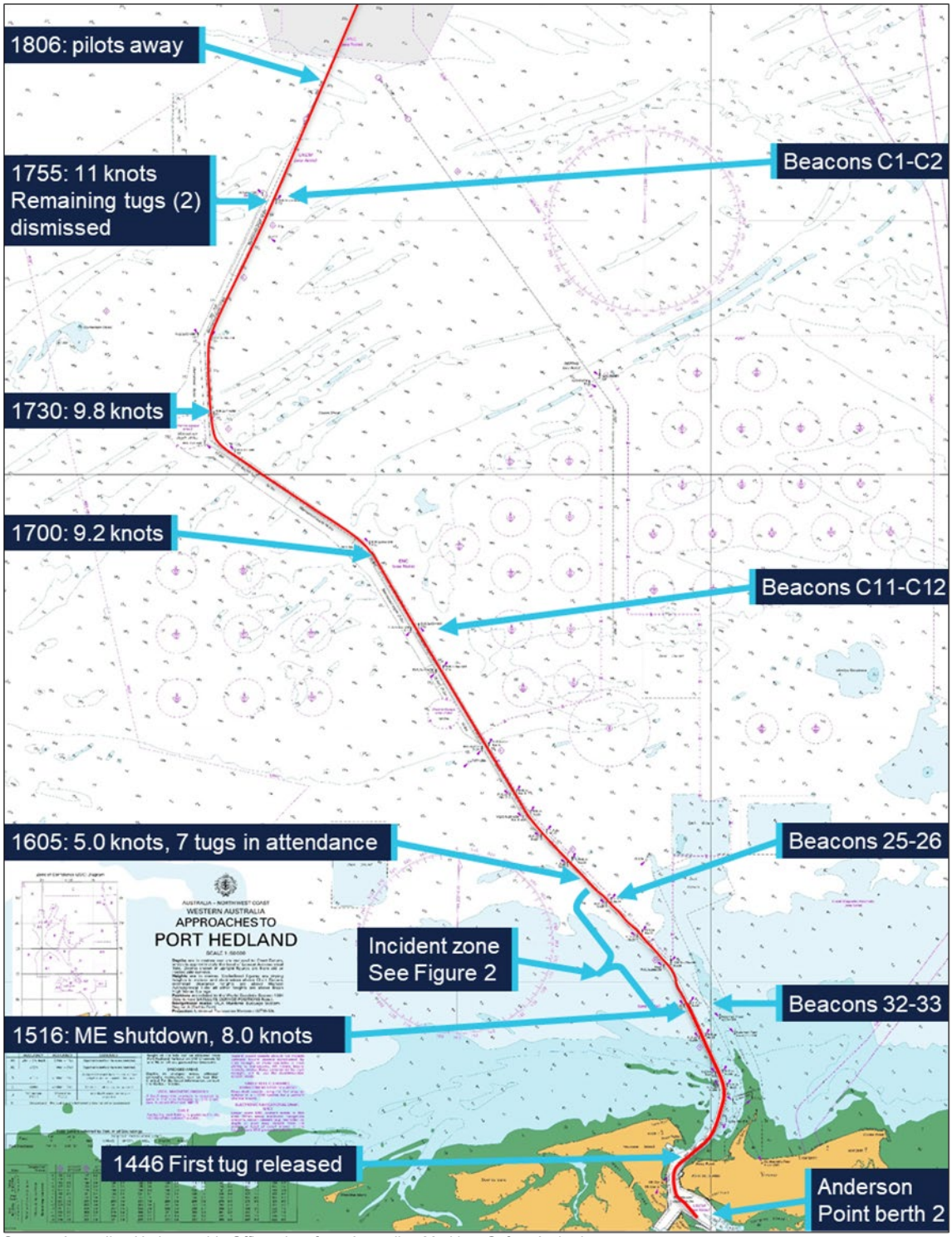
At 0832 local time on 7 February 2025, the 327 m bulk carrier *FMG Nicola* (cover image) completed loading 237,088 t of iron ore at its berth in Port Hedland, Western Australia. The fully laden ship had a draught of 17.51 m forward and 17.69 m aft and was due to depart its berth in the afternoon (a high water of 5.56 m was predicted for 1634).

