Report on the investigation of

the loss of a passenger overboard from

Hurlingham

at Westminster Pier, on the River Thames

17 August 2008

Marine Accident Investigation Branch
Carlton House
Carlton Place
Southampton
United Kingdom

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Extract from

The United Kingdom Merchant Shipping

(Accident Reporting and Investigation)

Regulations 2005 – Regulation 5:

"The sole objective of the investigation of an accident under the Merchant Shipping (Accident Reporting and Investigation) Regulations 2005 shall be the prevention of future accidents through the ascertainment of its causes and circumstances. It shall not be the purpose of an investigation to determine liability nor, except so far as is necessary to achieve its objective, to apportion blame."

NOTE

This report is not written with litigation in mind and, pursuant to Regulation 13(9) of the Merchant Shipping (Accident Reporting and Investigation) Regulations 2005, shall be inadmissible in any judicial proceedings whose purpose, or one of whose purposes is to attribute or apportion liability or blame.

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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

BML	-	Boat Masters Licence
CCTV	-	Closed Circuit Television
DSMC	-	Domestic Safety Management Code
ILB	-	Inshore Lifeboat
ISM	-	International Safety Management (Code)
LRS	-	London River Services
MCA	-	Maritime and Coastguard Agency
MGN	-	Marine Guidance Notes
MOB	-	Man Overboard
MSN	-	Merchant Shipping Notice
PLA	-	Port of London Authority
RNLI	-	Royal National Lifeboat Institution
SAR	-	Search and Rescue
STCW	-	International Convention on the Standards of Training, Certification and Watchkeeping 1995 (as amended)
TfL	-	Transport for London
VHF	-	Very High Frequency
VTS	-	Vessel Traffic Services

Times: All times in this report are local (UTC + 1) unless otherwise stated

Hurlingham

SYNOPSIS

Late in the evening of 17 August 2008, a passenger fell into the River Thames and died as he was attempting to disembark from the passenger vessel *Hurlingham* onto Westminster Pier after an evening party.

Hurlingham was secured to Westminster pier using one mooring line at the bow, and the skipper had left the wheelhouse unattended with the engine in gear while he attended to the bar account and tidied up after the party. The stern of the boat drifted away from the pier, and the mate moved from his position on the pier, supervising the passengers disembarking, to manoeuvre the boat back alongside and attach two more mooring lines. No gangway was used and passengers were allowed to continue disembarking unsupervised while the boat was put back into position.

Shortly after the stern was brought back into the pier, a gap opened up between the front of the boat and pier at the point where passengers were disembarking. One passenger stepped forward and fell into the gap. Despite an extensive search, he could not be found and his body was recovered further downriver on 22 August 2008. A postmortem determined cause of death to be '*drowning in the presence of alcohol intoxication'*.

The investigation found that: the skipper was distracted from his primary responsibilities of ensuring the safety of the vessel and passengers, by other duties concerning the running of the licensed bar and by tidying up after the party; the vessel was not adequately secured; and the mate had left his position, supervising and assisting passengers, to reposition, and secure the boat. Also, the vessel's safety management system was poor, with ineffective emergency drills, flawed risk assessments and inadequate procedures for mooring and passenger disembarkation.

The owners have, during the course of the investigation, made a number of improvements to their safety management system. The Port of London Authority (PLA), in partnership with the Maritime and Coastguard Agency (MCA), London River Services (LRS) and the Passenger Boat Association, has developed a Code of Practice for Passenger Vessel Operations on the River Thames which provides detailed guidance to operators to supplement regulations in the Domestic Passenger Ships Safety Management Code (DSMC).

In a safety bulletin, issued shortly after the accident, MAIB recommended that the MCA and LRS took urgent action to satisfy themselves that Class V passenger vessels operating on the River Thames had effective systems in place to ensure their safe operation. In addition, the MCA has been recommended to improve the guidance available to operators for complying with the DSMC; and to improve the targeting of inspections on the operation of these vessels. LRS has also been recommended to assess the risks associated with the movement and control of passengers on its piers at night. A number of detailed recommendations have been made to the owners of *Hurlingham* on aspects of their safety management system, conduct of crew and arrangements for passenger access.

SECTION 1 - FACTUAL INFORMATION

1.1 PARTICULARS OF *HURLINGHAM* AND ACCIDENT

Vessel details

Registered owner	:	Thames Cruises Ltd
Port of registry	:	London
Flag	:	UK
Type	:	Class V Passenger Vessel
Built	:	1915, Salter Brothers, Oxford
Construction	:	Steel
Length overall	:	30.93m
Gross tonnage	:	113.99
Engine type	:	Gardner 6LX driving a fixed pitch, four bladed propeller through a reversing gearbox
Service speed	:	9 knots

Accident details

Time and date	:	2324, 17 August 2008
Location of incident	:	Westminster Pier, River Thames, London
Persons on board	:	127 comprising: 2 marine crew, 2 bar staff, 1 caterer, 1 DJ and 121 passengers
Injuries/fatalities	:	One passenger died after falling overboard
Damage	:	None

1.2 NARRATIVE

1.2.1 Evening cruise

Thames Cruises Ltd operates five vessels and specialises in providing boats for charter by companies and groups. *Hurlingham* had been booked by a local company for its annual staff party, to cruise on a circular route from Westminster Pier to Greenwich **(Figure 1)**, with a licensed bar, buffet and disco.

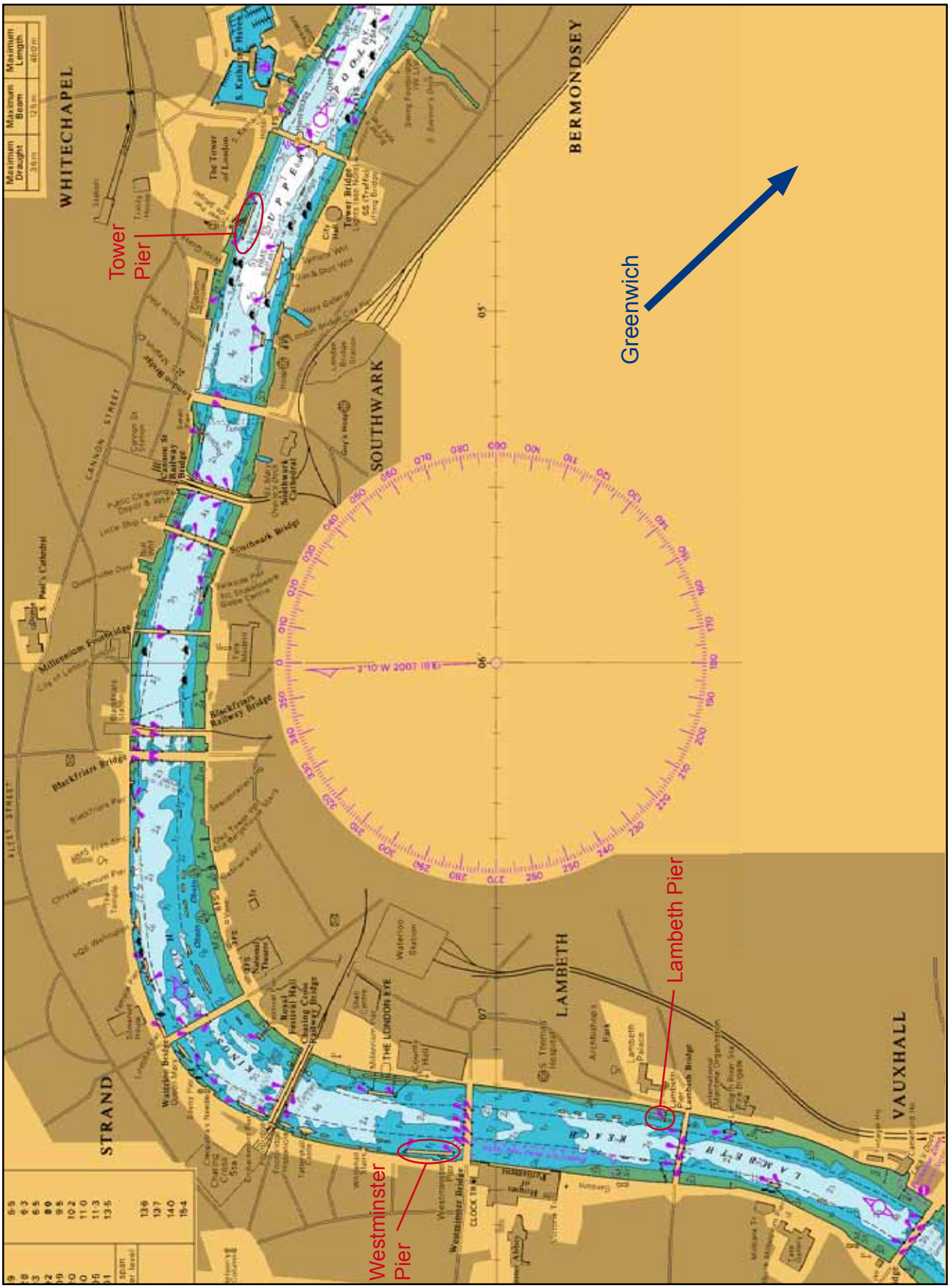
The boat was kept at Lambeth Pier. On 17 August 2008, the skipper arrived at about 1600 to prepare the boat for the party. As it was a Sunday, the company's office was closed. He checked the overall condition of the boat, cleaned the public areas and worked through the pre-sailing, safety and engine checks. The mate had been working on another of Thames Cruises' boats from 0800 that morning. He arrived at Lambeth Pier at 1800 and boarded *Hurlingham* at 1815. The two bar staff and the caterer arrived and, at 1855, *Hurlingham* left Lambeth Pier for the short journey to Westminster Pier.

