Australian Government
Australian Transport Safety Bureau

Collision involving the bulk carrier *Goliath* and tugs *York Cove* and *Campbell Cove*

Devonport, Tasmania on 28 January 2022

ATSB Transport Safety Report
Marine Occurrence Investigation (Defined)
MO-2022-002
Preliminary – 5 May 2022

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Addendum

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Preliminary report

This preliminary 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. Preliminary reports contain no analysis or findings, which will be detailed in the investigation's final report. The information contained in this preliminary report is released in accordance with section 25 of the *Transport Safety Investigation Act 2003*.

The occurrence

On the morning of 28 January 2022, the 143 m Australian-registered, bulk cement carrier *Goliath* (Figure 1) was on passage from Melbourne, Victoria to Devonport, Tasmania. The ship had departed Melbourne the previous evening and was bound for the bulk cement facility at Devonport's berth number One West, where it usually berthed port side alongside.

Figure 1: *Goliath*

Source: CSL Australia

Shortly after 1000 Eastern Daylight-saving Time,[1] the officer of the watch (third mate) began to complete the ship's bridge arrival checklist in preparation for arrival at Devonport. This included checks of the bridge equipment and other machinery. By about 1020, most of the checks in the bridge arrival checklist had been completed, including checks of the ship's steering gear,[2] whistle and very high frequency (VHF) radios. At about 1045, the master came to the bridge and, shortly after, took over the conduct of the ship. By 1050, the deck crew reported that the ship's anchors had been unsecured and made ready for use.

At about 1106, as the ship approached Devonport port limits (Figure 2), the third mate tested the ship's bow thruster and had the main engine put on stand-by for manoeuvring. Shortly after, the master called Devonport vessel traffic service (VTS) on the port's VHF radio working channel (VHF channel 14). The master reported the ship's draught and pilotage exemption details to the

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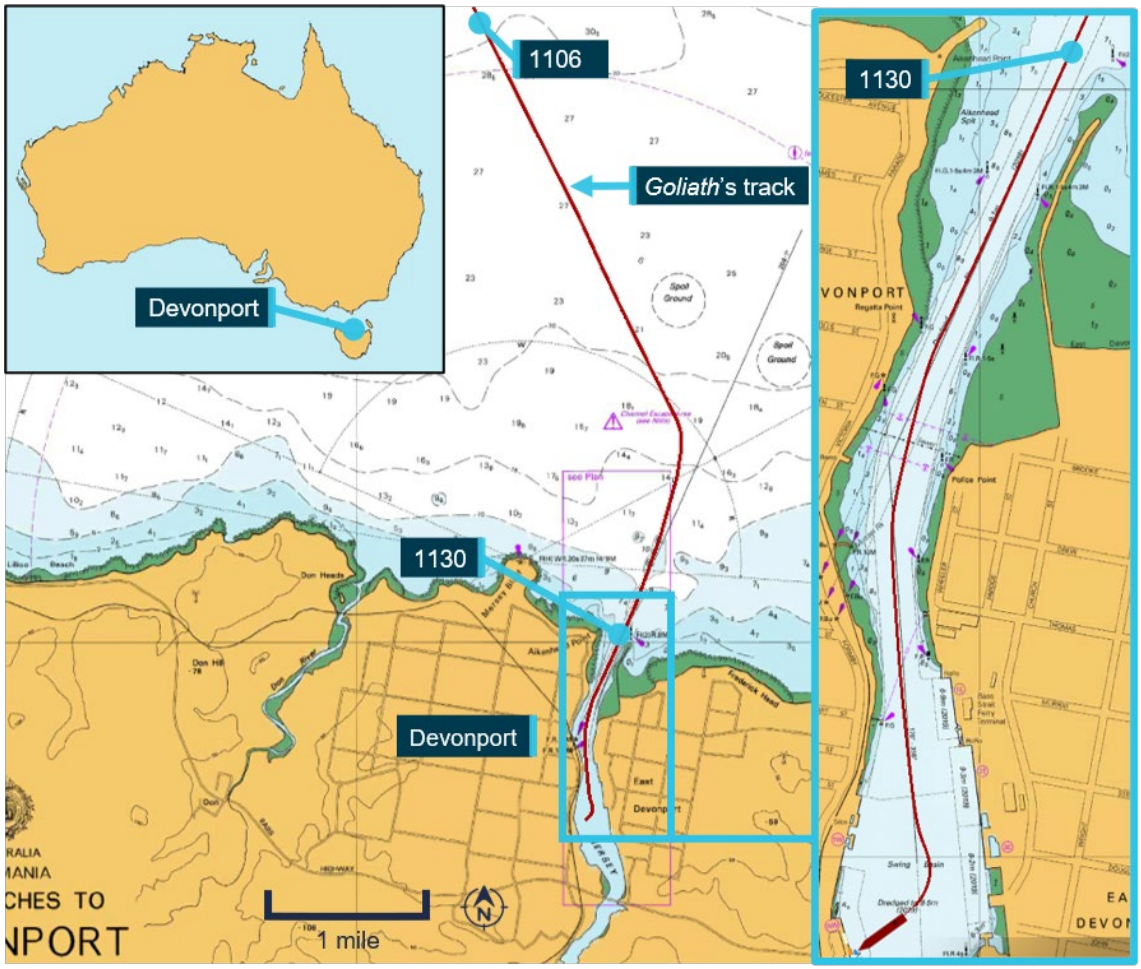
1 Eastern Daylight-saving Time (EDT): Coordinated Universal Time (UTC) + 11 hours.

