FERRY SAFETY INVESTIGATION REPORT

CLOSE QUARTERS INCIDENT INVOLVING COLLAROY AND CAPTAIN COOK II

SYDNEY HARBOUR

18 FEBRUARY 2014
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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

Investigation Reference 04639
THE OFFICE OF TRANSPORT SAFETY INVESTIGATIONS

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ACRONYMS AND ABBREVIATIONS

AIS          Automatic Identification System
AMSA         Australian Maritime Safety Authority
CCC          Captain Cook Cruises Pty Ltd
CCF          Critical Control Failure
COLREGS      International Regulations for Preventing Collisions at Sea, 1972
CRM          Crew Resource Management
DIP          Directly Involved Party
FLIR         Forward Looking Infrared
GPH          General Purpose Hand
HCF          Harbour City Ferries
LOA          Length Overall
MED II       Certificate of Competency as a Marine Engine Driver Grade 2
MED III      Certificate of Competency as a Marine Engine Driver Grade 3
OTSI         Office of Transport Safety Investigations
RMS          Roads and Maritime Services
SMS          Safety Management System
SPC          Sydney Ports Corporation
VDR          Vessel Data Recorder
VTS          Vessel Traffic Service
# GLOSSARY OF TERMS

<table>
<thead>
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<th>Term</th>
<th>Definition</th>
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<tr>
<td><strong>Automatic Identification System (AIS)</strong></td>
<td>AIS is an automatic tracking system used on ships and by the Vessel Traffic Service (VTS) for identifying and locating vessels by electronically exchanging data with other nearby ships and AIS base stations. AIS information is relayed to other vessels and shore based stations by transponder sending a GPS signal. AIS supplements marine radar, which continues to be the primary method of collision avoidance for water transport.</td>
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<td><strong>COLREGS</strong></td>
<td>Convention on the International Regulations for Preventing Collisions at Sea. COLREGS are published by the International Maritime Organisation (IMO) and set out the navigation rules for vessels at sea in order to prevent collisions between vessels.</td>
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<td><strong>Ferry</strong></td>
<td>A vessel designed and surveyed to carry passengers for payment or reward.</td>
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<tr>
<td><strong>Port</strong></td>
<td>The left hand side of a vessel when looking forward from the stern. The side where a red light is exhibited at night.</td>
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<td><strong>Standard Port</strong></td>
<td>A place for which independent daily predictions are given in the tide or stream tables, from which corresponding predictions are obtained for other locations, known as secondary ports, by means of differences or factors.</td>
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<tr>
<td><strong>Starboard</strong></td>
<td>The right hand side of a vessel when looking forward from the stern. The side where a green light is exhibited at night.</td>
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<td><strong>Survey Class</strong></td>
<td>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).</td>
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<tr>
<td><strong>Vessel Traffic Service (VTS)</strong></td>
<td>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 “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”. (IMO Resolution A.857 (20))</td>
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EXECUTIVE SUMMARY

At approximately 18:54 on 18 February 2014, the Harbour City Ferries’ Collaroy and the Captain Cook Cruises Pty Ltd Captain Cook II came into a close quarters situation between Circular Quay and Kirribilli Point. A collision was averted by Collaroy taking evasive action.

Collaroy was on a regular passenger service run from Circular Quay to Manly with 350 passengers and a crew of six onboard. Captain Cook II had completed passenger shuttle services at Cockle Bay and was returning to its base in Neutral Bay with a crew of three. Immediately prior to the incident the passenger ship Carnival Spirit had departed from the Overseas Passenger Terminal on the western side of Circular Quay and commenced to proceed east to sea.

After passing under the Harbour Bridge, the Master of Captain Cook II was aware of a Manly Ferry (Collaroy) departing Circular Quay. However, he was focussed on inbound ferries ahead and the wash of Carnival Spirit proceeding outbound, and did not further observe Collaroy.

Due to Carnival Spirit’s location and manoeuvring, instead of turning east immediately after rounding Bennelong Point as was usual, Collaroy’s Master proceeded further north to the stern of Carnival Spirit before turning. This course alteration was not expected or observed by the Master of Captain Cook II and he maintained his course and speed despite being the give way vessel.

As the ferries were converging, Collaroy sounded six short blasts but Captain Cook II did not respond. Consequently, the vessels came within approximately 2 metres of colliding before Collaroy had completed evasive action. Neither Master attempted to communicate with the other by radio at any stage.

Not all passenger carrying vessels are fitted with an automatic identification system (AIS) which allows Masters to establish the identity, course and speed of other vessels. It is recommended that Transport for NSW require all public passenger carrying vessels operating within Sydney Harbour to be fitted with AIS and that Captain Cook Cruises expedites the installation of AIS on the remaining vessels in its fleet.
The Master of *Captain Cook II* was alone on the bridge at the time of the incident. It is recommended that Captain Cook Cruises undertakes an analysis of the risks associated with having the masters of ferries such as *Captain Cook II* not having the assistance of a lookout on the bridge when navigating within the high traffic density area defined by Bennelong and Kirribilli Points to the east and Blues Point to Goat Island to the west.

