



Office of Transport Safety Investigations

# FERRY SAFETY INVESTIGATION REPORT

**SINKING OF MV *VENTURE***

**CABARITA, PORT JACKSON**

**1 MARCH 2015**



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Released under the provisions of  
Section 45C (2) of the *Transport Administration Act 1988* and  
46BBA (1) of the *Passenger Transport Act 1990*

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Established on 1 January 2004 by the Transport Administration Act 1988, and confirmed by amending legislation as an independent statutory office on 1 July 2005, OTSI is responsible for determining the causes and contributing factors of accidents and to make recommendations for the implementation of remedial safety action to prevent recurrence. Importantly, however, OTSI does not confine itself to the consideration of just those matters that caused or contributed to a particular accident; it also seeks to identify any transport safety matters which, if left unaddressed, might contribute to other accidents.

This OTSI investigation was conducted under powers conferred by the Transport Administration Act 1988 and the Passenger Transport Act 1990. OTSI investigators normally seek to obtain information cooperatively when conducting an accident investigation. However, where it is necessary to do so, OTSI investigators may exercise statutory powers to interview persons, enter premises and examine and retain physical and documentary evidence.

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Once OTSI has completed an investigation, its report is provided to the NSW Minister for Transport and Infrastructure for tabling in Parliament. The Minister is required to table the report in both Houses of the NSW Parliament within seven days of receiving it. Following tabling, the report is published on OTSI's website at [www.otsi.nsw.gov.au](http://www.otsi.nsw.gov.au).

OTSI cannot compel any party to implement its recommendations and its investigative responsibilities do not extend to overseeing the implementation of recommendations it makes in its investigation reports. However, OTSI takes a close interest in the extent to which its recommendations have been accepted and acted upon.

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## ACRONYMS AND ABBREVIATIONS

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<b>AMSA</b>	Australian Maritime Safety Authority
<b>CSH</b>	Cruise Sydney Harbour Cruises
<b>DIP</b>	Directly Involved Party
<b>GPH</b>	General Purpose Hand
<b>MED 3</b>	Certificate of Competency as a Marine Engine Driver Grade 3
<b>OTSI</b>	Office of Transport Safety Investigations
<b>PANSW</b>	Port Authority of NSW
<b>RMS</b>	NSW Roads and Maritime Services
<b>SMS</b>	Safety Management System
<b>VTs</b>	Vessel Traffic Service

## GLOSSARY OF TERMS

<b>Ferry</b>	A vessel designed and surveyed to carry eight or more passengers for payment or reward.
<b>Port</b>	The left hand side of a vessel when looking forward from the stern. The side where a red light is exhibited at night.
<b>Starboard</b>	The right hand side of a vessel when looking forward from the stern. The side where a green light is exhibited at night.
<b>Survey Class</b>	The figure in a Survey Class designation identifies the type of vessel e.g., “1” identifies the vessel as passenger carrying. The letter defines the permitted area of operation: A = unlimited offshore operation; B = offshore operation to 200 nautical miles seaward of the coast; C = restricted offshore operations up to 30 nautical miles seaward of the coast; D = sheltered operations (partially smooth water operations); and E = sheltered waters (smooth water operations).
<b>Vessel Traffic Service (VTS)</b>	VTS is a marine traffic system, similar in concept to air traffic control, which uses information from radar, close circuit television, a vessel’s automatic identification system and VHF radio to provide active monitoring and navigational advice to vessels. It is “ <i>a service designed to improve the safety and efficiency of vessel traffic and to protect the environment. The service should have the capability to interact with the traffic and to respond to traffic situations developing in the VTS area</i> ”. (IMO Resolution A.857 (20))

## EXECUTIVE SUMMARY

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At 0050 on 1 March 2015, the Cruise Sydney Harbour Cruises' (CSH) charter ferry *Venture* returning to its berth after completion of a charter collided stern first with a concrete finger pontoon at Cabarita Marina. In the collision, *Venture* sustained a breach in the timber transom and, as a consequence, sank in six metres of water. At the time, there were four crew on board none of whom sustained any injury. The vessel was scrapped after it was released by investigators.

The Master claimed a control failure occurred with the starboard engine going full astern instead of going ahead while manoeuvring into the berth. The investigation found no defects in the control system. The collision most probably resulted from human error.

The watertight bulkhead door separating the engine room from the steering compartment was found to have been left open. This allowed water to enter the engine room instead of being confined to the steering compartment which had been breached. The volume of water then entering the hull was greater than the capacity of the vessel's bilge pump.

A warning light on the wheelhouse dashboard should have been illuminated while the bulkhead door was open. However, the light was found to have been unserviceable for a considerable period. Consequently, the crew were not alerted to the open door which, if closed, may have constrained the ingress of water into the hull to a manageable level.

The investigation found the vessel's Safety Management System (SMS), among other inadequacies, did not cover emergency procedures so the crew had no guidelines for action to be taken in the event of a collision or subsequent sinking. A number of significant deficiencies were also identified in the recordkeeping in the vessel's log.

Recommendations made to CSH because of this investigation focus on establishing emergency procedures, training in emergency drills, bringing the SMS up to standard and ensuring vessel logs are completed legibly and comprehensively.



## PART 1 FACTUAL INFORMATION

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### Introduction

- 1.1. At 0050<sup>1</sup> on 1 March 2015, the Cruise Sydney Harbour Cruises' (CSH) charter ferry *Venture* returning to its berth after completion of a charter collided stern first with a concrete finger pontoon at Cabarita Marina. Because of the collision, *Venture* sustained a breach in the planked timber transom and sank in six metres of water. At the time there were four crew on board none of whom sustained any injury.



Photograph 1: *Venture* sunk at berth

- 1.2. The Master of a private vessel moored adjacent on the marina reported the collision and subsequent sinking to the Vessel Traffic Service (VTS) operated by the Port Authority of NSW (PANSW). Water Police overhearing the initial report attended. They also informed VTS that *Venture* had sunk and that contamination of the waterway had occurred due to diesel fuel leaking from the submerged vessel's fuel tanks. PANSW emergency response crews attended and placed spill containment booms around the ferry.

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<sup>1</sup> All times expressed in this report are Eastern Daylight Saving Time (GMT + 11)

- 1.3. The Master's initial report stated a control failure had occurred when he was attempting to berth stern first into the marina pen. He reported that when he placed the starboard engine control ahead the engine failed to respond. Instead, it went astern resulting in the transom colliding with the pontoon.
- 1.4. A PANSW VTS operator advised NSW Roads and Maritime Services (RMS) of the incident soon after the collision. OTSI was not informed of the incident until 6 March 2015. OTSI Investigators attended Cabarita Marina on 6 March 2015 and conducted a preliminary investigation. After a review of information obtained in the preliminary investigation, a formal OTSI investigation was initiated.