2 The testing of the steering gear was done with the steering in manual mode and with all four steering motors running. The test involved the officer of the watch (third mate) on the bridge applying up to 20° of helm to either side, on both rudders, and the deck cadet physically verifying the rudder movements in the steering gear room.

VTS and requested permission to enter port limits. The VTS granted permission and advised that there was no expected traffic in the port. The weather at the time was overcast with slight seas and a light north-easterly breeze. The tide was ebbing with low water at Devonport predicted at 1422.

Figure 2: Section of chart Aus 164 showing *Goliath*'s track



Source: Australian Hydrographic Office, annotated by the ATSB using electronically recorded data

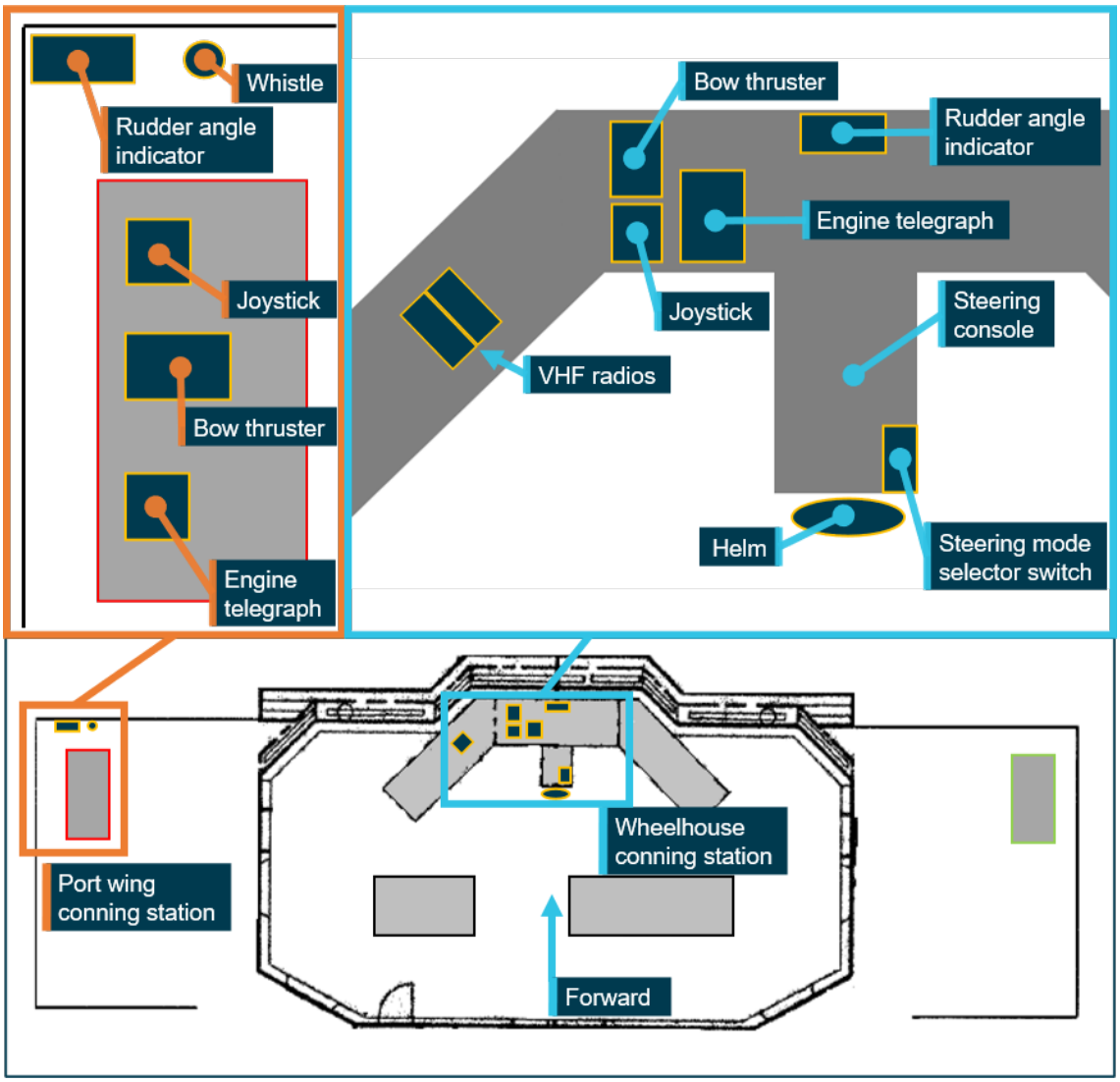
At about 1110, the watchkeeping integrated rating (IR)[3] came to the bridge for helmsman duties. Shortly after, the ship's steering mode was switched from autopilot to manual steering using the steering mode selector switch located on the starboard side of the steering console (see the section titled *Steering system*), and the IR began steering.