At 1330, 2 harbour pilots, one of whom was under supervision, boarded the ship. The port authority's marine services delivery manager (MSDM), who was also a harbour pilot, boarded to observe the departure. By 1348, the ship's main engine and steering had been satisfactorily tested and the master-pilot information exchange was completed in readiness for departure. The pilot under supervision would conduct[1] the pilotage and 4 tugs were secured to assist (see the section titled *Towage*).

By 1412, all mooring lines had been cast off and the ship departed the berth (Figure 1). There was a 25-knot north-north-west wind with waves of up to 1.5 m on a 0.5 m swell in the area, including the port's single shipping channel.

[1] In conducting a pilotage, the pilot effectively has control of the ship's navigation but legally only provides relevant advice to its master who remains responsible and always in command of the ship.

Figure 1: Overview of *FMG Nicola*'s track through shipping channel



Source: Australian Hydrographic Office, data from Australian Maritime Safety Authority

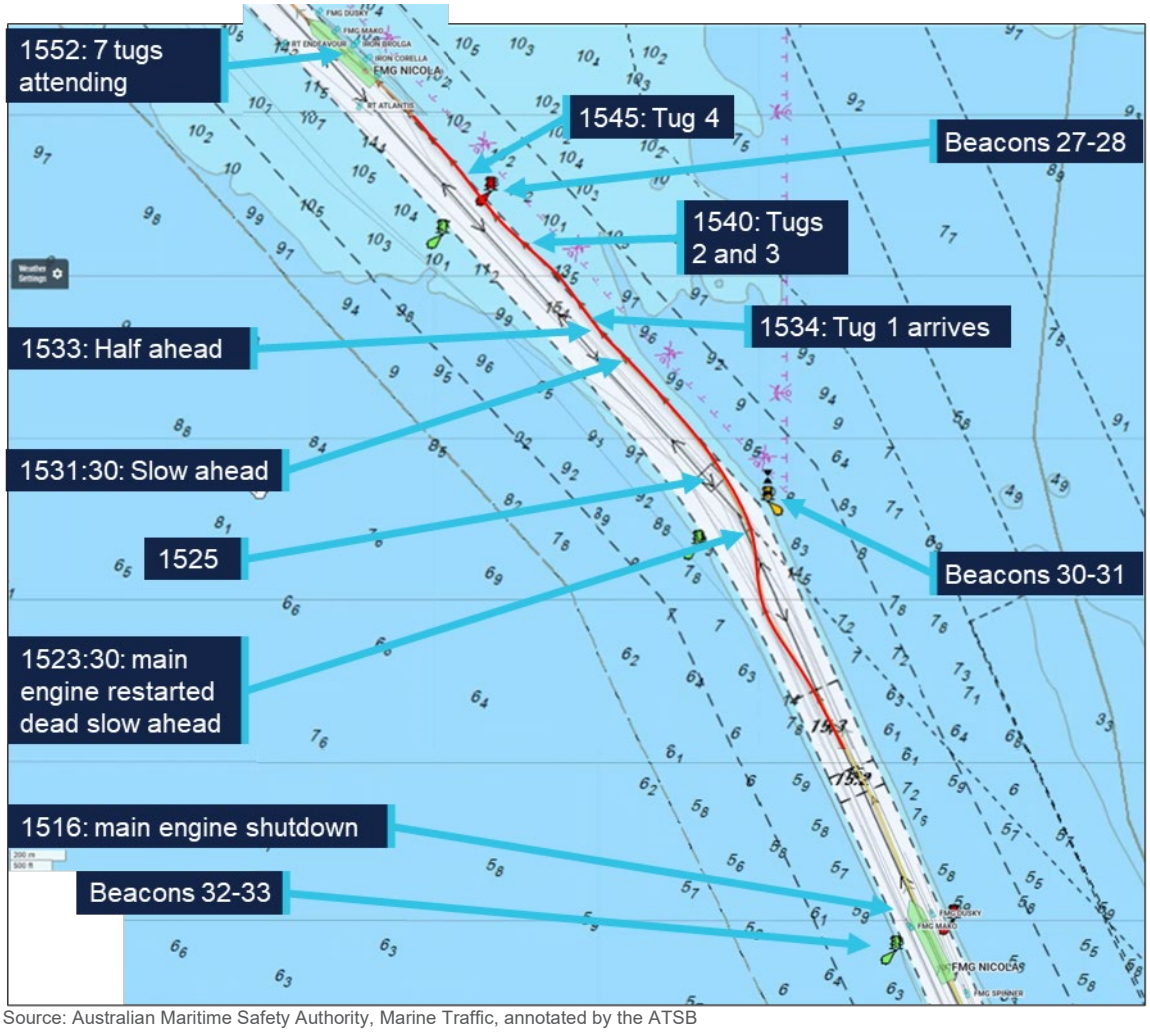
At 1442, with the ship progressing along the channel as planned, the MSDM disembarked via pilot launch. At 1446, one of the tugs was let go and returned to base.

