

Report on the investigation of
a person overboard during a passenger transfer from

HMS Westminster to Princess Rose

on the River Thames

24 November 2008

Marine Accident Investigation Branch
Carlton House
Carlton Place
Southampton
United Kingdom
SO15 2DZ

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Extract from
The United Kingdom Merchant Shipping
(Accident Reporting and Investigation)
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CONTENTS

	Page
GLOSSARY OF ABBREVIATIONS AND ACRONYMS	
SYNOPSIS	1
SECTION 1- FACTUAL INFORMATION	2
1.1 Particulars of <i>Princess Rose</i>	2
1.2 Particulars of <i>HMS Westminster</i>	3
1.3 Narrative	4
1.3.1 Background	4
1.3.2 Preparation and passage	4
1.3.3 Rescue	9
1.3.4 Subsequent actions	10
1.4 Location and environmental conditions	10
1.4.1 Gravesend Reach	10
1.4.2 Predicted conditions	10
1.4.3 Actual conditions	10
1.5 Planning	11
1.6 <i>Princess Rose</i>	11
1.6.1 General	11
1.6.2 Design and construction	11
1.6.3 Crew	11
1.6.4 Operation and safety management	12
1.6.5 Preparation	13
1.7 <i>HMS Westminster</i>	13
1.7.1 Equipment	13
1.7.2 Passenger briefing	14
1.7.3 Experience and onboard procedures	15
1.8 Regulation and guidance	15
1.8.1 International and national	15
1.8.2 Royal Navy	15
1.9 Risk assessment	16
1.10 Best practice	16
1.11 Port of London Authority	17
1.12 Similar accidents	17
SECTION 2 - ANALYSIS	18
2.1 Aim	18
2.2 The accident	18
2.3 Equipment and precautions	18
2.3.1 Use of the painter	18
2.3.2 The pilot ladder	20
2.3.3 Hook ropes	20
2.4 Assessment of the conditions	20
2.5 Decision-making	21
2.6 Training	21

2.7	Manning	22
2.8	Risk assessment	23
	2.8.1 City Cruises	23
	2.8.2 <i>HMS Westminster</i>	23
2.9	MCA guidance	24
SECTION 3 - CONCLUSIONS		25
3.1	Safety issues directly contributing to the accident which have resulted in recommendations	25
3.2	Other safety issues identified during the investigation also leading to recommendations	25
3.3	Safety issues identified during the investigation which have not resulted in recommendations but have been addressed	25
SECTION 4 - ACTION TAKEN		26
4.1	The Commander in Chief Fleet	26
SECTION 5 - RECOMMENDATIONS		27

GLOSSARY OF ABBREVIATIONS AND ACRONYMS

ALARP	-	As low as reasonably practicable
CBM	-	chief boatswain's mate
COSWOP	-	Code of Safe Working Practice for Merchant Seamen
DRNLO	-	Deputy Royal Navy Liaison Officer
DSMS	-	Domestic Safety Management System
hp	-	horse power
IMO	-	International Maritime Organization
IMPA	-	International Marine Pilots' Association
kts	-	knots
m	-	metre
MCA	-	Maritime and Coastguard Agency
mm	-	millimetre
MoD	-	Ministry of Defence
OOW	-	Officer of the watch
PLA	-	Port of London Authority
RNLI	-	Royal National Lifeboat Institute
rpm	-	revolutions per minute
UKMPA	-	United Kingdom Marine Pilots' Association
UKMPG	-	United Kingdom Major Ports Group
VHF	-	Very high frequency
VTS	-	Vessel Traffic Services
WECDIS	-	Warship Electronic Chart Display and Information System

Times: All times used in this report are UTC unless otherwise stated



Princess Rose



HMS Westminster

SYNOPSIS



On 24 November 2008, a Royal Naval officer fell into the River Thames at Gravesend Reach when transferring from the frigate *HMS Westminster* to the class V passenger vessel *Princess Rose*. The vessels were making way at a speed of 4 knots. The officer was quickly recovered by the Gravesend lifeboat, which was following the two vessels; she was then taken ashore, where she was treated by paramedics.

The officer was climbing down the pilot ladder when the painter connecting *Princess Rose* to the warship parted. As the passenger vessel drifted away from the transfer position, the lower rungs of the ladder became trapped in the boarding access. Consequently, the bottom of the ladder was pulled away from the warship's side to an angle of about 40° until its lower spreader gave way under the increasing tension. As the bottom of the ladder ran free, the officer fell off and, although she managed to momentarily hold on to a manrope, she soon lost her grip and fell into the water.

Factors which contributed to the accident included: the sea conditions were marginal; the painter was too short and lay at a steep angle; the bottom of the ladder was taken through the boarding access on to the deck of the passenger vessel; and the wheelhouse of the passenger vessel was left unattended during the transfer. These factors could have been avoided had the risks involved in this operation, which is inherently dangerous, been assessed and appropriate procedures developed.

Since this accident, the Royal Navy has closely scrutinised the transfer of passengers to and from warships by commercial vessels while underway, and has issued detailed direction and guidance to its fleet. It has also issued an advisory notice to all surface warships regarding the rigging and use of pilot ladders, and has included the lessons learned from this accident in its training syllabi.

A recommendation has been made to the Maritime and Coastguard Agency (MCA) to provide guidance on the conduct of passenger transfers between vessels when making way, and the movement of passengers to and from vessels which are not secured to a quay. Further recommendations have been made to City Cruises intended to improve the safety of its boat transfer operations through risk assessment, the development of procedures, and the provision of training for its crews.

SECTION 1 - FACTUAL INFORMATION

1.1 Particulars of *Princess Rose*

Vessel details

Registered owner	:	City Cruises Limited
Port of registry	:	London
Flag	:	British
Type	:	Class V passenger vessel – area C
Built	:	1967
Classification society	:	MCA
Construction	:	Steel
Length overall	:	19.355 metres
Gross tonnage	:	36.68t
Engine power and/or type	:	120hp - Gardner 6LX
Service speed	:	11 knots
Persons on board	:	2
Other relevant info	:	Certified to carry 164 passengers by day and 60 passengers at night

1.2 PARTICULARS OF *HMS WESTMINSTER*

Vessel details

Registered owner	: Ministry of Defence
Managers	: CinCFleet
Flag	: Royal Navy
Type	: Type 23 frigate
Built	: 1992 at Swan Hunter shipyard Wallsend
Classification society	: Lloyd's Register
Construction	: Steel
Length overall	: 133 metres
Gross tonnage	: 4200t
Engine power and/or type	: 38Mw - Combined diesel electric and gas turbine
Service speed	: 28 knots
Persons on board	: 170
Other relevant info	: Twin fixed pitch propeller

Accident details

Time and date	: 1324 UTC 24 November 2008
Location of incident	: Gravesend Reach – River Thames
Injuries	: Person overboard while disembarking

1.3 NARRATIVE

1.3.1 Background

HMS Westminster arrived at the Port of London during the morning of 20 November 2008 and berthed alongside *HMS Belfast* on the south bank of the River Thames between London and Tower bridges. When the vessel sailed on 24 November, 11 passengers were on board, including the Deputy Royal Navy Liaison Officer (DRNLO), who had arranged with City Cruises and the Port of London Authority (PLA) for the passengers and herself to disembark by boat off Gravesend. Apart from the DRNLO, the passengers were civilians of varying ages. City Cruises allocated *Princess Rose* to conduct the transfer. It was intended that the passengers would transfer to *Princess Rose* in Gravesend Reach while the vessels were underway, and then be taken to the Royal Terrace Pier (**Figure 1**).