## Vessel Information

- 1.5. MV *Venture*<sup>2</sup> was a 20 metre (66 ft) timber two deck charter ferry in current Survey (Class 1 E) No. 15606 with Australian Marine Safety Authority (AMSA). The survey allowed for a maximum number of 257 persons on board comprising of 255 passengers and two crew.
- 1.6. The ferry was built in 1984 by Millkraft and Thompson, Bulimba, Brisbane. It had a beam of 7.48 metres and a draft of 2.9 metres. The hull was constructed with Oregon timber planking from the waterline to the gunwale including the transom, and hardwood planking below the water line. The ferry had a wheelhouse located forward on the upper deck and a single wing station on the starboard side.
- 1.7. Engine commands were made with Morse Teleflex<sup>®3</sup> single lever controls to each engine from the wheelhouse and Teleflex<sup>®</sup> controls on the starboard wing. Steering was hydraulic with a single conventional steering wheel in the main wheelhouse. There were no steering position gauges, switches or alarms at the starboard wing position.
- 1.8. The hull was divided into five watertight sections by bulkheads. Two bulkheads were fitted with watertight hatches with open door warning lights on the dashboard in the wheelhouse, but no audible alarms. These were a

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<sup>2</sup> The vessel was named *Port Venture* when launched in 1984. CSH renamed it *Venture* when it was acquired by them.

<sup>3</sup> Morse was taken over by Teleflex in 2001. All subsequent cables and controls were manufactured by Teleflex.

collision bulkhead forward and another aft of the engine room separating the steering and engine compartments (see *Diagram 1*).

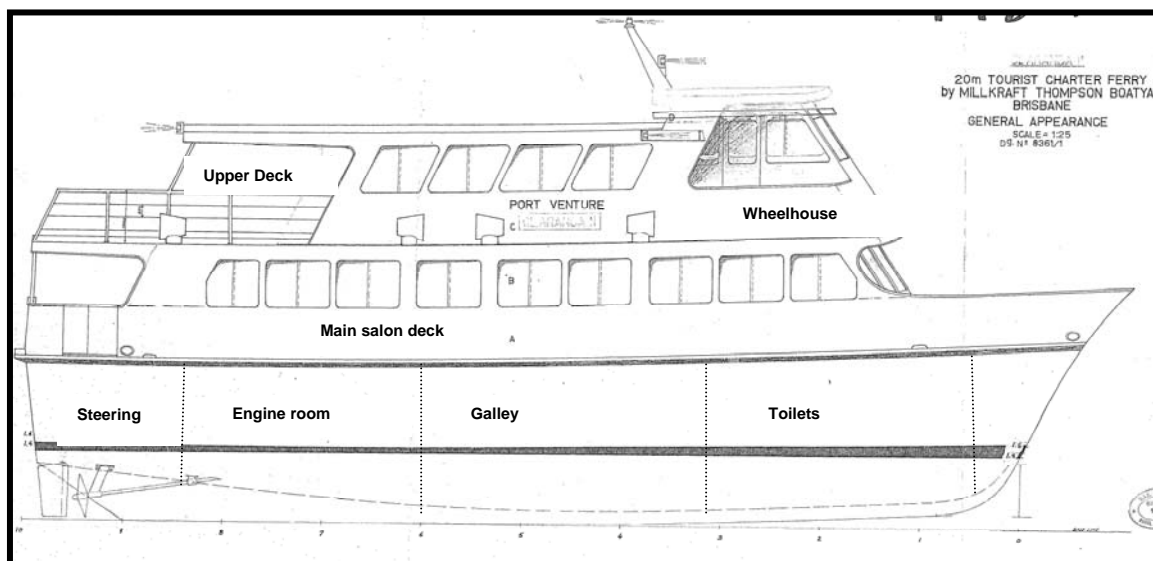


Diagram 1: Layout of *Venture*

## Master and Crew

- 1.9. *Venture's* survey required the Master to hold a current Master 5 certificate, with an Engineer to hold a Marine Engine Drivers 3 (MED 3) certificate. If the Master held both qualifications, an Engineer was not required. One General Purpose Hand (GPH) was required for up to 150 passengers. An additional GPH was required when more than 150 passengers were on board.
- 1.10. At the time of the sinking *Venture* was crewed by a Master, a GPH, a Cruise Director and a Stewardess. The Master was dual qualified. He held a current Master 4 Certificate of Competency for vessels less than 35 metres in length and a MED 3 qualification. Therefore, a dedicated Engineer was not required. The crewing complied with the survey requirements.
- 1.11. The Master had held a Harbour and River Masters certificate issued by the Maritime Services Board of NSW in 1985. This perpetual qualification was relinquished by him in November 1995 and replaced with a Master 4 certificate issued under the Uniform Shipping Law Code that was in existence at the time. The Master had over 30 years' experience working on commercial vessels and ferries on Sydney Harbour.



1.12. The GPH had held a Master 5 Certificate of Competency and a MED 3 certificate for the past nine years. Consequently, he was qualified to drive the charter ferry and could relieve the Master for rest breaks. He had also been responsible for the maintenance of *Venture* since December 2014.

1.13. Neither the Cruise Director nor the Stewardess held any maritime qualifications.

## Incident Location

1.14. *Venture* was returning to its berth, #126 wharf arm D, at Cabarita Marina after completion of a charter terminating at 2300 (see *Photograph 2*). The marina is situated at the entrance to Hen and Chicken Bay at Cabarita Point.



Photograph 2: Cabarita Marina

1.15. The marina consists of floating concrete pontoons. The height of the pontoons above the water at the berth was approximately 600 mm. The marina is serviced with water and electricity and is utilised by both commercial and recreational vessels.

## Environmental Conditions

1.16. On 28 February 2015, the moon was at 84.1% visibility. It rose at 1550 and set at 0231 on 1 March 2015.

- 1.17. The tidal information recorded at Fort Denison was a low of 0.64 m at 2348 on 28 February 2015 and a high of 1.55 m at 0519 on 1 March 2015. . A time difference of 10.5 minutes exists at Gladesville Bridge, which is 1.4 nautical miles downstream from Cabarita Marina. It was estimated that the tide at the marina at 0050 when the collision occurred would have been just rising to 0.71 m.
- 1.18. As the incident occurred close to slack water, tidal effects were not considered a factor affecting the navigation of *Venture*.

