

Report on the investigation of
two accidents during berthing and unberthing
of

Logos II

St Helier, Jersey

20 and 26 June 2007

Marine Accident Investigation Branch
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Report No 1/2008
January 2008

Extract from
The United Kingdom Merchant Shipping
(Accident Reporting and Investigation)
Regulations 2005 – Regulation 5:

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

NOTE

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

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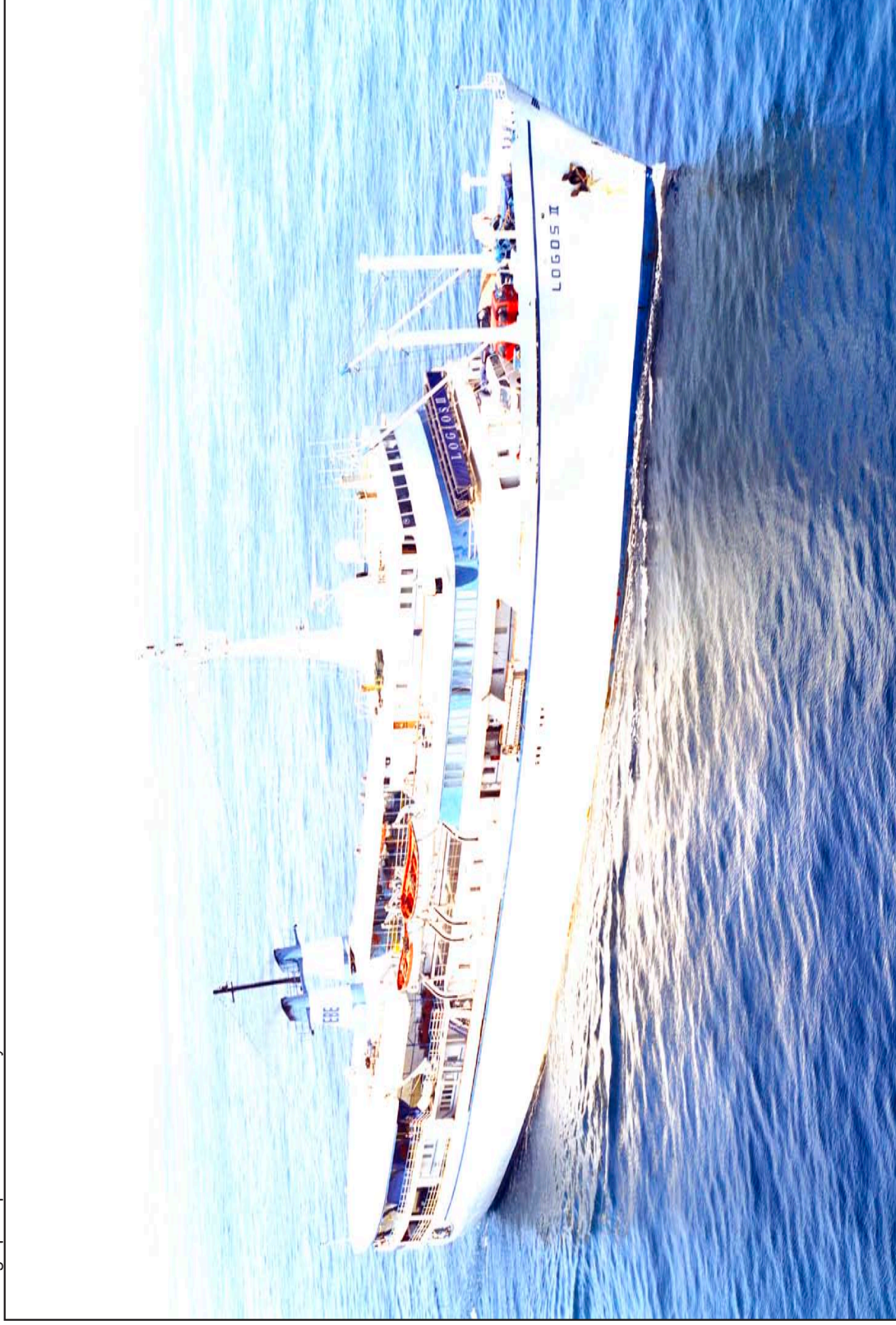
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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