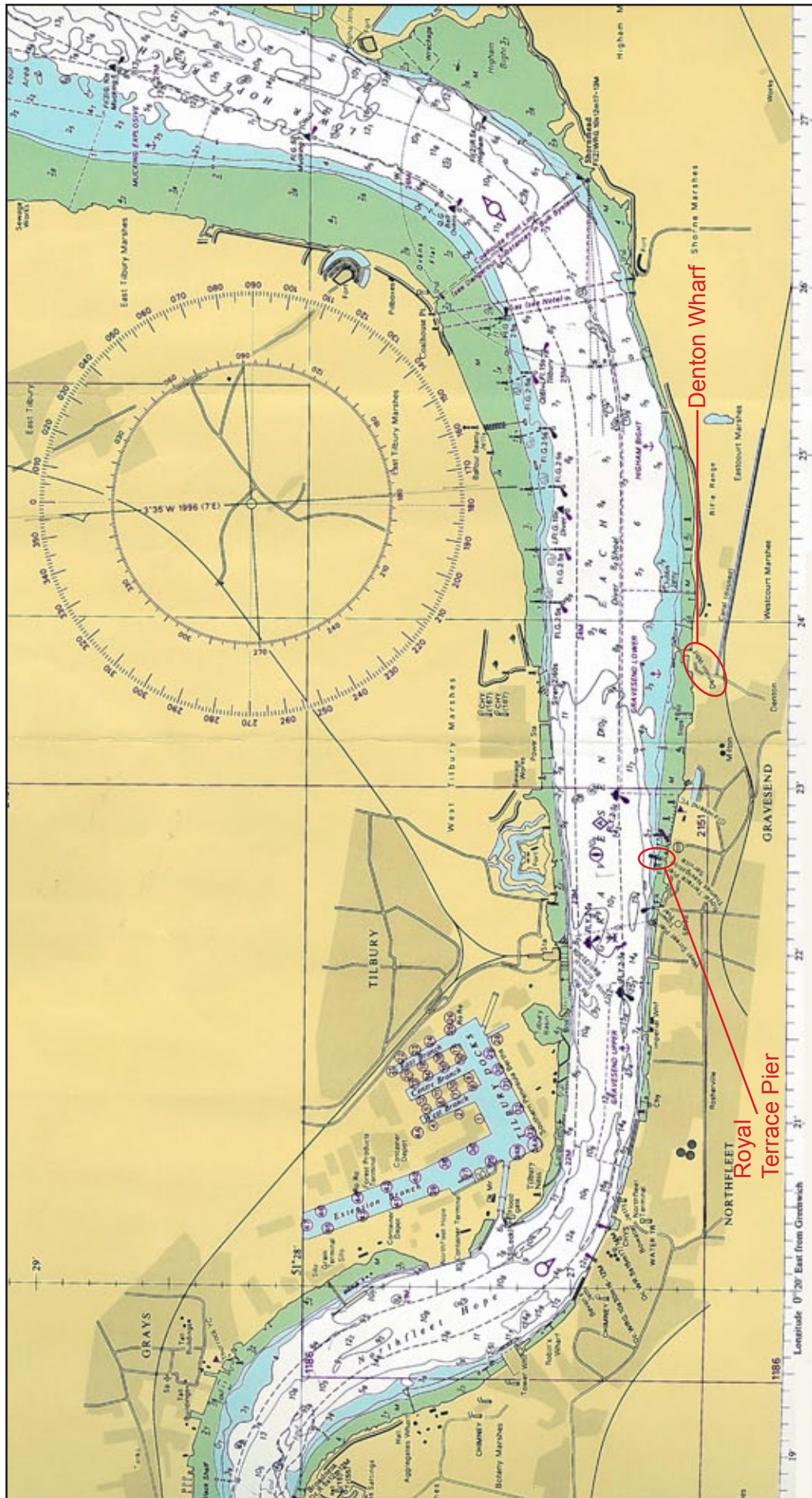
1.3.2 Preparation and passage

At 0800 on 24 November 2008, *HMS Westminster's* navigation officer briefed the departure plan to nominated crew, including the chief boatswain's mate (CBM), the safety officer for the boat transfer. The brief included that the vessel would be sailing on an ebb tide, the forecast wind was north to north-east at Beaufort force 4 to 5, and that the embarked passengers would be transferred in Gravesend Reach.

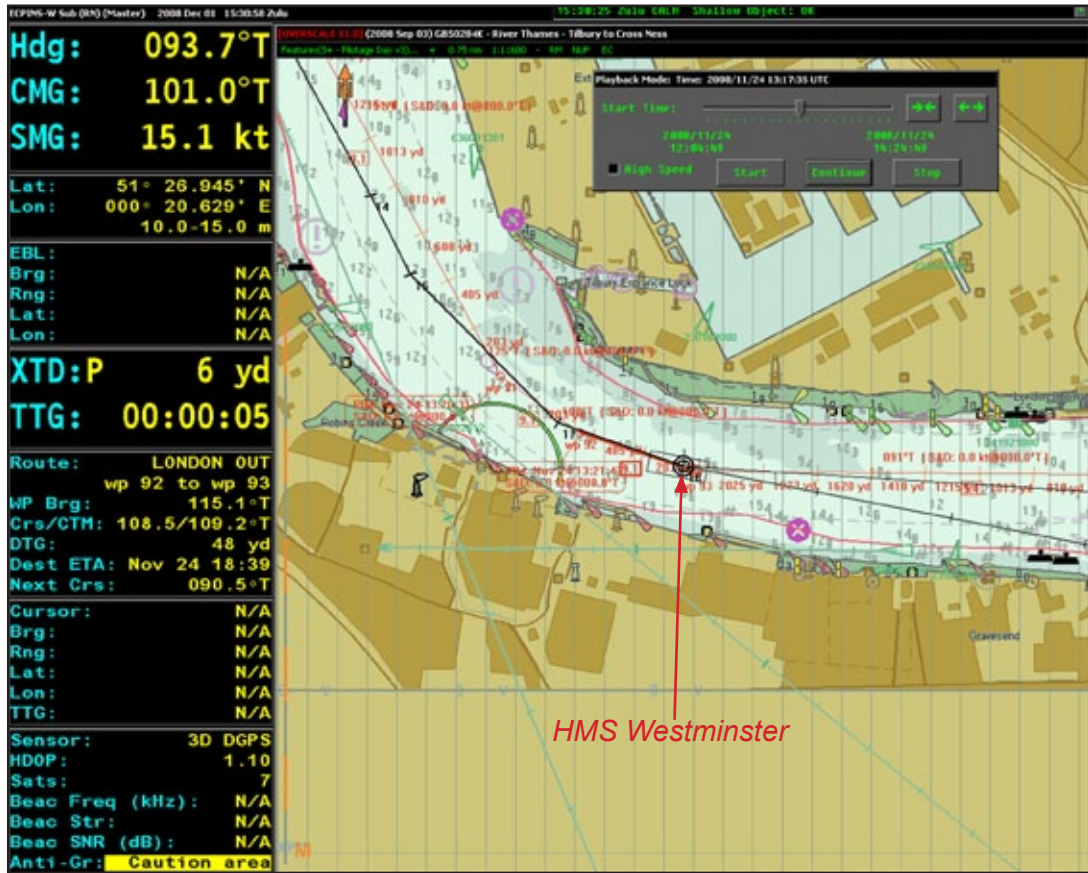
The DRNLO confirmed with the PLA by telephone that the conditions at Gravesend were suitable for the boat transfer before *HMS Westminster* sailed at 1100. At 1130, the warship's executive officer assumed responsibility for the conduct of the vessel from her commanding officer. The executive officer remained on the bridge supported by the navigation officer, the officer of the watch (OOW) and a river pilot.