During the investigation an error was identified in Section 3 of Schedule 3A of the *Marine Safety (General) Regulation 2009* (general navigation requirements relating to Sydney Cove) and it is recommended that Transport for NSW initiate corrective action.
PART 1  FACTUAL INFORMATION

Introduction

1.1 At approximately 18:54 on 18 February 2014, the Harbour City Ferries’ (HCF) Collaroy and the Captain Cook Cruises Pty Ltd (CCC) Captain Cook II came into a close quarter situation between Circular Quay and Kirribilli Point on Sydney Harbour. At the time of the incident, Collaroy was on a regular passenger service run from Circular Quay to Manly with 350 passengers and a crew of six onboard. The Captain Cook II had completed passenger shuttle services for the day and departed Cockle Bay in Darling Harbour to return to its base in Neutral Bay with a crew of three onboard.

1.2 Immediately prior to the incident the passenger ship Carnival Spirit had departed the passenger terminal on the western side of Circular Quay stern first and had completed her swing and commenced to proceed east to sea. At the same time there were three commercial passenger vessels travelling west and to the north of Carnival Spirit inbound for Circular Quay.

1.3 OTSI was alerted to the incident by the Sydney Ports Corporation (SPC) Harbour Master on 19 February 2014. The incident was recorded by the Vessel Traffic Service (VTS) using the automatic identification system (AIS), radar and CCTV, and monitored by VHF radio communications.

Vessel and crew information

Captain Cook II

1.4 Captain Cook II is a steel hulled ship of 32.06 metres in length with a beam of 8.23 metres and a draft of 2.97 metres. It is fitted with twin 114 kW Gardner diesel engines with conventional drive shafts and fixed propellers. (For more details refer to Appendix 1) The ship is fitted with VHF radio but does not have GPS, radar or AIS.

1.5 Captain Cook II was in current commercial 1E survey with the Australian Maritime Safety Authority (AMSA) with Identifying Number 17455. The survey permitted the vessel to carry up to 257 passengers and required a crew of three, a Master holding a Master Class Four (Trading) Certificate of
Competency, an Engineer holding a Marine Engine Driver Grade Three (MED III) Certificate of Competency and one general purpose hand (GPH).¹

1.6 At the time of the incident Captain Cook II was under the control of a Master holding a current AMSA Master 1 qualification which he attained in 1970 with an endorsement to operate in NSW issued by Roads and Maritime Services (RMS). The Master had been with CCC since 2010 and served as the Master of Captain Cook II and other similar sized vessels within the fleet. He held the required Certificate of Local Knowledge issued under Section 29 of the Marine Safety Act 1998 to operate vessels over 30 metres within the Port of Sydney. Both the Engineer and the GPH held current certificates of competency issued by RMS.

Collaroy

1.7 Collaroy is one of four monohull Freshwater Class double-ended ferries owned by the NSW Government and operated by Harbour City Ferries (HCF). Launched in 1988, it has a steel hull with an aluminium superstructure, is

¹ When on charter CCC vessels carry additional crew such as cruise directors, stewards and cooks.
69.54 metres long, displaces 1140 tonnes and is powered by two 2238 kW Daihatsu engines. It was in current AMSA 1D survey, Identifying Number 17819. The survey certified the ferry to carry 1100 passengers with a minimum crew of five.

1.8 Both bridges of Collaroy were equipped with radar, Class A AIS, forward looking infrared camera (FLIR), GPS, vessel data recorder (VDR), VHF radio and a HCF internal radio network. (For more details refer to Appendix 2.) Collaroy was exhibiting the prescribed lights for a power-driven vessel over 50 metres in length in accordance with COLREGS Rule 23 (a) (i) to (iv).

Photograph 2: Collaroy

1.9 Collaroy had a crew of six, consisting of the Master, Engineer and four GPHs. The Master had 32 years experience as a Master and 25 years experience operating within Sydney Harbour, 20 years as Master of Freshwater Class vessels. Additionally, he held a Certificate of Local Knowledge issued under Section 29 of the Marine Safety Act 1998 to operate vessels over 30 metres within the Port of Sydney. The Engineer held a current MED II Certificate of Competency and three of the four GPHs held current certificates of competency. The fourth GPH had completed the necessary requirements but had not been issued with a certificate.
**Carnival Spirit**

1.10 Immediately prior to the incident *Carnival Spirit* was in the process of departing Circular Quay Overseas Passenger Terminal (OPT). *Carnival Spirit*, IMO No.9188647, is a seagoing cruise ship with a displacement of 85,920 tons, an overall length of 292.2 metres, a beam of 34 metres, a draft of 8 metres and an air draft of 52 metres.

**Incident location**

1.11 The incident occurred in the part of Sydney Harbour which experiences the highest density of traffic comprising of ferry, commercial, and recreational vessels. Seagoing shipping also transits the area including overseas passenger ships either entering or departing the Circular Quay Overseas Passenger Terminal or proceeding to and from the White Bay Terminal to the west of the Harbour Bridge at Balmain.

1.12 Circular Quay acts as the main hub for ferry services providing commuter and charter services to most suburbs and bays around Sydney Harbour. Relevant key points within Sydney Harbour are shown on the chart extract at *Figure 1*.

