Report on the investigation of

the collision between

Brenda Prior* and *Beatrice

Lambeth Pier, River Thames

Friday 17 December 2004

Marine Accident Investigation Branch
Carlton House
Carlton Place
Southampton
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Extract from

The 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 purpose is to attribute or apportion liability or blame.

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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

AIS	-	Automatic Identification System
COC	-	Certificate of competency
DfT	-	Department for Transport
DUKW	-	D Year of production code U Body style, utility truck (amphibious) K Front-wheel drive W Two rear driving wheels
GMDSS	-	Global maritime distress and safety system
GPS	-	Global positioning satellite
MCA	-	Maritime and Coastguard Agency
PLA	-	Port of London Authority
UTC	-	Universal co-ordinated time
VHF	-	Very high frequency
VTS	-	Vessel traffic services

SYNOPSIS

Description

At 1508 on 17 December 2004, the aggregates carrier *Brenda Prior,* and the DUKW *Beatrice*, collided adjacent to Lambeth Pier on the River Thames. *Brenda Prior* was sailing downriver in ballast having just completed a discharge of sand at Battersea, *Beatrice* `was carrying 25 passengers on a circuit of the river between Vauxhall and Westminster Bridges. *Beatrice* sustained minor structural damage, but was able to return to shore, supervised by a Port of London Authority launch that was in the vicinity. *Brenda Prior* sustained no damage.

Factual

The mate of *Brenda Prior*, acting as lookout from her bridge, had reported the presence of *Beatrice* on two occasions prior to the incident. As an overtaking vessel, *Brenda Prior* was required to keep out of *Beatrice*'s way, but failed to do so because the master himself had not positively sighted the DUKW.

Brenda Prior's master decided to deviate from the normal route under the centre arch (No.3) of Lambeth Bridge, and chose to take No.4 arch to help him line up for Westminster Bridge No.5 arch and avoid conflicting with upstream traffic.

While under Lambeth Bridge, the master of *Brenda Prior* saw a DUKW inside the barge roads half way between Lambeth and Westminster Bridges. Believing this to be the DUKW reported earlier by the lookout, the master continued his passage. In fact, the master had seen a second DUKW, *Titania*, whose presence he was unaware of, which had entered the river ahead of *Beatrice*. Very shortly after passing under Lambeth Bridge and when abeam of Lambeth Pier, *Brenda Prior* collided with *Beatrice*. All passengers onboard *Beatrice* remained safe and were returned to shore immediately.

Analysis

Both DUKWs had reported into Woolwich Radio VTS in accordance with PLA instructions. However, *Brenda Prior*'s master had not maintained an effective listening watch on VHF before departure, so was unaware of the first DUKW entering the river.

The lookout in *Brenda Prior*'s wheelhouse reported sighting *Beatrice* on two occasions, but the master failed to sight the DUKW himself because the trim of the vessel in the ballast condition created a considerable blind sector forward. Had the lookout been positioned at the bow, his additional reports would have alerted the master earlier, and probably prompted him to take avoiding action.

Had the J J Prior fleet (owners of *Brenda Prior*) operated a safety management scheme, standard operating procedures, based on an assessment of the hazards associated with the fleet's operating pattern, would have provided guidance and instructions for masters, including the requirements for maintaining a safe lookout.

Conclusions

Use of VHF:

- Before her departure, *Brenda Prior* failed to note that *Titania* had entered the water, and *Beatrice*'s report was only partially heard.
- *Brenda Prior*'s master failed to report his intention to deviate from his planned track to pass under Lambeth Bridge via No.4 arch.
- The VTS Woolwich Information Service currently does not alert reporting traffic to DUKW operations between Vauxhall and Westminster Bridges.
- The skipper of *Beatrice* did not directly report the incident to VTS to avoid alarming his passengers.

Lookout:

- *Brenda Prior* failed to maintain an effective lookout, resulting in the mis-identification of *Beatrice* and the subsequent collision.
- PLA General Directions require vessels greater than 40 metres in length with the wheelhouse aft, to station a lookout at the bow, but not smaller vessels in the ballast condition trimmed deep by the stern and with limited visibility forward.
- Although DUKWs are painted yellow, the visibility of these vessels could be improved.
- Acting as Tour Guide reduces the DUKW lookout's effectiveness.
- The skipper of *Beatrice* did not sound the 'wake-up' signal to alert *Brenda Prior* of his presence immediately before the collision.

Safety Management:

- Standard operational guidance and procedures were not available to the J J Prior Ltd fleet.
- *Brenda Prior*'s master and deckhand's certificates of competency had expired 9 months before the collision.

Recommendations

J J Prior Ltd has been recommended to develop their safety management system. The PLA has been recommended to review the mandatory VHF reporting requirements for DUKW operations, and to amend General Directions to provide further instruction on the requirement for, and the placing of lookouts. Additionally, London Duck Tours Ltd, the PLA and the MCA, have been recommended jointly to examine the options for enhancing the visibility of DUKWs for other river users.

Figure 1

Brenda Prior

Figure 2

The DUKW *Beatrice*

SECTION 1 - FACTUAL INFORMATION

1.1 PARTICULARS OF *BRENDA PRIOR*, *BEATRICE* AND THE ACCIDENT

Vessel details		*Brenda Prior* **(Figure 1)**
Registered owner/manager	:	J J Prior Transport Limited
Port of registry	:	Colchester
Flag	:	British
Type	:	Aggregates carrier
Built	:	1968 at Rochester
Classification society	:	Under MCA survey regime
Construction	:	Steel
Length overall	:	30.63 metres
Gross tonnage	:	198.05 tons
Engine power and/or type	:	Bergins 179 kilowatts
Service speed	:	8 knots
Other relevant info	:	Radar scanner is removable for passing under the Thames bridges.
Accident details		
Time and date	:	1508 on 17 December 2004
Location of incident	:	Lambeth Pier, River Thames
Persons on board	:	3
Injuries/fatalities	:	None
Damage	:	None

Vessel details		*Beatrice* **(Figure 2)**
Registered owner/manager	:	London Duck Tours Limited
Port of registry	:	London
Flag	:	British
Type	:	Amphibious vehicle
Built	:	1942 / 1945
Classification society	:	Under MCA survey regime
Construction	:	Steel
Length overall	:	9.44 metres
Gross tonnage	:	7.5 tons
Engine power and/or type	:	Perkins Phaser 4 litre turbo diesel engine
Service speed	:	6.0 knots
Other relevant info	:	Capable of carrying a 2.5 ton payload. 6 wheel drive and water propeller.

Accident details		
Time and date	:	1508 on 17 December 2004
Location of incident	:	Lambeth Pier, River Thames
Persons on board	:	2 crew members and 25 passengers
Injuries/fatalities	:	None
Damage	:	Canopy, and rear access ladder

1.2 BACKGROUND

Brenda Prior

Brenda Prior, a 198 grt aggregates carrier, had just left her berth at Battersea and was on passage to the ship's home port of Fingringhoe near Colchester. The vessel's regular trading pattern was transporting soft sand and aggregates from Fingringhoe to various wharves along the River Thames.

Beatrice

Beatrice is one of 5 amphibious DUKW craft owned and operated by London Duck Tours Ltd, originally built to take troops ashore at the D day landings, and now used as a tourist attraction on the River Thames. The craft follow the same route for all excursions, taking passengers around a circuit of the river between Vauxhall and Westminster Bridges.

Thames Navigation – Keying Device

Certain vessels navigating the River Thames are required to carry and use a 'keying device'. The device activates an 'isophase' light above the centre arch of a bridge in advance of a vessel's passage to notify other vessels that the main arch of the bridge will shortly be in use. Should two vessels on opposite sides of the bridge both activate the light, the light will 'flash', warning both vessels of the hazard. A more complete description of the keying device is at paragraph 1.6.