At 1313, *HMS Westminster* entered Gravesend Reach at a speed of 15 knots and her pilot advised *Princess Rose* on VHF radio that the warship was ready for the boat transfer on her starboard side. *Princess Rose* was waiting in the Reach and her crew immediately requested that *HMS Westminster* rig fenders at the transfer position.

At 1317, while the fenders were prepared, the frigate started to reduce speed from 15 knots to 7 knots over the ground (**Figure 2**). Her heading had also been adjusted to 093°, which provided a lee on her starboard side from the brisk wind blowing over the port bow. During this period, the Gravesend 'E class' inshore lifeboat took up a position about 200m astern of *HMS Westminster* to act as a safety boat during the passenger transfer. The Thames pilot boat was also in close proximity astern, ready to disembark the pilot on completion of the boat transfer.



Gravesend Reach - Location used for passenger transfer



WECDIS download - HMS Westminster entering Gravesend Reach

At approximately 1321 (**Figure 3**), HMS Westminster's executive officer and OOW assessed from the starboard bridge wing that the river conditions were 'well within limits for transfer'. With the ship's speed now at 5 knots through the water and with the fenders in position, the executive officer gave approval for the boat transfer to commence. The fenders were not tied to the vessel's guardrails; they were being tended by hand.

The crew of *Princess Rose* noticed a slight deterioration in the river conditions while waiting for the transfer; they encountered increasingly larger waves and described the conditions as 'very swelly'. However, the crew were content to continue with the transfer, and approached the transfer position at slow speed with one of the crew steering from inside the wheelhouse and the other on deck. Neither of the crew were wearing lifejackets. When close enough, the crew on deck passed a painter¹ to the crew on board HMS Westminster, who then placed the eye of the painter around a deck cleat. On board *Princess Rose*, the painter was led around a cleat on the port shoulder and its length adjusted by the crew on deck to allow the vessel to fall back to a position where the bulwark gate was in line with the intended position of the ladder. The crewman then secured the painter around the centreline bow post. This resulted in the painter lying at a steep angle.

¹ A rope attached to the bow of a boat, used for tying up or towing.



WECDIS download - immediately before passenger transfer

Once secured, *Princess Rose* started to pitch, causing spray to be shipped over her bow. The warship's CBM felt that the conditions were becoming marginal for a boat transfer with a vessel of this type, and that *Princess Rose* was in danger of over-riding the fenders provided. As this had the potential to cause either injury to the crew tending the fenders or the loss of the fenders, the CBM ordered the ratings holding the fenders to recover them inboard.

The pilot ladder and manropes were then lowered but, with the bottom rung of the ladder lying just above the water, the CBM and the crew of *Princess Rose* were concerned that its lower wooden steps might be crushed between the two vessels. *Princess Rose's* helmsman placed the rudder amidships, engaged neutral and put the throttle to idle. He then left the wheelhouse to help bring the bottom four steps of the pilot ladder and its lower spreader² inboard through the boarding gate (Figure 4). The ladder was then flaked across the deck and the crew of *Princess Rose* signalled to the deck of *HMS Westminster* that they were happy for the passenger transfer to commence.

² A wide step designed to prevent a pilot ladder from twisting.

Figure 4



Princess Rose boarding gate

The DRNLO was the first passenger to disembark; she was wearing approved footwear and a hazardous duty lifejacket, and had a laptop computer bag slung across her back. The DRNLO was half way down the ladder when, at about 1323, *Princess Rose* pitched heavily and the painter parted near its mid point, 3.5m from the eye.

Princess Rose immediately started to drift away from *HMS Westminster*, taking the bottom of the pilot ladder with her. The pilot ladder started to twist as *Princess Rose* fell astern. To check this movement, *Princess Rose*'s helmsman quickly returned to the wheelhouse and engaged the main engine ahead. Seconds later, the pilot ladder's lower spreader gave way and the ladder fell back to the warship's side from an angle of between 30° and 40°. The DRNLO fell from the pilot ladder but managed to hold on to a manrope, which she had wrapped around her right wrist. However, she was unable to maintain her grip and soon fell between *HMS Westminster* and *Princess Rose* into the river. Her hazardous duty lifejacket inflated as she entered the water, which caused the strap of the laptop bag to tighten across her chest. The laptop bag filled with water.

1.3.3 Rescue

Manoverboard recovery procedures were immediately initiated by both vessels, and the coxswain of the lifeboat astern saw the accident and stopped his vessel adjacent to the DRNLO. The lifeboat crew were unable to lift her over the inflatable tube on the port bow and had to move her to the vessel's low stern transom (**Figure 5**), where they pulled her on board. The lifeboat took the DRNLO to the Royal Terrace Pier, where she was collected by an ambulance alerted by the Thames Vessel Traffic Service (VTS). She was then taken to the Gravesend lifeboat station where paramedics attended to her. The DRNLO was not required to be taken to hospital.

Figure 5



Low transom of RNLI lifeboat used to recover the casualty from the water

1.3.4 Subsequent actions

Following the recovery of the DRNLO, *HMS Westminster* and *Princess Rose* continued at slow speed while deciding on the next course of action. The conditions slowly worsened as the vessels progressed downstream, and the crew of *Princess Rose* soon informed *HMS Westminster* by VHF radio that it was too dangerous to make any further attempts to conduct the transfer. The commanding officer of *HMS Westminster* agreed and decided to disembark the remaining passengers the following day in Portsmouth. Soon afterwards, the pilot launch manoeuvred alongside *HMS Westminster* and the pilot disembarked safely.