Shortly before 1130, the chief mate came to the bridge and relieved the third mate who proceeded to the aft mooring stations. At 1130, *Goliath* passed the breakwater inbound. At the time, the ship's bridge team comprised the master, chief mate, helmsman, and the deck cadet.

At about 1140, the second mate came to the bridge with the intention of relieving the chief mate. The second mate and chief mate, situated to starboard of the steering console, began to discuss the state of the various ship's machinery, personnel, and bridge equipment. The helmsman was steering and the master was stationed to port of the steering console where the main engine telegraph, bow thruster controls and VecTwin steering control joystick were located (Figure 3).

[3] Integrated ratings are qualified to perform the duties of both an able seaman and an engine rating.

Figure 3: *Goliath*'s bridge layout showing the location of controls for various equipment



Source: CSL Australia, modified and annotated by the ATSB

At about 1142, crew on board the mooring lines boat *Rubicon* broadcast a call to Devonport VTS on VHF channel 14 advising that the boat was underway in preparation to assist with *Goliath*'s berthing. The call was acknowledged by VTS. Following this, *Rubicon* broadcast a call on VHF channel 14, directed at *Goliath*, requesting a radio check. On board *Goliath*, the master asked the second mate to deal with the radio call as he was busy conducting the ship on the approach to the swing basin.

The second mate crossed over to the master's left to use one of the two VHF radios located on the bridge-front console. One of the two VHF radios on the bridge-front console was used to maintain a listening watch on VHF channel 16[4] and the other to monitor the port's working channel (in this case, channel 14). A portable VHF radio was normally reserved for berthing communications (channel 6).[5] The second mate acknowledged *Rubicon*'s call on channel 14 and advised that the ship was standing by on channel 6.

[4] VHF channel 16 (156.800 MHz) is the international distress, safety and calling frequency. All VHF-equipped vessels are required to maintain a continuous listening watch on this frequency at sea.

[5] VHF channel 6 was the Devonport VHF working channel used for pilotage, towage, and berthing communications.

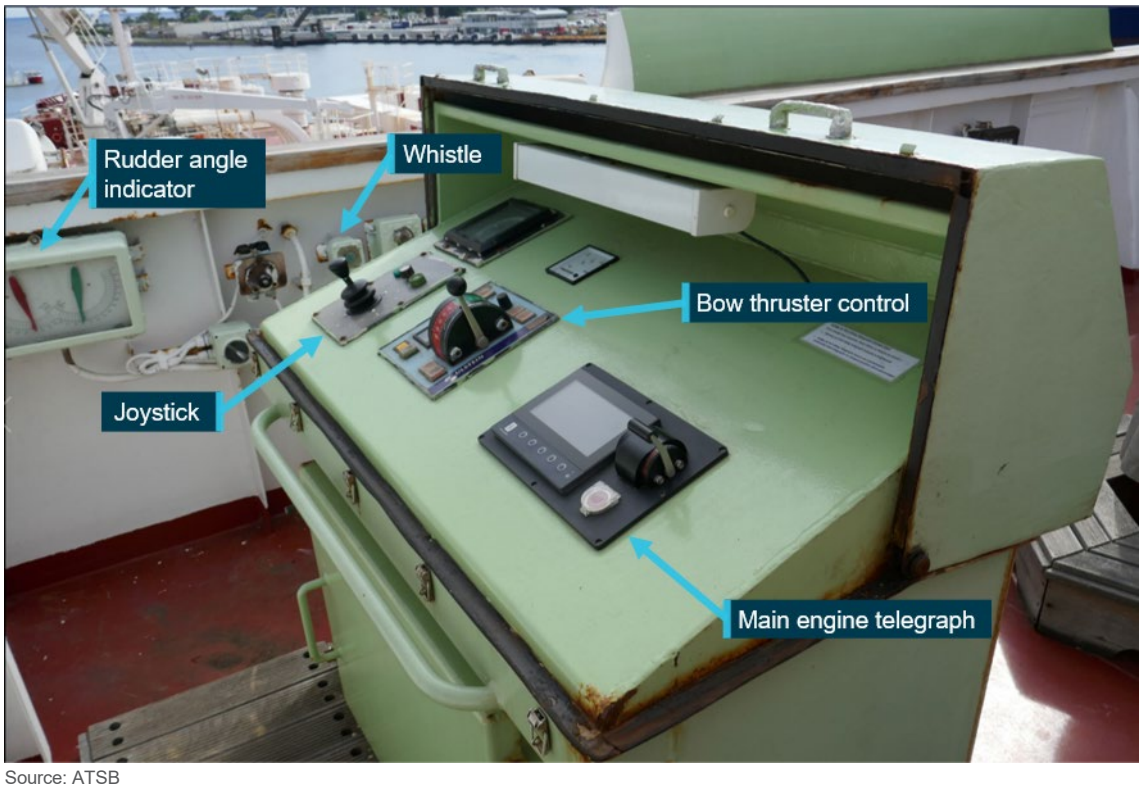
At about the same time, the helmsman advised the master that the ship was no longer steering (with the ship's decreasing speed). The master advised the helmsman that he was finished with the wheel and the helmsman promptly left the bridge for the aft mooring stations.