1.3 NARRATIVE

All times are UTC.

1.3.1 *Brenda Prior*

At 1415 on Friday 17 December 2004, *Brenda Prior* secured to Metro Greenhams wharf at Battersea to begin discharging her cargo of sand. Discharge commenced at 1418, and the cargo of 165 tons of sand was fully discharged by 1445.

It was normal practice to leave the vessel's engine running throughout the period of discharge. Toward the latter stages, the master began checking the bridge equipment prior to sailing. This included checking the operation of the keying device, the sailing draught, and cooling water for the main engine. During this period, he was monitoring the VTS primary VHF channel 14.

At 1449, the master called Woolwich Radio VTS informing them that *Brenda Prior* had slipped from Metro Greenhams wharf and was outbound for the bridges. London VTS acknowledged the transmission by repeating the message. *Brenda Prior* left her berth and proceeded downriver at half speed against the flood tide, sailing in the ballast condition with draughts of 0.76 metres forward, and 1.82 metres aft. The mate, who had been at harbour

stations, then made his way to the wheelhouse to act as the lookout. This was the normal procedure after sailing. The deckhand remained on deck to sweep up the remaining cargo deposits after the discharge.

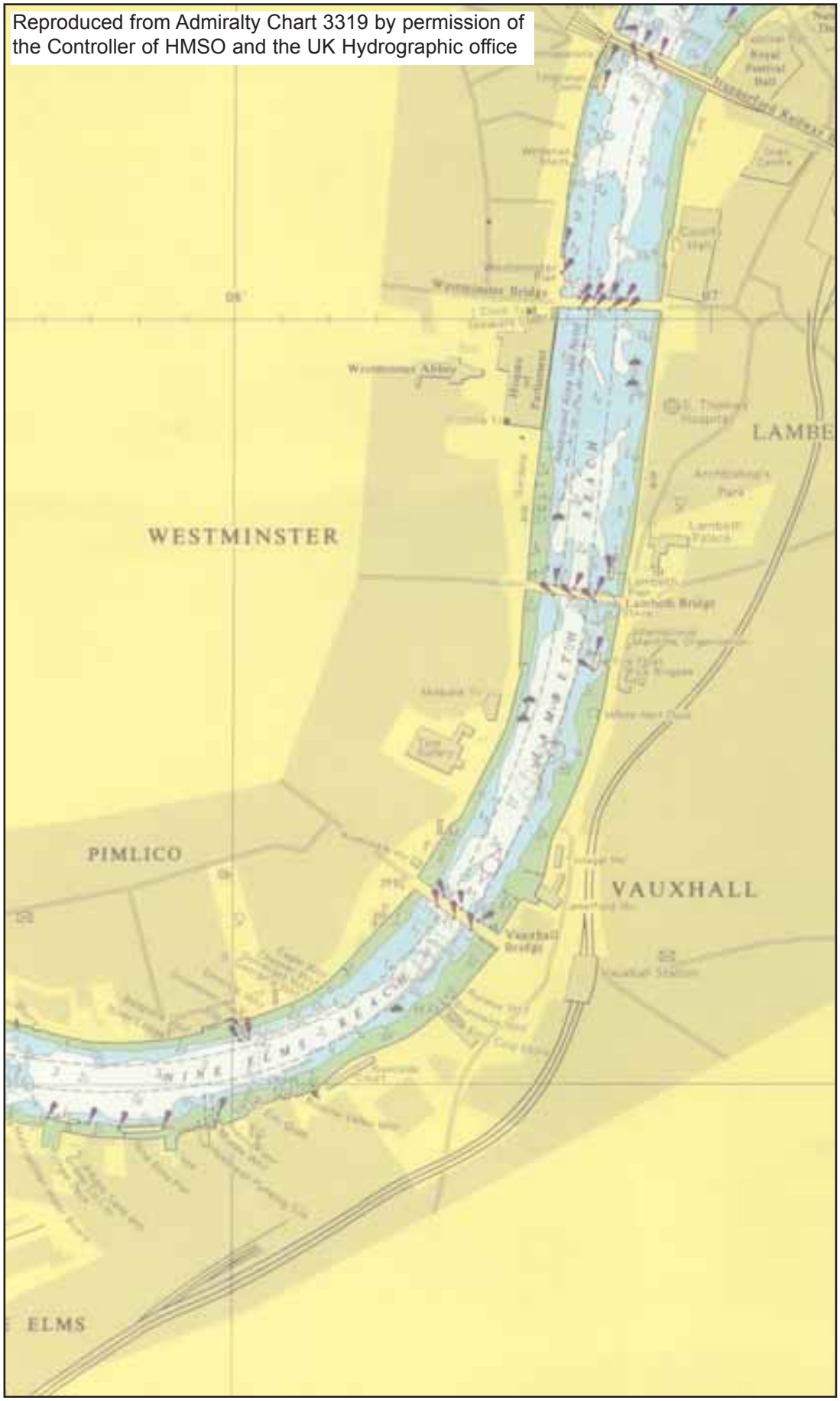
At 1450, the master heard an unidentified transmission on VHF channel 14 for a craft entering the river at Lacks Dock near Vauxhall Bridge. The master maintained that the name of the craft was not passed, and that VTS replied without passing the name. However, from his local knowledge of river operations, the master was aware that the craft entering the river was a DUKW.

The mate reported that while transiting Nine Elms Reach **(Figure 3)** on approach to Vauxhall Bridge, *Brenda Prior* passed two inbound tugs. The record of warning light activation maintained by the PLA confirmed this **(Annex B)**. The master called London VTS just before the charted reporting point at Vauxhall Bridge: *Brenda Prior* was now at three quarters speed, which equated to a speed over the ground of 4.0 knots. Before entering under the centre arch at Vauxhall Bridge, the master asked the mate to keep a good lookout for the DUKW that he knew had entered the water. The mate went to the port wing outside of the wheelhouse and stood on the raised section slightly aft of the wing. He sighted a DUKW approximately half way between Vauxhall Bridge and Lambeth Bridge, close to the starboard extremity of the channel proceeding downstream toward Lambeth Bridge. The mate reported the sighting to the master. With his transponder box switched on, in the downstream mode, the master took the centre arch at Vauxhall Bridge.

Proceeding downstream between Vauxhall and Lambeth Bridges, the master of *Brenda Prior* had not positively identified the DUKW ahead of him. The keying device activated the Lambeth Bridge warning light at 1502. The master reported that the warning light was flashing 'rapid flash', indicating that another reporting vessel was approaching from the downstream side of Lambeth Bridge. The master reported that the inbound vessel was the tug *Merit*, which, because she was following the flood tide, had priority using Lambeth Bridge centre arch. Regulation required *Brenda Prior* to give-way by either slowing down or using an alternative arch. The master was aware that due to maintenance work being undertaken at Westminster Bridge, No.3 and No.4 arches were closed, and that, as an outbound vessel, *Brenda Prior* was required to use the southerly, No.5 arch **(see Figure 4)**.

Based on these facts, the master made the decision to bias *Brenda Prior'*s track toward the south side of the river, and to change his line of approach to Lambeth Bridge, taking No.4 arch to allow a more natural line of approach to Westminster Bridge No.5 arch. This would also ensure the tug *Merit* was not impeded while lining up for the centre arch (No.3) at Lambeth Bridge from the upstream side. Having made the decision to deviate from his planned track, the master turned his keying device to stand-by, but he did not inform VTS of his revised intentions.