1.4 LOCATION AND ENVIRONMENTAL CONDITIONS

1.4.1 Gravesend Reach

Gravesend Reach is a 3-mile stretch of water running broadly east-west. The River Thames starts to open out to seaward at the eastern part of the Reach, exposing it to the effects of the sea in adverse weather from the north and east.

1.4.2 Predicted conditions

Predicted high water at Gravesend on 24 November was at 1018 with a height of 5.8m. The tidal range on the day was 50% of the spring range. The predicted tidal stream off Gravesend was 088° at 2kts.

The wind was forecast to be from the north to north east Beaufort force 4 to 5 (14 -19kts mean).

1.4.3 Actual conditions

HMS Westminster's logbook recorded:

Time	Wind direction	Speed (kts)	Sea state
1300	029°	15	1
1323	034°	19	1
1400	025°	26	2

The visibility was good. Estimates of the wave height varied. From the bridge wing, the executive officer and the OOW on board *HMS Westminster* estimated the height to have been between 0.1m and 0.6m, whereas the embarked pilot, together with *Princess Rose's* crew estimated the wave height to have been between 1.0m and 1.3m. Crew at the transfer position on board *HMS Westminster* described the conditions as rough and choppy, and estimated the wave height at 1m. Another craft in the vicinity estimated the wave height to be over 1.5m.

1.5 PLANNING

The transfer of people to, and from, warships on passage on the River Thames is a regular occurrence and is usually organised by the DRNLO. On this occasion, the DRNLO informed relevant organisations of the requirements for the transfer by letter on 20 November 2008 in which she advised that:

In the unfortunate event of poor weather, a decision will be made by safety staff whether to continue with the transit. [sic]

The term '*safety staff*', referred to the PLA, the master of the launch and *HMS Westminster's* commanding officer. The letter also stated that the passengers must wear trousers and non-slip shoes.

1.6 PRINCESS ROSE

1.6.1 General

Princess Rose is a Class V passenger vessel authorised by her passenger certificate to carry 164 passengers by day and 60 at night, within category C waters. Her Passenger Certificate and Domestic Safety Management Certificate were issued by the MCA on 10 February 2004. Denton Wharf marked the seaward extremity of *Princess Rose's* category C operating limits. A crew of two is the minimum required to operate the vessel.

1.6.2 Design and construction

Princess Rose has a bluff bow and half-rounded stern, and her steel hull is fitted with a composite rubbing band. Hinged boarding gates are sited in the bulwark on her port and starboard shoulders.

The wheelhouse is in the fore part of the vessel, slightly abaft of the boarding position. Visibility from the wheelhouse is satisfactory and, if necessary, the helmsman and crew on the fore deck can communicate verbally. The passenger accommodation is abaft the wheelhouse and extends right aft and to the port and starboard extremities; it is not possible to walk around the outside of the main deck. Access to the accommodation from the foredeck is via a forward facing door.

The vessel has a single fixed pitch propeller and unbalanced rudder and is reported to have good manoeuvrability and a maximum speed of about 11 knots.

1.6.3 Crew

Princess Rose's crew had successfully completed waterman apprenticeships in the late 1950s, and had been employed on the River Thames in various roles throughout their working lives. Although the men had recently retired from full-time employment, they had continued to work for City Cruises on an 'as-required' basis. Both had held boatmasters' certificates since 2007, which permitted them to conduct passenger, cargo, towing and pushing operations.

Records of working hours showed that in a 4-month period between August and December 2008 the men had worked 316 hours and 279 hours respectively. The hours worked had not exceeded 34 hours per week, and both crew were fully rested before starting work on 24 November 2008.

The men had previously conducted boat transfers on board *Princess Rose* on four occasions while underway and making way, all of which had involved vessels entering the river. The operations director of City Cruises had accompanied the men during some of these transfers.

1.6.4 Operation and safety management

City Cruises had a long association of providing marine services to visiting warships, and had purchased *Princess Rose* specifically for this purpose. The vessel's intended tasks included underway transfers, liberty routines to run the crew to and from the shore, and the removal of garbage from vessels.

City Cruises used *Princess Rose* to transfer service and civilian passengers to and from warships visiting London on several occasions. These included transfers to vessels underway and making way using a pilot ladder, vessels underway but stopped using an accommodation ladder (**Figure 6**), and vessels moored to a buoy using an accommodation ladder. The company was content for the warship to determine the method used for the transfer, but had not assessed the risks associated with the three transfer methods used.

Figure 6



Example of an underway passenger transfer at slow speed using an accommodation ladder

In accordance with City Cruise's Domestic Safety Management System (DSMS), a copy of its operating procedures was held on board *Princess Rose*. These included details of the actions to be taken in the event of a man overboard but did not contain any procedures for the crew to follow when conducting a boat transfer.

City Cruises held detailed training records for its full and part-time crew, which showed that neither of *Princess Rose*'s crew had undertaken any of the training required by the DSMS. The company's training schedule did not include the conduct of underway boat transfers.

Although City Cruises required its masters and crew to acknowledge by signature that they had read and understood the requirements of the company's DSMS, there was no record of *Princess Rose*'s crew completing this task. Both men acknowledged that they were not familiar with the company's safety management system, including its written procedures.