AHM	-	Assistant harbourmaster
BA	-	British Admiralty
BHP	-	Brake Horse Power
CEO	-	Chief Executive Officer
DHM	-	Deputy harbourmaster
grt	-	Gross registered tonnage
HM	-	Harbourmaster
kW	-	kilowatt
LOA	-	Length Overall
PEC	-	Pilotage Exemption Certificate
PMSC	-	Port Marine Safety Code
PMSMS	-	Port Marine Safety Management System
Ro-Ro	-	Roll on – Roll off
RPM	-	Revolutions per minute
SMS	-	Safety Management System
UHF	-	Ultra High Frequency
UK	-	United Kingdom
UTC	-	Universal Coordinated Time
VDR	-	Voyage Data Recorder
VHF	-	Very High Frequency

All times are UTC+1



SYNOPSIS

At 2047 on 20 June 2007, the 4804 grt passenger ship *Logos II* made contact with a shore crane and two small vessels when berthing alongside Victoria Pier in St Helier, Jersey. At 1200 on 26 June 2007, *Logos II* also made contact with a pier head as she was leaving St Helier after the tow line with which she was connected to a tug parted. Harbour pilots were embarked during both accidents with the tugs *Marineco Toomai* and *Titan* assisting during berthing operations and *Duke of Normandy* and *Titan* assisting during the departure from St Helier. Damage to *Logos II* was limited to indentations on her starboard bow, bent pulpit railings and superficial damage to paintwork. Structural damage was caused to the pier head and the two small vessels. There were no injuries.

The investigation identified a number of factors which contributed to the contacts, including:

During the berthing operation:

- As the vessel was pushed bodily towards her berth by two tugs, her speed of approach increased as she came into the lee of the harbour wall and the effect of the wind, which had been blowing off the berth, was lost.
- The actions of the pilot to reduce the speed of approach of the vessel's bow were unsuccessful because *Marineco Toomai* was positioned just aft of amidships of *Logos II* and not on the port quarter as the pilot had assumed.
- The pilot did not accurately monitor the position of *Marineco Toomai*.
- The two small vessels which were damaged were not moved prior to the arrival of *Logos II* as they were not considered to be at risk.

When departing St Helier:

- There was a lack of co-ordination and communication between the pilot and the tug's skipper.
- A ship's line was used to secure *Duke of Normandy*, which was probably not as strong as lines specifically manufactured for towing.
- After the tow line parted, *Logos II* drifted onto Victoria Pier head due to the effect of the moderate north west breeze.

A number of factors affecting the overall safe operation of the port of St Helier and its compliance with the Port Marine Safety Code were also identified during the investigation.

These included:

- No audits to verify the port's compliance with the Port Marine Safety Code had been undertaken.
- The port's safety management system was a working draft and had not been formally reviewed since its introduction in 2001.
- Risk assessments had not been accessible since March 2007.
- There had been no formal risk assessment for the visit of *Logos II*, which was an unusually large vessel to enter the port's inner harbour and was known to be difficult to manoeuvre.
- No towage guidelines had been developed.
- There was no continuous professional development programme for pilots.

To prevent similar accidents in the future, Jersey Harbours has commenced a review of its marine safety management system, developed an audit plan and a procedure for the initiation of a risk assessment when accepting unusually large vessels, commenced the development of towage guidelines, and implemented a review of pilot training requirements.

Recommendations have been made to the States of Jersey Economic Development Department and Jersey Harbours, with the aim of improving Jersey Harbours' safety management organisation and providing verification of its compliance with the Port Marine Safety Code through an independent audit body.