Figure 3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WESTMINSTER
PIMLICO
VAUXHALL
LAMBE
ELMS
Westminster Bridge
Lambeth Bridge
Vauxhall Bridge
MILLBANK
WINE ELMS REACH

Figure 4

Construction work at Westminster Bridge

Shortly after *Brenda Prior* elected to take Lambeth Bridge No.4 arch, the mate reported that he could see the DUKW, which was proceeding in the same direction as *Brenda Prior*, approaching No.4 arch. Just prior to entering under Lambeth Bridge No.4 arch, the master gained positive identification of a DUKW approximately half way between Lambeth and Westminster Bridges, on the south side of the river inside the barge roads. The master made the assumption that this was the same DUKW that the mate had been reporting during their transit between Vauxhall and Lambeth Bridges, so *Brenda Prior* continued her passage under Lambeth Bridge No.4 arch. At 1508, as she came clear from under the arch and was almost adjacent to Lambeth Pier, the master and mate felt a slight nudge on the starboard bow. Both were unaware that they had collided with another vessel - a DUKW.

The nudge, and the shouting of witnesses aboard leisure craft moored to Lambeth Pier, alerted the crew of *Brenda Prior* to something untoward. The mate went out onto the starboard bridge wing to investigate, and saw a DUKW manoeuvring hard to starboard, attempting to peel away from the starboard shoulder of *Brenda Prior*. The mate informed the master of the situation, upon which the master immediately engaged the engines full astern, allowing the DUKW to disengage itself from *Brenda Prior'*s starboard bow.

Immediately the vessels had separated, the DUKW skipper called *Brenda Prior*'s master on VHF channel 14 to inform him that everyone onboard was safe, and his intentions were to turn around and proceed back to the slipway at

Lacks Dock. The master was now aware, for the first time, that the DUKW was named *Beatrice.* The master asked whether there was any damage, and informed *Beatrice* that he would 'take a turn' on the nearby barge roads moorings.

Once the vessel was secured to the barge roads, at 1510 the master reported the incident to Woolwich Radio VTS on the secondary ship to shore VHF channel 22. VTS responded by requesting confirmation that *Brenda Prior* had used the centre arch at Lambeth Bridge. The master answered *'no we came down through the south side'*.

A PLA patrol launch had coincidentally followed *Brenda Prior* downriver from the area around Vauxhall Bridge, and had witnessed the collision. The launch accompanied *Beatrice* back to Lacks Dock as a safety precaution. Meanwhile, *Brenda Prior* was in danger of becoming trapped between the bridges by the rising tide, and was given approval by VTS to proceed downstream to Greenwich, secure, and await boarding by a PLA official.

The master was tested to determine his blood alcohol level. The result of the test was negative.

1.3.2 *Beatrice*

On the afternoon of 17 December 2004, the DUKWs *Titania* and *Beatrice* were participating in a joint corporate entertainment package. Both were fully loaded, each with 2 crew and 25 passengers. At 1445:26 *Titania* reported to VTS on VHF channel 14, requesting permission to enter the water at Lacks Dock outward bound to Westminster and then return. The message was repeated by VTS, and positive identification was established using the vessel's name - *Titania* - by both the skipper and VTS duty officer. *Titania* entered the river at Lacks Dock, and proceeded downstream toward Lambeth Bridge.

At 1450, *Beatrice* reported to Woolwich Radio VTS that she was entering the water at Vauxhall and proceeding down to Westminster and then returning to Vauxhall. Woolwich Radio VTS acknowledged this report and, once again, positive identification was established by the VTS duty officer repeating the vessel's name. Shortly after this report, *Beatrice* entered the river at Lacks Dock close to Vauxhall Bridge. At this stage, *Titania* was approximately 365 metres ahead of *Beatrice,* and proceeding at about 3.5 knots over the ground downstream against the flood tide.

The skipper of *Beatrice* became aware of the presence of *Brenda Prior* as he approached Lambeth Bridge. At that time, *Brenda Prior* was some way back, and the skipper assumed that *Brenda Prior* would be using the centre (No.3) arch of Lambeth Bridge, as there were no vessels coming upriver between Lambeth and Westminster Bridges. *Beatrice* proceeded under No.4 arch keeping well over to the starboard side of the river, and the skipper reported that the only vessel he could see ahead was *Titania* inside the barge roads. Passing Lambeth Pier, *Beatrice* maintained a distance of between 1.5 to 3 metres off the

moored craft at the end of the pier. While abeam of Lambeth Pier, the skipper saw *Brenda Prior* exiting from under No.4 arch, and tried to manoeuvre closer to the moored craft in an attempt to give *Brenda Prior* more room to pass. Seconds after this, *Brenda Prior*'s bow collided with the stern of *Beatrice*.

Brenda Prior propelled *Beatrice* forward through the water at about 4 knots, during which time the DUKW started to go down by the head due to the force being applied to her stern. The skipper of *Beatrice* could not alter his course to starboard until clear of Lambeth Pier. When *Brenda Prior*'s master applied astern power, this coincided with *Beatrice* clearing the eastern side of Lambeth Pier, and allowed the skipper to alter course to starboard and clear himself from under *Brenda Prior'*s bow.

Once clear, all passengers were briefed to remain calm. The skipper made the decision to turn hard to port once *Brenda Prior* was clear, and return to his slipway at Lacks Dock as, with the assistance from the flood tide, he would be ashore again within 5 minutes. Once safely turned and heading back, the skipper contacted *Brenda Prior* to inform him that *Beatrice* was safe and had suffered only minor damage **(see Figure 5)**. The skipper did not report the incident to Woolwich Radio VTS during the passage back to Lacks Dock because he did not want to further distress the passengers by allowing them to

Figure 5

Damage sustained by the DUKW *Beatrice*

overhear his conversation describing the post-accident events on VHF. The PLA harbour launch *Wandsworth* accompanied *Beatrice* back to the slipway, where all the passengers disembarked safely.

The skipper was tested by the PLA to determine his blood alcohol level. The result of the test was negative.

1.3.3 Subsequent report

On return to Lacks Dock, the skipper of *Beatrice* reported the incident to Woolwich Radio VTS using his mobile telephone. In his report, he highlighted that he believed *Brenda Prior* had not seen him, because his vessel might have been situated in *Brenda Prior*'s "blind spot", and that as *Beatrice* was only 1.5 to 3 metres away from the craft moored alongside Lambeth Pier, he could not manoeuvre any further to starboard. The report confirmed that no injuries were sustained, however, *Beatrice* had received a glancing blow and had suffered damage to the rear access ladders and canopy top.

1.4 QUALIFICATIONS AND EXPERIENCE

1.4.1 *Brenda Prior*

The master of *Brenda Prior* had 40 years' seagoing experience, and had been employed by the present company for the past 38 years. He had sailed as *Brenda Prior*'s master for 18 years and was an experienced master within the parameters of his normal operating area. He was in possession of a Boatmaster's Licence Grade Two, issued in 1999, and endorsed for sand and gravel barges of less than 200 grt operating from Clacton Pier to Reculver, including the River Thames to Wandsworth and the River Medway to Rochester Bridge. His certificate of competency had expired on 14 March 2004.

Brenda Prior's mate had a fishing background and was in possession of a Second Engineer's Fishing Class Two certificate of competency. Employed by the company for just less than 2 years, as well as acting as mate he was also the vessel's engineer. Additionally qualified in GMDSS operation and sea survival, his long-term aim was to qualify for a Boatmaster's licence.

Brenda Prior's deckhand had been at sea on an irregular basis, but had been in permanent employment by the present company for the past 9 years. In possession of a Boatmaster's licence Grade Two, issued in 1999, he was also an experienced seaman on the J J Prior fleet. His certificate of competency had expired on 15 March 2004.