1.6.5 Preparation

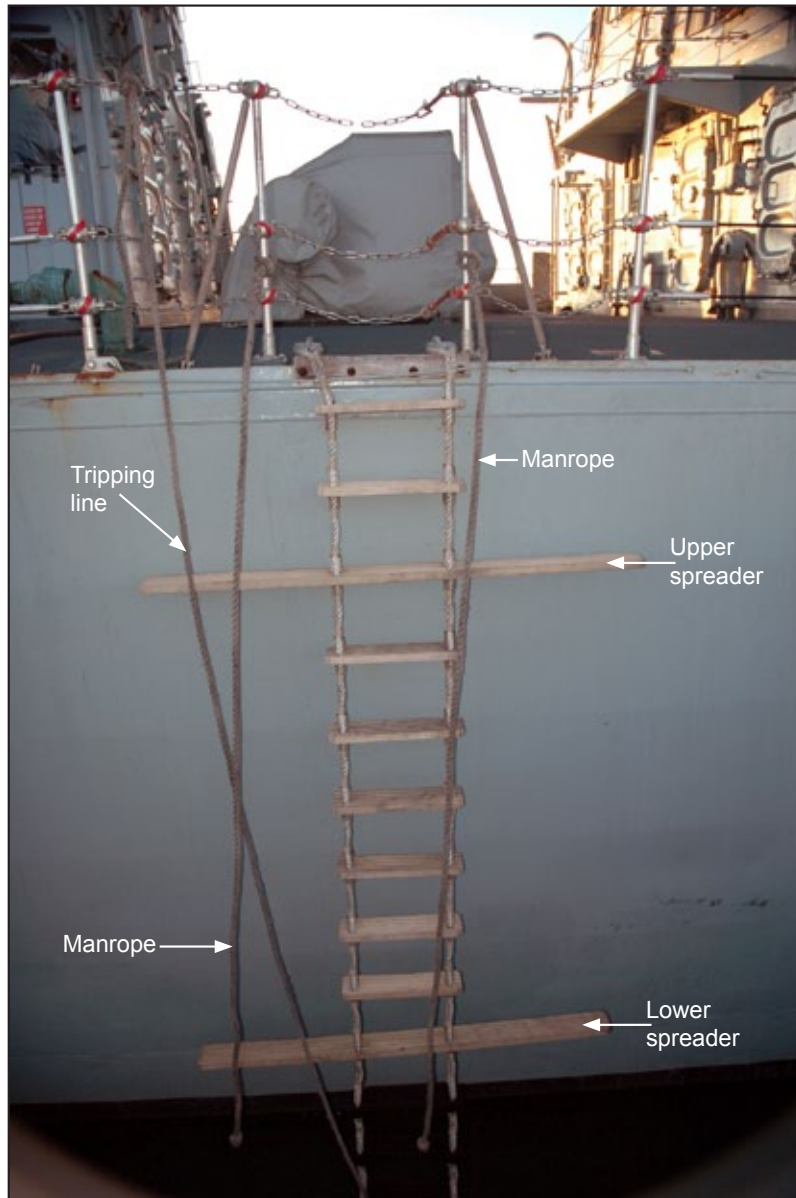
The operations director advised the crew of the requirement to provide the boat transfer with *HMS Westminster* by telephone on 21 November 2008. The crew were told the time of the intended transfer, its location, where to drop off the passengers and which vessel to use. When the men arrived on board *Princess Rose* on the morning of 24 November 2008, one manufactured a new painter using about 11m of 32mm polypropylene rope with a breaking strain of 10.24t. The ends of the rope were whipped with adhesive tape, and a bowline was tied at one end, creating an eye. *Princess Rose* sailed from Cherry Garden Pier at about 0845 for the 19 mile passage to Gravesend Reach. Both crew took turns in the wheelhouse to navigate and manoeuvre the vessel; neither had been nominated to be in charge.

1.7 HMS WESTMINSTER

1.7.1 Equipment

The equipment comprised a pilot ladder secured to deck eye pads using spring hooks, two 24mm polypropylene manropes, and a hook line. The pilot ladder was fitted with two anti-twist spreader bars and its bottom four steps were made of moulded rubber. A tripping line was attached to the bottom rung of the ladder to assist with its deployment and recovery (**Figure 7**). There was no rescue strop provided in the area of disembarkation. VHF radio communication was available between the deck and the bridge.

Figure 7



Pilot ladder as rigged at the time of the accident

1.7.2 Passenger briefing

The CBM briefed the passengers on the use of the hazardous duty lifejacket and its methods of inflation in the amidships cross-passage on the upper deck, adjacent to where the pilot ladder was rigged. The brief did not refer to the use of manropes, the use of a hook rope to transfer baggage, or the availability of a marine rescue strop to assist less confident passengers during their descent. The DRNLO was first told to use the manropes as she stepped onto the ladder.

1.7.3 Experience and onboard procedures

The CBM had been on board *HMS Westminster* for 2 months, and considered the rigging of the pilot ladder a standard operation, which he had carried out on many previous occasions. *HMS Westminster's* crew had considerable experience conducting boat transfers using the vessel's own rescue boat, and craft supplied by a long-standing service provider in UK naval bases. The warship had also transferred passengers via a pilot ladder off Gravesend during a previous visit to London.

Although procedures were in place for the use of the warship's rescue boat, some of which were relevant to transfers involving commercial vessels and civilian passengers, the need for additional procedures when conducting such transfers had not been fully considered.

1.8 REGULATION AND GUIDANCE

1.8.1 International and national

The practice of conducting boat transfers while making way is usually associated with the embarkation and disembarkation of pilots, which is regulated by SOLAS Chapter V, Regulation 23 and IMO Resolution A.889 (21) Pilot Transfer Arrangements. A code of safe practice for embarkation and disembarkation of pilots has been produced jointly by the United Kingdom Major Ports Group (UKMPG), the United Kingdom Marine Pilots' Association (UKMPA), and the British Ports Association (BPA). Guidance on the rigging of pilot ladders is provided by the International Maritime Pilots' Association (IMPA). A poster entitled *Required Boarding Arrangements For Pilots (Annex A)* shows the do's and don'ts for rigging pilot ladders in accordance with the IMO requirements and IMPA recommendations.

The transfer of personnel between moving vessels is included in the Code of Safe Working Practices for Merchant Seamen (COSWOP) (**Annex B**), which states '*a risk assessment of the transfer arrangements should be undertaken and appropriate safety measures put into place to ensure the safety of those involved*'. It is also included in MGN 127 – Means of Recovering Casualties from the Sea When Involved in Ship to Ship Personnel Transfers (**Annex C**).

1.8.2 Royal Navy

HMS Westminster's seamanship data book contained specific information on the use and rigging of the pilot ladders held on board (**Annex D**). The Admiralty Manual of Seamanship also provided a comprehensive description of the pilot ladder, the equipment that was to be available for a transfer, and advice on the requirements for lowering the ladder once a craft is alongside (**Annex E**). The manual specifies that the pilot ladder should terminate 300mm above the waterline in calm conditions and should be shackled to suitable strong points on a ship's structure.

1.9 RISK ASSESSMENT

The MoD has assessed the risks of personnel falling from a pilot ladder when boarding a ship's boat to be As Low As Reasonably Practicable (ALARP) with the frequency and severity assessed as occasional and marginal respectively. It also identified the following control measures: personnel to wear lifejackets and safety boots; a safety brief conducted before the operation; and personnel to be trained in routines.

The MoD has not fully assessed the risks associated with the transfer of civilian passengers with a commercial vessel, and City Cruises had not conducted a risk assessment of the transfer of passengers from a warship using a pilot ladder when making way.

1.10 BEST PRACTICE

Operational requirements require that the Royal Navy regularly carries out boat transfers while making way. These are usually conducted using similar techniques to normal pilot boarding procedures, and tend to be carried out in naval base areas using a contracted service provider. The majority of passengers are service personnel, but civilian contractors referred to as MoD sponsored personnel are sometimes required to be transferred. The MoD and the MCA have agreed that transfers to and from warships and submarines conducted by the service provider when underway and making way, is an affected service and lies outside the regulation of the MCA. It has also been agreed that as an '*affected service*'³ the transfers will be '*conducted under a safe system of working acceptable to MoD ...and that the MCA retains no regulatory risk*'. The MCA advised the service provider that if the transfer of passengers was a regulated service then Merchant Shipping Act provision would apply and there would be a requirement for the ship to be secured to a buoy.