The skipper brought *Hurlingham* alongside Westminster Pier **(Figures 2a and b)** and, due to the effect of turbulence from Westminster Bridge, he asked the mate to secure it with head and midships lines. The skipper left the propeller engaged in astern gear and the engine running at idle to put some tension on the mooring line and draw the boat into the pier. The layout of the boat and height of the pier made it preferable for passengers to embark using the forward entrances. These were on the turn of the bow, and it was normal practice for the boat to berth at a slight angle against the pier and for passengers to step directly from the pier onto the boat. A gangway was not routinely used, and none was used throughout that night.

The party organiser boarded to meet the skipper and mate, and shortly afterwards passengers started to embark. The skipper and mate stood at the entrance gate and the skipper used a hand counter to record the number of passengers boarding. At 1927, *Hurlingham* left Westminster Pier and sailed upriver towards Lambeth Bridge. The boat then turned and headed downriver to Tower Pier to pick up some more passengers. Although a standard safety announcement was made during this period, not all the passengers heard it due to the background noise from the party.

River traffic at Tower Pier was heavy, and the only berth available to *Hurlingham* was the one set aside for the regular commuter service. The skipper brought *Hurlingham* alongside at this berth and the mate secured the boat with a single headline. The boat was head into the ebbing tide and the effect of this, the wind blowing onto the berth, and the engine running astern, was sufficient to hold her close against the pier. The skipper, mate and party organiser waited at the pier gate for the remainder of the passengers, but it was reported that they were going to arrive later than expected. The skipper was concerned that *Hurlingham* might obstruct the commuter service, and told the party organiser that he

Figure 1



Chartlet of the River Thames from Lambeth Pier to Tower Bridge

Figure 2a

Westminster Pier, viewed from the river

Figure 2b

Details of Westminster Pier

wanted to stand off the pier, stemming the tide to wait for the passengers to arrive. The conditions of the bar licence required the bar to be closed while the boat was alongside the pier, so standing off in mid stream also allowed staff to continue serving drinks. The party organiser had pre-paid for drinks at the bar; at about 2100 the initial £1250 float had been used up, and a further £1000 was provided. By 2115 the remainder of the passengers had arrived and the cruise got underway. A total of 121 passengers and 6 crew were on board.

The party was good humoured, and none of the passengers or crew reported any unruly or foolish behaviour. There was a company policy not to serve alcohol to passengers who were considered to have had too much to drink, and the bar staff did not report being unduly concerned by the state of any of the passengers that they saw ordering drinks.

1.2.2 Return to Westminster Pier

The skipper and mate took it in turns to take the wheel during the cruise, and on the return leg the mate passed control back to the skipper at Tower Bridge. As *Hurlingham* approached Westminster pier the tide was on the last of the ebb and there was very little stream flowing. However, the skipper expected the flood tide to start soon and turned *Hurlingham* to head downriver and into the expected tide, berthing port side to in the centre part of Westminster Pier.

The mate went to the forward open part of the deck, opened the boarding gate in the boat's port bulwark and prepared a headline. At 2316:30, he stepped onto the pier and secured the mooring line, as a head line, leading from a cleat forward of the gate on the boat, to a bollard on the pier which was also forward of a gate in the pier's guardrail. The mate then opened the gate on the pier and, 20 seconds later, the caterer and two passengers followed him onto the pier.

Once the head line was secured, the skipper put the engine astern to draw the boat up against the pier. He had not given the mate any specific instructions on how he wanted to moor the vessel, assuming that the mate would know what to do. The skipper looked down from the wheelhouse and saw the mate near the gate on the pier, and passengers on the forward deck preparing to disembark. The passengers partially obscured his view so that he could only see the forward mooring line. However, he assumed that the boat was adequately secured, and did not think it necessary to check the mooring arrangements. With the engine still running at low power astern, the skipper then left the wheelhouse to go down to the accommodation area, where he met the bar staff and checked whether the party organisers had signed to accept the bar account. One of the organisers came over, signed the account and thanked the skipper for the cruise. The skipper then went aft and up to the top deck to check that none of the safety equipment had been damaged. Finding it all in order, he began tidying up chairs and glasses.

1.2.3 Passenger disembarkation

Westminster Pier is fitted with a number of Closed Circuit Television (CCTV) cameras, two of which recorded the accident. The recordings from these were studied to determine how the passenger fell overboard. All the times referred to are from the CCTV recording system.

The mate had a brief conversation with the caterer and then moved to stand near the pier gate. At 2318:00 he re-boarded the vessel and moved two rubbish bags, that he thought were in the way of passengers, onto the edge of the pier. He stayed near the pier gate briefly, then went back on board *Hurlingham*. Very few passengers had left the boat at this stage, and the mate returned to the pier and leant on the pier guardrails just upriver of the gate opening, facing the boat and periodically drinking from a container.

At 2320:40 *Hurlingham*'s stern started to drift out into the river. The reason for this is not known, but as the wind was very light, it is most likely that it was either due to the effects of other vessels moving on the river, or turbulence from the changing tidal stream. Seventeen passengers disembarked across the widening gap, before the mate re-boarded at 2321:40. The mate went up to the wheelhouse and attempted to stop the swing. He then went back to the side of the boat to prepare a second mooring rope, attached to a cleat immediately aft of the disembarkation gate. The mate then made two further visits to the wheelhouse, using the controls to try and move the stern of the boat back alongside, and returning to the pier to attach the second mooring rope, and a third amidships. However, it was not until 2323:20 that *Hurlingham*'s stern started to swing back towards the pier, the angle between the vessel and the pier having reached a maximum of approximately 40º.

Both the gates on the pier and boat had been left open throughout, and by the time the mate returned to the pier at 2324:08 and secured the third and final, midships mooring line, a further 48 passengers had disembarked and 4 had re-boarded. At this time, the effect of the stern swinging into the pier caused the bow to move away to the limit of the forward mooring lines. A gap between *Hurlingham*'s deck and the pier opened up and passengers were seen having to make long strides to cross the gap. The mate went back up to the wheelhouse to take the engine out of gear.

One passenger, Mr Hernandez, moved towards the gate on *Hurlingham*. At 2324:48 he took one step forwards and fell into the gap that had opened up between the boat and the pier. The passenger immediately behind him shouted in alarm, and another passenger ahead of Mr Hernandez heard a splash as he entered the water. A few seconds later, *Hurlingham* reached the limit of the forward mooring ropes and moved back up against the pier. Passengers crowded around the immediate area at the front of the boat and on the pier, searching for Mr Hernandez, but were unable to see him. The mate was in the

wheelhouse and realised that something had happened. He became aware, from the shouts, that a passenger had fallen into the river, and he came down to the fore deck to look himself. He could not see anyone in the water and returned to the wheelhouse to call for help, using the VHF radio to contact London Vessel Traffic Services (VTS). London Coastguard also heard the transmission and activated Search and Rescue (SAR) plans.

1.3 EMERGENCY RESPONSE

The skipper had been at the aft end of *Hurlingham* tidying up after the party, and became aware that the stern had drifted away from the pier when he felt the engine movements that were being used to bring the vessel back alongside. He heard shouts coming from the front of the boat and moved forward to find out what was going on. He was met by the mate, who told him that one of the passengers had fallen into the river. The skipper moved towards the wheelhouse to call for assistance, but stopped when the mate told him that the emergency services were already on their way.