SECTION 1- FACTUAL INFORMATION

1.1 PARTICULARS OF LOGOS // AND ACCIDENTS

Vessel details

Registered owner	:	Logos Limited
Manager	:	Gute Bucher fur Alle e.V.
Port of registry	:	Valletta
Flag	:	Malta
Type	:	Passenger Ship
Built	:	1968, Union Navel Levante SA, Valencia
Classification society	:	Bureau Veritas
Construction	:	Steel
Length overall	:	109.55 metres
Gross tonnage	:	4804
Engine power and/or type	:	4653 kW
Service speed	:	11 knots
Other relevant info	:	Twin screws, single balanced rudder. No bow thruster

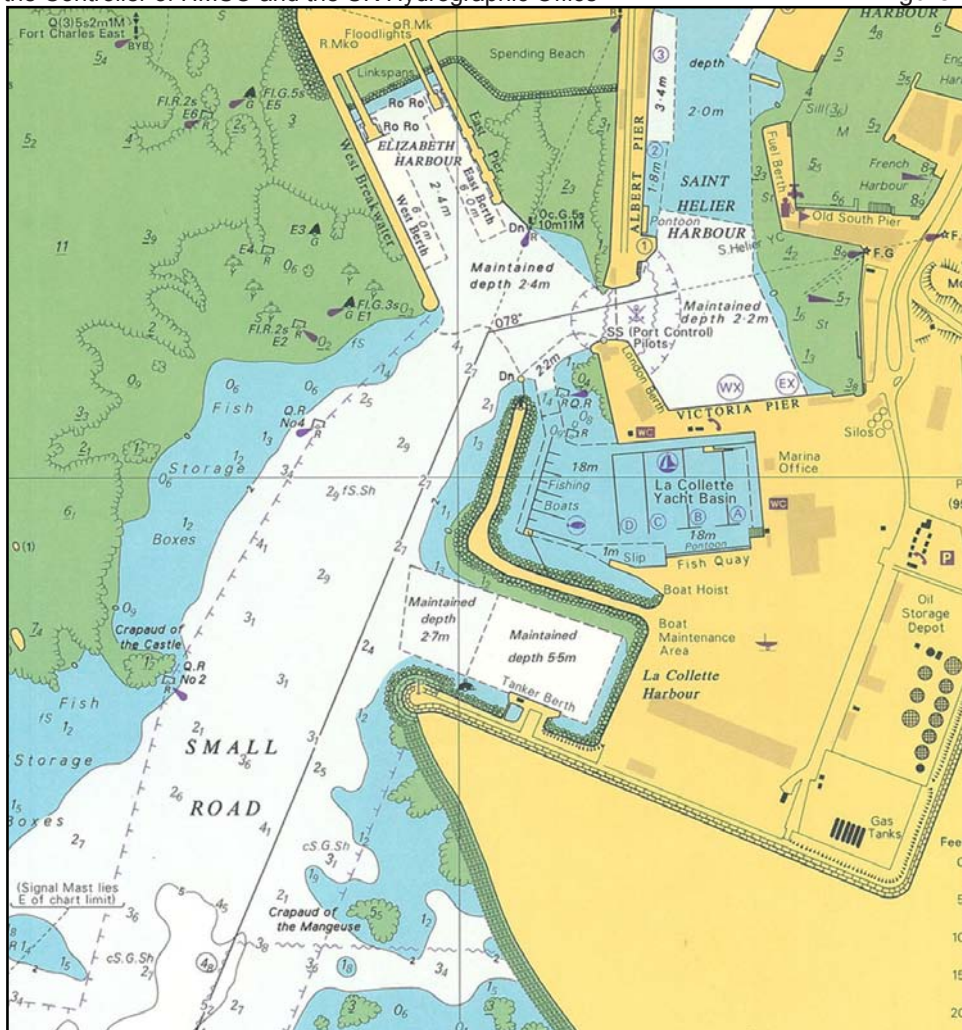
Accident details (Arrival)

Time and date	:	2047 (UTC+1) on 20 June 2007
Location of incident	:	St Helier, Jersey
Persons on board	:	197
Injuries/fatalities	:	None
Damage	:	Vessel sustained indent on her starboard bow, bent pulpit railings and superficial damage to paintwork. Structural damage was caused to two small craft and minor damage to a shore crane.