1.13 The incident occurred in an area bounded by the Harbour Bridge to the west, a line between Bennelong Point and Kirribilli Point to the east and the entrance to Circular Quay in the south (see *Figure 1*). A 15 knot speed restriction applies to the area, and extends west of the Harbour Bridge to a line between Blues Point and Millers Point.

1.14 The area is divided into an inbound shipping channel to its north and an outbound channel to its south with a diamond-shaped marker at roadway level on the Harbour Bridge defining the boundary between the two channels. Circular Quay traffic entering and leaving the area does so at effectively a T-intersection.
Directions and regulations

1.15 All commercial vessels operating within the Port of Sydney are to comply with the Harbour Master’s Directions\(^2\) as well as the COLREGS and the Marine Safety (General) Regulation 2009 (the Regulation).

1.16 Under the Directions of the Harbour Master Section 2.38:

- “Vessels are not to impede the passage of seagoing ships under the conduct of a Pilot ... inside the shipping lane or fairway.”
- “Seagoing ships of LOA 100 metres or greater are escorted by Corporation vessels ...”
- Other vessels must not pass between the escort and the seagoing ship.

• “All vessel are to keep at least 30 metres from the seagoing ship being escorted.”

1.17 Commercial vessels operating within Sydney Cove (Circular Quay) are also subject to the Marine Safety (General) Regulation 2009. Schedule 3A, Section 3 General navigation requirements states:

(1) A vessel must not be operated within 100 metres of the Port Lateral Marker at Bennelong Point, unless the vessel is departing from:

   (a) Sydney Cove Wharf 5, or
   (b) Sydney Cove Wharf 6, or
   (c) the Eastern Pontoon.

This sub-section is incorrect. It should pertain to Sydney Cove wharves 2 and 3 only, to allow vessels departing Sydney Cove from the eastern side to negotiate east bound traffic with less interference.

1.18 Section 24 of the Regulation applies a speed limit of 10 knots to vessels of 30 metres or more in length operating in the Port of Sydney Central Area (from Bradley’s Head to Ballast Point). This applied to Carnival Spirit on departing Circular Quay outbound. However, Section 23 of the Regulation exempts ferries providing regular passenger services from the 10 knot speed limit. A speed restriction of 8 knots applies to all vessels within Circular Quay south of a line from Dawes Point to Bennelong Point.

1.19 The channel in which the incident occurred is relatively narrow, especially for large ships entering and departing the Overseas Passenger Terminal situated on the western side of Circular Quay or transiting to and from the White Bay Passenger Terminal at Balmain. The effective shipping channel width is only 453 metres between Bennelong Point and Kirribilli Point and 448 metres between Dawes Point and Milsons Point (see Figure 1).

1.20 Passenger ships departing the Overseas Passenger Terminal, irrespective of which way they have berthed, are required to move from the Quay then make a turn into the main channel before proceeding eastward. If the ship has berthed starboard side to the Terminal they have to reverse with the stern towards the Harbour Bridge before making their turn to the east. This
manoeuvre effectively blocks all other traffic in the area until the ship has swung and got underway.

**Sydney Ports Corporation’s Vessel Traffic Service (VTS)**

1.21 The *Ports and Maritime Administration Act 1995* requires SPC to carry out port safety functions, one of which is the provision of vessel traffic control which it provides under the Harbour Master’s Directions as a vessel traffic service (VTS). The VTS is responsible for monitoring and controlling the movement of all vessels 30 metres or more in length within the ports of Sydney Harbour and Botany Bay to the south. Vessel movements are tracked by the VTS system using inputs from radar, CCTV, AIS and VHF radio.

1.22 All Masters operating commercial vessels in the port must maintain radio communications with VTS on VHF Channel 13. Current weather, wave height, tidal conditions, shipping movements and navigation warnings for Sydney Harbour are broadcast every two hours from 01:05, also on VHF Channel 13.

1.23 All vessels over 30 metres, with the exception of ferries on regular scheduled service runs, are required to report their positions at specific locations when navigating within and into and out of the ports. Ferries on regular services must report to VTS at the commencement and finish of each regular scheduled service and also seek permission for any deviation from the normal passage plan. Being over 30 metres in overall length both *Captain Cook II* and *Collaroy* were required to participate in the VTS and did report as required.

**Environmental conditions**

1.24 Around the time of the incident, the weather was reported as fine and overcast. Sunset was at 19:44, civil twilight was at 20:10 and nautical twilight ended at 20:41. Both Masters described the visibility as good at the time.
1.25 Tidal predictions for Sydney Harbour are calculated from daily tide recordings made at Fort Denison which is a standard port. The tide prediction on 18 February 2014 was for a low of 0.37 metres at 17:26 flooding to a high of 1.52 metres at 22:39. However, the recorded height at 18:54 when the incident occurred was 0.66 metres, 0.11 metres higher than predicted. Wind speeds at Fort Denison at 18:50 were recorded as 5 knots from the east-nor-east at 072°.

1.26 As the close quarters sequence of events occurred close to Fort Denison, the tide and wind influence were not considered to be contributing factors.