1.4.2 *Beatrice*

The skipper of *Beatrice* had been working on the River Thames for 11 years, and had held a Waterman's licence for the past 6 years. The qualification incorporates a 5-year apprenticeship, and includes fire-fighting, chart work, navigation, seamanship and sea survival. The licence covers an operating area

between Teddington and Lower Hope Point. The skipper was also in possession of a Large Passenger Vessel Endorsement which allowed him to skipper craft carrying more than 250 passengers.

1.5 LOCAL REGULATIONS

1.5.1 Port of London - General Directions for Navigation

The General Directions for Navigation in the Port of London (hereafter, the General Directions) are issued by the Port of London Authority under Section III of the Port of London Act 1968, with the agreement of the Chamber of Shipping. The General Directions aim to maintain and enhance the safety of navigation within the designated Thames area. They must be read in conjunction with the regular VHF navigation information broadcasts passed by the two PLA VTS centres, the Merchant Shipping (Distress Signals and Prevention of Collisions) Regulations 1996, and both local and permanent Notices to Mariners.

1.5.2 Vessel traffic service - reporting procedures

All vessels using the River Thames are required to report to VTS before leaving their berth. Additionally, reporting vessels are required to report to VTS at the designated charted reporting points. General Directions (3.1.w) are quite specific about which vessels are classed as 'reporting vessels' :

'Reporting vessel' means every vessel which is required by these directions to report its position, intentions or movements, specifically:

- *Vessels of more than 40 metres in length overall*
- *Vessels of gross tonnage of more than 50 tons which ordinarily also navigate outside the Thames.*
- *Tugs engaged in towing, or about to tow one or more vessels.*

Under this definition, *Brenda Prior* meets the requirement of a reporting vessel based upon her gross tonnage and her area of operations outside of the Thames.

General Directions (sections 4.2.6 and 4.3) clearly states that vessels, which includes reporting vessels and passenger vessels shall:

- *Maintain an effective, continuous listening watch on the VHF channel appropriate to that part of the Thames in which it is navigating or lying.*
- *Prior to a vessel's departure from a berth, the master shall ensure that the appropriate PLA VHF channel is monitored for information that may effect the safe navigation of the vessel, including the routine half hourly VHF navigation information broadcast immediately prior to the departure time.*

Importantly in this case, a note contained under section 4.3 gives guidance for vessels maintaining a VHF listening watch:

- *Notwithstanding that only reporting vessels routinely report their movements …… other vessels to which this direction applies should generally "**listen and learn**" from VHF radio traffic. They must however report in an emergency and when required*

In Permanent Notice to Mariners P6, vessels are encouraged to pass inter-ship navigational messages on the relevant port operations channel, thereby ensuring that other traffic and the VTS station may be informed of the vessel's intentions.

VTS conducts scheduled information broadcasts at 15 and 45 minutes past the hour, or when there is an exceptional shipping movement on the river. These scheduled broadcasts contain navigation, meteorological, notices to mariners, and tidal information, but do not cover routine shipping movements.

1.5.3 Lookout

General Directions Section 17 specifies the requirements for vessels to post lookouts:

- *All vessels of 40 metres or more in length which do not have the wheelhouse in the forward half of the vessel, and are navigating upstream of the Thames Barrier, shall, at all times, have a lookout stationed in the bows who:*
- *is suitably trained and experienced in lookout duties.*
- *has been given clear instructions to report to the master every matter or occurrence which could affect the safe navigation of the vessel, including, sightings of vessels underway; and*
- *is in telephone or radio communication with the wheelhouse.*

PLA states that the rationale behind the length requirement is uncertain, other than that it assists the PLA to police the legal requirement for vessels to maintain a proper lookout at all times.

General Directions Section 17.4 provides further specific lookout requirements for Class V passenger vessels:

- *Class V passenger vessels, which have limited visibility from the wheelhouse, shall at all times when underway, have a lookout stationed in an appropriate position, maintaining a continuous lookout, so as to cover the areas of limited visibility.*

1.6 KEYING DEVICE

Introduced in 1990 following the recommendations made by the MAIB report into the *Marchioness/Bowbelle* accident, all reporting vessels are required to carry a keying device **(see Figure 6)**, designed to activate a white light strategically positioned on the centre arch of all bridges between Tower Bridge and Wandsworth Bridge, except the Millennium Footbridge. The keying device should be operational at all times when using the river. Reporting vessels not regularly trading on the Thames receive the boxes via a PLA launch at the Teddington and seaward extremities of the river. As a reporting vessel, *Brenda Prior* carried the keying device.

Figure 6

Keying device as fitted to *Brenda Prior*

The keying device consists of an electronic box positioned in the wheelhouse, with three switches which operate the main power supply, selection for proceeding upstream or downstream, and activation of the GPS transmitter. Once power is applied, the master selects 'up' or 'downstream' passage and then activates the GPS and transmitter. Subject to GPS accuracy, the radio transmitter will activate approximately 750 metres before a bridge, triggering an 'isophase' white light. It is possible for the same transmission to activate a light further up or downstream if the radio signal has 'line of sight' with the next bridge. When a light has been activated, the action is recorded in the VTS

operations centre, and when a vessel passes under a bridge arch, the keying device triggers a second receiver, which is similarly recorded by VTS to provide an accurate historical record of vessel movements. If the master of a vessel makes the decision to take an arch other than the centre arch, the General Directions require that he must inform the Woolwich VTS Centre of his intention (see below). The time the vessel passes under the arch will still be recorded.

In 2000, a modification to the system was introduced by the PLA, which provided a facility for a second vessel approaching from the opposite direction to trigger the same light. In doing so, the light would change its characteristic from 'isophase' to 'rapid flash' and provide masters with an indication that another vessel was in close proximity to the same bridge. The system serves to assist masters in recognising that another vessel is in the vicinity, and to help them make an informed decision on what action to take. When the light signal has been illuminated, General Directions Section 19.3.b requires that:

- *When two or more reporting vessels are approaching an arch from opposite directions, the vessel navigating against the direction of the tidal stream shall ease her speed, stop, or if conditions allow, and having informed the harbour master in accordance with paragraph 8 (see below), use an alternative arch in compliance with the regulation and rules of navigation contained in the river bylaws.*

Paragraph 8 of the same section explains the actions required when navigating through a bridge arch that is not illuminated:

- *The master of a reporting vessel navigating or intending to navigate through a bridge arch in the area that is not fitted with a special signal light, …… is to inform the Woolwich VTS centre of his intentions before so navigating.*

1.7 VISIBILITY OF SMALL PASSENGER VESSELS

General Directions section 21 draws attention to the requirement for the sterns of Class IV and Class V vessels to be marked by an area of high visibility reflective material:

- *Every passenger vessel of Class IV and V which regularly navigates upstream of Gravesend shall have, at or on her stern, an area of high visibility reflective material. So far as practicable the area shall be:*
    - *of between 3.75 and 4.5 square metres. ie 2.5 to 3.0 metres horizontally and a minimum of 1.5 metres vertically, evenly distributed either side of the vessels centre line.*
    - *In a vertical or near vertical plane facing directly astern.*

1.8 CONSTRUCTION AND DESIGN

1.8.1 *Brenda Prior*

A Class VIIIA vessel, *Brenda Prior* was designed with aft accommodation and engine room, a single cargo hold with intermediate bulkhead and conventional hatch boards, and forward water ballast tanks **(see Annex A)**. Exempt from the provisions of the Merchant Shipping (Load Line) Regulations 1998 under the condition that the ship remains within laid down geographical limits, she operates a schedule of three runs per week from Fingringhoe near Colchester to various wharves along the upper reaches of the Thames. Loading at Fingringhoe and discharging on the Thames, the return journey is in the ballast condition.