By 2325:44, one passenger had climbed over *Hurlingham*'s bulwark and was standing on the outboard part of the deck in an attempt to get a better view of the water. Other passengers were crowding round the forward part of the boat and the pier immediately opposite, searching for the man overboard. One passenger was on the outboard part of the pier, outside the guardrail, walking up and down as he spoke on his mobile telephone. A lifebuoy was taken from the starboard side of *Hurlingham*, and passengers lowered the light over the edge to help with the search. No-one reported seeing any sign of Mr Hernandez.

An 'E' Class Inshore Lifeboat (ILB) from the RNLI Tower station was on exercise, and once tasked by the coastguard it diverted to Westminster Pier. The skipper saw it approaching and decided that he should move *Hurlingham* off the pier to allow the ILB to search more effectively. He let go the mooring lines that were secured amidships and just aft of the gate, and told the mate to standby to release the forward mooring line. The skipper went to the wheelhouse and began to move the boat astern. The mate let the last line go, and at 2328:25 *Hurlingham* began to move off the berth. The boarding gate was shut, but one passenger remained standing outside the boat's bulwark.

Hurlingham turned and started to search upriver. The lifebuoy had been put into the water and the increasing flood tide had swept it upriver, past Westminster Bridge. The skipper manoeuvred the boat to recover it and to search for the missing passenger. Launches from the Police, and Fire and Rescue Services joined the search, but Mr Hernandez could not be found. A police helicopter using a night vision camera later searched the area, but nothing was seen and the coastguard terminated the search and rescue operation at 0047.

1.3.1 Subsequent action

Hurlingham returned to Westminster Pier and the skipper began his own search around the inboard parts of the pier **(Figure 3)**. He met up with the ILB crew, who confirmed that they had not been able to find the missing passenger on either side of the pier.

Police officers breathalysed the skipper and a negative result was recorded. The mate was not breathalysed.

Figure 3

Westminster Pier viewed from the river bank

1.3.2 Accident reporting

After the incident, the crew discussed what had happened. Some passengers had told the crew that Mr Hernandez might have gone home, and in the confusion it was not clear to them that he had actually been lost overboard. Nothing had been found during the extensive search, and the crew hoped that the reports of his loss were mistaken. Neither the skipper nor the mate reported the incident or their concerns to Thames Cruises, and the company was still unaware of the accident when contacted by the MAIB the following day.

The loss of Mr Hernandez could only be confirmed by a very small number of passengers who were eye-witnesses, and following careful study of the CCTV images.

1.4 THE VICTIM

Mr Hernandez was aged 32, and he was an employee of the company chartering the boat for the party. He had been at a festival during the afternoon before the party and was considered by friends and colleagues, who were with him during the evening, to be enjoying the party and showing the effects of alcohol consumption. His body was recovered downriver, at Embankment Pier on 22 August 2008. The postmortem examination reported that there was little evidence of any natural diseases and, specifically, no crush injuries. Toxicological analysis found evidence of alcohol consumption equivalent to more than 3.5 times the drink drive limit. The cause of death was recorded as "*drowning in the presence of alcohol intoxication*" [sic].

1.5 CREW

Hurlingham's skipper and mate held the appropriate Boatmasters licences (BML) with local knowledge endorsements to allow either of them to command the vessel. Both men had previously been licensed by the Port of London Authority (PLA) as Watermen and Lightermen, and each had been automatically awarded the BML in January 2007 when the new, national, Boatmasters scheme entered into force.

The skipper was aged 60 and had spent his entire working life on the River Thames. He had worked for Thames Cruises (and its predecessors) for 23 years, the last 15 of which as the regular skipper of *Hurlingham*. As the company's trade had changed, he had worked less for Thames Cruises and was in regular employment with a lighterage company. His work on *Hurlingham* was seasonal and predominantly during the evenings. In agreement with the directors of Thames Cruises, he was the Designated Premises Supervisor for the purposes of the bar alcohol licence. He managed the bar, employed the bar staff and also had a financial interest, taking a share of the profits to supplement his wages as skipper.

The mate was aged 23, and had completed his Waterman's apprenticeship before the BML came into force. He had worked on a number of commuter and pleasure boats on the river. He was self-employed and offered himself on a freelance basis to several different companies, either as mate or skipper. Although he was a Personal Licence Holder under the licensing regulations, as a casual employee, he did not have a financial interest in the bar.

One of the two bar staff was designated as a competent crewman to assist in an emergency. The skipper had shown him the location of the lifesaving and fire-fighting appliances, and had explained how to use them. His understanding of the role was to react to, and assist other crew in an emergency. His instructions in the event of a Man Overboard were to keep a lookout, standby with a lifebelt, and keep other passengers calm.

1.6 ACCESS ARRANGEMENTS

During the investigation, *Hurlingham* was brought alongside Westminster Pier to examine passenger access **(Figure 4)**. It was found that by bringing the boat into the pier at a shallow angle, the deck edge at the forward boarding gate could be brought up against the pier, without leaving a gap. *Hurlingham'*s deck was lower than the pier, requiring passengers to step up a distance of between 17 and 23cm depending on the number of people on board.

Figure 4

Possible means of access from *Hurlingham* to Westminster Pier

The fore deck disembarkation area was lit by background light from the accommodation of *Hurlingham* and from overhead lights on Westminster Pier. The combination provided general lighting but, on the evening of the accident, the immediate area of the gates on the boat and pier would have been in shadow **(Figure 5)**. The deck edge of *Hurlingham* was painted white, and the fender material at the edge of the pier was black.

Figure 5

General arrangements on Westminster Pier

Hurlingham also had midships doors on either side of the main deck accommodation, near the aft end of the bar where stairs led to the upper and lower decks. These doors were on the straight sided part of the hull, which would have been parallel to the pier had the boat been secured alongside in the conventional way. However, the deck sheer meant that these doors were lower than the forward boarding gates, such that the step needed to get up onto Westminster Pier would have been much greater. The accommodation area doors also opened inwards to about 90º, but then became jammed by the camber of the deck. This made this part of the boat extremely congested when the doors were opened with passengers on board and, although they were available as emergency exits, the accommodation doors were considered to be too awkward to use routinely.

1.7 PASSENGER SAFETY ON THE RIVER THAMES

Current regulations and operational practices for passenger vessels on the River Thames are heavily influenced by the collision in 1989 between the passenger vessel *Marchioness* and the dredger *Bowbelle*, which resulted in the deaths of 51 people. A number of investigations were made into the circumstances of the accident of which, for the purpose of this report, the most significant are the Thames Safety Inquiry (2000) and the Formal Investigation (2001), both by

Lord Justice Clarke. These reports made a number of recommendations, which have since been implemented. Of relevance to this accident are the following recommendations from the Formal Investigation report:

- Recommendation 11: "*We recommend that the consultation process relating to the introduction of the Safety Management Code for Domestic Passenger Ships be completed with the minimum of delay and the Code introduced as soon as possible*."[1]

- Recommendation 14: "*We recommend that all owners and operators of Class V passenger vessels should consider the training requirements for their crews, particularly in relation to emergency training and that consideration be given to extending the 'Crowd Management and Passenger Safety' training requirements in STCW95, Section A-V/2*[2] *to all persons working on Class V vessels, not only on the Thames but also nationally*."[3]

- Recommendation 17: "*We remind shipowners and operators of the importance of keeping accurate contemporaneous records and of the importance of ensuring that their standing orders include instructions to that effect and that such instructions should be monitored closely*."[4]

1.8 REGULATIONS

1.8.1 Domestic Safety Management Code

The Safety Management Code for Domestic Passenger Ships of Classes III – VI(A) came into effect on 1 November 2001. Often referred to as the Domestic Safety Management Code (DSMC), it was intended to establish a common standard for the safe operation of passenger ships operating in the UK. It was adapted from the International Safety Management (ISM) Code for large, seagoing ships and simplified to make it more manageable for small companies and owner operators.

The aim of the Code is to foster a culture of safety management and, specifically, it requires operators to develop and implement safe practices and procedures for:

- health and safety protection;

- ensuring the safe operation of ships in compliance with the relevant rules;

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[1] Recommendation 11: Statutory Instrument 2001:3209 'The Merchant Shipping (Domestic Passenger Ships) (Safety Management Code) Regulations 2001 refers.

[2] International Convention on the Standards of Training, Certification and Watchkeeping for Seafarers 1995.

[3] Recommendation 14: Marine Guidance Notes (MGN) 203, Crew Training for Personnel Serving on Domestic Passenger Vessels and MGN 290, Local Passenger Vessels: Manning refers.

[4] Recommendation 17: MGN 158, Safety Management Code For Domestic Passenger Ships of Classes III-VI(A) refers.

- lines of communication between personnel, ashore and afloat;
- reporting accidents; and
- responding to emergency situations.