At about 1144, *Rubicon*'s crew again broadcast a call directed at *Goliath*, this time requesting a radio check on VHF channel 6. On board *Goliath*, the call from *Rubicon* was heard by the bridge team, most likely over the portable VHF mooring radio as it was the only radio tuned to channel 6. However, being unable to immediately locate the portable VHF radio, the second mate responded to *Rubicon*'s call using one of the VHF radios on the bridge-front console. The second mate then remained near the VHF radios, to the left of the master, while the chief mate went to locate the portable VHF mooring radio.

At about 1145, the master used the main engine and bow thruster to commence slowly turning the ship to starboard in preparation to swing it onto a northerly heading for approaching the berth.

As was normal practice, the master then called out that he was ready to move out to the port bridge wing conning station to complete the swing and berth the ship. The second mate (who was closer to the port bridge wing door) recalled going out on to the bridge wing and taking control of the main engine, bow thruster and VecTwin steering system (joystick) on their respective panels on the port bridge wing console. Once the second mate confirmed that the wing console was ready, the master walked out and took the con at the port bridge wing conning station (Figure 4). The chief mate, who had walked to the bridge wing door and observed the second mate taking control of the propulsion and steering at the wing console, then left the bridge and went down to the mess room.

Figure 4: *Goliath*'s port bridge wing conning station (looking forward)

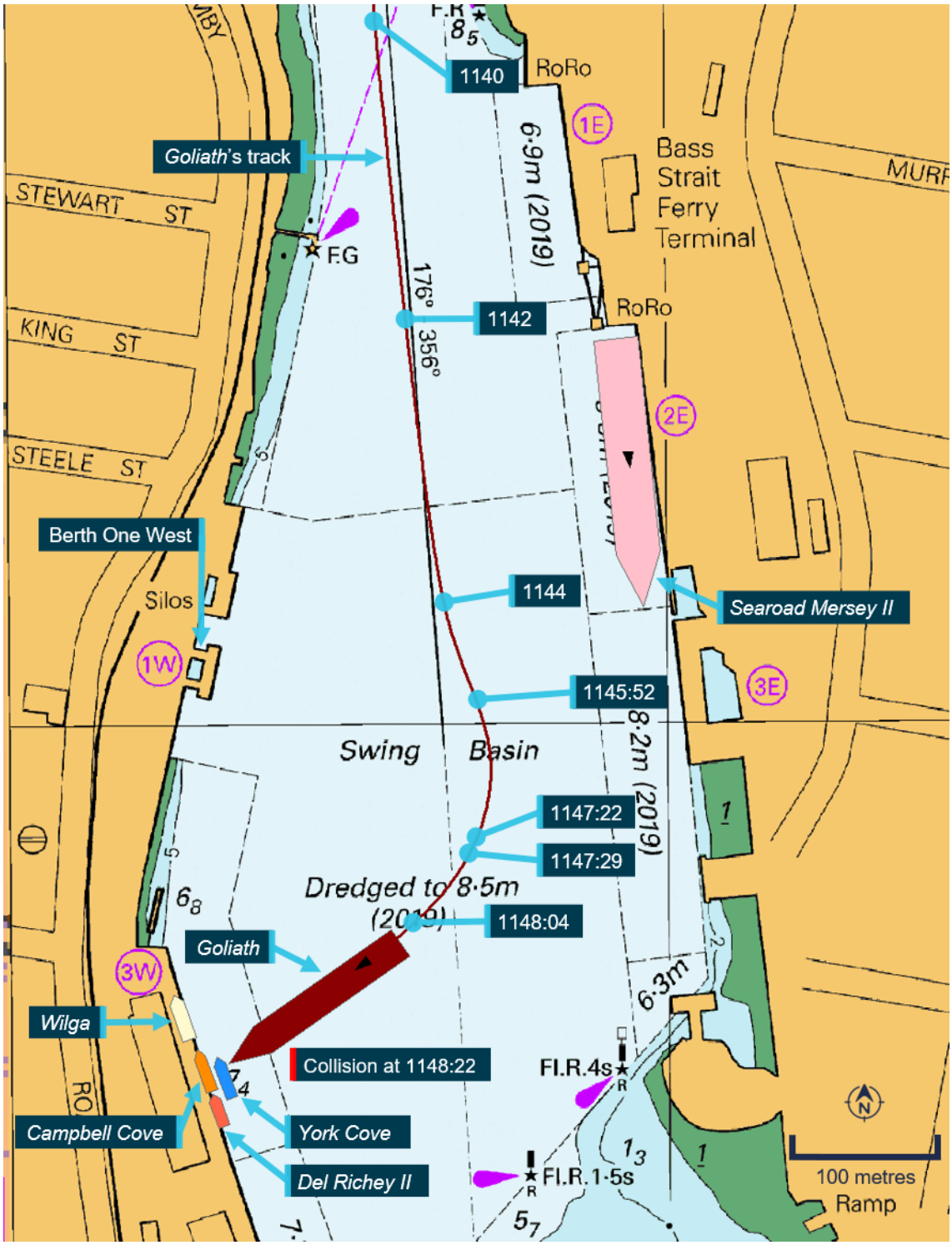


Source: ATSB

By this time, *Goliath* was turning slowly to starboard in the swing basin and its speed was about 1.3 knots. The third mate reported clearances from the ship's port quarter while the bosun stationed on the foc'sle reported clearances ahead of the ship. At 1145:52, the master announced to the second mate that he was placing the bridge wing engine telegraph on 'slow ahead' (Figure 5). As was standard practice on board, the second mate went back inside the bridge and confirmed that the wheelhouse telegraph was appropriately replicating the master's engine

telegraph orders. The master set the VecTwin joystick to the 'astern to port' setting[6] and continued to use the bow thruster to swing to starboard. The second mate positioned himself just outside the wheelhouse door to monitor the ship's swing and assist the master as required.