In the ballast condition, the vessel has a maximum draught of 1.83 metres aft, and 0.76 metres forward. With a resultant trim of 1.07 metres by the stern, this creates a considerable blind sector under the bow. Calculations show that for a master or officer on watch looking forward from the centreline wheelhouse window, the blind sector extends a distance of 53.3 metres from the bow through a sector of 14 degrees: 7 degrees either side of the centre line.

In order to operate on the upper reaches of the Thames, *Brenda Prior* has a radar scanner that can be lowered to allow passage under bridge arches at the higher states of tide.

1.8.2 *Beatrice*

Beatrice was manufactured in the Second World War as an amphibious vehicle to carry troops and land them ashore, but has subsequently been extensively modified for the commercial tourist market. DUKWs have a maximum overall length of 9.45 metres and stand approximately 2.74 metres high on the road. Once afloat, the DUKW's height above the water is reduced to 1.68 metres. The original paint scheme of the DUKWs has been changed to yellow, as agreed by the operator and PLA at the commencement of Duck Tours' river operation.

The maximum speed of a DUKW through the water is 6.0 knots, requiring considerable forward planning when altering course in strong tidal streams. The manoeuvrability of a DUKW in the water is commensurate with the available power output.

The single interior compartment accommodates the skipper, attendant, and 30 fare paying passengers on standard road transport seating **(see Figure 7)**. Protection from the elements is achieved using a solid roof and vinyl side canopies supported by a steel framework. Access is gained by two retractable ladders positioned at the stern **(see Figure 8)**.

Figure 7

Interior of DUKW *Beatrice*

Figure 8

Damage sustained at the stern of *Beatrice*

Figure 9

View looking astern from the attendant's position

Figure 10

Vehicle wing mirrors used to assist skipper and lookout

Lookout responsibilities on a DUKW are shared between the skipper and the attendant. The attendant fulfils the statutory requirement for a dedicated lookout, but is also the safety advisor and Tour Guide. Both are seated forward of the passengers, and have direct sight ahead through the windscreen and to the sides through windows immediately to port and starboard. With passengers onboard, it is not possible for the skipper to gain a direct line of sight internally through the rear canopy, and he uses road vehicle wing mirrors to view astern **(see Figures 9 and 10)**.

1.9 SAFETY MANAGEMENT

As a Class V passenger vessel, *Beatrice* and all other DUKWs owned by London Duck Tours Ltd, operate under the guidelines laid down in the Domestic Safety Management Code.

As a Class VIIIA vessel (ships engaged on voyages which are not international voyages) of less than 500 grt, *Brenda Prior* and other vessels in the JJ Prior Company have no statutory requirement to comply with the International Safety Management Code. However, vessels between 150 and 500 grt are strongly urged to comply with the Code and to apply for voluntary certification. The company has current health and safety, and environmental protection policies, however, *Brenda Prior* was not ISM compliant.

1.10 THAMES TRANSPONDER DEVELOPMENT

As part of recommendation 27.18 of the Thames Safety Inquiry "to introduce AIS transponder technology in reporting vessels and Class V passenger vessels, if technical and operational trials are successful", a trial, funded jointly by the PLA and the DfT, has examined the most suitable type of AIS transponder equipment for use on the River Thames.

The investigation into which type of AIS is most suited to the unique operating conditions on the Thames, as well as meeting the requirements of river users and VTS, has examined closely both the Alpha and Bravo AIS variants. Difficult issues identified at the start of the project (including capability, performance and cost) have largely been overcome by technological advances, and implementation of the scheme for mandatory carriage by reporting vessels and Class V passenger vessels appears feasible in the near future.

1.11 VTS

The Port of London maintains two VTS control centres, both providing a service 24 hours a day. Gravesend VTS controls the area from the seaward approaches of the River Thames to Crayfordness, and Woolwich VTS controls from Crayfordness to Teddington Lock. Both centres provide Information, Traffic Organisation and Navigational Assistance services.

VTS Woolwich provides an information service throughout its area, and is able to provide traffic organisation and navigational assistance in the area covered by radar between Crayfordness and Greenwich. Outside of the radar surveillance coverage, the Traffic Information service is provided to individual reporting vessels based on information received by vessels reporting at any of the eight statutory reporting points or when departing a berth. Between Tower Bridge and Wandsworth Bridge, reporting vessels are required to carry and operate the electronic keying device, the data from which is recorded and logged by Woolwich VTS.

1.12 ENVIRONMENTAL CONDITIONS

At the time of the collision, the tidal stream was flooding at 75 percent of the spring rate, resulting in a tidal stream of approximately 2 knots. Low water was at 1205 at a height of 0.7 metres, high water was at 1759 at 6.8 metres. At the time of the incident the height of tide was 4.4 metres.

Weather conditions at the time were good, with a south-easterly wind force 4 to 5, with good visibility.

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 FATIGUE

Records and interviews confirm that fatigue could not be considered as a contributory factor in the collision.

2.3 VHF MONITORING ONBOARD *BRENDA PRIOR*

Brenda Prior departed from Metro Greenhams wharf having carried out the same preparations for sailing as she had done on many previous occasions. The discharge of cargo on a vessel of this size is a rapid process, allowing bridge equipment and main engines to be left in the operational state throughout the period of the discharge. Consequently, the VHF had remained on while alongside, and had been available for the master to maintain a listening watch on channel 14.

A reporting vessel is required to contact VTS 10 minutes before navigating the Thames. On *Brenda Prior,* the normal practice was to call shortly before departure, and then again once the vessel had slipped. Had the master made the 10 minute pre-departure call, and then continued to monitor the VHF until slipping on the 'listen and learn' basis described in the General Directions, he would have been aware of *Titania* entering the river at Lacks Dock only 3 minutes before his own departure.

Brenda Prior called VTS as she was departing Metro Greenhams wharf, and 1 minute later *Beatrice* correctly reported her own intended movements. At the time of *Beatrice'*s report, the master was alone on the bridge, both crewmen being at harbour stations recovering mooring lines.

Although the master reported that full monitoring of the VHF had been carried out, he had not heard the report by *Titania* 3 minutes before his departure, and had missed the detail of *Beatrice'*s report, possibly while concentrating on his own ship handling and manoeuvring off the berth. The routine onboard *Brenda Prior* for monitoring VHF traffic before departure, therefore appears questionable.

Specific opportunities existed for the master to gain clarification from VTS of vessel names and intended movements on sailing, and at the mandated reporting point at Vauxhall Bridge, but also at any time while on passage. Had he done so, the master would have gained a better awareness of vessel movements likely to affect his own passage, thereby focussing his mind on the need to continuously monitor their location and progress.

2.4 DECISION TO ADJUST THE PASSAGE PLAN

When *Brenda Prior's* master identified the 'rapid flash' light on Lambeth Bridge No.3 arch, he made a conscious decision to take No.4 arch based on two key facts:

- Another vessel was approaching Lambeth No.3 arch from the downstream side and, as it was proceeding with the tidal stream, it had right of way.
- By using Lambeth No.4 arch he would leave No.3 arch clear for the inbound traffic and also would achieve a better line of approach to Westminster Bridge No.5 arch.

However, having made the decision to alter course for Lambeth No.4 arch, the master failed to report the change of plan to Woolwich VTS. Had he done so, this would have provided early warning to the skipper of *Beatrice* that *Brenda Prior* was intending to take the same arch, and thus given him the opportunity to make direct contact with *Brenda Prior* on VHF. It might also have triggered Woolwich VTS into informing *Brenda Prior* that there were two DUKWs on the river en route to Westminster Bridge.