At about 1500, *FMG Nicola* was turned to port to follow the channel at a speed of about 7 knots. Of the 3 tugs assisting, *FMG Mako* was fast at the ship's port shoulder,[2] *FMG Dusky* at the starboard shoulder and *FMG Spinner* through the centre lead aft.

At 1514, as the ship approached beacons 32-33 (Figure 1), the pilot ordered a heading[3] of 334°. At about this time, *FMG Mako*'s master requested the pilot for its towline to be let go as there were choppy seas on the ship's port side. The pilot concurred, and the towline was let go at 1515.

Soon after, at about 1516, *FMG Nicola*'s main engine suddenly shut down as it was passing beacons 32-33 (Figure 2). The ship's speed was 8.3 knots and the pilot ordered the rudder midships. The pilot informed the tug masters that the ship had lost propulsion and directed them to help keep it in the channel.

Figure 2: *FMG Nicola* track from about 1516 to 1552



Source: Australian Maritime Safety Authority, Marine Traffic, annotated by the ATSB

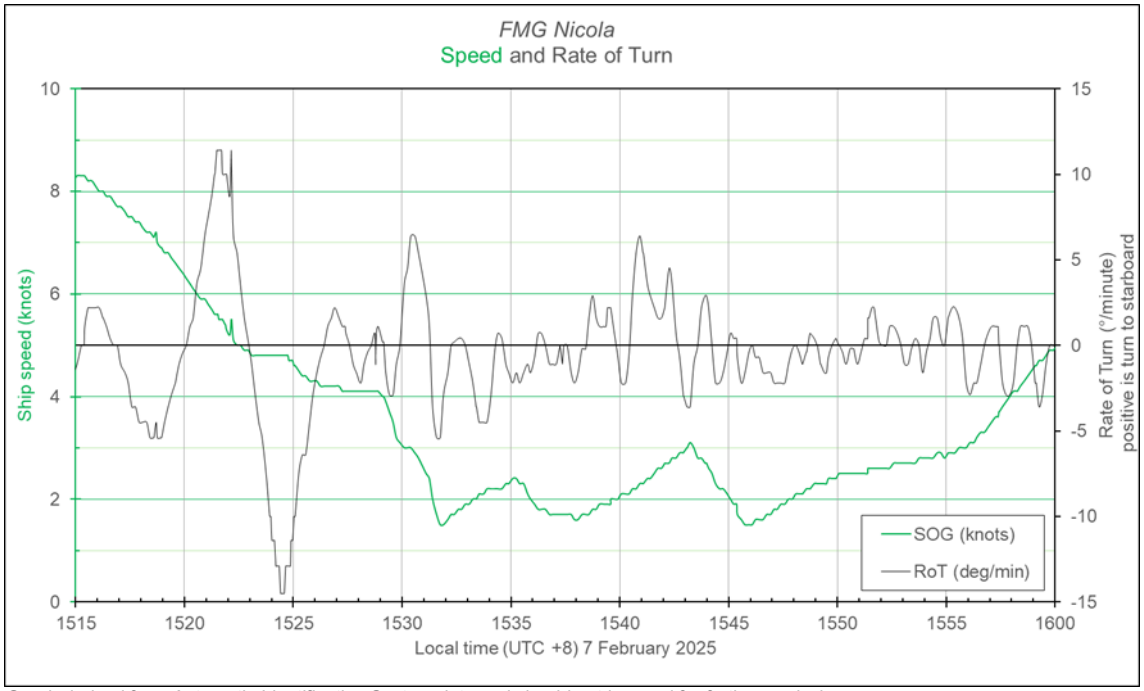
At 1518, the pilot notified Port Hedland vessel traffic service (VTS) of the emergency and requested additional tugs. The pilot gave helm orders and used the tugs to follow the channel. The ship's speed had decreased to 7.4 knots and it was getting closer to the