**Passage plans**

**Collaroy**

1.27 The four HCF Freshwater Class ferries have a comprehensive sailing plan in place for operation between Circular Quay and Manly wharves which has been in existence since this class came into operation in 1982. Prior to 1982 all ferries travelling on the Manly service also followed this established route as part of the sailing plan to enable regular passenger services to run to a timetable. Masters of commercial vessels operating within the port are aware of the normal passage taken by these ferries as they operate both day and night services along the same corridors within the Harbour seven days a week.

1.28 The normal course from Circular Quay to Manly is for the ferry to turn to starboard after exiting Circular Quay at Bennelong Point and proceed east to pass south of Fort Denison keeping the Garden Island port lateral mark to the south. This course keeps the ferry north and clear of naval moorings No.3, No.3A and No.3B between Garden Island and Clarke Island to the east of the Fort. The ferry then proceeds south of the safe water mark off Bradley’s Head, turns around the mark and proceeds northward down the starboard side of the Western Channel across the heads to Manly.

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3 Standard Port: A place for which independent daily predictions are given in the tide or stream tables, from which corresponding predictions are obtained for other locations, known as secondary ports, by means of differences or factors.
In this incident both Collaroy and Carnival Spirit were travelling the same route outbound from Circular Quay. To avoid congestion Collaroy’s Master decided to navigate to the stern of Carnival Spirit then proceed north of Fort Denison to Bradley’s Head safe water mark. This would allow him to overtake Carnival Spirit and remain on or close to timetable as he could travel at Collaroy’s service speed of 14 knots while Carnival Spirit was restricted to a speed of 10 knots up to Bradley’s Head.

This course was only available to Collaroy provided there was no inbound shipping north of Fort Denison and permission to deviate from the normal passage plan was obtained from VTS.

**Captain Cook II**

At the completion of shuttle services in Darling Harbour, the passage plan for Captain Cook II was to navigate north out of Darling Harbour, turn to starboard around Millers Point, proceed east under the Harbour Bridge and, when clear of Kirribilli Point and traffic, turn to port and proceed north to the Neutral Bay base.

The Safety Management System (SMS) for Captain Cook II requires the Master to comply with the Harbour Master’s Direction in relation to passage around seagoing ships.

**Vessel movements**

The events and movements of the vessels, taken from the descriptions by the Masters, are set out below.

Collaroy departed No.3 Wharf East, Circular Quay, at 18:52 on a scheduled passenger service to Manly with 350 passengers and a crew of six onboard. Collaroy was driven from the No 1 wheelhouse and operated in the sailing mode.

The Master reported:

The “Carnival Spirit” had let go about 25 mins before my departure and had completed a turn in front of Circular Quay and proceeding out bound. My intentions were to pass “Carnival Spirit” at a safe
distance astern and proceed down her port side, navigating north of Fort Denison and safely over taking the "Carnival Spirit".

Upon departing Circular Quay on a due north course around the stern of “Carnival Spirit” I observed “Captain Cook II” on an easterly course passing under the Harbour Bridge. I assessed “Captain Cook II” as the give way vessel. “Captain Cook II” made no course deviation or speed change and was proceeding at a course that would bring us dangerously close. I blew six short blasts on my ship’s whistle but “Captain Cook II” did not respond. I took all way off my vessel (stopped propeller). “Captain Cook II” kept on coming and we were less than six inches from a collision.

1.36 The Master of Captain Cook II reported:

At approx 1850 hrs a close quarters situation developed off Kirribilli Pt with the ferry “Collaroy”, which came up fast on my starboard quarter outbound from Circular Quay. After hearing “Collaroy’s” whistle I started to move to port which was restricted by two inbound ferries. At the time I was following about 80 metres behind “Carnival Spirit” on my way to Neutral Bay and believe “Collaroy” was pushed sideways towards me by the liners wake. No contact was made between the vessels. “Collaroy” had not sought clearance to deviate from the normal ferry route prior to the incident.
PART 2 ANALYSIS

Introduction

2.1 The investigation involved detailed examination of the relevant AIS, radar, CCTV and communications recordings captured by the SPC VTS integrated vessel tracking system. Information from Collaroy’s radar, FLIR and VDR, and CCTV from Milsons Point Wharf captured by HCF, was also analysed.

2.2 The Masters of Collaroy and Captain Cook II were interviewed and were shown radar, AIS recordings and CCTV obtained from VTS. The Engineer from Captain Cook II and the ‘trainee’ GPH from Collaroy were also interviewed.

2.3 Safety Management Systems (SMS), logs, crew rostering and training records for both vessels were examined.

2.4 OTSI investigators inspected Captain Cook II on 28 March 2014 and Collaroy on 8 April 2014.

Sequence of events

2.5 The following describes positions and headings of Captain Cook II and Collaroy leading up to the point at which they were closest. These positions and distances were developed from VTS AIS recordings and radar and Collaroy’s radar and FLIR recordings. A plot of the relative positions of the two vessels is shown on the Chart Extract at Figure 2.