The master was aware of a DUKW in the general vicinity of Lambeth Bridge. Because he had not personally gained visual identification of the DUKW reported by the lookout, when he saw *Titania* inside the barge roads approximately 365 metres ahead, he was content he had identified the DUKW he expected. That the master believed there was only one DUKW operating on the river, was as a direct consequence of missing *Titania's* VHF broadcast on entering the river.

2.5 LOOKOUT PROCEDURES

2.5.1 *Brenda Prior*

Once clear of the berth, it was normal practice to establish a lookout routine run from the wheelhouse, there being no requirement in General Directions for a vessel of *Brenda Prior's* length (under 40 metres) to have a lookout stationed at the bows. However, when in the ballast condition, a lookout observing from the centreline of the bridge would experience a blind sector area on the waterline of nearly two ships' lengths from the stem.

Had *Brenda Prior's* master stationed a lookout in the bows, the additional information available would have brought to his attention the presence of a second DUKW. Further, a lookout in the bow would have provided early warning of the impending collision.

While the mate identified and reported a DUKW (*Beatrice*) at an early stage, and minutes later reaffirmed the presence of the same DUKW approaching Lambeth Bridge, the master did not take time to assess the situation by gaining visual identification of the DUKW himself. Had he done so, he would have probably recognised the potential that existed for a collision and reconsidered

his decision to take No.4 arch at Lambeth Bridge. In any event, early identification of *Beatrice* would have enabled him to realise that the DUKW he saw half way towards Westminster Bridge was a different vessel (*Titania*), and thereby prompt him into focussing on the movements of *Beatrice*.

As a consequence of MAIB recommendations following the *Marchioness* and *Bowbelle* accident, PLA General Direction 17 introduced a requirement for all vessels of 40 metres or more in length which do not have a wheelhouse in the forward half of the vessel, and are navigating upstream of the Thames Barrier, to station a lookout in the bows at all times. The General Direction could be interpreted as implying there was no requirement for vessels of less than that length to station a lookout forward, even though their condition might make the posting of such a person essential to the maintenance of an effective lookout. It would, therefore, appear appropriate to re-word the General Direction to remove this possible ambiguity.

Notwithstanding this, it remains the master's responsibility to ensure that his vessel maintains a proper lookout by sight and hearing, as well as all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision.

2.5.2 *Beatrice*

In accordance with company safety management procedures, the attendant of a DUKW is the nominated lookout. However, the duty of lookout is hampered by the dual role of tour guide; in this incident, the lookout was unaware of *Brenda Prior'*s presence until moments before impact. Further, given the limited rear visibility from the lookout/tour guide's position next to the skipper, the only view of river traffic approaching from the rear, was by the skipper, using the small wing mirrors on each side.

Such restricted rearward visibility could have compromised the skipper's situational awareness. Certainly, the current wing mirrors cannot be as effective as a dedicated lookout stationed with an all-round view.

2.6 ACTIONS TAKEN BY *BEATRICE*

Once the skipper was aware of *Brenda Prior* approaching from astern, he became concerned at her projected closest point of approach. However, he did not consider using the appropriate sound signal to warn *Brenda Prior* of his presence. Used in adequate time, the signal could have alerted *Brenda Prior'*s master to the presence of *Beatrice*, and allowed avoiding action to be taken.

The skipper of *Beatrice* did not report the incident to VTS immediately because he was concerned that his passengers might overhear the conversation and start to panic. Under the circumstances, this was perhaps understandable, although the skipper had already called *Brenda Prior* on VHF to report his status. However, it remains paramount that the responsible harbour authority is

informed immediately an incident occurs in the event that emergency services are subsequently required on scene at a later stage. If DUKW skippers are to operate in the same compartment as passengers, consideration must be given to the provision of a method of communications that allows discreet two-way conversations by VHF radio in the passenger compartment. Besides allowing the operator to talk discreetly on VHF, it would also enable him to listen to VHF traffic without being distracted by the attendant's commentary and noise from the passengers.

2.7 DUKW

Paragraph 1.7 of this report drew attention to the PLA General Direction requiring Class V passenger vessels to be marked by an area of high visibility reflective material. DUKWs do not operate between sunset and sunrise, therefore reflective material is of secondary importance. However, although DUKWs are painted yellow, the small amount of structure above the water, in conjunction with the transparent side canopy creating a more subdued image, leaves room for improvement in DUKW identification. Modifications, by way of colour and/or lights, could significantly increase the DUKWs' visibility to other river users and, in the case of *Brenda Prior*, might have helped to attract the master's attention before the collision.

2.8 SAFETY MANAGEMENT

Although JJ Prior has no statutory obligation to comply with ISM procedures, there nevertheless remains a responsibility on the company to operate a voluntary form of safety management. Such a system could have ensured standard operating procedures and best practice across the JJ Prior fleet, based on an assessment of the navigational hazards associated with the fleet's operating pattern.

The master and deckhand's certificates of competency (COC) on board *Brenda Prior* had expired 9 months prior to the collision. An effective safety management system would have identified that these COCs were about to expire. This would have helped JJ Prior Ltd ensure their vessels at all times were manned with in-date, certificated seafarers.

2.9 VTS

A key aspect to this collision was that the master of *Brenda Prior* was unaware there were two DUKWs on the river. Notwithstanding the master's duty to maintain an effective lookout, and the VHF 'listen and learn' principle, extra consideration could be given to the unique operating pattern and limited maximum speed of the DUKWs.

VTS receives reports from all vessels leaving a berth intending to navigate on the River Thames. The high number of Class V passenger craft using the river, particularly at peak tourist times, creates a large volume of reporting traffic,

especially on the upper reaches between the Waterloo Bridge and Vauxhall Bridge reporting points. The lack of radar coverage in this area means that only reporting vessels can be effectively monitored based on information received at reporting points, and using data from the keying device.

In the longer term, the CCTV installation which became operational in May 2005, and the introduction of the Thames AIS-based transponder system, in conjunction with the currently operational keying device, will provide VTS with real time data to provide a full Traffic Information service on the upper reaches.

Until these enhancements are in place, measures could be adopted to provide an enhanced Traffic Information service for reporting vessels to raise awareness of DUKW movements.

SECTION 3 - CONCLUSIONS

3.1 SAFETY ISSUES

The following safety issues have been identified by the investigation. They are not listed in any priority order.

- The master of *Brenda Prior* failed to establish an effective lookout organisation, resulting in the misidentification of *Beatrice* and the subsequent collision. [2.5.1]

- Monitoring of the VHF in *Brenda Prior*, before her departure, failed to establish that the first DUKW, *Titania,* had entered the water and the report by the second DUKW, *Beatrice,* was only partially heard. [2.3]

- PLA General Directions require vessels greater than 40 metres in length, with the wheelhouse in the aft half of the vessel, to station a lookout at the bow. However, there is no such requirement for smaller vessels in the ballast condition trimmed deep by the stern with limited visibility forward. [2.5.1]

- In contravention of General Direction No 19, the master of *Brenda Prior* failed to report his intention to deviate from his planned track and take No.4 arch at Lambeth Bridge, thereby depriving both VTS and *Beatrice* of essential information capable of being used to prevent the collision. [2.4]

- Although DUKWs are painted yellow, room for improvement exists in DUKW identification. Modifications, by way of colour and/or light signals, could significantly increase their identification. [2.7]

- The absence of a voluntary safety management system by JJ Prior Ltd was a contributory factor to the collision, in that operational guidance and procedures were not available. [2.8]

- The master and deckhand's certificate of competency onboard *Brenda Prior* had expired 9 months prior to the collision. Neither certificate was in the process of re-validation. [2.8]

- The effectiveness of a DUKW lookout is reduced by his secondary role as tour guide, thereby placing more reliance on the less effective method of the skipper using road vehicle wing mirrors to view astern. [2.5.2]

- Due to the passengers' ability to overhear VHF conversations, the skipper of *Beatrice* did not directly report the incident to VTS. [2.6]

- The VTS Woolwich Information Service does not alert reporting traffic to DUKW operations between Vauxhall and Westminster Bridges. [2.9]

- Consideration was not given to the use of the sound signalling appliance by the skipper of *Beatrice* to alert *Brenda Prior* of his presence. [2.6]

SECTION 4 - ACTION TAKEN

1. J J Prior

A memorandum has been issued by the managers for all skippers serving on Prior vessels, reminding them:

- Of the requirement that ship to shore radios must be switched on and audible, so that all messages from the Port Authority can be monitored.