[2] A shoulder is the area where a ship's hull form changes from the bow shape to the parallel mid body.

[3] The direction of the bow of a vessel expressed in degrees, either magnetic or true. All ship's headings in this report are in degrees by gyro compass with negligible error.

western side of the channel and with a slow rate of turn of about 4° per minute to port (Figure 3).

Figure 3: *FMG Nicola* speed and rate of turn at the time of the incident



Graph derived from Automatic Identification System data and should not be used for further analysis.
Source: Australian Maritime Safety Authority, analysis by the ATSB

Meanwhile, the ship's engineers identified that the engine had shut down as the 'main bearing and thrust bearing lubricating oil pressure low' non-cancellable trip had activated. The engineers determined that it had activated due to faulty operation of the pressure switch. After confirming all engine systems were operating normally, the engine trip lockout system[4] was reset and, at 1523, the engine was restarted at dead slow ahead.

At about 1525, *FMG Nicola* had passed beacons 30-31, and, with a rate of turn 7.5° per minute to port and speed of 4.3 knots, it closed on the eastern side of the channel. Soon after, the ship stopped turning and began moving along the side of the channel, which was aligned along a 318° (T) direction there.

The ship continued to move along the side of the channel (Figure 2). At 1534, the first of the additional tugs arrived and was tasked to push up on the ship's starboard side. In the following 10 minutes, 3 more tugs arrived and assisted as required by the pilot. At 1540, the ship passed close to beacon 28 while moving along the side of the channel at a speed of 2.5 knots.

By 1550, the ship had been moved away from the channel side and its speed was increasing as the main engine speed had progressively been increased to full ahead. The tugs continued escorting the ship out the channel towards open water.

At about 1635, 3 tugs were released and a further 2 were released about 10 minutes later as the ship approached beacons C11-C12. The remaining 2 tugs were retained and escorted the ship until it passed beacons C1-C2 and to sea.

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[4] With all engine systems verified to be operating normally, the main engine trip lockout reset required return of the engine telegraph to the stop position (on the bridge and in the machinery control room (MCR)) and operating a manual reset push-button in the MCR.

By the time the ship passed beacons C1-C2, the ship's crew had completed inspecting and testing the main engine systems and rectified the fault. They had also conducted an inspection, including sounding compartments, to confirm there was no ingress of water.

Shortly after, at 1806, the pilots departed the ship by helicopter and the ship continued its passage to the next port, Dongjiakou, China.

During the passage, the crew inspected all ballast tanks on the starboard side and found no physical damage to the ship's side or structure.