2.6 At 18:52 Collaroy had departed No.3 Wharf East heading north. Carnival Spirit had negotiated her turn after departing the Passenger Terminal stern first with her bows pointing east. Captain Cook II was west of the Harbour Bridge heading east on a course of 085° at 7.8 knots.

2.7 At 18:53:08 Collaroy was on a course of 005° and her speed had increased to 12.9 knots. Captain Cook II was proceeding on a course of 090° at a speed of 7.8 knots and was east of the Harbour Bridge.

2.8 At 18:53:45 Collaroy was heading 021° at 11.1 knots and Captain Cook II was maintaining a steady course which would intersect Collaroy’s current path.
Ferries Seacat 2, Supercat4 and Borrowdale were all travelling west and were to the north of Carnival Spirit which was proceeding east.

2.9 At 18:53:49 Collaroy sounded six short blasts on her horn which sought a response from Captain Cook II as to her intentions as they were not clear to Collaroy. At this time Captain Cook II was 160 metres from Collaroy and on her port side ahead.

2.10 At 18:53:56 Collaroy was on a course of 038° and had reduced speed to 9.5 knots. Captain Cook II continued on her course and did not respond to Collaroy’s signal.

2.11 At 18:54:11 Collaroy was on a course of 058° at a speed of 7.9 knots, continuing to turn to starboard and reduce speed.

2.12 At 18:54:28 Collaroy was now at 6.7 knots heading 059° with Captain Cook II less than 20 metres away. At this time both AIS and radar showed both vessels together.

2.13 At 18:54:46 Collaroy was on a heading of 079° still swinging to starboard and had reduced speed to 4.8 knots. Both vessels were almost touching.

2.14 CCTV captured from Milsons Point Wharf clearly showed the two vessels converging (see Photographs 3 to 8). It also showed Captain Cook II continued on at the same speed until alongside Collaroy’s port side when it then moved slightly to port and increased speed.
Figure 2: Chart Extract - Plot of Collaroy and Captain Cook II

Collaroy sounds 6 short blasts

Capt. Cook II

Milsons Point Wharf CCTV
Photographs 3 to 8: Sequence showing Collaroy and Captain Cook II converging

Photograph 3

Photograph 4
Visibility

2.15 *Carnival Spirit*, while manoeuvring from its berth stern first and until it had swung and commenced its course to sea, restricted visibility between vessels departing Circular Quay and vessels inbound from the north and north-east.
around Kirribilli Point. However, once swung, it did not impede visibility between Captain Cook II and Collaroy on their respective course headings.

Collaroy

2.16 Collaroy’s bridge provided the Master and the ‘trainee’ GPH with him on the bridge with good unobscured visibility forward and to the sides of the vessel. Having two people on the bridge was advantageous in enhancing the lookout capacity. The bridge is approximately 9 metres above the water surface which further enhances visual observation and recognition of other traffic and objects (see Photograph 9). The Master also has the benefit of operational radar, FLIR and GPS to assist in navigation.

Photograph 9: View from Collaroy Bridge

2.17 The Master was able to identify other traffic in the area to his immediate east and west but Carnival Spirit blocked his view to the north-east and restricted radar and FLIR imaging in that sector. The Master of Collaroy had not turned his radar from the standby position to the run position when departing Circular Quay as he was fully occupied with visual observations. As visibility was good he did not require radar at that time.
Captain Cook II

2.17 The bridge position on Captain Cook II also has good visibility at a height of 5.56 metres above the water (see Photographs 10 and 11). Unlike the Collaroy, the Master did not have the benefit of radar, FLIR or GPS to assist in determining other vessels’ courses and speeds. He had to rely on his own experience and observations to determine the proximity of other vessels.

Photograph 10: View from Captain Cook II bridge

2.18 Unlike Collaroy, Captain Cook II only had the Master on the bridge to keep a lookout. The GPH is mostly occupied on lower decks and not in a position to assist the Master with lookout duties and observation of other traffic. The Master has to call the GPH by portable radio if he requires assistance during operation.

2.19 After passing under the Harbour Bridge, the Master’s view of vessels departing Circular Quay and vessels proceeding inbound along the Kirribilli shoreline was not obstructed by Carnival Spirit ahead.
Navigation

Captain Cook II

2.20 The Master stated in his initial report of the incident that Collaroy “came up fast on my starboard quarter” indicating that Collaroy was an overtaking vessel. Based on radar, CCTV and AIS evidence Collaroy was never astern of Captain Cook II. The two vessels were crossing vessels and Captain Cook II was required by the Collision Rule to give way.\(^4\)

2.21 At interview the Master of Captain Cook II indicated that he was aware of a Manly ferry departing Circular Quay, however, he could not identify it as the Collaroy as he did not have AIS. He did not subsequently observe Collaroy on his starboard side as he continued on his course and the two vessels converged. He heard what he described as a long whistle blast but did not respond to this signal. He did not reduce speed or alter course until his Engineer alerted him to the Collaroy’s very close proximity. He intimated that he was focused on the ferries travelling west and the wash of the Carnival

\(^4\) Refer to COLREGS Rule 15 Crossing situation and Rule 16 Action by give-way vessel.
2.22 The Engineer described coming from the engine room doorway at the stern of Captain Cook II onto the main deck and seeing Collaroy within 2 metres on the starboard side. He ran up the stairs to the wheelhouse on the top deck and alerted the Master to Collaroy's position calling, “... we are going to hit”. As he entered the wheelhouse, the Engineer observed the Master looking towards other ferries ahead and on his port side inbound. The Master's response to the Engineer's alert was to look towards Collaroy then push both throttles to full ahead and steer slightly towards port. The Engineer described the normal throttle setting for operations at about 1000 rpm being increased to the maximum 1400 rpm.