Accident details (Departure)

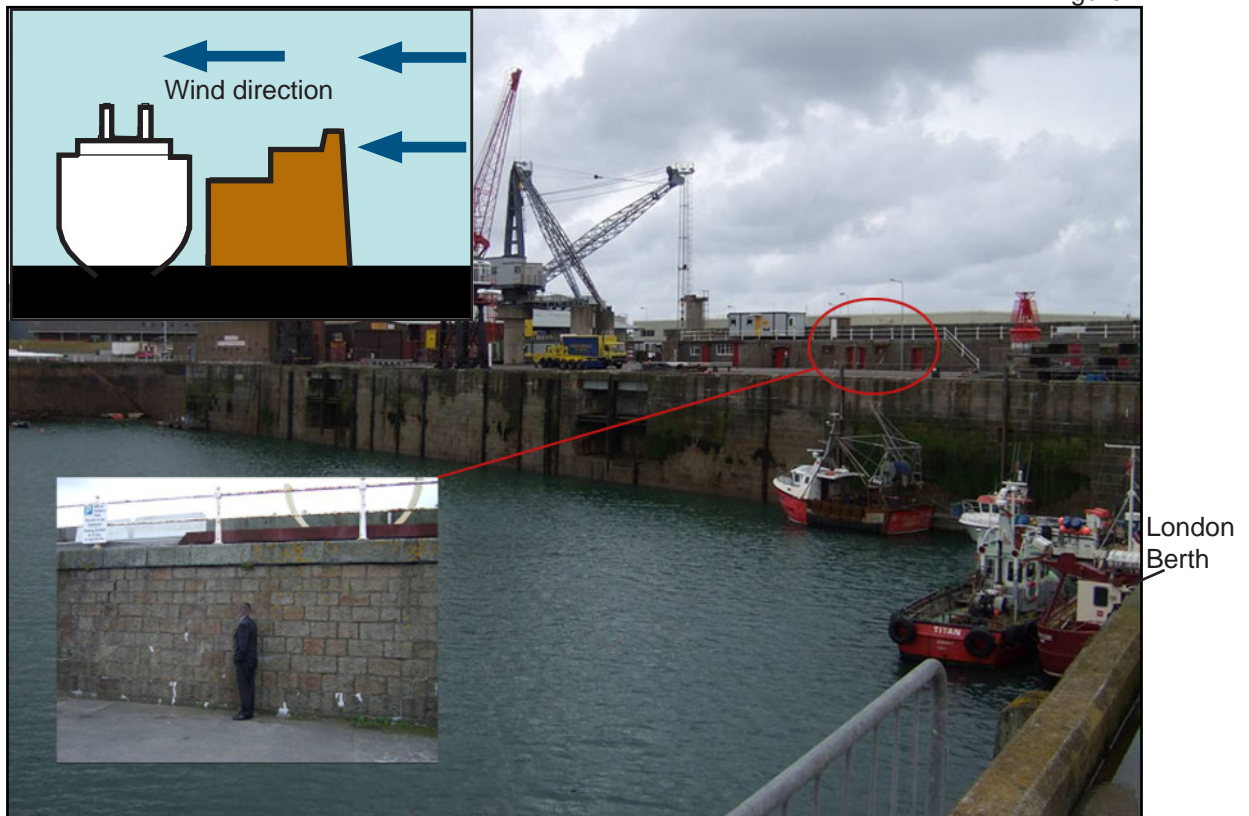
Time and date	:	1200 (UTC+1) on 26 June 2007
Location of incident	:	St Helier, Jersey
Persons on board	:	189
Injuries/fatalities	:	None
Damage	:	Structural damage was caused to concrete land ties and safety railings on Victoria Pier head.

Figure 1



Extract of chart BA 3278

Figure 2



Victoria Pier

1.2 NARRATIVE

1.2.1 Arrival

Following a 2 week visit to Falmouth, UK, *Logos II* anchored 3 miles off the port of St Helier at 1102 on 20 June 2007. She was unable to enter the port because her allocated berth, Victoria Pier (**Figure 1**), was occupied by the cement carrier, *Ronez*. This was *Logos II*'s second visit to St Helier, having previously visited the port in September 2005.

Ronez sailed from Victoria Pier at 1930 with the deputy harbourmaster (DHM) embarked as her pilot. The DHM had not been scheduled for pilotage duties on 20 June but had agreed to stand in at short notice for the nominated pilot, who had personal commitments. The DHM had been working during the day but considered himself to be well rested. His intention was to transfer from *Ronez* to *Logos II* by cutter and then pilot the delayed vessel to Victoria Pier.