To supplement the vessels used for passenger transfers, the Royal Navy's service provider commissioned two purpose built craft, specifically designed to transfer passengers underway. These vessels are twin screw and are very manoeuvrable; they also use a hydraulically powered rigid gangway for the transfers. The service provider requires the masters and crew on all its vessels to complete specific type training, which includes passenger transfers. It also encourages its crews to understudy the master during boat transfers whenever possible.

Detailed procedures have been developed for these vessels (**Annex F**). These include the use of a head line and a back spring, the wearing of lifejackets by the deck crew and the passengers being transferred, and the monitoring of communications. The service provider does not permit the transfer of civilians by

³ MCA Instructions to surveyors section 5.8 – Due to their unusual role, some government ships may be called upon to conduct operations which would not be expected to fall within the scope of equivalent merchant ships.

its vessels when making way. The limit for the conduct of transfers is the upper scale of sea state two with an average wave height 0.3m. The final decision rests with the master if he feels that conditions are unsuitable.

1.11 PORT OF LONDON AUTHORITY

The accident occurred in the Port of London (Lower) harbour limits. Having been made aware by the DRNLO of the intended transfer, the port authority advised the Gravesend inshore lifeboat crew, which provided safety cover as part of a routine training exercise. Had the Gravesend inshore lifeboat not been available, the Port of London Authority would have used one of its own tenders as a safety boat.

1.12 SIMILAR ACCIDENTS

The MAIB is aware that between 1998 and 2007 inclusive, nine people have fallen overboard while transferring or, preparing to transfer, between commercial vessels at sea. Seven of these people fell from vessels underway or underway and making way; four fell when using a pilot ladder and three fell when transferring across decks. The remaining two people fell when rigging a safe means of access.

Royal Navy records, available since 2005, indicate that one person has fallen overboard while using a pilot ladder to disembark.

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

The DRNLO fell overboard when descending the pilot ladder due to a series of events triggered by the parting of *Princess Rose*'s painter. This caused an unexpected movement of *Princess Rose* away from the transfer position, which was not immediately checked. As the distance between *Princess Rose* and the transfer position increased, the pilot ladder's lower anti-twist spreader caught against the vessel's bulwark and prevented it from running clear. Tension on the ladder increased until the weight on the spreader caused it to give way, allowing the ladder to fall back to the warship's side from a steep angle. It was not surprising that this caused the DRNLO to fall off the ladder. It was even less surprising that she was unable to hold on to the manrope.

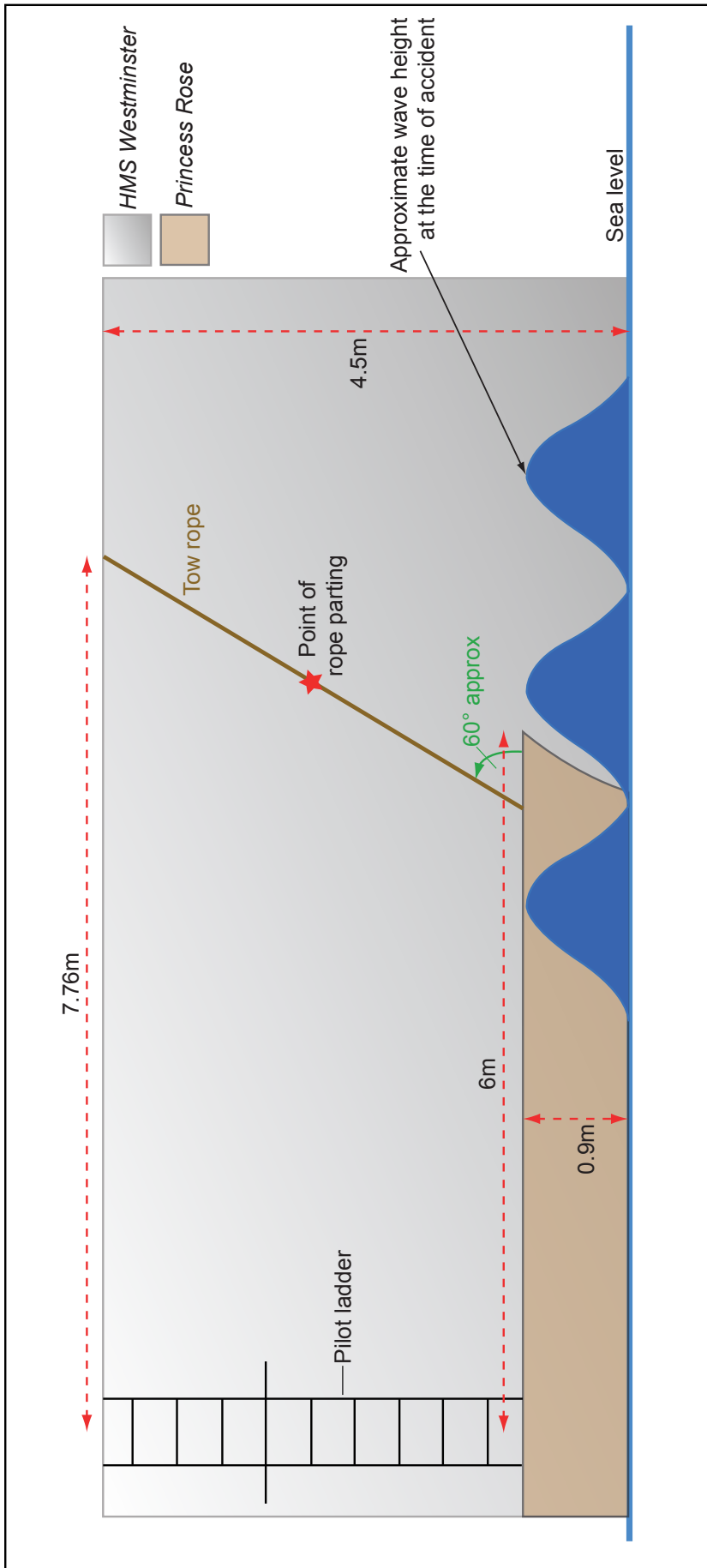
2.3 EQUIPMENT AND PRECAUTIONS

2.3.1 Use of the painter

It is a common practice for vessels to use a painter when lying alongside a pilot ladder or other embarkation point when making way through the water. A painter effectively tows a vessel in its intended transfer position, but to reduce shock loading when operating in choppy seas, it is essential that the painter has a shallow lead. This requires a painter to be not only of sufficient strength but also a suitable length.

In this case, the angle of the painter was relatively steep (**Figure 8**), and when *Princess Rose* began to pitch as the sea conditions worsened, the resultant vertical movement of the vessel's bow induced a shock loading and caused the polypropylene rope to part. It is likely this could have been avoided had a longer painter been provided and attached further forward on board *HMS Westminster*. It is also likely that the movement of *Princess Rose* in relation to the transfer position following the failure of the painter would have been controlled more quickly if one of the crew had remained in the wheelhouse. Although the use of a painter reduced the need for frequent engine and helm movements, the need to be able to manoeuvre immediately is very important, particularly when transferring people.