These must be written and may be presented in a checklist format. The Code also requires that personnel receive training appropriate to the tasks they are expected to undertake, and that they have an understanding of the relevant regulations. Guidance on how to comply with the Code states that each employee should have '*familiarisation training and proper instruction in onboard procedures … including mooring and unmooring*.'

1.8.2 Safe Means of Access

The Merchant Shipping (Means of Access) Regulations 1988 set out the duties of the employer and the vessel's master, who must ensure that there is a safe means of access between the ship and any quay, pontoon or similar structure. Any access equipment and the immediate approaches to it must be adequately illuminated. Although the regulations require any ship over 30 metres registered length to carry a gangway, and the regulations comment in detail about other access equipment, there is no explicit requirement for a gangway to be used.

1.9 SAFETY MANAGEMENT SYSTEM

The introduction of the DSMC was a major change and Thames Cruises, like many other operators on the River Thames, sought assistance from consultants to produce the necessary paperwork needed to comply with the Code. A Marine Safety Management Manual was produced, and copies of it were put on board each of the company's five boats.

1.9.1 Safety manager

Soon after the Code came into effect, a safety manager joined the company on a part-time basis to manage the paperwork and act as the Designated Person Ashore, providing the communications link between the crews and management. The safety manager was responsible for the '*monitoring of vessel safety*' [sic], by providing and communicating guidance, policies and procedures to all other staff. This included ensuring compliance with regulations, maintaining the marine safety management system as well as accident reporting and investigation.

Although the safety manager described attempts to get crew involved in the safety management system, at the time of the accident, it was evident from descriptions of the role that it had reduced to producing enough paperwork to satisfy the regulations.

1.9.2 Marine Safety Management Manual

Crew were required to sign the Marine Safety Management Manual to record that they had read and understood it. The manual found on board *Hurlingham* at the beginning of the investigation had been signed by the managing director on 21 November 2007, but there were no signatures on the appropriate page for crew. Although other crew had signed manuals on other Thames Cruises' vessels, the safety manager reported that it was difficult to ensure the signature pages were kept up to date. This was emphasised in a company "safety memo" dated 23 August 2007 **(Annex A)**.

The manual included the statutory sections on:

- Health and Safety Policy
- Responsibilities of personnel
- Policies and procedures
- Emergency plans and procedures
- Accident reporting

The Health and Safety Policy Statement specified that the company would '*establish and maintain a proactive health and safety culture by:*

Keeping the workplace safe and ensure that access and egress are safe and without risk

Maintaining agreed safety standards by monitoring performance'

The manual noted that its method of accounting for passengers, by using a manual 'clicker' on arrival on board, complied with MSN 1794, Counting and Registration of Persons on Board. It did not, however, give any instructions for counting passengers leaving the boat or, as required by the regulations, maintaining a running total of those left on board.

There were several references to the consumption of alcohol, both by crew and passengers. A very clear policy prohibited crew from consuming alcohol both at any time up to 8 hours before and during their period of duty. Crew were required to wear a uniform, during which time they were not permitted to enter any licensed premises. Sales of alcohol were not permitted to anyone under 18, or to any passengers who made a nuisance of themselves or were aggressive due to the affects of alcohol. Opening the bar and serving of alcohol were at the skipper's discretion.

The Emergency plans took the form of laminated checklists, and were kept readily to hand in the wheelhouse. They included a plan for reacting to a Man Overboard (MOB), but this was presumed to be in mid-stream. There was no guidance provided to cater for someone falling overboard while the vessel was alongside or close to a pier.

1.9.3 Mooring and passenger access

The Marine and Safety Manual did not contain any specific procedures for mooring and passenger access, other than a generic statement: *'The company should establish and manage procedures that facilitate safe access/egress of all their vessels by:*

- *Risk assessment*
- *Reviewing risk assessment after incident or near miss*
- *Ensure staff carry out working procedures correctly*
- *Keeping staff updated on the relevant regulations*' [sic]

The managing director and safety officer both considered the management of safe access and egress to be a very basic element of a Waterman's professional knowledge, and something that should not need to be stated in detail in the manual. They expected that crews would embark and disembark passengers using the forward boarding gates on either the port or starboard sides, and the boat should be moored using three ropes, one on each side of the boarding gate and a third, amidships. However, a notice to crew dated 6 May 2004 and a standing order to crew dated 26 February 2007 (both reproduced at **Annex B**), were found on board, which gave conflicting instructions. The first required crew to use a head and a stern rope to secure the vessel, the second simply stated that the vessel should be '*moored tight alongside*' [sic]. The number of ropes to be used was only specified in the second instruction, on occasions when the boat was moored outboard of another boat. In this case, two ropes were to be used, one positioned on either side of the access gate in the bulwark. Despite these instructions, the skipper reported that his preference was to use three ropes in the way described by the managing director and safety officer. The mate also used this method to secure *Hurlingham* after the stern drifted away just before the accident.

It was Thames Cruises' company policy that at least one member of crew would stay in the position of the boarding gate, counting passengers on and supervising, or assisting their departure. Statements to this effect were found in several documents on board *Hurlingham*, the earliest dated 1989 and the latest, a loose memo reinforcing the requirement, dated July 2006. A further memo found in the company's office, dated 26 February 2007 **(Annex B)**, advised crew to '*stand by the exit gate'*. Supervising passengers disembarking was also a condition of the Premises Licence, issued by Westminster City Council. Both the skipper and the mate were aware of these requirements.

1.9.4 Risk assessments

The Marine and Safety Manual stated that it was the skipper's duty to complete and update risk assessments, and a comprehensive set was kept in a folder on board *Hurlingham*. However, the risk assessments had all been completed

without the crew's involvement. The skipper reported that he had not seen the risk assessments before, and was unable to explain what information the form contained or how the process worked. The manual also stated that the mate was responsible for monitoring and implementing the control measures identified by the risk assessments. While the mate understood the process, he was not familiar with the requirements for *Hurlingham*.

The consultant who originally set up the safety management system in 2001 had produced a risk assessment for 'falling overboard'. The safety manager had signed the form, but the spaces on the form for the risk assessor and skipper were all blank. The control measures to prevent someone from falling overboard included:

- *Establish a safe system of work for mooring / departure*
- *Establish a procedure for person overboard*
- *Ensure adequate lighting is provided*

While there was a procedure for responding to an MOB in the middle of the river, there were none covering mooring and departure operations. There was no lighting of the forward boarding gates on *Hurlingham*, other than background light from the accommodation, and the company accepted that illumination of the embarkation area would be mostly provided by the lighting on the pier.

1.9.5 Emergency drills

The DSMC requires procedures for potential emergencies to be exercised and recorded. The safety manager was responsible for advising when emergency exercises were held and assisting in running them. A timetable, covering the period from December 2002 to March 2007, had been produced for a range of different exercises, and a new schedule was issued in January 2008. The most recent record for an emergency drill, involving the skipper, was in July 2007.

The safety manager acknowledged that it was extremely difficult to get the crew to do effective emergency drills. This was made harder by the irregular working pattern of evening parties and use of casual crew. The safety manager and managing director reported that they had identified the problem and were considering additional measures to conduct emergency drills more frequently.

1.9.6 Audit and assessment

The MCA issued *Hurlingham*'s combined Passenger Certificate and Domestic Safety Management Certificate on 13 February 2004. The certificate was valid until 11 January 2009, and stated that it had to be endorsed annually at the Mid Term Safety Management Audit which was to be held between 13 May and 13 August. The annual hull inspection and survey had both been completed in

January 2008, but the Mid Term Audit had not been done since October 2007. The previous Mid Term Audit in 2006 also occurred in October, and it was only in 2005 that the Mid Term Audit was held within the prescribed period, on 10 August.

The aim of the Mid Term Audit is for MCA surveyors to see the vessel's safety management system in action, and it is meant to occur during the part of the season when the vessel is most likely to be operating. There is no requirement for the crew to be present at the Mid Term Audit and, in practise, the safety manager and managing director normally hosted the audit.

The DSMC requires operators to conduct a formal review of their system every 3 years. Thames Cruises had not done this, preferring a continuous and more informal process. The safety manager and managing director reported that they had regular contact, during which they discussed matters relating to regulatory compliance and safety. Similarly, both men were often present when crews arrived to prepare their boats for evening functions. Paperwork was updated either by passing it directly to the skipper, or by putting it in the boat concerned. The regular skipper would then put it in the file kept on the boat. On *Hurlingham,* there were a number of folders and a 'portable metal home file', containing numerous loose sheets of paper, variously dated from 1989 and, at the time of the accident, in no clear order.

Although both the safety manager and managing director made regular inspections of the material state of the boat and its safety equipment, their only contact with the crew was while they were preparing the boat for departure. It was unusual for either of them to audit the operation of the boats, or pay an unscheduled visit to a boat to see for themselves how the crew performed away from the company's base at Lambeth Pier.