2.23 The Master of Captain Cook II also in his initial report stated: “… and believe Collaroy (from Sydney Cove) was pushed sideways towards me by the liners wake”. The Master described being about 100 metres from the stern of Carnival Spirit and believed his speed was reduced from 7.8 knots to about 5 knots due to the wash. However, this could not be verified in the absence of instrumentation such as log, GPS or AIS. Given his belief that Captain Cook II had been affected by the wash from Carnival Spirit, he assumed the same had occurred to Collaroy.

2.24 Between 18:52:18 and 18:54:28 (2 minutes 10 seconds) Captain Cook II travelled a distance of 489 metres on a steady course of 090° heading directly for Kirribilli Point. This equates to a speed of 7.3 knots which indicates the wash of Carnival Spirit had little effect on his vessel. This was also supported by CCTV images captured from Milsons Point ferry wharf which showed no speed reduction of Captain Cook II on its passage from under the Harbour Bridge until the two vessels were alongside each other.

2.25 Examination of the FLIR recording from Collaroy revealed no evidence of it being affected by Carnival Spirit's wash and pushed towards Captain Cook II.

2.26 In his report to AMSA the Master stated: “Collaroy had not sought clearance to deviate from the normal ferry route prior to the incident.” This statement indicates that the Master of Captain Cook II expected Collaroy to turn to...
starboard earlier, and close to Bennelong Point, and not travel further north to the stern of *Carnival Spirit* before turning east.

2.27 *Collaroy* was not required to seek permission for this course from VTS at this time. It is a normal practice to choose this route if available when encountering large ships outbound. This course allows a ferry travelling to Manly the opportunity to maintain scheduled services by passing a slower ship which is restricted by the 10 knot speed limit.

2.28 The Master of *Captain Cook II* had unobstructed visibility of *Collaroy* departing Circular Quay and with the additional warning signal from *Collaroy* should have complied with his obligations under the Collision Regulations and given way rather than maintaining his course and speed.

2.29 The Master of *Captain Cook II* indicated there was no delay in the vessel’s engines going from ahead to astern. However, he was aware that all the Manly ferries had a delay when operating in the sailing mode due to the variable pitch propeller requiring the hull speed to drop to below 5 knots before engaging astern.

**Collaroy**

2.30 The information obtained from the VTS capture of radar, AIS and CCTV substantiates the report by the Master of *Collaroy* that, when he sounded his ships whistle, *Captain Cook II* was 160 metres approaching on his port bow and with this warning should have initiated actions to prevent the situation from developing.

2.31 *Collaroy’s* Master indicated that, due to the presence of *Carnival Spirit*, when leaving No.3 Wharf East he decided to steer to a position at the stern of *Carnival Spirit* which would allow him to overtake down the port side knowing *Carnival Spirit*’s speed was less than *Collaroy’s* sailing mode speed of 14 knots. When he reached a position to fully observe if there was inbound traffic north of Fort Denison he would, if permission was granted by VTS, travel north of Fort Denison.

2.32 At interview, *Collaroy’s* Master stated that he was able to see the Master of *Captain Cook II* at the helm position prior to sounding six short blasts and observed that the Master did not turn his head and look towards *Collaroy* at
any time as the two vessels converged. He described another person come to the starboard bridge on Captain Cook II when the two vessels were almost together.

2.33 On determining Captain Cook II was not altering course or reducing speed Collaroy’s Master stopped his engine and turned more acutely to starboard to prevent a collision.

Close quarters

2.34 The Marine Safety (Domestic Commercial Vessel) National Law 2012 defines ‘close quarters’ as “a situation in which vessels pass each other, or a vessel passes another vessel, a person or an object, in such proximity that a reasonable person would conclude that in all the circumstances there was a risk of an imminent collision”.

2.35 The United Kingdom’s maritime regulator, the Maritime Coastguard Agency, identifies “closing speeds of the vessels involved, manoeuvring characteristics, visibility, weather, traffic density, restricted or open waters, will all have an influence on determining at what distance a close-quarters situation begins to exist”.

2.36 As Collaroy proceeded north from No.3 Wharf East, Captain Cook II was on Collaroy’s port side. Their courses and speeds placed them in potential danger of collision if they continued. Captain Cook II was required by Rule 15 of the COLREGS to give way to Collaroy by taking early and substantial action to keep well clear. This could be achieved by altering course or stopping or slowing down to allow Collaroy to pass ahead.

2.37 On determining the two vessels were on a collision or near collision course, the Master of Collaroy sounded six short blasts seeking to know what Captain Cook II intended doing. However, Captain Cook II did not respond to this signal though there was ample time and space in which to give way and allow Collaroy to pass ahead.