Context

FMG Nicola

General details

FMG Nicola was a Singapore-registered, capesize[5] bulk carrier built in 2016 by Jiangsu Yangzi Xinfu Shipbuilding, China. At the time of the incident, the ship was owned and operated by Fortescue Shipping Nicola, managed by Bernhard Schulte Shipmanagement (BSM), Hong Kong, and classed with Lloyd's Register (LR).

At the time of the incident, *FMG Nicola* was crewed by 23 Sri Lankan and Indian nationals, including the master, all appropriately qualified for their positions on board.

The master had 26 years of seagoing experience, all on bulk carriers, with about 4 years in command. The master joined Bernhard Schulte Shipmanagement in 2015 and had completed several assignments on *FMG Nicola* since 2021.

The chief engineer had about 18 years of seagoing experience, with about 9 years at that rank. The chief engineer joined Bernhard Schulte Shipmanagement in September 2024 and was assigned to work on *FMG Nicola*.

Main engine

FMG Nicola's propulsion was provided by a 6-cylinder, MAN-B&W 6G80ME-C9.5 engine developing 18,240 kW. The main engine drove a single 4-blade, fixed-pitch propeller, providing a service speed of 14 knots.

Lubricating oil system

The main engine lubricating oil (LO) system was fitted with a hierarchy of oil pressure monitoring and alarm controls to limit inadvertent engine stoppage while preventing catastrophic engine damage. In addition to local, analogue indicators and pressure gauges, the LO pressure was monitored via a pressure transducer and pressure switches (Figure 4).

Signals from the sensors fed into the ship's machinery alarm, monitoring and control system. This system provided real time, remote indication of the LO pressure. Software

[5] Capesize ships generally have dimensions larger than that allowable for transit of Panama and Suez Canals and therefore have to sail around Cape Horn and the Cape of Good Hope.

limits were incorporated to trigger alarms and other actions. Normal operating pressure for the system was about 250 kPa with software triggers set at:

- 210 kPa for standby pump start
- 200 kPa for low LO pressure alarm
- 180 kPa for main engine slow down alarm.

In addition to these triggers and alarms, the main engine LO system had a separate pressure switch set to activate at 160 kPa. This switch, independent of the oil pressure monitoring circuit, was for the main engine low LO pressure shutdown. This initiated rapid shutdown of the engine to prevent catastrophic damage due to complete loss of bearing lubricating oil.

Figure 4: Main engine lubricating oil pressure sensing and switches

Source: Fortescue Metals Group

The normal, expected, sequence of loss of LO pressure indications would follow persistently falling oil pressure: standby pump start, low pressure alarm and main engine automatic slow down prior to main engine shutdown.

The machinery monitoring system allowed for (adjustable) time delays on activation of each of these triggers. At the time of the incident, the engine LO pressure shutdown delay was set to 0.1 s (following subsequent advice from the engine manufacturer that the delay could be increased up to 2 s, it was reset to 1.9 s).

Components of the main engine LO system were subject to regular maintenance through the ship's planned maintenance system (PMS). The PMS records showed that the main engine pressure transmitter and pressure sensors had last been checked on 15 November 2024 (about 3 months before the incident).

Post-incident action

The ship's managers (BSM) conducted an investigation, which focused on the cause of the main engine shutdown. Other interested parties also conducted independent investigations, which included inspections by the engine manufacturer and an underwater (dive) survey. All investigations concluded that the root cause of the main engine shutdown was a faulty lubricating oil low pressure switch which triggered an engine emergency stop despite all system parameters being normal.

The separation between the LO shutdown system and the pressure monitoring system meant that when the shutdown switch activated, the monitoring system low LO pressure alarm was not triggered, and the pressure display did not show a fluctuation in pressure.