Figure 5: Section of chart Aus 164 showing *Goliath*'s track and sequence of collision



Source: Australian Hydrographic Office, annotated by the ATSB using electronically recorded data

[6] In VecTwin steering (joystick) mode, the 'astern to port' joystick setting sets the port rudder to a rudder angle of 105° to port and the starboard rudder to a rudder angle of 75° to starboard. In this setting, ahead movements of the ship's main engine could be used to generate astern thrust and swing its stern to port.

As the manoeuvre progressed, the master felt that the ship was not swinging as expected and closing with two tugs moored at berth number Three West ahead. In an effort to arrest the ship's movement ahead, the master set the VecTwin joystick to the 'astern' setting[7] and, at 1147:22, put the main engine 'half ahead'. A few seconds later, at 1147:29, the master used 'full ahead', but the ship's movement ahead continued to increase, with the speed now about 2.9 knots. Meanwhile, the bosun had begun reporting rapidly decreasing clearances to the tugs ahead. The bridge engine telegraph data logger shows that at 1147:41, the telegraph was placed at 'half ahead' before quickly being returned to 'full ahead'.[8] At 1148:04, the master placed the telegraph at 'navigation ahead' (that is, maximum available rpm) as the ship's speed increased to 4 knots.

As the ship's speed continued increasing, the master checked the rudder angle indicator located in front of the port wing console and found that both rudders were still amidships and not at the angles corresponding to the VecTwin joystick setting as expected. The master called out to the second mate that the steering was not in VecTwin steering mode and immediately placed the engine telegraph to 'stop'.

At about the same time, at 1148:22, *Goliath* collided with the two tugs while moving at a speed of 4.7 knots (Figure 6). The ship struck the tug *York Cove*'s amidships area on its starboard side. *York Cove* was moored outboard of and alongside the tug *Campbell Cove*. Both the tugs were severely damaged and began to take on water almost immediately. The tug *Wilga* and the fishing vessel *Del Richey II*, berthed to the north and south of the two impacted tugs respectively, were not impacted.

Figure 6: *Goliath*, immediately before the collision with the tugs

Source: TasPorts

On board *Goliath*, the second mate had run back into the wheelhouse, checked the steering mode selector switch on the steering console and found that it was still in manual steering mode. The second mate immediately switched it over to VecTwin (joystick) steering mode while the master placed the engine at 'half astern' followed by 'full astern' and, by 1148:31, at 'emergency astern'.

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[7] In VecTwin steering (joystick) mode, the 'astern' joystick setting sets the port rudder to a rudder angle of 105° to port and the starboard rudder to a rudder angle of 105° to starboard. In this setting, ahead movements of the ship's main engine could be used to generate astern thrust.

[8] The times and sequence of engine telegraph orders in this report are based on a preliminary analysis of bridge engine telegraph logger data, engine monitoring data and voyage data recorder audio data and may be subject to change once further detailed analysis is complete.

At about 1149, crew on board the lines boat *Rubicon* called Devonport VTS on VHF channel 14 and advised that *Goliath* had collided with *York Cove*.

Shortly after, at 1153, the second mate called VTS on VHF channel 14 and reported the collision. By this time, *Goliath* had started moving astern and the master decided to concentrate on getting clear of the tugs and berthing the ship. The chief mate, who had been resting in the mess room, felt the impact of the collision, and came up to the bridge. As the master manoeuvred the ship towards the berth, the crew began sounding the forepeak tank while the chief mate and second mate monitored tank levels on the bridge's ballast control screen.

At about 1154, two other vessels in the port (*Searoad Mersey II* and *Torquay Ferry*) called VTS on VHF channel 14 and advised that they were standing by to render assistance if required. Meanwhile, the Tasmanian Ports Corporation (TasPorts)[9] activated the port's crisis management and incident management teams while port personnel began to deploy oil spill response equipment and oil containment booms around the two foundering tugs.

On board *Goliath*, the berthing of the ship proceeded normally with the master using the engine, bow thruster and VecTwin steering joystick to bring the ship alongside. By 1159, the first line was ashore. At 1204, the master called VTS on the telephone to report the collision and was informed by the VTS operator that there was no one present on board the tugs at the time of the collision. The master subsequently also reported the collision to ship's manager (Canada Steamship Lines Australia) as well as to the Australian Maritime Safety Authority (AMSA). There were no reported injuries on board *Goliath* and, by 1218, the ship was all fast, port side alongside, at berth number One West.