2.38 The Master of Collaroy was required by Rule 17 of the COLREGS to maintain course and speed, assess the dangers of the situation then take such action
as would best avoid collision. This he did by stopping forward propulsion and continuing to turn increasingly acutely to starboard.

Manoeuvring and warning sound signals

2.39 In accordance with Rules 32 and 33 of the COLREGS, all vessels are required to have appropriate devices for signalling intentions or give warnings to other vessels within hearing. The Master of Collaroy complied by sounding six short blasts seeking Captain Cook II “to state her intentions” when he determined the two vessels were on a possible collision course. Captain Cook II did not respond.

Communications

2.40 Both Collaroy and Captain Cook II were on Channel 13 VHF as required by VTS and could have communicated with each other directly or through VTS as the situation developed.

2.41 The Master of Captain Cook II called VTS on Channel 13 when departing Cockle Bay and maintained radio watch throughout. He stated that he heard the request from Collaroy to VTS after the incident for Collaroy to pass north of Fort Denison but did not hear Collaroy seek permission to deviate from its normal course on departing Circular Quay. Captain Cook II did not initiate any communications until arrival and securing of the vessel at Neutral Bay indicating Channel 13 VHF was available to him.

2.42 When interviewed, the Master of Captain Cook II indicated that, with many vessels operating and many of the same design (HCF First Fleet Class for example) he was not able to immediately identify the name of the vessel without having AIS available to assist identification.

2.43 Collaroy’s Master made no attempt to communicate with Captain Cook II on VHF as the situation developed. He reported the close quarter occurrence to VTS before seeking permission to pass north of Fort Denison after the incident when he was closing on Carnival Spirit’s port quarter. Like Captain Cook II communication was available.
Safety management systems

2.44 The operators of both Captain Cook II and Collaroy are required to comply with the requirements of sections 12(2) (b), 16(2) and 48(5) (e) of the Marine Safety (Domestic Commercial Vessel) National Law Act 2012 in relation to SMSs. Both HCF and CCC have in place robust SMSs which have been developed over many years of operation and are constantly reviewed and upgraded as operations require. Both fleets are regularly audited by the RMS SMS Auditor/Surveyor Section.

Training and drills

2.45 HCF conducts regular training of all crews onboard all vessels with regular drills being conducted covering all emergency procedures. Drills are scenario-based with crew members physically responding to different emergency situations and utilising the necessary equipment. Debriefing is conducted on completion and a register is kept containing the details of all drills performed and the crews involved.

2.46 At the time of the reported incident all crew onboard Collaroy had recently been involved in drills. In the 12 months prior to the incident, the Master had conducted 24 drills which involved Critical Control Failures (CCF) and Crew Resource Management (CRM). The Engineer had undertaken 20 drills including CCF/CRM drills. The ‘trainee’ GPH who was on the bridge at the time had received training and participated in 13 drills since being endorsed for duty on the Collaroy on 8 November 2013. The remaining three GPHs had all received training and participated in drills including CCF/CRM.

2.47 CCC maintained a comprehensive register of crew training of all crew performing duty onboard its vessels. The crew onboard Captain Cook II at the time of the incident had performed the following drills in the period January 2013 until the time of the incident on 18 February 2014:

- Master - 11 drills, one on Captain Cook II
- Engineer - 21 drills, three onboard Captain Cook II
- GPH - 17 drills, one onboard Captain Cook II.
2.48 The drills on other than Captain Cook II were performed on vessels of similar size and type. The drill records examined indicated the crew were competent in all emergency procedures.
PART 3 FINDINGS

3.1 There is sufficient evidence to establish that a dangerous close quarter situation developed on Sydney Harbour on the evening of 18 February 2014 which resulted from the manoeuvring of the vessels Captain Cook II and Collaroy.

Contributing factors

3.2 After passing under the Harbour Bridge en route from Cockle Bay to Neutral Bay, the Master of Captain Cook II was aware of a Manly Ferry (Collaroy) departing Circular Quay. However, he was focussed on inbound ferries ahead and the wash from Carnival Spirit outbound, and did not further observe Collaroy on his starboard side.

3.3 Instead of turning east immediately after rounding Bennelong Point on the regular passage to Manly, Collaroy proceeded further north to the stern of Carnival Spirit before turning. This change from the normal course was not expected or observed by the Master of Captain Cook II and he maintained his course and speed and did not give way to Collaroy as required.

3.4 As the ferries were converging, Collaroy sounded six short blasts but Captain Cook II did not respond. Consequently, the vessels came within approximately 2 metres of colliding before Collaroy had completed evasive action.

3.5 Neither Master attempted to communicate with the other either directly or via VTS on VHF radio.

Other safety matters

3.6 The Master of Captain Cook II did not have the assistance of a lookout on the bridge.

3.7 The Master of Captain Cook II did not have the benefit of a log for recording vessel’s speed. Consequently, he was not able to determine if his vessel was being affected by wash from Carnival Spirit.
3.8 *Captain Cook II* did not have AIS. Not all passenger carrying vessels have AIS though it provides a very useful additional means for crew to establish the identity, course and speed of other vessels.