### Cruise Sydney Harbour Cruises

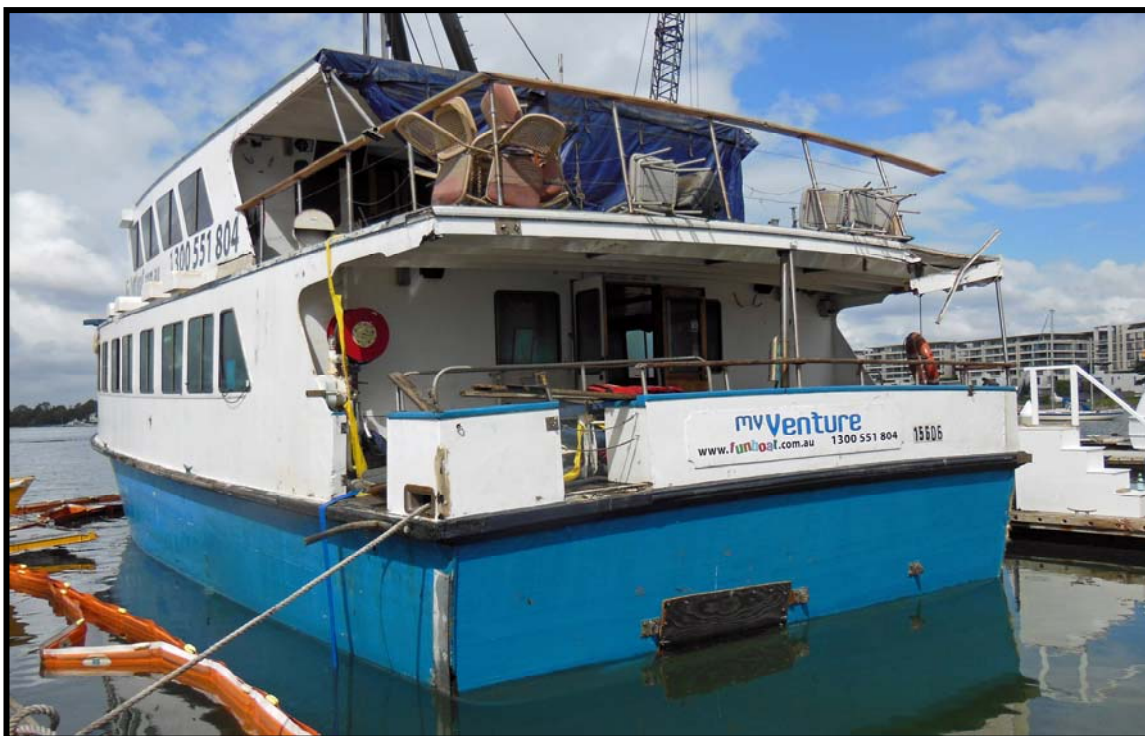
- 1.19. *Venture* was owned by 'Somewhere to Stay', a Port Macquarie based registered family trust. *Venture* was leased to CSH, a private NSW registered business established in 2012. CSH was owned by the trust. Initially CSH operated charter ferry services on Port Jackson with two vessels, *Katika*<sup>4</sup> and *Venture*. The charter services offered were based on 'Pub Crawl', 'Bingo' and private parties.

### Initial Inspection

- 1.20. An initial inspection of *Venture* was made by OTSI Investigator's on 6 March 2015 after being notified of the incident by RMS. *Venture* was resting on the bottom at its berth with only a portion of the upper deck and wheelhouse above the surface.
- 1.21. Salvage of *Venture* only commenced on 6 March 2015 after negotiations with insurers. Salvage divers secured a plywood patch over the hole in the transom and attached airbags around the stern. A large sheer leg crane with a 50 ton capacity provided a sling around the hull forward. At 1400 the hull was raised to gunwale height. Large pumps were then used to re float the ferry which was achieved at 1700 (see *Photograph 3*). Salvage crews maintained a watch overnight as there was still some water ingress into the hull. Portable pumps were used to hold the water ingress.

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<sup>4</sup> *Katika* ceased operations in 2010 after a series of collisions due to a control failure in Pyrmont Bay. The incident was investigated by OTSI and the report is available from OTSI's website at [www.otsi.nsw.gov.au](http://www.otsi.nsw.gov.au)



**Photograph 3: *Venture* after salvage**

- 1.22. On 7 March 2015 with *Venture* floating, an inspection was made of the interior of the vessel. This inspection was limited due to the amount of fuel and oil contamination, and debris, creating an unsafe site.
- 1.23. The single lever engine telegraph controls in both the wheelhouse and starboard wing position were examined. All four levers were observed as set at the neutral position. Inspection of the Morse Teleflex<sup>®</sup> cables at both gearboxes found them to be well secured in the retaining clamps. The linkages and cables were in good condition. Testing of the controls from the wheelhouse to the gearboxes could not be undertaken because of the conditions inside the vessel.
- 1.24. Examination of seacocks on the raw water inlets and bilge pump chest were tested and found to be in working order. The drain gate valve connecting the tiller flat to the engine room was in the closed position with the gate valve in working order. The sea suction gate valve was also tested and found to be in working order with no sign of leakage or break in the line to the valve chest. The door between the tiller flat and the engine room was open. Testing of the securing latches determined they were in working order.

- 1.25. The following documentation was removed from the wheelhouse for further examination:
- engine manual
  - folder containing survey documents and correspondence
  - folder containing loose sheets headed 'Vessels Log' together with wharf booking correspondence
  - incident reporting book
  - maintenance schedule
  - emergency drill report book
  - MSB Survey Book
  - 2013 diary labelled 'Engine Room and Maintenance Checks'
  - 'Tool Box Talk Report Book'.
- 1.26. On 7 March 2015 the ferry was towed to a salvage yard at Rozelle Bay by the salvage company's tug under escort of RMS and PANSW vessels. The escort was considered a necessary precaution as there was a risk the vessel might break up or sink during the tow.

### Subsequent Inspection

- 1.27. A further inspection of the ferry was made on 9 March 2015 in Rozelle Bay by OTSI and RMS investigators, together with a RMS Naval Architect / Surveyor. At this inspection, testing of the engine controls was undertaken from both the wheelhouse and the starboard wing position. Both engines were inoperable as they had been running at the time of sinking. Therefore, examination was restricted to determining if the mechanical operation of the engines' telegraph controls were functional.
- 1.28. The Morse Teleflex<sup>®</sup> cables and controls at the wheelhouse, and the Teleflex<sup>®</sup> control wing positions, were examined (see *Photograph 4*). From this examination, it was determined that both the controls for both port and starboard were correctly secured with the cables operating the selection at both gearboxes and the engine throttles.