1.9.7 Implementation of the Domestic Safety Management Code

Inspection of the DSMC on *Hurlingham* identified that there were no procedures for mooring, a lack of emergency drills, ineffective risk assessments, muddled paperwork records and an incomplete description of the passenger accounting system. Most of these shortcomings would have been present at previous Mid Term Audits held in 2005, 2006 and 2007.

In 2005, the MCA commissioned Research Project 527, an independent assessment of the DSMC as part of the Formal Safety Assessment on Domestic Passenger Vessel Safety Standards. The results from the assessment were reported to be:

> *Compliance with the requirements of the DSMC was found to be good. However, there were concerns in the following areas:*
>
> - *Health and Safety Protection Policy*
> - *Procedures to Ensure Safe Operation*

- *Communication*
- *Accident and Incident Reporting*
- *Procedures for Responding to Emergency Situations*
- *Training*

In particular, (the project) *found that in most cases the Safety Management System was viewed as an exercise in compliance with regulations, rather than being integrated into, and therefore informing company safety systems."*

The areas of concern identified in the results section of the report, form a substantial part of the DSMC. The MCA responded, reporting that it was reassured by the level of compliance and believed that the integration of safety management systems into the day to day running of passenger vessels would come in time.

The report **(Annex C)** made eight recommendations, two of which are considered to be particularly relevant to this accident. These, and the responses from the MCA, are summarised below:

- The second recommendation suggested that MCA audits should assist operators to determine where gaps in Health and Safety Protection Policy existed and help them to develop objectives and targets for improvements. The MCA acknowledged this, and reported that training in risk assessment and safety management was included in the syllabus for the national Boatmaster's Licence. Neither the skipper nor mate were required to do any such training as BMLs were automatically awarded to licensed Watermen and Lightermen in January 2007, when the Boatmasters Scheme came into force.
- Recommendation five suggested that checklist systems should be expanded to include the management system items which will regularly check the status of the Domestic Safety Management System as a means for companies to carry out an internal audit. The MCA reported that it did not consider it appropriate for them to develop standard checklists and that this issue should be a matter for operators.

Guidance on compliance with the DSMC has not been updated since it was introduced in 2001 as MGN 158.

1.10 PIER OPERATION AND MANAGEMENT

Westminster Pier is owned and operated by London River Services (LRS), part of Transport for London (TfL). LRS issues licences to all boat operators who use its piers for commercial purposes to ensure an appropriate level of safety is maintained.

One of the clauses of the licence states:

> *Each approved vessel is at all times adequately fendered and secured when stationary alongside a Pier with a view to maintaining the safety of passengers, the approved vessel and the Pier. Without prejudice to the foregoing, when vessels are berthed or moored at any Pier, they must:*
>
> > *a) have their mooring adjusted from time to time to allow for the rise and fall of the tide*[5] *and to provide for the safety of persons lawfully embarking and disembarking.*

LRS began its own investigation immediately after the accident. No defects were found with the pier's lighting, guardrail or safety equipment. The pier was fitted with chains at the waterline, and ladders to assist anyone in the water to support themselves and climb out.

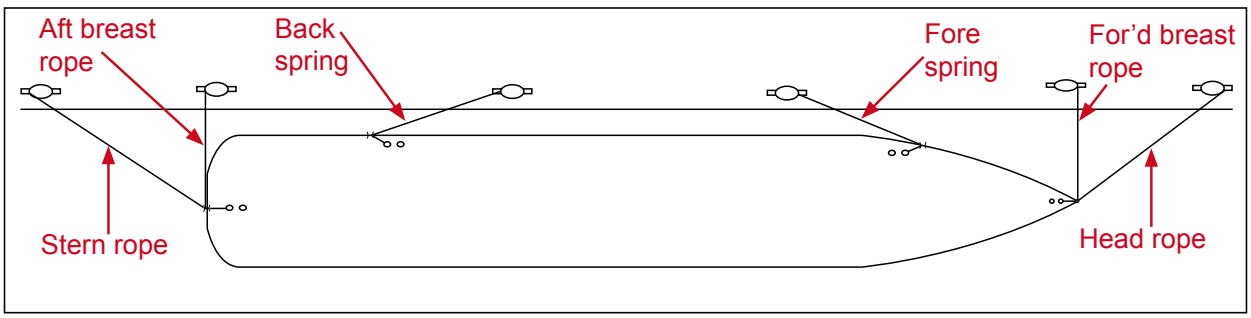
Westminster Pier is fitted with a substantial, black coloured, fender **(Figure 2)**. The lights are fitted above the central part of the pier and provide a level of illumination typical of street lighting at a public facility. A substantial guardrail is fitted around the edge of the pontoon and inevitably casts a shadow over the outboard edge of the pontoon. The shadow is reduced when the gate is opened, but increases if passengers congregate at the guardrail.

LRS provides caretaker staff on Westminster Pier from 0700 to 1900. Their role is to monitor usage and the material state of the pier. Companies using the pier are expected to provide their own staff to assist and supervise their own passengers. At the time of this accident, there were no LRS staff on Westminster Pier.

1.11 SINGLE POINT MOORING

Any vessel alongside a pier will move in a combination of four principal ways: surging forwards and backwards along its longitudinal length, laterally sideways, yawing about a vertical axis and lastly, pitching and rolling with the motion of waves or wash from other vessels. Conventional mooring practice uses several ropes **(Figure 6)** to resist the longitudinal, sideways and yawing movement.

Figure 6



Conventional arrangement of mooring lines

[5] Westminster Pier is floating and its freeboard remains constant throughout the tidal range.

These ropes can, to some extent, also limit vertical motion from waves and wake. Equally, as the vessel is restrained by ropes leading in different directions it can only move a limited amount, and there is generally no need to use engine power to keep it in position.

Some piers and jetties, particularly in the south-west of the UK have very restricted access and, in practice, only part of the vessel can lie alongside the embarkation point. In these circumstances, operators use a single mooring line to hold the vessel into the pier, and the engine and rudder to keep the boat in position. This practice has also been adopted on the River Thames, for several reasons:

- By allowing some boats to overhang the ends of the piers, more boats can use the pier at the same time.
- It is quicker and easier for boats operating with two crewmen to moor with a single line.
- Using the current and engine power to tension the single line causes the boat to lie snugly against the pier, reducing the amount of movement caused by the effects of waves and passing vessels.

Vessels from a number of other companies on the River Thames were observed mooring with a single line during this investigation.

Single point mooring[6] requires the engine power and or current to apply a force against a mooring rope to hold the boat stationary. If done successfully, the forces can be used to hold the boat tightly against a pier, so that waves and wake cause relatively little movement. However, it is a dynamic situation that must be kept in equilibrium all the time. Any changes, or application of additional forces could upset the balance and cause the boat to move off the pier or jetty.

There are no regulations specifying how many mooring lines should be used to secure a vessel alongside her berth. However, following a fatal accident[7] on the River Thames when a mooring bollard became detached, the MCA advised operators[8] to assess the risks of mooring with a single line and to take action to minimise the risks involved.

[6] Colloquially known as ‘steaming on a spring’.

[7] Failure of a mooring bollard from the Class V passenger vessel Star Clipper resulting in a fatal accident at St Katharine’s Pier, River Thames, London on 2 May 2004. http://www.maib.gov.uk/publications/investigation_reports/2005/star_clipper.cfm

[8] MCA Safety Alert – Technical No.2, Quick Mooring Equipment and Techniques, January 2005.

1.12 SIMILAR ACCIDENTS

MAIB records between 2000 and 2008 were analysed to determine how many incidents involving passengers falling overboard from Class V passenger vessels on the River Thames have been reported. The following 12 cases were identified:

- Three cases involving a passenger becoming injured after falling in a gap between the boat and the pier, and being trapped. Only one of these passengers fell into the water.
- Three cases where a passenger slipped and injured themselves while boarding or disembarking a vessel, but did not become trapped or fall overboard.
- Two cases involving the failure of a mooring line while 'steaming on a spring'. One of these caused fatal injuries to a passenger[7], the other caused damage to the boat.
- Two cases where passengers attempted to climb over guardrails or jump across the gap between the boat and pier to board or disembark.
- One case where a gangway became detached and passengers fell into the gap between the boat and the pier.
- One case where two passengers fell overboard after emergency doors opened accidentally.

Despite explicit requirements in the Merchant Shipping (Accident Reporting and Investigation) Regulations and DSMC, it is likely that not all accidents of this type are reported. A notice to crew **(Annex D)** was found on board *Hurlingham* which described a similar accident in summer 2001 on board *Royal Princess*, belonging to Thames Cruises. This accident was not reported to MAIB. Other accidents involving other operators became apparent during the investigation, suggesting that the frequency of such events is much greater than statistics indicate.