TasPorts notified the Environment Protection Authority (EPA) Tasmania[10] of the incident and an EPA incident management team assumed responsibility for the management of environmental aspects related to the incident.

By about 1700, both tugs had sunk in about 7 m of water alongside berth number Three West (Figure 7).

[9] The Tasmanian Ports Corporation (TasPorts) is the Tasmanian State-owned company responsible for the operation and management of eleven Tasmanian ports (including Devonport).

[10] The Environment Protection Authority (EPA) is Tasmania's independent statutory environmental regulator.

Figure 7: *York Cove* and *Campbell Cove* submerged alongside berth number Three West

Source: ATSB

On 29 January, the EPA declared the incident a 'level 2 marine pollution incident'[11]. The EPA and TasPorts continued to deploy pollution response equipment to contain and begin to recover the approximately 54,000 litres of diesel fuel and other oil on board *Campbell Cove* and approximately 15,000 litres on board *York Cove*. Additionally, personnel from the Department of Natural Resources and Environment Tasmania, supported by EPA staff, monitored shorelines over the following days for signs of pollution and affected wildlife. By 8 February, the EPA assumed a stand-by and monitoring posture with containment measures retained around the sunken tugs while professional salvors worked to recover fuel and oil from the tugs.

As a result of the collision, and subsequent sinking of the tugs, both *York Cove* and *Campbell Cove* were subsequently declared a constructive total loss (CTL).[12] Damage sustained by *Goliath* included deformation of the bulbous bow shell plating and internal structural members and, a non-penetrating crack in the bow's starboard shell plate. The ship was detained by AMSA in Devonport while inspections, temporary repairs and other regulatory actions were carried out. On 4 February *Goliath* was allowed to sail to Melbourne for further repairs. On 10 February, after additional repairs and meeting other regulatory requirements, the AMSA detention was lifted and *Goliath* returned to service.

Context

Goliath

Goliath is an Australian-registered, self-unloading, bulk cement carrier built in 1993 by Hanjin Heavy Industries in Ulsan, Republic of Korea. At the time of the collision, the ship was classed with Lloyd's Register and owned by Canada Steamship Lines Australia (CSL Australia). It was managed and operated by CSL Australia and engaged almost exclusively in the carriage of cement from Devonport, Tasmania to Melbourne, Victoria.

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[11] According to the Tasmanian Marine Oil and Chemical Spill Contingency Plan (TasPlan) and the National Plan for Maritime Environmental Emergencies (National Plan), level 2 Incidents are more complex in size, duration, resource management and risk and may require deployment of jurisdiction resources beyond the initial response.

[12] A constructive total loss (CTL), in the case of damage to a ship, occurs when the cost of repairing the damage under its insurance terms would exceed the value of the ship when repaired.

Goliath was crewed by a crew of 17, including a master, three deck watchkeeping officers, chief engineer and three engineers, two cadets, six IRs (including a trainee) and a cook.

The ship's main propulsion was provided by a Sulzer 5RTA 52 engine developing 6,080 kW driving a single, fixed pitch, right-handed propeller. The ship was also equipped with an Ulstein 883 kW bow thruster.

The ship's primary and back-up means of navigation was electronic chart display and information system.

Steering system

Goliath was fitted with a Hamworthy Industramar VecTwin steering system comprising two highlift, Schilling rudders installed symmetrically behind the propeller. Each rudder was independently driven by a Frydenbø-Mjølner HS 120 rotary vane steering gear unit, each fitted with two steering motors.

The steering gear could be operated in four main modes of steering control:

- autopilot steering
- manual steering (wheel control)
- non-follow-up (NFU) steering
- VecTwin steering (joystick control).

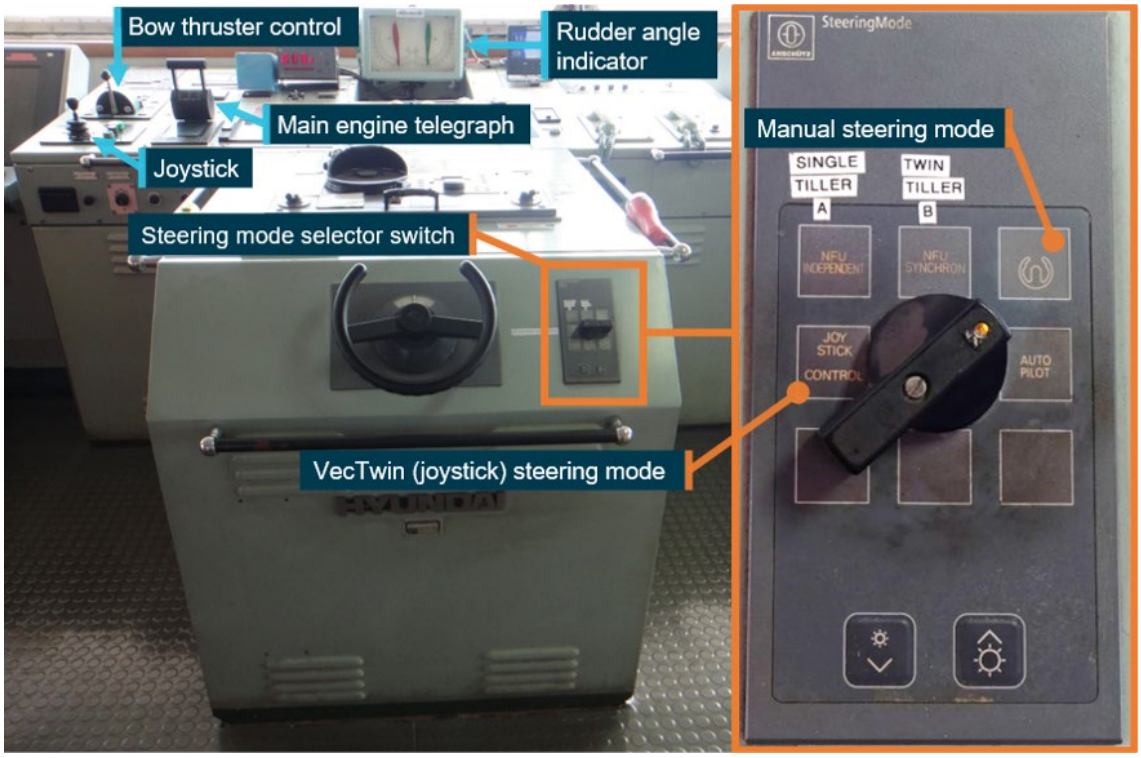
Additionally, in an emergency, the steering could be operated locally from the steering gear room.