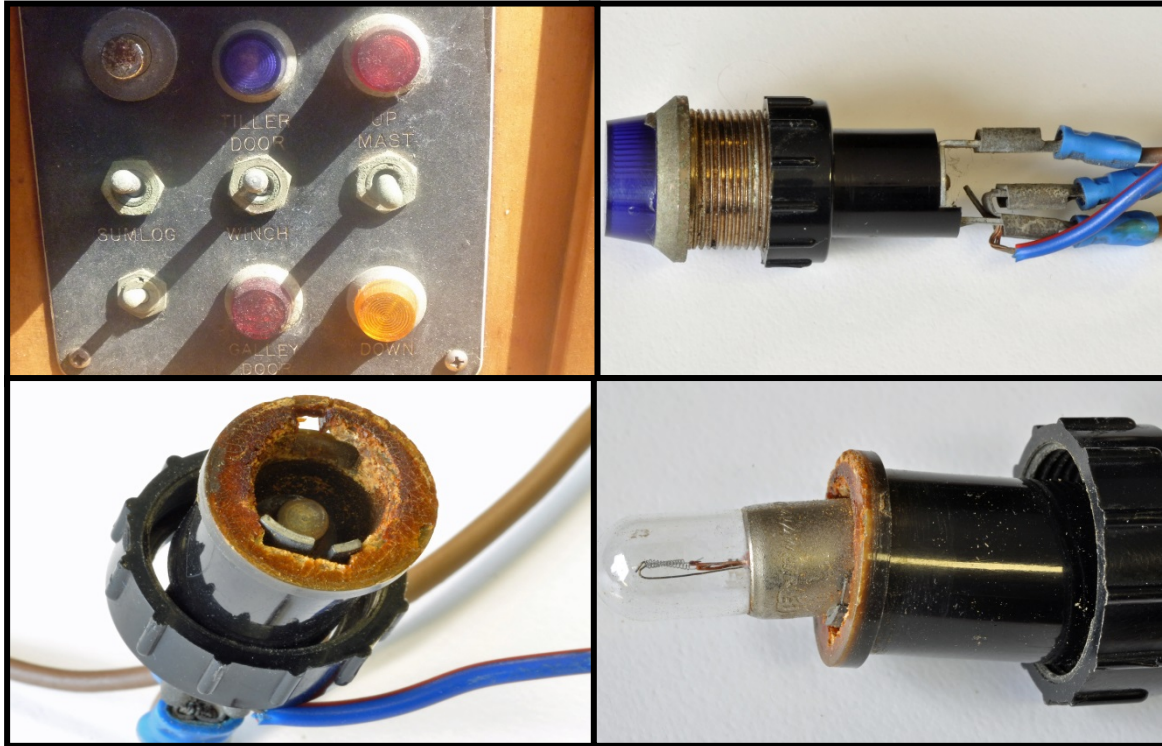


**Photograph 4: Wheelhouse and starboard wing controls**

- 1.29. The wheelhouse starboard control lever was placed in the astern position and the wing control was tested. The starboard engine gearbox remained in the astern position. However, the wing starboard control lever could be moved through both ahead and astern positions without changing the astern position at the gearbox. The operation of the starboard wing lever while the gearbox position was in astern was stiff, and firm resistance was noticeable. Full movement in both directions was accomplished. The movement of both levers in astern and ahead positions advanced the throttle the same amount. Although the levers on the wing position were longer than the levers in the wheelhouse, advancement of throttles was the same at the engine.
- 1.30. The examination determined that, providing there was no gear selected from the alternate position, both the wheelhouse and wing positions in both astern and ahead selections operated the gear selection at the gear box correctly. Also, the throttle advancement functions were functioning as intended.
- 1.31. The warning light indicating the aft watertight bulkhead door being open was removed from the wheelhouse dashboard panel for examination. The bulb and its housing were photographed and tested. The impedance across the supply wires with the bulb in place was measured at 18.4 ohms, while the impedance of the bulb alone was 17.9 ohms. The inscription on the bulb indicated it to be a 24 volt, 4 watt bulb, branded Tungsram (a Hungarian company, now a GE subsidiary). The bulb socket appeared to be made from a phenolic resin such as "Bakelite", and had a metal insert on one side. The side without the insert was badly worn, causing the bulb to sit at an angle, (see *Photograph 5*). Due to the wear in the socket it was possible to



momentarily break circuit continuity by gently moving the bulb. However, with the bulb in its natural position circuit continuity appeared secure.



Photograph 5: Open aft bulkhead door pilot light

- 1.32. Because the wiring harness and circuits supplying electrical power to the *Venture* had been immersed in water, they could not be tested. Therefore, it was not possible to determine if the watertight bulkhead door open warning pilot light was functional at the time of sinking.

### Bilge and Emergency Pumping

- 1.33. Accumulation of water in the bilges of the five sections of *Venture* was pumped out by a Jabsco® pump driven off the port engine (see *Diagram 2*). The bilge pump was connected to a valve chest and overboard discharge. The forward and aft voids bilges were not connected directly to the bilge system. They were connected by drain pipe fitted with a shut off gate valve. This allowed accumulated water to be drained into the adjacent compartment where bilge pickups were located.
- 1.34. An additional 240 volt electric fire pump located at the stern on the port side supplied water direct from outside the hull through the pump to the fire hydrants on the rear and upper deck. The pump plumbing did not allow

immediate conversion for use as a bilge pump without shutting off the intake valve, removing the line from the through hull fitting to the pump and placing the line into the bilge.