3.9 There is an error in the *Marine Safety (General) Regulation 2009*.

**Remedial action**

3.10 *Captain Cook II* has been fitted with AIS Type B.
PART 4  RECOMMENDATIONS

4.1 The following recommendations are made in the interests of contributing to a safe maritime environment on Sydney Harbour.

Transport for New South Wales

4.2 Initiate action to have Section 3 of Schedule 3A General navigation requirements of the Marine Safety (General) Regulation 2009 corrected:

1) A vessel must not be operated within 100 metres of the Port Lateral Marker at Bennelong Point, unless the vessel is departing from:
   (a) Sydney Cove Wharf 5, or
   (b) Sydney Cove Wharf 6, or
   (c) the Eastern Pontoon.

Change (a) and (b) to read wharves 2 and 3 only, to allow vessels departing Sydney Cove from the eastern side to negotiate east bound traffic with less interference.

4.3 Require all public passenger carrying vessels operating within Sydney Harbour to be fitted with AIS.

Captain Cook Cruises

4.4 Undertakes an analysis of the risks associated with having the masters of ferries such as Captain Cook II not having the assistance of a lookout on the bridge when navigating within the high traffic density area defined by Bennelong and Kirribilli Points to the east and Blues Point to Goat Island to the west.

4.5 Expedites the installation of AIS on all passenger carrying vessels within its fleet.
### Appendix 1: Vessel Information – *Captain Cook II*

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Captain Cook II</td>
</tr>
<tr>
<td>Vessel Type</td>
<td>Passenger Ferry</td>
</tr>
<tr>
<td>Registered owner</td>
<td>Sealink Pty. Ltd</td>
</tr>
<tr>
<td>Manager / Operator</td>
<td>Captain Cook Cruises</td>
</tr>
<tr>
<td>Construction</td>
<td>Steel</td>
</tr>
<tr>
<td>Builder</td>
<td>State Dockyard (Carrington Slipway), Newcastle, NSW</td>
</tr>
<tr>
<td>Launched</td>
<td>1988</td>
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<tr>
<td>Length</td>
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<tr>
<td>Breadth</td>
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<tr>
<td>Draught</td>
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<tr>
<td>Displacement</td>
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<tr>
<td>Engine</td>
<td>Two Gardner marine diesel engines</td>
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<tr>
<td>Power</td>
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<tr>
<td>Service speed</td>
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<tr>
<td>Propeller</td>
<td>Fixed propellers</td>
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<tr>
<td>Crew</td>
<td>3 (Master, Engineer, 1xGPH)</td>
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<tr>
<td>Equipment</td>
<td>VHF Radio</td>
</tr>
<tr>
<td>Survey Class</td>
<td>1E</td>
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<tr>
<td>Identifying Number</td>
<td>17455</td>
</tr>
<tr>
<td>Passengers</td>
<td>257 plus crew of 3 (max)</td>
</tr>
</tbody>
</table>
Appendix 2: Vessel Information - Collaroy

Name: Collaroy
Vessel Type: Freshwater class ferry
Registered owner: NSW Government
Manager / Operator: Harbour City Ferries
Construction: Steel with aluminium superstructure
Builder: State Dockyard (Carrington Slipway), Newcastle, NSW
Launched: 1988
Length: 70.4 metres
Breadth: 12.5 metres
Draught: 5.5 metres
Displacement: 1140 tonnes
Engine: Two Daihatsu marine diesel engines
Power: 2238kW
Service speed: 14 knots
Propeller: Variable pitch propellers
Crew: 6 (Master, Engineer, 4xGPH)
Equipment: AIS type A, FLIR, VHF Radio, Radar
Survey Class: 1D
Identifying Number: 15528
Passengers: 1100 (max)
Appendix 3: Sources, Submissions and Acknowledgements

Sources of Information
- Captain Cook Cruises Pty Ltd
- Harbour City Ferries
- Roads and Maritime Services
- Sydney Ports Corporation

References
- Charts Aus 200 and Aus 202
- Marine Safety (General) Regulation 2009
- NSW Navigation (Collision) Regulations 1983 (which incorporates the International Regulations for Preventing Collisions at Sea)
- Passenger Transport Act 1990 (NSW)
- Sydney Ports Corporation – Harbour Master’s Directions for Sydney Harbour and Port Botany

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 Marine Safety Authority
- Captain Cook Cruises Pty. Ltd
- Harbour City Ferries
- Roads and Maritime Services NSW
- Sydney Ports Corporation
- Transport for NSW
Written responses were received from Harbour City Ferries, Captain Cook Cruises, Transport for NSW and Roads and Maritime Services. 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 Chart Extracts contained in the Report are used with the permission of Garman MapSource Blue Chart (R) Asia, Australia and New Zealand.
- Screen shots included in this report are taken from SPC VTS capture of Radar, CCTV and AIS recordings reproduced with permission of Sydney Port Corporation.
- Collaroy VDR and Radar downloads supplied by Harbour City Ferries.
- CCTV screen shots from Milsons Point Wharf provided by Harbour City Ferries.
- Cover Photo and Photo 1 were provided by Captain Cook Cruises.