- To advise skippers to maintain a forward lookout when traversing through bridges in the light condition **(see Annex C)**.

2. London Duck Tours Limited

The managing director of London Duck Tours Limited has issued an operations memorandum to all personnel. The memorandum included details regarding the collision between *Brenda Prior* and *Beatrice* and incorporated lessons learnt and measures to improve safety on the River Thames. It required with immediate effect that:

- Lookouts must ensure that they look out around 360 degrees and not just in a forward direction.

- All craft will announce to VTS when they turn by Westminster Bridge to make other vessels aware of their location.

And advised that:

- The company, together with the PLA and MCA, has agreed to look at methods of making their vessels more visible to other shipping. The company welcomed constructive suggestions.

London Duck Tours Limited has confirmed that MCA approved cameras have now been fitted to all vessels in the fleet as part of a review to ensure that a comprehensive all round lookout is maintained at all times.

SECTION 5 - RECOMMENDATIONS

JJ Prior Ltd is recommended to:

2005/157 In consultation with the MCA, review their current safety management system with the aim of developing and enhancing it to achieve voluntary compliance with the ISM Code.

The Port of London Authority is recommended to:

2005/158 Amend General Directions to remove the specific reference to vessels over 40m in length maintaining a dedicated lookout in the bows, and to provide direction to all Thames river users, to ensure an appropriate lookout is kept at all times, including, where necessary, placing a lookout in the bows.

2005/159 In consultation with London Duck Tours Ltd, review the mandatory VHF reporting requirements for DUKW operations, so as to enhance the traffic information on DUKW operations available to other river users. The revised reporting regime should be promulgated to other river users.

The PLA, MCA and London Duck Tours Ltd are recommended to:

2005/160
161
162 Jointly examine viable options to enhance the visibility of DUKWs for other river users, with a view to implementation of specific measures through General Directions.

Marine Accident Investigation Branch
August 2005

ANNEX A

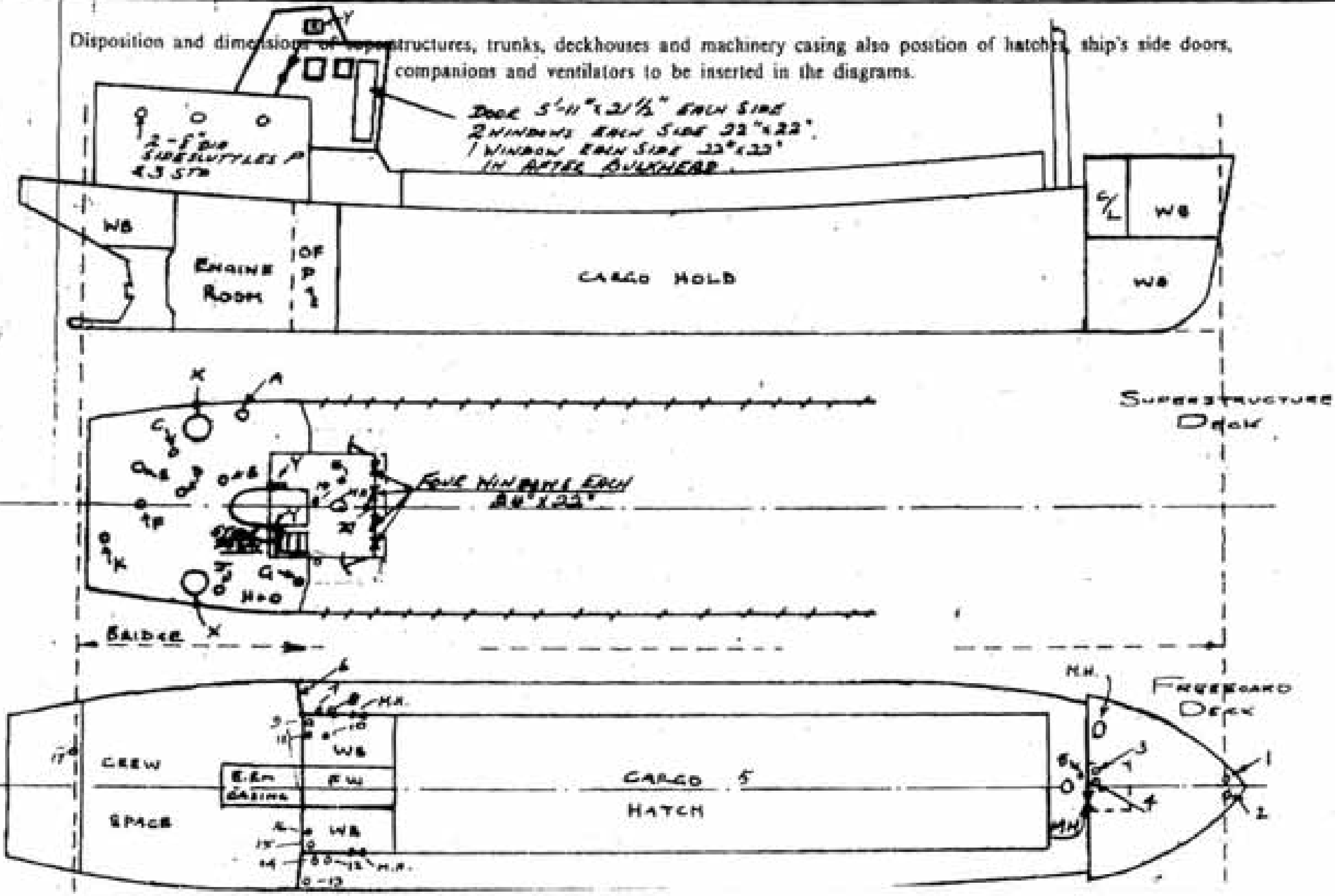
Conditions of assignment

(CONDITIONS OF ASSIGNMENT)

CERTIFYING CHANGE OF NAME 4TH JANUARY 1984

Ship's Name	~~[illegible]~~ ~~[illegible]~~ BRANDA RUSH	Port of Survey	ROCHESTER
Official Number and Port of Registry	COLCHESTER	Surveyor's Signature	[signature] [signature]
Moulded Dimensions	98·0' x 22·6' x 9·5'	Date of Survey	JUNE 1967 – APRIL 1968 Year of Build 1968

Disposition and dimensions of superstructures, trunks, deckhouses and machinery casing also position of hatches, ship's side doors, companions and ventilators to be inserted in the diagrams.