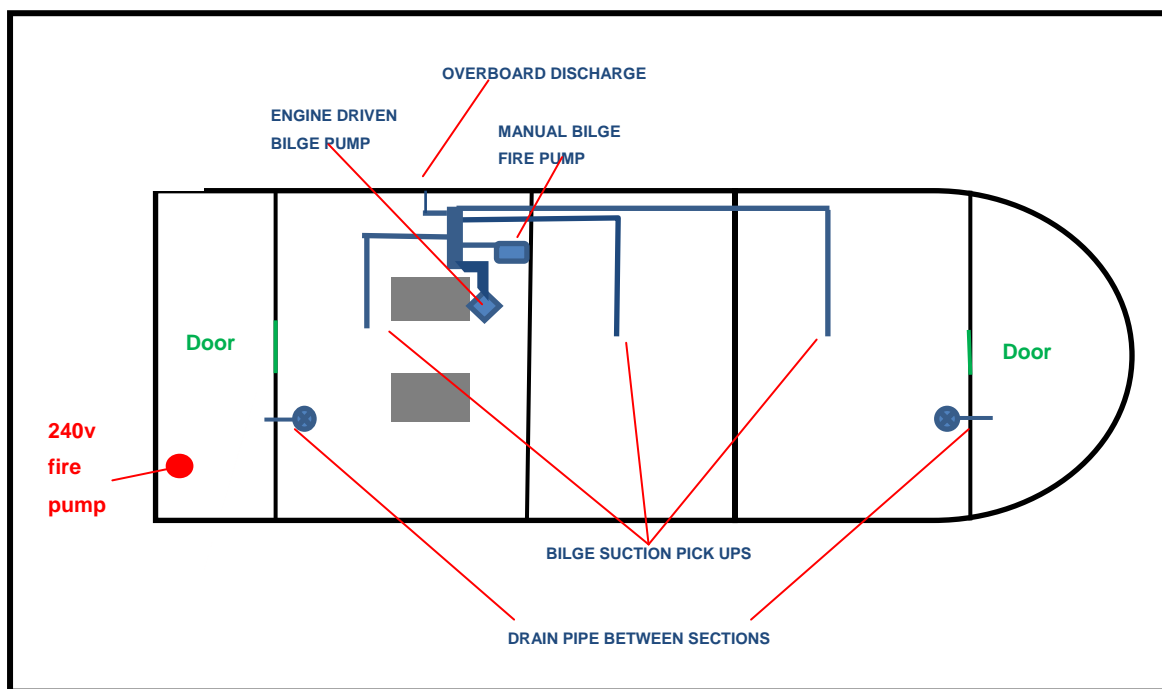


Diagram 2: Bilge pumping system

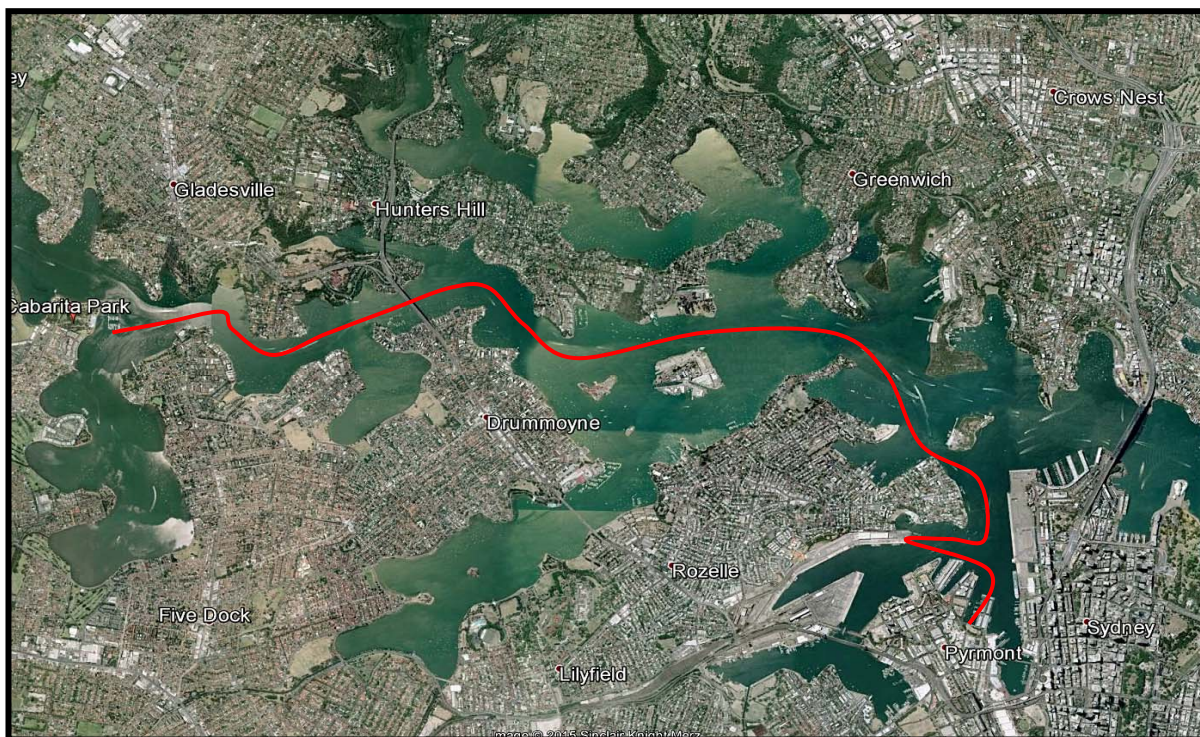
## Disposal

1.35. Insurers of *Venture* determined the vessel was a total constructive loss. After settlement, the ferry was broken up by the salvage company AWB on 24 March 2015 at their yard in Rozelle Bay.

## PART 2 ANALYSIS

### Interviews with Master and Crew

2.1. An interview was conducted with the Master of *Venture* on 28 March 2015. From this interview, it was established the crew assembled on board from 0930 in preparation for the day's two charters. The first charter was a 'pub crawl' commencing at King Street wharf, Darling Harbour, at about 1100 and returning about 1500. The second charter was a birthday party for 40 passengers. The scheduled pick up was 1900 at the Casino wharf in Pyrmont with a drop off about 2300. After the last charter group departed at Pyrmont, *Venture* was driven to Bailey's Marina, Balmain, to pump out the sullage tanks before returning to its berth at Cabarita.



Photograph 6: *Venture*'s route after charter to marina berth

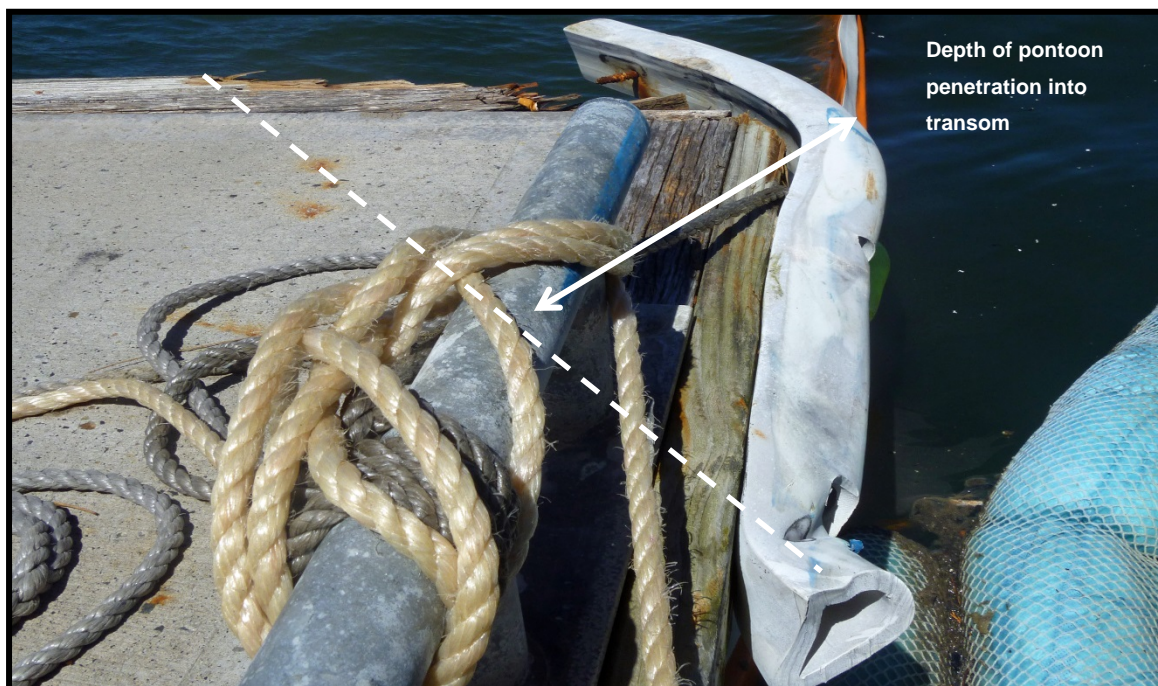
2.2. At completion of the sullage discharge at about 2400, *Venture* was driven to Cabarita by the Master arriving at 0050. The Master stated: "*I drove from the wing position the whole way*". Asked why he navigated from the wing position and not the wheelhouse, he replied: "*The cables in the wheelhouse do not allow you to get full revs*". When asked how steering was accomplished from