Inspection and testing of the shutdown pressure switch showed it to activate at 185 kPa and to operate erratically. The switch was replaced with a new spare on board and the operating point set to 160 kPa. In addition, the planned maintenance system routines were amended to require calibration of main engine LO pressure switches monthly and replacement of the shutdown switch reduced to 2.5 years (from 5 years).

The ship's hull inspections included an underwater survey. In summary, the survey report indicated that no evidence of hull or bilge keel damage was found and the hull paint was intact. Similarly, no damage to the propeller and rudder was reported.

All inspections, testing and corrective actions were conducted to the satisfaction of Lloyds Register, the ship's Classification Society.

Port Hedland

General information

Port Hedland, situated in the Pilbara region of Western Australia, is the world's largest bulk export port by tonnage, handling over 500 million tonnes of cargo annually. More than 95 per cent of this volume is iron ore, exported primarily by BHP,[6] Fortescue Metals Group (FMG) and Roy Hill Infrastructure, with the port serving as the companies' main export hub for all Pilbara output. In addition to iron ore, the port also handles exports of salt, manganese, copper concentrates, lithium minerals and livestock.

At the time of the incident, the port's infrastructure comprised 19 operational berths. Eight of these berths were owned and operated by BHP, with the remaining berths owned and operated by FMG (5 berths), Roy Hill (2 berths) and Pilbara Ports Authority[7] (4 berths). Shipping activity is significant, with more than 6,000 ship movements (inbound and outbound) each year.

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[6] In 2001, BHP Limited merged with Billiton Plc to form BHP Billiton. In 2018, 'Billiton' was dropped from the organisation's name, and it is now known as BHP.

[7] The Pilbara Ports Authority (PPA) was established on 1 July 2014, as a result of the *Ports Legislation Amendment Act 2014* which consolidated 7 of Western Australia's 8 port authorities into 4 new regional port authorities. The PPA was formed by the amalgamation of the former port authorities of Dampier and Port Hedland and also encompassed the ports of Ashburton and Varanus Island.

Shipping channel

Access to the port was provided by a single 22-mile[8] dredged channel, which allowed only one large ship to pass at a time. For most laden ships, particularly capesize ships, such as *FMG Nicola*, use of the channel was restricted by tidal conditions. The incident took place within the 10-mile section of the channel closest to the port, an area prone to strong tidal flows and with particularly confined spaces, narrowing to a minimum width of 162 m and featuring steep batter slopes. The channel depth in this section was maintained at about 15 m, while adjacent waters were generally about 6 m deep.

The features of the channel described above make the risks associated with channel blockage high. A disabled ship can strand on a receding tide as well as blocking the passage of other ships. Depending on departure times, separation between ships and the location of an incident, up to 3 additional ships could be committed to, or within, the channel and exposed to this hazard at a given time.

Pilbara Ports Authority

The port was managed by the Pilbara Ports Authority (PPA), which had overarching responsibility for safety and efficiency of port operations and the environment under state legislation. The PPA's jurisdictional responsibilities were exercised through the Port Hedland harbour master.

The harbour master's responsibilities included the coordination of vessel traffic services, ship scheduling, pilotage and maintenance of shipping channels, navigational aids and port infrastructure. The PPA issued third-party contracts or licences for stevedoring, towage, some pilotage services and pilot transfers (helicopter and boat).

Pilotage

Vessels 35 m or greater in length using the main shipping channel and navigating within port limits were required to use the services of a licenced harbour pilot. Pilotage services for the port were provided by PPA through directly employed pilots as well as by third-party, contracted providers.

The pilots on board *FMG Nicola* at the time of the incident were employed by PPA. All PPA pilots had undertaken a competency-based pilotage training program incorporating on-water and simulator training and competency assessments.

The supervising pilot had worked for PPA since 2023. They had over 25 years of experience in the maritime industry, including positions as a marine pilot in Brisbane, Queensland, as an LNG loading master and as Senior Advisor Seafarer Standards with AMSA.