When steering in autopilot or manual steering modes, the two rudders operate in unison based on rudder angle commands respectively from the autopilot or the manual steering wheel. In non-follow-up (NFU) mode, the rudders could be operated either independently with separate levers (tillers) or by a single lever.[13] In VecTwin steering mode, a joystick was used to control the rudders.

The mode of operation was selected by means of a manually operated selector switch on the bridge steering console (Figure 8). Rudder angle indicators were installed in the wheelhouse, one each on the port and starboard bridge wings, and in the steering gear room.

[13] In non-follow-up (NFU) mode, the movement of rudder to port or starboard is controlled through the use of a lever. The lever is released when the rudder reaches the required angle.

Figure 8: *Goliath*'s wheelhouse, steering console and steering mode selector switch



Source: ATSB

VecTwin steering mode

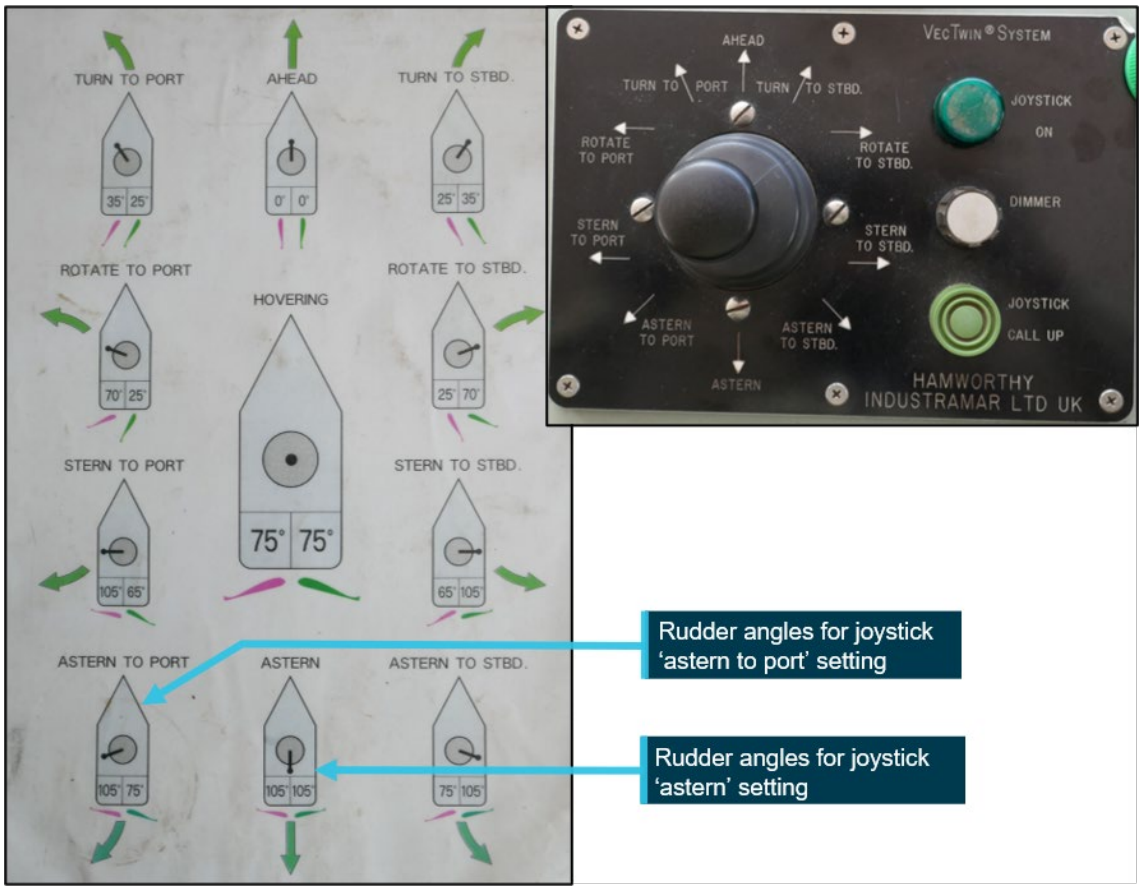
In VecTwin steering mode, a joystick was used to arrange the twin rudders in various pre-set combinations of rudder angles which, in combination with ahead inputs on the ship's main engine, allowed for the generation of thrust in different directions and for enhanced manoeuvrability, particularly at slow speeds. The system coordinated the two rudders independently with rudder angle settings ranging from 105° outboard to 25° inboard depending on the joystick setting selected.