the wing position, he replied: *“I just move across to the wheel in the wheelhouse; it’s only a short distance or use the engines”*.

- 2.3. The Cruise Director, GPH and Stewardess worked below cleaning up the *Venture* from the charter during the passage from Balmain to Cabarita.
- 2.4. According to the Master, when off the marina berth, he stopped the ferry, placed the starboard engine ahead and the port engine astern to skew the ferry to port prior to backing into the berth. He stated that he had no movement to port and the controls were not responding to his commands. The ferry was going straight backwards. He could not get both control levers into neutral so the ferry continued going astern on both engines and hit the pontoon. He described the throttles as slack over the full range after the collision, although neutral was obtainable.
- 2.5. After the collision the GPH came to the wheelhouse and informed the Master of the flooding. The GPH disengaged the port engine gear, advanced the engine revs and switched on the bilge pump from the dashboard control panel. The GPH advised the Master he was going with the Cruise Director to obtain additional pumps from another boat on the marina.
- 2.6. The Master stated that, after the GPH and Cruise Director departed, he went below to the lower deck and looked through the rear hatch. He saw the door between the tiller flat and engine room was open and water was flooding into the hull and engine room. He did not enter the void because of the risk of getting trapped below decks.
- 2.7. At interview, the GPH and Cruise Director indicated that, on arrival at Cabarita, they had positioned themselves on the rear deck in readiness to pick up the berthing lines. The GPH was on the starboard side and the Cruise Director on the port side. They both described the ferry becoming stationary at about a 45° angle to the east west line of pontoons on the southern side of the marina with the stern about 60 metres from the berth. When *Venture* then went straight astern on both motors increasing in speed, they both yelled a warning to the Master. However, the transom collided with the corner of a pontoon near the centre line of *Venture* (see *Photograph 7*). The GPH described the ferry *“as hung on the pontoon for a short time”* then forward off



the pontoon. The Cruise Director described the ferry as being “*impaled on the end of the pontoon for a short time*” then possibly driven forward before becoming stationary.



**Photograph 7: Pontoon damage from collision**

- 2.8. The crew of the charter ferry, *Goodtime*, moored nearby heard the warnings and subsequent collision. They assisted the GPH and Cruise Director to physically pull *Venture*'s stern into the pen and secure it.
- 2.9. Immediately after the collision *Venture*'s GPH went through the aft deck hatch into the steering compartment. There he saw a plank missing from the transom above the waterline and other damage to planks below the water line. He also observed the stern knee cracked and pushed inwards with a large flow of water into the hull. Next, he went into the engine room and opened the bilge suction valve before departing the engine room through the bulkhead door which he stated he secured. He then went via the steering compartment to the back lower main deck, and on to the wheelhouse to inform the Master in the wheelhouse of the damage and flooding.
- 2.10. The GPH stated that, having informed the Master of the flooding, he then tested the controls. He found them to be in working order and was able to select both forward and reverse gear from the wheelhouse control unit. The

GPH then disengaged the port engine control lever gear shift, pushed the lever forward to increase engine revolutions to 1600rpm, and switched on the bilge pump at the dashboard switch.

- 2.11. The Master corroborated the GPH's statement about advancing the wheelhouse port control to increase revolutions for the bilge pump. However, the lever was not in the advanced position when the initial inspection was made by the OTSI investigator on 7 March 2015. The Master indicated to insurance assessors he changed the lever position back to neutral before leaving the wheelhouse but would not give an explanation as to why.
- 2.12. The GPH suggested several courses of action to prevent *Venture* from sinking. One option was to take the vessel to a shipyard with a travel lift; the other was to beach it near to the marina. The GPH said the Master did not respond to his suggested courses of action. He then informed the Master he was going with the Cruise Director to obtain extra portable pumps and power packs from a nearby moored vessel. He had arranged this by mobile phone. The Master was still in the wheelhouse when they left.
- 2.13. When the GPH and Cruise Director returned with the pumps and batteries about 35 minutes after the collision, they noticed there was no sound of engines and everything was quiet. *Venture's* stern was submerged with the bow sticking upwards. The Master was standing on the dock.
- 2.14. A person living on the motor cruiser, *Y Knott*, at the marina heard the yelling and subsequent sound of the collision. He went and assisted getting lines to *Venture* from the dock and called to the Master to provide lines. He went on board and assisted securing lines to the rear deck, then got off the vessel.
- 2.15. The person from *Y Knott* subsequently joined the Master on the dock while *Venture* sank. There, he asked the Master if he had called VTS or the Water Police as there would be diesel fuel leaking which would need floating containment booms. The Master responded to the effect he had not made any calls to anyone.
- 2.16. There was no report to or call for assistance from VTS until 43 minutes after the collision. The call that was then made was instigated by the person from *Y Knott*.

- 2.17. Water Police overheard the radio call from *Y Knott* to VTS at 0133 and responded arriving at the scene at 0144. On arrival the Water Police notified VTS of contamination from *Venture's* diesel fuel tanks. VTS notified the Port Authority who sent two vessels to contain the spill.
- 2.18. Water Police interviewed the crew and conducted drug and alcohol testing. All returned a negative result.