1.12.1 Findings from other investigations

The Formal Investigation into the collision between *Marchioness* and *Bowbelle*, found that shortcomings in the management of the vessel and the crews' commercial interest in the bar were contributory factors. It was reported that the managers had no proper system for ensuring that written instructions were regularly given to, and retained by their crews and that, at best, such instructions were put into a cardboard box.

One of the crewmen on board *Marchioness* had spent much of his time tidying up glasses rather than assisting with the navigation of the vessel, and the report noted that it was, in principle, undesirable for the skipper and mate to have a financial interest in the bar. However, it was concluded that this arrangement was not impossible, provided that a proper system of safe navigation was instituted.

SECTION 2 - ANALYSIS

2.1 AIM

The purpose of the analysis is to determine the contributory causes and circumstances of the accident as a basis for making recommendations to prevent similar accidents occurring in the future.

2.2 THE ACCIDENT

Hurlingham had been secured with a single line and the wheelhouse left unattended. With a single mooring line, the vessel was extremely vulnerable to movements caused by tidal movements or passing vessels, and with no-one in the wheelhouse, there was no way to make sure that the boat stayed in position. It was highly likely that *Hurlingham* would drift away from the pier during the time needed for 121 passengers to finish their drinks and leave the party.

After the mate manoeuvred the stern of the boat back into the pier, the resulting contact caused the bow to move away. This opened up the gap between the boat and the pier at the point where passengers were disembarking.

The skipper was checking that the bar account had been signed and then became involved in tidying up. The mate went to the wheelhouse to move the boat back into position, and no-one else was assigned to assist or supervise passengers. Both gates were left open, and passengers were allowed to continue disembarking.

The evening cruise was intended to be a party and Mr Hernandez, like many other passengers, was under the influence of alcohol. As no gangway was used, the safety of the mooring depended on there being little or no gap between the boat and the pier. Study of the CCTV images shows him take a normal step and fall into the water. It is thought unlikely, considering his last movements, that he saw that there was a gap between the boat and the pier.

Although it was August, the water would have felt cold and caused Mr Hernandez body some shock. The postmortem noted that he did not have any crush injuries, and it is likely that once he entered the water, he was unable to get back to the surface as the gap between *Hurlingham* and the pier would have been very narrow.

2.3 BERTHING AND PASSENGER DISEMBARKATION

2.3.1 Electing to use a single point mooring

In a conventional mooring with multiple lines, there is generally no need to leave the propeller turning. The skipper had considered that, in this case, the propeller would help draw the boat into the pier to reduce the amount of movement from the waves or passing vessels. Despite his reported preference to secure the boat with three mooring lines, the skipper told the mate to use two lines at Westminster Pier earlier in the evening, and only one line was used at

Tower Pier. Other vessels were observed using a single line to moor during the investigation, and it is evident that this practice was used on *Hurlingham*. At the end of the cruise, only one line was used and, whether or not he intended to use more lines, the skipper did not check to confirm the mooring arrangements.

Thames Cruises had issued several different instructions on mooring which, viewed collectively, and compared with the managers' and safety officers' expectations, gave a confused view of what was required. None of these instructions had been incorporated into the Marine Safety Management Manual.

Both the skipper and mate knew that there was a possibility that the boat could drift away from the pier if it was secured with only one line. Managers were also aware of this risk. Although it was the mate who secured the boat, both the skipper, through direct supervision, and managers, via company procedures, also had a responsibility to ensure that the requirements to secure the boat properly were clear and that they were being followed.

There was ample opportunity to secure the boat with additional mooring lines, and using only a single point mooring when disembarking 121 passengers, after a party, was inappropriate.

2.3.2 Supervision of passengers disembarking

For the first few minutes after *Hurlingham* moored alongside Westminster Pier, the mate stayed on the pier, near the gate. After chatting with the caterer, and moving some bags of rubbish, he leant on the rail. He made no attempt to guide the few passengers that disembarked and could be seen drinking from some form of drinks container. Although the mate reported that he would not have had an alcoholic drink, this can not be confirmed, because he was not breathalysed.

The mate remained in this position as the stern drifted away from the pier. Seventeen passengers crossed the widening gap before he took action and re-boarded the boat. Despite the increasing hazard, he did not close either the gate on the pier or the boat to stop passengers. During his attempts to bring the boat back alongside, 48 passengers disembarked and 4 re-boarded. The gap was substantial and it is interesting that none of these people thought to wait until the boat was properly secured. It must be remembered that they were leaving a party where, on average, the bill for drinks was nearly £20 per person; it is likely that the judgment of many was affected by consumption of alcohol. It is therefore essential that the measures described in the conditions for the Premises Licence – that passengers must be supervised while disembarking the vessel – are observed.

Although repositioning and securing the boat were positive actions, the passengers should have been prevented from leaving the boat while this was being done. A safer procedure would have been to close the boarding gates, call the skipper to assist and perhaps even use bar staff to keep passengers

clear of the forward deck until the boat was re-secured. The use of portable radios or other means of communication between the crew would have helped them to respond more effectively.

2.3.3 Crew's actions

The skipper had left the wheelhouse because of his commercial interest in the bar, his desire to check the safety equipment, and to begin tidying up after the party. There was no obligation for him to do any of these tasks immediately, but it was part of his normal practice to ensure that the party finished as quickly and effectively as possible. The change in engine noise prompted him to stop tidying at the rear part of the boat, and he realised that the stern had drifted away from the pier. Although he came forward to find out what was happening, a hazardous situation had already developed, and he was not in an appropriate position to take the proper action. The skipper did not appreciate the risks of leaving the wheelhouse unmanned with the engine left in gear, he was not in a position to supervise the crew, and could not be contacted easily.

It is essential that skippers are able to supervise both passengers and crew to identify and minimise hazards as they appear, and to take preventative action in case of emergencies. This duty should be stated in company procedures, and managers should check periodically to ensure that these are being complied with.

The mate had the same qualification as the skipper. Despite the poor instructions for mooring, he also found it acceptable to moor *Hurlingham* with a single line, leaving the propeller turning and the wheelhouse unattended. He was already paying little attention to the passengers before the stern drifted away. With the skipper elsewhere, he decided to move the boat himself without seeking assistance, and without preventing passengers from disembarking while he repositioned the vessel.

Both the skipper and mate showed very little appreciation of the potential consequences of their actions.

2.3.4 Emergency response

The mate had left the pier and was in the wheelhouse when he became aware that someone had gone into the water. He called the emergency services quickly, but passengers crowded around the front of the boat making it difficult for him to see what was happening or to respond effectively. He became isolated because other crew were not informed and, as his uniform did not stand out, passengers were not able to identify him easily.

Both the gates on the boat and pier remained open and passengers were able to move freely. Although it was good thinking on the part of passengers to use the light from a lifebuoy to help with the search, some put themselves in additional danger by walking outside the guardrails in their well-intentioned

attempts to search for Mr Hernandez. If other crew had been told about the emergency, they could have helped move passengers, many of whom would have been under the influence of alcohol, to a safer place. It is not the primary responsibility of LRS staff to assist and supervise passengers, but they are present during the day to act as caretakers and help with the general running of the pier. In an emergency, either they, or employees from the boat operator would be extremely helpful in controlling passengers on the pier and supporting the crew.

As no-one was supervising passengers disembarking, there was no way to immediately identify and assist the MOB. The area where the man entered the water was difficult to see, and by the time crew responded access was obstructed by passengers.

The skipper saw the ILB approach and decided to move *Hurlingham* off the berth. His reaction was instinctive to give the ILB space to search, but it created additional risks, both to the man in the water and the remaining passengers. The tide was now flooding and it was likely that the MOB would be swept up river towards and past *Hurlingham*'s propeller. No-one was looking out aft, and by going astern off the berth the boat could have run over the top of him. There were no warnings that the boat was leaving the berth, and the crew had no idea how many passengers were left on board. As *Hurlingham* pulled away, one passenger was still standing outside the bulwark, and he could easily have lost his balance and fallen in. Several passengers later commented that they would have jumped into the water if they had seen Mr Hernandez, a brave but extremely dangerous action. The strength of the tidal stream was growing and with no additional buoyancy, they too would probably have become casualties.

The immediate reactions put passengers and the man in the water in greater danger. In an emergency, all crew must be involved immediately and respond in a way that minimises the danger to passengers and has the best chance of recovering the situation. To achieve this, the crew must be in control, and emergency procedures have to be relevant, pre-planned and, most importantly, rehearsed to make sure that everyone knows what to do, and to test that the procedure is likely to work.