ANNEX B

PLA - Record of warning light activation

17/12/2004	15:00	Cat A under bridge (heading upstream)	[Mark Prior]	Vauxhall Br
17/12/2004	15:01	Incoming Call OK		Vauxhall Br
17/12/2004	15:00	Cat A under bridge (heading upstream)	[Regain]	Victoria No2
17/12/2004	15:01	Revert to Off status	[8]	Vauxhall Br
17/12/2004	15:01	Incoming Call OK		Victoria No2
17/12/2004	15:01	Incoming Call OK		Vauxhall Br
17/12/2004	15:01	Cat A under bridge (heading upstream)	[Regain]	Chelsea Br
17/12/2004	15:01	Incoming Call OK		Chelsea Br
17/12/2004	15:02	Cat A under bridge (heading upstream)	[Symphony II]	Waterloo Br
17/12/2004	15:02	Ship under Bridge with switch OFF	[Symphony II]	Waterloo Br
17/12/2004	15:02	Incoming Call OK		Waterloo Br
17/12/2004	15:02	Request for Warning Light (heading up)	[Mersina]	Chelsea Br
17/12/2004	15:03	Incoming Call OK		Chelsea Br
17/12/2004	15:03	Request for Warning Light (heading up)	[Mark Prior]	Victoria No2
17/12/2004	15:03	Incoming Call OK		Victoria No2
17/12/2004	15:03	Request for Warning Light (heading down)	[Brenda Prior]	Vauxhall Br
17/12/2004	15:04	Incoming Call OK		Vauxhall Br
17/12/2004	15:03	Cat A under bridge (heading upstream)	[Merit]	Lambeth Br
17/12/2004	15:03	Request for Warning Light (heading up)	[Merit]	Lambeth Br
17/12/2004	15:03	Warning Light on		Lambeth Br
17/12/2004	15:04	Incoming Call OK		Lambeth Br
17/12/2004	15:03	Request for Warning Light (heading up)	[Regain]	Albert Br No2
17/12/2004	15:04	Incoming Call OK		Albert Br No2
17/12/2004	15:04	Request for Warning Light (heading up)	[Mark Prior]	Chelsea Br
17/12/2004	15:04	Incoming Call OK		Chelsea Br
17/12/2004	15:03	Warning Light on		Vauxhall Br
17/12/2004	15:04	Request for Warning Light (heading up)	[Merit]	Vauxhall Br
17/12/2004	15:04	Incoming Call OK		Vauxhall Br
17/12/2004	15:04	Revert to Off status	[8]	Lambeth Br
17/12/2004	15:04	Incoming Call OK		Lambeth Br
17/12/2004	15:05	Request for Warning Light (heading up)	[Regain]	Battersea Br
17/12/2004	15:05	Warning Light on		Battersea Br
17/12/2004	15:06	Incoming Call OK		Battersea Br
17/12/2004	15:06	Revert to Off status	[8]	Albert Br No2
17/12/2004	15:06	Incoming Call OK		Albert Br No2
17/12/2004	15:06	Revert to Off status	[8]	Chelsea Br
17/12/2004	15:06	Incoming Call OK		Chelsea Br
17/12/2004	15:06	Cat A under bridge (heading upstream)	[Merit]	Westminster
17/12/2004	15:06	Request for Warning Light (heading up)	[Merit]	Westminster
17/12/2004	15:07	Incoming Call OK		Westminster
17/12/2004	15:07	Revert to Off status	[8]	Battersea Br
17/12/2004	15:07	Incoming Call OK		Battersea Br
17/12/2004	15:07	Request for Warning Light (heading up)	[Regain]	Battersea Rly
17/12/2004	15:08	Incoming Call OK		Battersea Rly
17/12/2004	15:08	Cat A under bridge (heading downstream)	[Brenda Prior]	Vauxhall Br
17/12/2004	15:08	Incoming Call OK		Vauxhall Br
17/12/2004	15:08	Request for Warning Light (heading down)	[Brenda Prior]	Lambeth Br
17/12/2004	15:08	Incoming Call OK		Lambeth Br
17/12/2004	15:09	Revert to Off status	[8]	Vauxhall Br
17/12/2004	15:09	Incoming Call OK		Vauxhall Br
17/12/2004	15:08	Warning Light on		Lambeth Br
17/12/2004	15:09	Incoming Call OK		Lambeth Br
17/12/2004	15:08	Request for Warning Light (heading up)	[Merit]	Charing X Rly
17/12/2004	15:08	Warning Light on		Charing X Rly
17/12/2004	15:09	Incoming Call OK		Charing X Rly
17/12/2004	15:08	Request for Warning Light (heading up)	[Mark Prior]	Chelsea Br
17/12/2004	15:08	Warning Light on		Chelsea Br
17/12/2004	15:10	Incoming Call OK		Chelsea Br
17/12/2004	15:10	Revert to Off status	[8]	Chelsea Br
17/12/2004	15:10	Incoming Call OK		Chelsea Br
17/12/2004	15:10	Request for Warning Light (heading up)	[Merit]	Waterloo Br
17/12/2004	15:10	Warning Light on		Waterloo Br
17/12/2004	15:11	Incoming Call OK		Waterloo Br
17/12/2004	15:11	Request for Warning Light (heading up)	[Mark Prior]	Chelsea Br
17/12/2004	15:11	Incoming Call OK		Chelsea Br
17/12/2004	15:11	Warning Light on		Chelsea Br
17/12/2004	15:11	Incoming Call OK		Chelsea Br
17/12/2004	15:13	Cat A under bridge (heading downstream)	[Brenda Prior]	Lambeth Br
17/12/2004	15:13	Incoming Call OK		Lambeth Br
17/12/2004	15:13	Request for Warning Light (heading down)	[Brenda Prior]	Westminster
17/12/2004	15:13	Incoming Call OK		Westminster
17/12/2004	15:13	Revert to Off status	[8]	Lambeth Br
17/12/2004	15:14	Incoming Call OK		Lambeth Br
17/12/2004	15:14	Revert to Off status	[8]	Charing X Rly
17/12/2004	15:14	Incoming Call OK		Charing X Rly
17/12/2004	15:14	Revert to Off status	[8]	Battersea Rly
17/12/2004	15:14	Incoming Call OK		Battersea Rly
17/12/2004	15:14	Revert to Off status	[8]	Chelsea Br
17/12/2004	15:15	Incoming Call OK		Chelsea Br

Please note: Subtract 5 minutes from recorded time to obtain true time

ANNEX C

Memorandum from JJ Prior to all skippers

PRIOR

J. J. PRIOR TRANSPORT LIMITED

Sand & Gravel Producers

Registered office:
Ballast Quay,
Fingringhoe,
Colchester,
Essex CO5 7DB

Telephone: 01206 729412
Fax: 01206 729551

Registered in England No: 236082

Mark S. Prior - Chairman & Managing Director; L. Peter Harman - Director Finance & Administration; John R. Greenleaf - Operations Director; Pamela J. Marcou-Hicks - Company Secretary

18th February 2005

FOR THE ATTENTION OF ALL SKIPPERS

As you are aware an incident involving the "Brenda Prior" has resulted in the skipper being prosecuted for breaching two PLA by-laws.

Regardless of mitigating circumstances it is essential that our crews comply with the rules and by-laws of the River Authorities.

It has always been and remains our Policy that the skipper is in charge of the vessel when underway. It is his responsibility to make decisions in the manoeuvering of the vessel through the water according to the conditions surrounding him.

However, there are several points we must insist are adhered to which include, the Health and Safety and Environmental Policies of the Company, the local river by-laws, port rules and the rules of the sea. In addition to this we must remind you that your ship to shore radios **MUST** be switched on and audible throughout the journey in order that you will hear all messages broadcast by the Port Authority.

The incident referred to above has been investigated by the Marine Accident Investigation Board (MAIB) and we await their report and recommendations. In the meantime we would advise all Skippers to keep a forward lookout when traversing through bridges "light". We also advise that you ensure that you radio your intent to VTS each and every time it is required.

Please make your crew members aware of the contents of this letter.

Yours sincerely

John Greenleaf (Operations Director)
Peter Harman (Finance & Administration Director)