Before *Ronez* sailed, the DHM called the port control to arrange for three small boats moored on the western cross pontoon on Victoria Pier (**Figure 2**) to be moved by the duty officer, as he considered that they could potentially hinder the berthing of *Logos II*. Two other small boats moored alongside each other at the south end of London Berth (**Figure 3**) were not considered to be at risk. Using the VHF radio, the DHM also provided a briefing to the skippers of the tugs *Titan* and *Marineco Toomai* on his intended berthing plan.

Figure 3

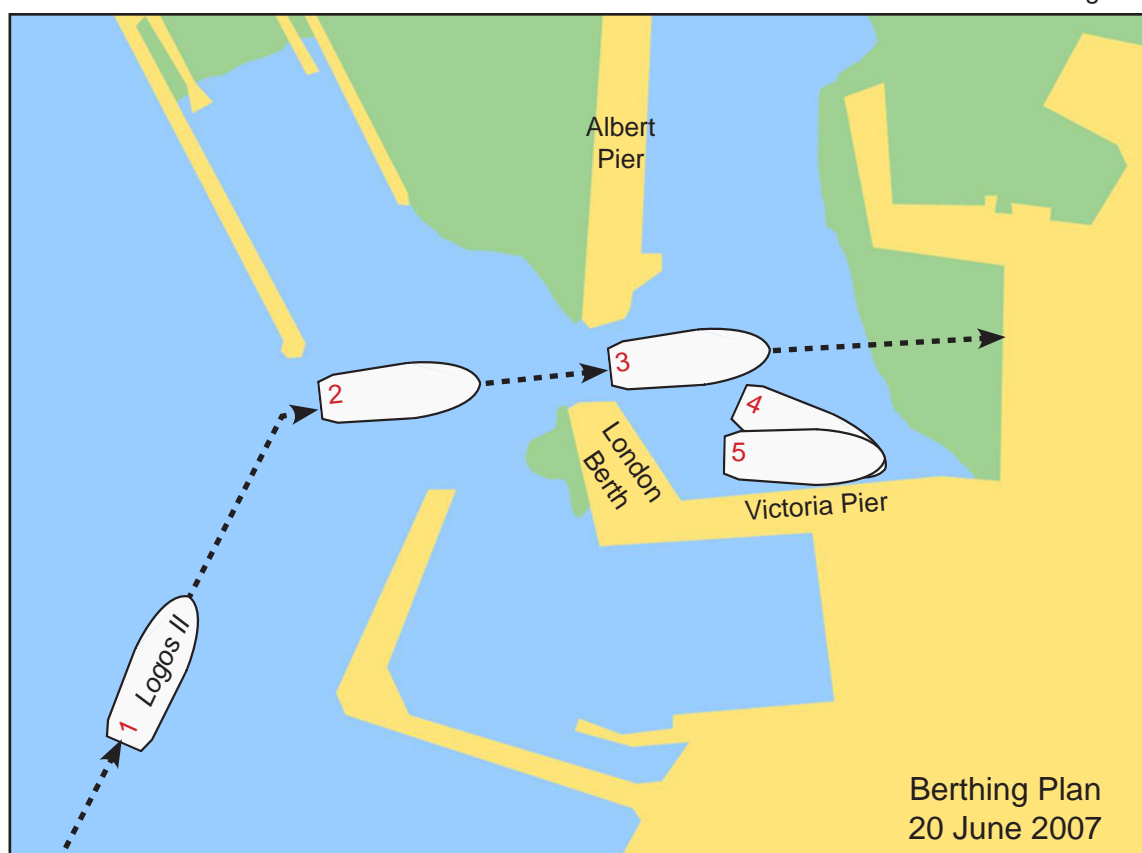


Diagram of the berthing plan of *Logos II*

The DHM transferred to *Logos II* at 1957 accompanied by the harbourmaster (HM), who had previously served on the vessel and was on board to visit old friends. The HM was not there in an official capacity and advised the master that he was not involved in the pilotage of the vessel as soon as he arrived on board.