Figure 8



Relative position of Princess Rose and the pilot ladder while alongside HMS Westminster

2.3.2 The pilot ladder

The bottom rungs and lower anti-twist spreader were pulled on board *Princess Rose* because they were in danger of being crushed following the removal of the pneumatic fenders. Had they not been pulled on board, which was contrary to the advice provided in the Admiralty Manual of Seamanship, the ladder would have been unaffected by the movement of *Princess Rose*. Consequently, the DRNLO would have been able to climb back up the ladder after the painter had parted. There would have been no need to move the bottom of the ladder if the ladder's length was adjustable as advised by IMPA (**Annex A**), but this was prevented by its securing arrangement.

It is also possible that it would not have been necessary to move the bottom of the ladder had the fenders been kept in place. The use of fenders at the transfer position was a reasonable precaution in view of the flare of the warship's side and, although it would have been increasingly difficult to position the fenders effectively as the wave height increased, they might have still afforded adequate protection for the ladder. Fenders can only prevent damage to vessels and structures when they are used. Their occasional loss is usually a small price to pay, and the risk of injury to the ratings tending them could have been eliminated by tying the fenders to the guardrails.

Although the use of spring hooks to secure the pilot ladder to the deck eye pads on board *HMS Westminster*, and the permanent fitting of a tripping line which was not led clear of the ladder (**Figure 7**), were contrary to the instruction detailed in the Admiralty Manual of Seamanship (**Annex E**), neither were contributory to the accident.

2.3.3 Hook ropes

Hook ropes are used to transfer luggage between vessels lying alongside. In this case, although a hook rope was available, it was not used to transfer the DRNLO's laptop case. Consequently, when the DRNLO was in the water, her bag acted as a drogue and hindered her recovery. It was extremely fortunate that her lifejacket inflated and the RNLi lifeboat was immediately on the scene. Otherwise, the effect of the water-filled bag would have undoubtedly been a considerable hindrance. The transfer of baggage on hook lines not only allows people to use both hands when negotiating a ladder, it also ensures they are not impeded by an unnecessary weight on their backs, and, in an emergency, it allows lifejackets to inflate as intended.

2.4 ASSESSMENT OF THE CONDITIONS

After *HMS Westminster* entered Gravesend Reach, the delay to the boat transfer while the fenders were readied and the warship reduced speed, meant that the vessels were already 8 cables further east by the time the transfer started. The river conditions deteriorated as the vessels entered the more exposed waters and, while the warship's heading protected the transfer

position from the prevailing wind, it did not prevent *Princess Rose's* exposure to increasing wave heights, which were probably exacerbated by the wind and tidal stream being in opposition. Although the deteriorating conditions were recognised by *Princess Rose's* crew, and the frigate's CBM, they appear to have been unnoticed or under-estimated by *HMS Westminster's* bridge team. This underlines the potential for inaccuracy when assessing sea conditions from height.

2.5 DECISION-MAKING

The use of Gravesend Reach for passenger transfers is understandable, given its location and the proximity of Royal Terrace Pier. However, although *HMS Westminster* sailed with the passengers embarked only after confirming that the conditions in the Reach were suitable, there was no contingency plan in the event of their deterioration. Therefore, it is possible that an underlying pressure was placed on the crews of the vessels to complete the transfer in the marginal conditions they encountered.

Moreover, the use of a pilot ladder to disembark passengers, some of whom were either unfamiliar or unpractised in this method of transfer and undoubtedly held different levels of fitness and physical capability, was questionable. Descending a pilot ladder is not straightforward, and the degree of difficulty is increased where a ship's side has a significant flare. Consequently, the use of pilot ladders for transferring non-seafarers, particularly when making way, is best avoided unless absolutely necessary. Where such transfers cannot be avoided, the use of a safety harness to prevent a person from falling into the water, is an invaluable precaution to take, providing the harness is properly tended.

2.6 TRAINING

Although *Princess Rose's* crew were quick to identify that fenders had not been positioned, it is evident that a number of their actions departed from established practice when conducting boat transfers when making way. In particular:

- No person was nominated to be in charge;
- The painter was too short to provide a long, shallow lead;
- The wheelhouse was left unattended and therefore the vessel could not be manoeuvred to reduce the weight on the painter;
- The bottom of the pilot ladder was pulled on board; and,
- Lifejackets were not worn when working on the foredeck with a bulwark gate open.

Princess Rose's crew had conducted transfers under the guidance of the company operations director, but neither had received any dedicated training in passenger transfer operations. This was probably because they were employed

on casual contracts and had been inadvertently excluded from company training schedules. Consequently, the crew relied solely on their previous experience in general river operations.

The skills required to carry out a boat transfer when making way exceed those required for routine operations. This has been acknowledged by the training conducted by the Royal Navy's service provider, and in the training of the skippers of pilot boats. This typically requires: a minimum period of service on a vessel; a dedicated period of boat handling of about 2 weeks, which includes manoeuvring alongside vessels at varying speeds, and manoeuvring in emergency situations such as man overboard; a proportion of the training to be conducted during the hours of darkness; and an assessment by an experienced skipper. Had City Cruises adopted similar requirements, the likelihood of the departures outlined above would probably have been reduced considerably.

2.7 MANNING

The passenger and domestic safety management certificate required that *Princess Rose* was manned using a minimum of two crew. However, when determining the minimum number of crew required, the MCA had primarily considered the vessel's normal operating role, carrying passengers to and from various berths along the River Thames. Guidance on the need to review manning levels was contained in MGN 290 'Local Passenger Vessels: Manning', which stated that, '*The owner should keep manning levels under review. There may be circumstances where additional staff are required – such as a charter requiring more involvement of crew in the catering arrangements or where passengers have special needs. If in doubt, in these circumstances it is advisable to discuss the situation with the Marine Office*'.

When *Princess Rose* started to carry out underway and making way boat transfers, the minimum manning needed for such operations had not been considered by City Cruises as part of any risk assessment process. Had it done so, the company might have identified that the operation presented significantly different hazards that required appropriate control measures to be put in place, one of which was additional manning.

As this operation demonstrated, two crew were required on deck to deal with the mooring lines and ladder, and to supervise the safe embarkation of passengers. It was inappropriate for the helmsman to leave the wheelhouse to assist with these tasks, as it removed the one person monitoring safety, communicating with the other ship, and operating the boat's controls. An additional crewman was required to ensure that all the tasks associated with passenger embarkation were conducted safely and efficiently, and the wheelhouse remained manned by an appropriately qualified person throughout the evolution.