The pilot under supervision joined PPA in 2024 after more than 15 years as a pilot in Ningbo-Zhoushan, China. At the time of the incident, they held a level 3 authority to pilot in Port Hedland and were undertaking supervised pilotages to upgrade this licence to level 4.

Towage

The *Port of Port Hedland - Port User Guidelines and Procedures* documented the tug allocation requirements based on specified criteria. Laden outbound capsize ships

[8] A nautical mile of 1,852 m.

required 4 tugs secured to the ship from the berth to Hunt Point, near the harbour entrance. The requirement for the transit from Hunt Point to beacons 31/30 was 3 tugs.

Tugs in Port Hedland were operated under towage licences granted by the PPA to Pilbara Marine (a subsidiary of FMG) and BHP Towage Services (BHPTS). KOTUG operated tugs under the Pilbara Marine towage licence while Rivtow was contracted to operate the tugs under the BHPTS licence.

The 4 tugs assigned to *FMG Nicola* on the day of the incident were ART85-32W class advanced rotortugs, operated by KOTUG. Each tug had a bollard pull[9] of 85 tonnes and used a hybrid propulsion arrangement with 2 azimuth thrusters forward and a third azimuth thruster aft.

The tugs which came to render assistance after *FMG Nicola* lost propulsion were operated by Rivtow and comprised of 2 ART80-32 rotortugs and 2 RAstar85 azimuth stern drive (ASD) tugs.

Investigation into incident

Pilbara Ports Authority conducted an investigation into this incident, which focused on the loss of propulsion, the effectiveness of pilotage and towage procedures, and the response. The investigation recommended updating pilotage emergency response procedures to consider loss of ship propulsion resulting in loss of steerage and optimal positioning and use of tugs. Another recommendation was the additional training of pilots and tug masters, including on the hydrodynamic interaction between tugs and ships with low under keel clearance.

Incident reporting

The *Navigation Act 2012* required owners and masters of all vessels involved in a marine incident in Australian waters report it to the Australian Maritime Safety Authority (AMSA).[10] The reporting involved a 2-step process by submitting an:

- incident alert form[11] as soon as 'reasonably practicable' (within 4 hours) after the incident either online or by email to the AMSA email address identified on the form.
- incident report form[12] with further details within 72 hours.

Additionally, incidents were required to be reported to the ATSB in accordance with the governing legislation.[13] Under this legislation, responsible persons (that in summary, included the ship's master, owner, operator, agent, the pilot, pilotage provider and VTS authority) were required to report an incident. Incident reports submitted to AMSA are forwarded to the ATSB, which allowed a responsible person to meet their TSI Act reporting obligations.

Reporting of the incident

At 1642 on 7 February, a couple of hours after *FMG Nicola*'s propulsion loss, the ship's local agent asked the master to submit the required incident reports, including the AMSA forms. Later that evening, the master emailed incident reports and supporting documents to the agent.

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9 The pulling power of a tug, expressed in tonnes.

10 Sections 185 and 186 of the *Navigation Act 2012* (Cth), Incident reporting | AMSA.

11 Incident alert form 18, available at www.amsa.gov.au.

12 Incident alert form 19, available at www.amsa.gov.au

13 *Transport Safety Investigation Act 2003* (TSI Act), refer to Marine accident or incident notification | ATSB

The following morning, 8 February, the agent forwarded the incident reports, including AMSA forms 18 and 19, and attachments to relevant parties, including AMSA's local office in Port Hedland. The reports were forwarded to AMSA's incident reporting email address on 10 February. The notifications submitted by *FMG Nicola*'s master regarding the loss of propulsion incident did not, at that time, reach the ATSB.

On 12 February, AMSA received an anonymous marine safety concern (AMSA form 355) of a 'grounding event' involving the ship that reportedly had occurred at 1412 on 8 February (the day after *FMG Nicola*'s departure). This report was forwarded to the ATSB and AMSA's offices in Fremantle and Port Hedland. The Port Hedland office reported back that the ship's agent and PPA had no record of a grounding event, but noted there had been a stoppage of the ship's main engine during departure.