There was no record of how many people had disembarked from *Hurlingham* because it was assumed that passengers did not need to be counted off at the end of a voyage. However, this accident demonstrates that if passengers are not counted as they leave, there is no way to corroborate if someone is missing. Although this is not required by the regulations, it offers a more positive way of supervising passengers and ensuring that crew are paying proper attention. The crew allowed themselves to believe that the reported loss of Mr Hernandez was a mistake, and decided that they would not report the incident to Thames Cruises until the following day despite the attendance of the emergency services and the extensive search.

2.4 FATIGUE

The mate had started work at 0800 in the morning, and had undertaken a cruise from 1100 until 1210, and again from 1450 until 1800 before starting work on *Hurlingham*. Although his working time complied with the regulations contained in The Merchant Shipping Notice MSN 1778(M), it is considered likely that after a long day, once the passengers started disembarking, the mate's concentration waned.

The skipper had recently returned from holiday. He commenced work on *Hurlingham* that day at 1600. He is not considered to have been unduly affected by fatigue.

2.5 MOORING PRACTICE AND PASSENGER ACCESS

2.5.1 Lighting

Although the central part of Westminster Pier was adequately lit, the position of the lights and guardrail meant that the edge of the fender would have been in shadow. The only lighting from *Hurlingham* was from the accommodation area. The edge of the deck was painted white, but there would not have been much contrast between the edge of the pier's fender and the water. It might not have been obvious, particularly to a person under the influence of alcohol, that there was a gap, and given the way Mr Hernandez stepped off *Hurlingham*, it is unlikely that he saw that a gap existed. Improvements to lighting and a change in the colour of the fender material, to give a greater contrast between the edge of the pier and the water, could improve safety of passengers.

2.5.2 Single point mooring

The perceived advantages for passenger boats to moor with a single rope are clear, because of access limitations at a berth, time or limited manpower. The forces set up by using engine power against line tension can also damp the boat's movement in the water, making it easier for passengers to board and disembark. However, it is a dynamic system dependent on two, single points of failure; the mooring rope and the engine. For a single point mooring to be used safely, it is vital that the mooring system (rope, bollards, cleats etc) is sufficiently strong and that the boat's engine and rudder are controlled at all times. Failure of any of these elements will inevitably cause some form of hazard to passengers, which must be immediately controlled. While a single point mooring may at times be appropriate it can, by definition, never be as reliable as a conventional mooring using multiple ropes. Where a single point mooring is used, additional measures should be taken to mitigate the inherent hazards. These will include:

- Engine and rudder under control at all times
- Access points manned
- Passenger movements controlled and allowed only when the vessel is considered to be securely moored alongside.

- Communications between personnel at the engine controls and the access point
- Mooring equipment of adequate strength, and maintained in good condition

Where large numbers of passengers need to be embarked or disembarked, a conventional mooring, using multiple ropes, is more appropriate than a single point mooring.

2.5.3 Snap back zones

On *Hurlingham*, and several other boats seen during this investigation, the mooring ropes were secured at points which were very close to passenger access areas. Such mooring ropes are relatively short, and on regular services become worn in the same place each day. If a rope should part, it is likely that the free ends will snap back, striking passengers boarding or disembarking. Most vessels can be moored in several different ways, and operators should satisfy themselves that moorings are arranged so that their passengers would be adequately protected if any part of the mooring system failed.

2.5.4 Use of gangways

Very few operators on the River Thames use gangways, despite the requirement in the Means of Access Regulations for all vessels over 30m in length to carry one. Many boats can berth close up to a pier and have a suitable freeboard to match the height of the pier. However, a properly designed and used gangway can increase safe operating margins by covering gaps as the boat moves relative to the pier and providing a safe walkway across a hazardous area.

Hurlingham had midships doors, which could have been used for passenger access. However, they were too low and did not open fully. A proper assessment of mooring and passenger access, and study of previous incidents, should have identified that by using the forward boarding gate an increased risk of a passenger falling into the gap between the boat and the pier existed. An option for reducing this risk could have been to modify the midships doors, moving them to a better position, making them open fully and even fitting an integral gangway to lead up onto the pier. Such an arrangement could also have kept passengers clear of mooring lines.

2.6 EFFECTIVENESS OF SAFETY MANAGEMENT SYSTEMS

2.6.1 Implementation of the DSM Code

Although the DSMC is intended to foster a culture of safety management, it is possible to produce all the paperwork needed to show compliance with the regulations without making the shift in attitude that the Code was intended to achieve. This is demonstrated by Thames Cruises, which produced sufficient paperwork to satisfy surveyors over a 7-year period, but employed crew that

had not done sufficient effective emergency drills, knew nothing of the risk assessments and had not signed to record that they had read the safety manual. Nothing in the DSMC prevented or detected these shortcomings. Comparison of this incident with the findings of the MCA's Research Project 527 indicates that further practical guidance to owners is needed on how to fully implement the DSMC. This should include the provision of specific training in risk assessment and safety management for those who have been automatically awarded BMLs as a consequence of their previous professional qualifications, and detailed advice to operators on conducting internal audits.

2.6.2 Role of the safety manager

The safety manager's job had been diminished over time to 'looking after the paperwork', and practical efforts to improve safety in the past had almost been abandoned. Although a new schedule for emergency drills had been published in January 2008, the last recorded drill involving the skipper, was in July 2007. Neither of the crew had done any recent training or exercises to help them prepare for this emergency.

At the time of the accident, the safety manager worked 1 day per week for Thames Cruises, and was typically only present in normal office hours. As the crews mostly worked during the evening, his contact with them was minimal, hence there was almost no opportunity for him to explain or discuss regulations and procedures. Consequently, from the crews' perspective, the safety manager had become increasingly irrelevant and his influence on working practices was negligible.

2.6.3 Crew knowledge and involvement

Although crews arriving to prepare a boat for an evening function would have had some contact with the managing director, they would often arrive to find papers left inside the boat for them to read. These were then kept in a file on board. It was evident that there was little order to the filing, and certainly no incentive for the crew to search through the papers in order to keep themselves up to date. It is concerning that this situation is so similar to that reported by Lord Justice Clarke in the Formal Investigation report into the collision between *Marchioness* and *Bowbelle*.

The skipper had not been involved in compiling the risk assessments; he could not explain how the process worked and did not know what control measures had been identified to reduce the risks. The mate understood how to carry out a risk assessment, but although the Marine Safety Manual stated that he was responsible for enforcing the control measures, in the case of MOB the description was too vague to be of any help to him. The risk assessment was flawed, offering the statement, '*Establish a safe system of work for mooring / departure'* as a means of preventing an MOB. Although managers had an expectation of what this "safe system" should be, it was not included in the Marine Safety Management Manual, and loose instructions on

mooring were contradictory. Other control measures were incomplete; there was no emergency procedure for a person overboard while the vessel was alongside and *Hurlingham* was reliant on background light from the pier and its accommodation area to illuminate the access areas.

2.6.4 Audit

The DSMC requires that boat operators monitor the effectiveness of their procedures and formally review them every 3 years. The managing director and safety manager reported that they did this as part of routine daily business. While this may be so, they had limited contact with their crews and it was rare for either of them to witness the actual operation of the boat away from Lambeth Pier, and especially at the end of the night when passengers were disembarking. Consequently, they could not see how effective their procedures were, or even if crews were using the procedures at all.

LRS conducted an annual audit to satisfy themselves that the boats licensed by them to use their piers were safe. This focussed on the material state of the boat and its safety equipment, and there was little opportunity for LRS staff to review the operation of boats and control of passengers. Even if they had done so, with no formal mooring procedures, there was nothing for them to judge the operating standards against.

The last two Mid Term Audits conducted by the MCA were done outside the period stated on the combined Passenger and DSMC certificate. The audits were done in October, at the end of the peak season, making it less likely that the boat would have been in normal operation. Like any audit, the Mid Term Audit can only make an assessment based on the sample visit, and conducting the audit outside of the boat's main operating season must reduce its effectiveness. While the MCA conducts spot checks on the operating standards of vessels on the River Thames, this is now constrained to during normal working hours, and the evening 'party boats' are not normally seen. Mid Term Audits on *Hurlingham*, conducted over several years, were not able to detect any of the shortcomings identified by this accident.

2.6.5 Operation of the licensed bar

It was reported in the Formal Investigation into the collision between *Marchioness* and *Bowbelle* that crew became distracted by their involvement in running the bar. It was, however, concluded that it should not be impossible for the skipper to have a financial interest in the bar. However, during this accident, the skipper also became distracted, firstly by the bar account and secondly by tidying up after the party. This must have been at least partly motivated by his commercial interest. The potential for distraction will always exist in these circumstances and must be avoided.