When using the VecTwin steering mode, ahead inputs on the ship's main engine could be used to generate astern thrust, transverse thrust or even to 'hover', all with the propeller kept rotating in the ahead direction. For example, with the 'astern' joystick setting selected, each rudder was set to 105° outboard, with ahead inputs on the main engine generating astern thrust to slow/stop the ship or move the ship in the astern direction (Figure 9). This meant that the ship could be slowed, stopped or moved astern without the need to stop the engine and engage astern propulsion, as is usually required during conventional ship manoeuvring.

There were three VecTwin joystick control panels, one in the wheelhouse and one each at the port and starboard bridge wing conning stations.[14] Control could be taken at any one of the joystick panels by pushing the 'joystick call up' push button and the joystick selected for command was indicated by the illumination of a 'joystick on' indicator lamp. The illumination of the 'joystick on' lamp was independent of the steering mode in use and only indicated which joystick panel was selected at any given time. This meant that the 'joystick on' lamp remained illuminated at whichever joystick panel had been selected even when the chosen steering mode was a mode other than 'joystick control' (such as 'autopilot' or 'manual' steering modes).

[14] At the time of the collision, the starboard bridge wing joystick control station was not in commission.

Figure 9: VecTwin steering joystick showing settings and corresponding rudder angles



Source: ATSB

Further investigation

Specialist ATSB investigators attended *Goliath* in Devonport to collect relevant physical, documentary, and electronic recorded evidence, including from TasPorts, and interviewed the master and relevant crew.

The investigation is continuing and will include a review and assessment of the:

- ship's safety management system and navigation procedures
- effectiveness of bridge resource management on board
- TasPorts' pilotage exemption processes and port procedures
- shore pollution response following the collision
- past incidents involving *Goliath*.

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.

A final report will be released at the conclusion of the investigation.

General details

Occurrence details

Date and time:	28 January 2022 – 1148 EDT	
Occurrence class:	Accident	
Occurrence categories:	Collision	
Location:	Devonport, Tasmania	
	Latitude: 41º 11.087' S	Longitude: 146º 21.851' E

Ship details

Name:	*Goliath*	
IMO number:	9036430	
Call sign:	VMGO	
Flag:	Australia	
Classification society:	Lloyd's Register	
Departure:	Melbourne, Victoria	
Destination:	Devonport, Tasmania	
Ship type:	Self-discharging bulk carrier	
Builder:	Hanjin Heavy Industries	
Year built:	1993	
Owner(s):	Canada Steamship Lines Australia	
Manager:	Canada Steamship Lines Australia	
Gross tonnage:	11,754	
Deadweight (summer):	15,599 t	
Summer draught:	8.335 m	
Length overall:	143 m	
Moulded breadth:	25.50 m	
Moulded depth:	11.94 m	
Main engine(s):	Sulzer 5RTA 52	
Total power:	6,080 kW	
Speed:	14 knots	
Injuries:	Crew – 0	Passengers – 0
Damage:	Minor damage to bow shell plating and internal structural members	

Name:	*York Cove*
IMO number:	8844244
Call sign:	VJT5694
Flag:	Australia
Classification society:	Lloyd's Register
Ship type:	Tug
Builder:	Ryochu Kairiku Unyu, Japan
Year built:	1990
Owner(s):	Tasmanian Ports Corporation

Manager:	Tasmanian Ports Corporation	
Gross tonnage:	217	
Deadweight (summer):	58 t	
Draught:	2.7 m	
Length overall:	28 m	
Moulded breadth:	8.2 m	
Main engine(s):	2 x Niigata 6L22HX	
Total power:	1,912 kW	
Injuries:	Crew – 0	Passengers – 0
Damage:	Constructive total loss (CTL)	

Name:	*Campbell Cove*	
IMO number:	7606023	
Call sign:	VJT6270	
Flag:	Australia	
Classification society:	Lloyd's Register	
Ship type:	Tug	
Builder:	Carrington Slipways, Newcastle, Australia	
Year built:	1976	
Owner(s):	Tasmanian Ports Corporation	
Manager:	Tasmanian Ports Corporation	
Gross tonnage:	266	
Deadweight (summer):	150 t	
Draught:	4.73 m	
Length overall:	29.01 m	
Moulded breadth:	9.54 m	
Main engine(s):	2 x Blackstone EZSL8	
Total power:	1,794 kW	
Injuries:	Crew – 0	Passengers – 0
Damage:	Constructive total loss (CTL)	