## Sequence of Communications

- 2.19. The following is a sequence of key communications and events developed from VTS recordings, notes from the Water Police and phone records:

- 0050 *Venture* collides with pontoon.  
Crew secure ferry with assistance from *Goodtime* crew.  
GPH goes into engine room, opens bilge lines, exits engine room and goes to wheelhouse. GPH tests controls and engages bilge pump and advances port engine throttle.
- 0107 GPH phones Sydney City Marina to obtain hardstand. Call unanswered.
- 0110 GPH phones Polaris Marine for assistance. Call unanswered.
- 0112 GPH phones Noakes boatyard and advises of position. Expects to be bringing boat over to be placed on travel lift.  
GPH calls Marine Assist requesting to use pumps from their boat in the marina. Permission granted. Location of pumps and battery packs described.  
GPH and Cruise Director depart to collect additional pumps.
- 0125 GPH and Cruise Director return with pumps. *Venture* submerged with stern on the bottom.
- 0127 GPH phones Noakes shipyard to inform *Venture* on bottom.
- 0133 Vessel *Y Knott* radios VTS on Channel 13 to report sinking of *Venture*. VTS responds to the call.
- 0134 VTS radios Water Police to advise details of the incident.
- 0136 *Water Police 40* radios VTS after over hearing call from *Y Knott* on way. ETA 10 minutes.
- 0136 VTS phones Ports Authority advising need for booms.

0144 Water Police arrive.

0149 VTS phones RMS to report sinking.

0151 VTS phones EPA to report fuel spill (reference number 58555).

## **Watertight Rear Bulkhead Door**

- 2.20. A watertight bulkhead between the steering compartment and the engine room is designed to prevent a vessel foundering should a compartment's watertight integrity be breached. Survey requirements dictate the positioning of watertight bulkheads at both ends of the vessel where they are most vulnerable in the event of a collision. Hatches or doors are placed in these bulkheads to allow passage between compartments. These doors and hatches must be kept securely closed at all times when a vessel is underway.
- 2.21. At interview the Master advised that he performed pre-departure checks from memory. He did not use a checklist or create any other sort of record of items checked, including water and fuel levels. He stated that, after completing his engine room checks prior to departure for the day, he secured the aft watertight bulkhead door. Asked if he had ever seen the rear watertight door warning light on the wheelhouse dashboard illuminated, he replied: "*No, never in my time on board*".
- 2.22. The GPH said that, during breaks in the first charter, he did checks of the engines and of water levels in the engine room. On leaving the engine room after completing the checks he securely shut the door in the bulkhead between the engine room and steerage compartment. Like the Master, he had never seen the rear bulkhead door warning light activated at any time while on board.
- 2.23. The GPH stated that he had closed the watertight bulkhead door after his activities below decks following the collision. The Master stated that, after the GPH and Cruise Director had left to collect the additional pumps, he looked through the hatch on the aft deck and saw the door was open.
- 2.24. During their examination of *Venture* immediately after it was raised on 8 March 2015, OTSI investigators found the bulkhead door was open. Salvage divers first on board when access into the hull was initially gained confirmed



they found the door in the open position. The conclusion from these observations is that the door must have been in the open position at the time of the collision. This then allowed flooding into both compartments and subsequently into the remainder of the hull.

## Record Keeping

2.25. Documents retrieved from *Venture's* wheelhouse after it had been raised on 7 March 2015 were examined in detail. Key observations are set out below.

### *Venture's* Log

2.26. The 'Vessel Log' consisted of a folder containing loose sheets of paper. The log sheets covered the period 14 September 2014 to 18 December 2014. No log sheets or log book were recovered for the period 19 December 2014 to 1 March 2015. An examination of the 56 log sheets retrieved revealed a less than adequate standard of recordkeeping with important information not being entered on most occasions:

- No crew positions were entered on any log sheet.
- No log sheet recorded a crew briefing being conducted.
- There was no record of pre-departure checks in 51 log sheets.
- The number of passengers was shown on only 13 log sheets.
- No information on weather or tides was recorded on any log sheet.
- No time of day when charters were conducted was recorded.
- Crew and Master details were omitted on some log sheets.
- There was no recording of any emergency drills being conducted during the period.

2.27. When interviewed on 21 April 2015, the owner informed OTSI that a new type of log had commenced from the start of January 2015 in the form of a diary to get rid of the loose leaf pages previously in use. This new type of log was not recovered from *Venture* after the sinking although its existence and use since January 2015 was confirmed by the Master and GPH. The Master indicated that the diary log had been in the wheelhouse at the time of the collision and must have been washed overboard and lost in the sinking. The GPH recalled the diary log on the portside of the wheelhouse on the dashboard when he relieved the Master during the last charter.

- 2.28. When OTSI and the salvage operators observed the *Venture* in the sunken condition water was in the wheelhouse but had not reached a height where other books were located. The wheelhouse doors were shut and it seemed unlikely that the log diary could have been lost.
- 2.29. The owner advised that, although he was on board for the majority of charters, he did not personally check entries in the log. Instead, he relied on the Master and crew to keep the activities properly recorded.

## **Maintenance and Servicing**

- 2.30. Maintenance and servicing documents recovered from *Venture* were only to December 2013. There were no records after December 2013. However, the owner provided all the maintenance and servicing documentation for the period from January 2014 until the sinking. The maintenance and servicing records indicated that the ferry had been kept in good serviceable condition prior to the sinking. Repairs and maintenance were carried out regularly and by qualified tradespersons.
- 2.31. The GPH on board at the time of the incident advised that he was responsible for replacing the engine Teleflex<sup>(R)</sup> control unit on the starboard wing. The work was completed on 5 January 2015 as the unit gearing had been stripped. He stated that new cables had also been ordered but had not arrived as they had to come from America at the time of the installation. As a MED 3 the GPH was qualified to undertake this replacement work. On inspection the replacement was found to have been correctly installed in accordance with the manufacturer's instructions.
- 2.32. Though the vessel was being well maintained, there was no evidence of reports of the open rear bulkhead warning alarm/light being defective or repairs being undertaken. According to the Master, the system had not been tested for at least the past three and a half years. In the absence of evidence to the contrary, it is concluded the system had not worked for some considerable time.

## Safety Management System

- 2.33. No Safety Management System (SMS) was recovered from *Venture* though the owner said there had been three copies on board. These copies were not housed in the wheelhouse but in the bar server area on the lower main deck level. This area was completely flooded in the sinking and no records were recovered from the location. The Master stated that he had seen a SMS at some time but believed it lacked information. He was uncertain as to whether or not a copy had been on board.
- 2.34. CSH was not able to provide a copy of the SMS from their records as their computer had 'crashed' some time prior to the sinking. A copy of *Venture's* SMS was obtained from RMS who had conducted several audits in 2011 during visits to the ferry and the offices of CSH. This copy was clearly out of date as it listed names of personnel long removed from service with the company. The SMS did not contain coverage of any emergency procedures so the crew had no guidelines for action to be taken in the event of a collision or subsequent sinking.
- 2.35. RMS SMS auditors/surveyors also conducted audits of *Venture* in 2013. They were interviewed and confirmed there was a more recent version of the SMS than the one originally provided to OTSI. They had sighted it on 7 January 2013 but had not retained a copy. However, though the owner's claim that the SMS had been amended, in the absence of a copy to review, no assessment can be made as to its adequacy for *Venture's* operation.
- 2.36. At interview the Master stated that he had never sighted a float plan among the vessel's documents. A float plan would identify the effect on the vessel's stability if a section of the hull was flooded. It would have been provided by the Naval Architect when *Venture* was first placed into survey and should have been referenced in the SMS.