When determining the minimum safe manning, the MCA considers the ability of the crew to recover a man overboard. However, given the initial difficulties faced by the RNLI crew, had *Princess Rose* needed to recover the DRNLO unaided, then an additional crewman might have significantly improved the chance of a successful rescue.

2.8 RISK ASSESSMENT

2.8.1 City Cruises

Princess Rose is not as manoeuvrable as a twin-screw pilot vessel or the catamarans designed specifically for personnel transfers with naval vessels. Therefore, it is not surprising that the pilot boat was able to manoeuvre alongside *HMS Westminster* and transfer the pilot in conditions which were too severe for *Princess Rose*. However, the limitations on the suitability of the vessel to conduct passenger transfers had not been identified.

Although City Cruises had developed a safety management system which included procedures for routine emergencies, unlike the Royal Navy's service provider it had not embraced the comprehensive use of risk assessments. Consequently, despite the requirements of the COSWOP and boat transfers being a regular service, the associated risks with this activity had not been assessed. A risk assessment for transferring passengers while making way would necessarily consider all aspects of the operation, including: the suitability of the craft; manning requirements; the location of the transfer; the method of transfer; operating parameters such as the time of day, weather, and sea state; the experience and training of the crew; ship handling and manoeuvring; means of recovery in the event of a man overboard; and seamanship.

In addition to identifying control measures required to reduce the risks, the results of such an assessment would also enable the development of detailed operational procedures, such as the instructions followed by the Royal Navy's service provider (**Annex F**). These would be an invaluable reference for the crew, particularly when employed on casual contracts where the frequency of such operations might be reduced.

2.8.2 HMS Westminster

Notwithstanding the onboard procedures developed for boat transfers using the warship's rescue boat and craft operated by its service provider in naval base areas, and the control measures identified by the MoD to reduce the risks associated with the use of pilot ladders, it is evident that the specific risks encountered when conducting the transfer of civilian passengers from a warship to a commercial craft had not been fully considered. Such consideration would have identified the increased risk to non-seafarers of varying ages and physical ability when using pilot ladders, along with the benefits of hook ropes and marine rescue strops. Recognition that this type of transfer may need to be carried out

in other ports highlights the need for the suitability of the boat proposed to carry out the transfer to be considered. This would include the boat's communication facilities, the provision of suitable lines and fenders, means of embarkation and, if necessary, the need to conduct the transfer at anchor or stopped in the water. It might have also highlighted the differences between the warship's onboard procedures and the guidance provided by IMPA to commercial vessels.

2.9 MCA GUIDANCE

The COSWOP acknowledges that transferring people between vessels underway can be dangerous and should be risk assessed. However, the transfer of people, particularly non-seafarers, between vessels which are underway and making way, further increases the risks and MGN 127 (**Annex C**) emphasises that operational procedures must be developed and followed during such transfers to ensure rapid recovery of any person falling overboard is possible.

Fortunately, nearly all of the transfers of personnel between vessels making way are limited to the transfer of pilots, which are covered by separate regulatory requirements, and to specific operations such as that arranged between the MoD and its service provider. However, the need to transfer people between vessels when making way will occasionally arise in other circumstances and, although the use of this method should not be encouraged, vessels undertaking transfers when making way would undoubtedly benefit from the provision of more detailed guidance on the risks to be considered and the precautions to be taken.

SECTION 3 - CONCLUSIONS

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

1. The angle of the painter was relatively steep, and when *Princess Rose* began to pitch as the sea conditions worsened, the resultant vertical movement of the vessel's bow induced a shock loading and caused the polypropylene rope to part. [2.3.1]
2. The movement of *Princess Rose* in relation to the transfer position following the failure of the painter would have been controlled more quickly if one of the crew had remained in the wheelhouse. [2.3.1]
3. Had the bottom of the pilot ladder not been taken on board *Princess Rose*, the ladder would have been unaffected by the vessel's movement. [2.3.2]
4. *Princess Rose*'s crew were not trained in passenger transfer operations and relied solely on their previous experience in general river operations. [2.6]
5. An additional crewman was required to ensure that all the tasks associated with passenger embarkation were conducted safely and efficiently, and the wheelhouse remained manned by an appropriately qualified person throughout the evolution. [2.7]
6. City Cruises had not conducted a risk assessment on the transfer of passengers when making way or developed operational procedures for this activity. [2.8.1]

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

1. Vessels undertaking transfers when making way would undoubtedly benefit from the provision of more detailed guidance on the risks to be considered and the precautions to be taken. [2.9]

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

1. The use of a pilot ladder to disembark passengers, who were either unfamiliar or unpractised in this method of transfer, and undoubtedly held different levels of fitness and physical capability, was questionable. [2.5]
2. The specific risks encountered when conducting the transfer of civilian passengers from *HMS Westminster* and other warships to a commercial craft had not been fully considered. [2.8.2]

SECTION 4 - ACTION TAKEN

4.1 THE COMMANDER IN CHIEF FLEET

The Commander in Chief Fleet has taken the following actions:

- The transfer of personnel to and from warships, in particular, those involving civilian passengers and commercial vessels whilst underway has been closely scrutinised and detailed direction and guidance has been drafted and will be issued across the Fleet. The direction and guidance includes: a process to ensure transfers are categorised in advance; categories of transfer are defined according to risk; appropriate assessments and preparations undertaken for each category.
- Relevant training courses have been updated to both incorporate the lessons identified during this incident and the revised guidance and direction that has been issued to the Fleet.
- An assessed boat transfer serial has been included for all ships during their Safety and Readiness Checks (as they emerge from periods of refit or extended maintenance) prior to undergoing sea training. A boat transfer assessment has been incorporated into formal periods of sea training.
- To address the risk that direction already issued about the rigging of pilot ladders was not being followed or understood across the Fleet, and to clarify some of the existing direction, Navy Command Headquarters has issued an Advisory Notice to all surface warships reminding those involved in underway transfers of the instructions contained in the Admiralty Manual of Seamanship (**Annex E**) on the rigging of pilot ladders. In addition, the Fleet has been directed that tripping lines are only to be attached to pilot ladders once the transfer of personnel has occurred and the use of hook ropes for the transfer of baggage has been made clearer.

SECTION 5 - RECOMMENDATIONS

The Maritime and Coastguard Agency is recommended to:

2009/144 Provide guidance on:

- The conduct of passenger transfers between vessels that are underway and making way.
- The movement of passengers to and from vessels which are not secured to a quay, including the use of vertical ladders.

City Cruises is recommended to:

2009/145 Carry out a comprehensive risk assessment on vessels it uses to conduct passenger transfers when making way. The assessment should examine all aspects of the transfer operation and lead to the development of robust procedures, guidance and appropriate manning levels for this type of operation.

2009/146 Provide training for its masters employed in conducting passenger transfers between vessels making way through the water. The training should be tailored to take account of the characteristics of specific vessels and should be incorporated into the training schedule contained within the company's safety management system.

Marine Accident Investigation Branch
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