The ATSB immediately followed up AMSA for information about the anonymous report but no further information was reportedly available. Over the following weeks, the ATSB followed up with AMSA to check if further information, including AMSA incident report forms, had become available. The ATSB was advised no further information was available.

In July of 2025, the ATSB became aware of media reports about the grounding of *FMG Nicola* while departing Port Hedland on 7 February. The ATSB again followed up with AMSA and was advised that there was no information about such an incident, other than the form 355 previously provided.

The ATSB then contacted PPA, which confirmed an incident involving a loss of the ship's propulsion had occurred. The port authority also provided copies of the incident reports and attachments that the master had submitted in February via the ship's agent.

On 9 July 2025, after assessing the incident reports and other available information, the ATSB formally commenced an investigation into this incident and its reporting.

Further investigation

To date, the ATSB has collected evidence from relevant parties including:

- AMSA
- PPA
- *FMG Nicola*'s master
- *FMG Nicola*'s managers
- *FMG Nicola*'s local agent
- FMG International.[14]

The investigation is continuing and will include examination and analysis of the evidence received, including:

- event sequence
- corroborating data
- ship track and position
- response to the incident

[14] FMG International (subsidiary of Fortescue Ltd) acted primarily as owner's representative for Fortescue owned ore carriers, managing vessels technical and crew ship management, performed through 3rd party vessel technical/crew managers.

- reporting of the incident to authorities.

A final report will be released at the conclusion of the investigation. Should a critical safety issue be identified during the course of the investigation, the ATSB will immediately notify relevant parties so appropriate and timely safety action can be taken.

General details

Occurrence details

Date and time:	7 February 2025 – 1516 Western Standard Time (UTC + 8 hours)	
Occurrence class:	Serious incident	
Occurrence categories:	Machinery failure	
Location:	14.2 km 111 degrees from Port Hedland	
	Latitude: 20.2574° S	Longitude: 118.57564° E

Ship details

Name:	*FMG Nicola*	
IMO number:	9747778	
Call sign:	9VBO8	
Flag:	Singapore	
Classification society:	Lloyd's Register	
Departure:	Port Hedland	
Destination:	Dongjiakou, PRC	
Ship type:	Dry bulk (ore) carrier	
Builder:	Jiangsu Yangzi Xinfu Shipbuilding, PRC	
Year built:	2016	
Owner(s):	Fortescue Shipping Nicola, Singapore	
Manager:	Bernard Schulte Shipmanagement, Hong Kong	
Gross tonnage:	134,840	
Deadweight (summer):	260,840 t	
Summer draught:	18.8 m	
Length overall:	327.00 m	
Moulded breadth:	57.00 m	
Moulded depth:	25.50 m	
Main engine(s):	MAN-B&W 6G80ME-C9.5	
Total power:	18,240 kW	
Speed:	14 knots	
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Nil	

About the ATSB

The **Australian Transport Safety Bureau** is the national transport safety investigator. Established by the *Transport Safety Investigation Act 2003* (TSI Act), the ATSB is an independent statutory agency of the Australian Government and is governed by a Commission. The ATSB is entirely separate from transport regulators, policy makers and service providers.

The ATSB's function is to improve transport safety in aviation, rail and shipping through:

- the independent investigation of transport accidents and other safety occurrences
- safety data recording, analysis, and research
- influencing safety action.

The ATSB prioritises investigations that have the potential to deliver the greatest public benefit through improvements to transport safety.

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

Purpose of safety investigations

The objective of a safety investigation is to enhance transport safety. This is done through:

- identifying safety issues and facilitating safety action to address those issues
- providing information about occurrences and their associated safety factors to facilitate learning within the transport industry.

It is not a function of the ATSB to apportion blame or provide a means for determining 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.

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