## Emergency Training and Drills

- 2.37. No register recording emergency drills performed or identifying crew member's participation in drills was retrieved from *Venture* or produced by CSH. The owner explained that drills were entered in the vessel's log but there was no record of any drill entered in the log sheets recovered from

*Venture*. The GPH indicated a fire drill had taken place on board in December 2014. The Master indicated he had conducted a fire drill in September 2014 when he ran through fire requirements with a new GPH.

2.38. The Master could not recall a drill involving flooding or sinking being performed at any time since 2013 when he became the Master.

2.39. A RMS SMS audit team worked extensively with the owner and crew following the collision due to control failure of the company's other ferry *Katika* in 2010. A follow up visit on 7 January 2013 included a range of scenario driven emergency drills. RMS. noted significant improvements in both SMS documentation and drills. The following feedback was provided to CSH by the auditors:

- *Documentation and record keeping are up to date.*
- *Communication between crew members is challenging. You may wish to review communication protocols, particularly between crew and the Master. There were periods when the Master was not aware of what was happening on the vessel. There were also periods when the crew was unsure of what procedures to follow.*
- *The crew was sometimes receiving orders from the Cruise Director rather than the Master. Again, the crew found this confusing. Leadership in an emergency is critical.*
- *During the fire scenario the fire pump took some time to bring on line. Two leaks were found.*
- *Passengers need announcements, preferably from the Master, when there is an emergency.*
- *I understand that you will have time available for drills during the 'pub crawl' cruises. This will be an excellent time to run drills and also have crew members further their knowledge of the vessel's equipment. For example, fuel shut offs and engine shut down.*
- *In the event of the Master becoming incapacitated are all crew members able to safely stop the vessel and make a radio transmission?*

## PART 3 FINDINGS

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### Cause

- 3.1. *Venture* sank after it collided with the corner of a floating concrete pontoon. The hull's transom was severely breached which caused the steering compartment to flood. The rear watertight bulkhead door being open when underway at the time of the collision allowed flooding to the engine room. As the rate of flooding was greater than could be handled by the single bilge pump the vessel sank.

### Contributing Factors

- 3.2. The collision with the pontoon was most probably the result of a human error in the manoeuvring of the vessel into the berth. There was no evidence of a mechanical control failure that would allow astern propulsion instead of forward propulsion.
- 3.3. The dashboard open door warning light indicating when the rear watertight bulkhead door was open was not working. Thus, the Master and GPH did not have the benefit of the visual alert to the potential hazard. Though the light had been unserviceable for a considerable time it had not been reported as defective and had not been tested.
- 3.4. *Venture's* single bilge pump could not cope with the ingress of water particularly as it increased as the vessel sunk lower. The fire pump could not be used as a bilge pump.
- 3.5. The Master did not call for assistance or give direction for action at any time. Advice of the incident to relevant authorities was eventually given by a party other than the Master or member of the crew.
- 3.6. The vessel's Safety Management System did not cover emergency procedures so the crew had no guidelines for action to be taken in the event of a collision or subsequent sinking.
- 3.7. The GPH took the initiative in attempting to mitigate the consequences of the collision and to arrange recovery of the vessel. Crew from two nearby vessels provided assistance with the attempts to manage the situation.

## Other Safety Matters

- 3.8. The crew had not received appropriate training in responding to emergencies while on the vessel. No evidence was found of effective emergency drills being conducted and no instructions or procedures were in place.
- 3.9. Examination of the vessel log sheets revealed a less than adequate standard of recordkeeping. A significant amount of voyage information was not being recorded or being recorded in a haphazard manner.

## PART 4 RECOMMENDATIONS

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To prevent a recurrence of this type of incident, it is recommended that Cruise Sydney Harbour Cruises undertake the following remedial safety actions:

- 4.1. Establish procedures to be adopted by all crew in all emergency situations including fire, grounding, abandon ship, medical emergency, person overboard and Master incapacity. The procedures should identify the role of each crew member in the emergency.
- 4.2. Establish a roster for the completion of emergency drills to ensure all crew employed are competent in performing these drills before being allowed to work on any Company vessel. Maintain details of all drills and induction completed in vessel logs and also in a consolidated Company record.
- 4.3. Ensure vessel logs are completed legibly and comprehensively including recording of the full names of all crew members along with their assigned positions and duties, the number of passengers on board, key voyage timings, and the completion of all pre-departure and safety equipment inspections.
- 4.4. Ensure the Safety Management System conforms to accepted industry standards and is kept up to date. All crew should be aware of the contents and have access to a copy on board.

## PART 5 APPENDICES

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### Appendix 1: Sources, Submissions and Acknowledgements

#### Sources of Information

- Cruise Sydney Harbour Cruises
- Maritime Services Board of NSW Stability and Survey - *Venture* 1984
- Roads and Maritime Services

#### References

- Chart AUS 200
- *Passenger Transport Act 1990* (NSW)
- Uniform Shipping Laws 2009

#### Submissions

The Chief Investigator forwarded a copy of the Draft Report to the Directly Involved Parties (DIPs) to provide them with the opportunity to contribute to the compilation of the Final Report by verifying the factual information, scrutinising the analysis, findings and recommendations, and to submit recommendations for amendments to the Draft Report that they believed would enhance the accuracy, logic, integrity and resilience of the Investigation Report. The following DIPs were invited to make submissions on the Draft Report:

- Australian Maritime Safety Authority
- Cruise Sydney Harbour Cruises
- Port Authority of NSW
- Roads and Maritime Services
- Transport for NSW
- *Venture's* Cruise Director
- *Venture's* General Purpose Hand
- *Venture's* Master

Written responses were received from all DIPs except the Australian Maritime Safety Authority and *Venture's* Cruise Director. The Chief Investigator considered all representations made by DIPs and responded to the author of each of the submissions advising which of their recommended amendments would be



incorporated in the Final Report, and those that would not. Where any recommended amendment was excluded, the reasons for doing so were explained.

## **Acknowledgements**

The locality map reproduced as Photograph 2 and Photograph 6 are used with the permission of Google Earth.

Diagram 1 was reproduced from Maritime Services Board of NSW Stability and Survey - *Venture* 1984.