SECTION 3 - CONCLUSIONS

3.1 SAFETY ISSUES DIRECTLY CONTRIBUTING TO THE ACCIDENT WHICH HAVE RESULTED IN RECOMMENDATIONS

- *Hurlingham* had been secured with a single line, with the engine left in gear and the wheelhouse unattended. In this condition, it was highly likely that it would drift away from the pier while the passengers disembarked. [2.2]
- The skipper was distracted by other duties on the boat, and while the mate manoeuvred her back into position, the boarding gates were left open and the passengers were allowed to continue disembarking across the gap between the boat and the pier, unsupervised. [2.2]
- It is considered likely that the deceased passenger did not notice the gap that had been allowed to open up between *Hurlingham* and Westminster Pier. [2.2]
- It is essential that skippers are able to supervise both passengers and crew to identify and minimise hazards as they appear, and to take preventative action in case of emergencies. This duty should be stated in company procedures and managers should check periodically to ensure that these are being complied with. [2.3.3]
- Both the skipper and mate showed very little appreciation of the potential consequences of their actions. [2.3.3]
- The mate had started work at 0800 that morning on another of Thames Cruises' vessels. Although his working time complied with the regulations, it is likely that at the end of the evening his concentration waned due to the effects of fatigue. [2.4]
- Improvements to lighting, and greater contrast between the colour of the fender material and water below would assist passengers determine whether a gap between the vessel and pier exists. [2.5.1]

3.2 OTHER SAFETY ISSUES IDENTIFIED DURING THE INVESTIGATION ALSO LEADING TO RECOMMENDATIONS

- Passengers were exposed to unnecessary additional risks because the crew were unable to command or control the immediate response to the emergency, and there were no pier staff present to assist. [2.3.4]
- Where single point moorings are used, additional measures should be taken to mitigate the inherent hazards. [2.5.2]
- Operators should ensure that passengers will be adequately protected if a mooring line parts while passengers are boarding or disembarking. [2.5.3]

- Using a properly designed and constructed gangway can increase safe operating margins by covering gaps between a boat and a pier and providing a safe walkway across a hazardous area. [2.5.4]
- Although Thames Cruises was found to be compliant with the DSMC, the accident demonstrates several shortcomings which the Code neither prevented nor detected. Further guidance to owners is needed on how to implement the Code in practice [2.6.1]
- The crew had a poor understanding of the safety management system, and were not involved in it enough to make the system work properly. [2.6.3]
- Audits of *Hurlingham* did not detect how the vessel was operated in practice. [2.6.4]
- The potential for a master to be distracted from his primary duties by commercial interests must be avoided. [2.6.5]

3.3 SAFETY ISSUES IDENTIFIED DURING THE INVESTIGATION WHICH HAVE NOT RESULTED IN RECOMMENDATIONS BUT HAVE BEEN ADDRESSED

- There was ample opportunity to secure the boat with additional mooring lines. Using a single point mooring, while disembarking 121 passengers, was inappropriate. [2.3.1]
- Passengers under the influence of alcohol are less able to look after themselves, making it essential that the conditions specified in Premises Licences, for passengers to be supervised while boarding and disembarking, are followed. [2.3.2]
- Although not required by the regulations, counting passengers as they leave the vessel at the end of the voyage offers a more positive way of supervising passengers during disembarkation and ensuring that crew are paying proper attention. [2.3.4]

SECTION 4 - ACTION TAKEN

Thames Cruises Ltd:

Has reviewed its health and safety system and taken the following actions:

- Revised and updated the filing system on all its vessels, including a closed system to ensure that relevant crew sign to record that they have seen important documents.
- Introduced a simplified filing system on board each vessel, instructed skippers on how documents are to be kept and included checks on the filing in periodic internal audits of each vessel.
- Assessed the risks of catering staff loading equipment onto vessels and working on board, and introduced a system of reporting, training and supervision to minimise the risk of staff falling overboard. Catering staff are also required to wear lifejackets while loading equipment.
- Constructed boarding platforms at the company's base at Lambeth Pier to improve access to vessels.
- An announcement is to be made to passengers just before disembarkation, asking them to take additional care, and reminding crew of their obligations (reproduced at **Annex E**).
- Issued an instruction to crew specifying detailed procedures for mooring, boarding and disembarkation of passengers. Summaries of these procedures are included on each "*party advice note*" as a reminder.
- Issued a personal copy of the Marine Safety Management Manual to all crew, in addition to those kept on board each vessel.
- Revised the risk assessments for passenger access and personnel falling overboard.
- Arranged training courses for all crew in first-aid, crowd control and anger management.
- Arranged training courses for all crew in the operation of the company's safety management system.
- Intends to increase the amount of time the safety manager works for Thames Cruises.
- Arranged formal meetings between crew representatives and the safety manager to discuss the operation of the safety management system and training drills.
- Fitted additional lighting to all five vessels owned by Thames Cruises to illuminate passenger access areas.

- The managing director and safety manager will conduct random checks on vessel operations, crew performance and mooring procedures, particularly at night, and will record their observations.

Port of London Authority:

- Prior to this accident, the PLA had begun developing a Code of Practice for Passenger Vessel Operations on the Thames. Development continued throughout this investigation, in co-operation with the MCA, Passenger Boat Association, London River Services and Police marine units. The Code of Practice was published in May 2009, in time for the main operating season.

London River Services:

- Conducted its own investigation of the accident, which confirmed that the lighting, guardrails and safety equipment on Westminster Pier were all working as designed.
- Wrote to all vessel operators licensed to use LRS piers, reminding them of the need to moor safely, and that licences could be suspended if vessels were seen to be operating unsafely.
- Has begun trials of markings to improve the contrast between the edge of the pier and the water.

Marine Accident Investigation Branch:

- Issued a Safety Bulletin (3/2008, reproduced at **Annex F**) in September 2008, identifying the safety issues of mooring, passenger control and vessel management. The Safety Bulletin made a joint recommendation[9] to the Maritime and Coastguard Agency and London River Services to satisfy themselves that companies operating Class V passenger vessels had effective systems in place to ensure the safe operation of their vessels.

[9] Recommendation 2008/170 to the Maritime and Coastguard Agency and London River Services are recommended to: Take urgent action to satisfy themselves that all companies operating licensed Class V passenger vessels on the River Thames have effective systems in place to ensure the safe operation of their vessels in accordance with the Domestic Safety Management Code and the LRS licence agreement.

SECTION 5 - RECOMMENDATIONS

The **Maritime and Coastguard Agency** is recommended to:

2009/133 Improve the targeting of inspections on the operation of Class V vessels (particularly those working during the evening) to:

- Verify compliance with the procedures specified in their DSMC.
- Promote the adoption of procedures that reflect best practice, such as those described in the Code of Practice for Passenger Vessel Operations on the Thames 2009.

2009/134 Issue improved information to operators of Class III – VI (A) Domestic Passenger ships to guide them on the measures they should take to comply effectively with the Domestic Passenger Ships Safety Management Code.

London River Services is recommended to:

2009/135 Assess the risks associated with the movement and control of passengers on its piers at night, to:

- Clarify where the responsibility for passenger safety lies, and ensure that adequate control measures are in place to ensure passenger safety, particularly in emergency situations.
- Ensure the lighting and marking arrangements of the pier edges make a distinct contrast with the surrounding water in all ambient light conditions.
- Require all vessels using LRS piers to adhere to the Code of Practice for Passenger Vessel Operations on the Thames 2009.

Thames Cruises Ltd is recommended to:

2009/136 Review and amend its safety management system, as necessary, to comply with the Code of Practice for Passenger Vessel Operations on the Thames 2009 and, specifically, to:

- Implement a system to record accidents and near misses, identify the lessons to be learned, and review and update its risk assessments and emergency procedures.
- Conduct effective emergency training drills to practice responding to the range of hazards identified in its risk assessments of vessel operations.
- Introduce employment procedures to ensure, as far as possible, that crew are working in accordance with the regulations for hours of work and rest.

- Provide masters with clear guidance on the conduct of operations and, specifically, the requirement to ensure the wheelhouse is manned at all times when the vessel's engine is in gear.
- Introduce procedures to ensure that marine crews are not distracted by commercial activities, including responsibility for the bar, which could detract from the performance of their primary duties.

2009/137 Review the passenger access arrangements on all its vessels to ensure that:

- Passengers are protected in the event that a mooring line or other part of the mooring system fails.
- Access points are positioned appropriately to minimise the risk of a passenger falling overboard while embarking or disembarking, and that gangways are used where necessary.

Marine Accident Investigation Branch
June 2009