The master and pilot then exchanged information. The master gave the DHM a pilot card (**Annex A**) and advised him that *Logos II* had two inward turning controllable pitch propellers with a single rudder amidships. The master also highlighted that the vessel's stern was easily influenced by the wind. The DHM then briefed the master that the vessel would enter and stop in the inner harbour where she would be met by *Titan* and *Marineco Toomai*. The intention was to position *Marineco Toomai* on the port quarter to hold the stern up against the fresh southerly breeze, and for *Titan* to push the bow towards the quay. Once sufficient lines were made fast forward, the stern would be pushed in with the assistance of the tug aft (**Figure 3**).

Logos II weighed anchor at 2008 and the master handed the con to the DHM. The vessel proceeded at full ahead manoeuvring speed of 7 knots and, after the passage through Small Road, she executed the turn towards the inner harbour without difficulty. During the transit through the inner pier heads, on which a large crowd had gathered to greet the ship and was cheering loudly, the DHM instructed *Titan* to: 'get on the bow as soon as possible and start pushing us down south'. The skipper of *Titan* immediately complied with this instruction (**Figure 4**), and soon after, the port quarter of *Logos II* began to swing towards Albert Pier head. The DHM was able to check the swing of the port quarter by the use of ahead power and port helm.

Figure 4



Titan pushing *Logos II* on entry through the pier heads (image captured from video)

On clearing the pier heads, *Marineco Toomai* took up a position just aft of amidships (**Figure 5**) on the port side of *Logos II*. At 2043, the DHM instructed both tugs to push the vessel towards Victoria Pier. His instruction to *Marineco Toomai* was: 'can you push easy on the stern, we will to push her bodily down' [sic]. The DHM looked over the port side on several occasions as *Logos II* closed Victoria Pier, but was unable to accurately determine the position of *Marineco Toomai* due to obstructions in his line of site. He assumed she was in her assigned station; he did not check directly with the tug and was not informed otherwise. Soon after, *Halcyon*, a harbour work boat which had been requested by the DHM to standby to assist, positioned herself on the port quarter of *Logos II* and also started to push (**Figure 6**). This action was not requested or seen by the DHM.

As *Logos II* neared the berth, the vessel's bow started to close the pier much quicker than intended. This was commented upon by the master, and the DHM attempted to check this movement by ordering *Titan* to stop pushing and *Marineco Toomai* to push with full power. He also ordered the engines to full astern. These actions failed to check the vessel's movement, and at 2047 her bow made contact with the quay and a shore crane (**Figures 7 & 8**).

Following the contact, *Logos II* gathered sternway. The port duty officer stationed on Victoria Pier recognised the danger this posed to the small boats moored at the south end of London Berth and passed the distance between *Logos II* and the moored boats to the DHM at frequent intervals via UHF radio. The officer in charge of the aft mooring party provided similar information to the master.

The DHM immediately ordered the engines to be stopped and then set to half ahead, and for the helm to be put to hard to starboard. The aft tug was also ordered to stop pushing, but the stern of *Logos II* made contact with two of the small boats (**Figure 9**).

On clearing the boats aft, *Logos II* continued with her berthing operation and secured alongside at 2102. Review of VDR data indicates that all engine and helm orders given by the DHM were correctly expedited by the bridge team.

1.2.2 Departure

The nominated pilot for *Logos II*'s departure from St Helier on 26 June 2007 was the Assistant Harbour Master (AHM) responsible for fisheries and enforcement within the port. He boarded the vessel on 25 June 2007 to advise the master to advance the planned time of departure which was scheduled for 1600 the following day. This coincided with the predicted time of high water and, as the wind was forecast to strengthen from the north west, the AHM was aware that the harbour walls would provide better protection from the wind if the ship sailed at a lower state of tide. The master accepted the pilot's advice and agreed to sail at 1100. The pilot also briefed the master on the departure plan which involved the use of the tugs, *Titan* and *Duke of Normandy* (**Figure 10**).

The plan required *Duke of Normandy* to be made fast to the port bow of *Logos II* with a ship's line, and for *Titan* to position herself between the ship and the quay and push on the starboard quarter. As the stern came off the quay, *Duke of Normandy* would pull the bow to starboard while *Titan* continued to push. *Logos II* would then be manoeuvred astern towards the north before coming ahead and turning to starboard towards the gap between the pier heads. When clear of the pier heads, *Duke of Normandy* would be released.

Figure 5



Marineco Toomai pushing from amidships (image captured from video)

Figure 6



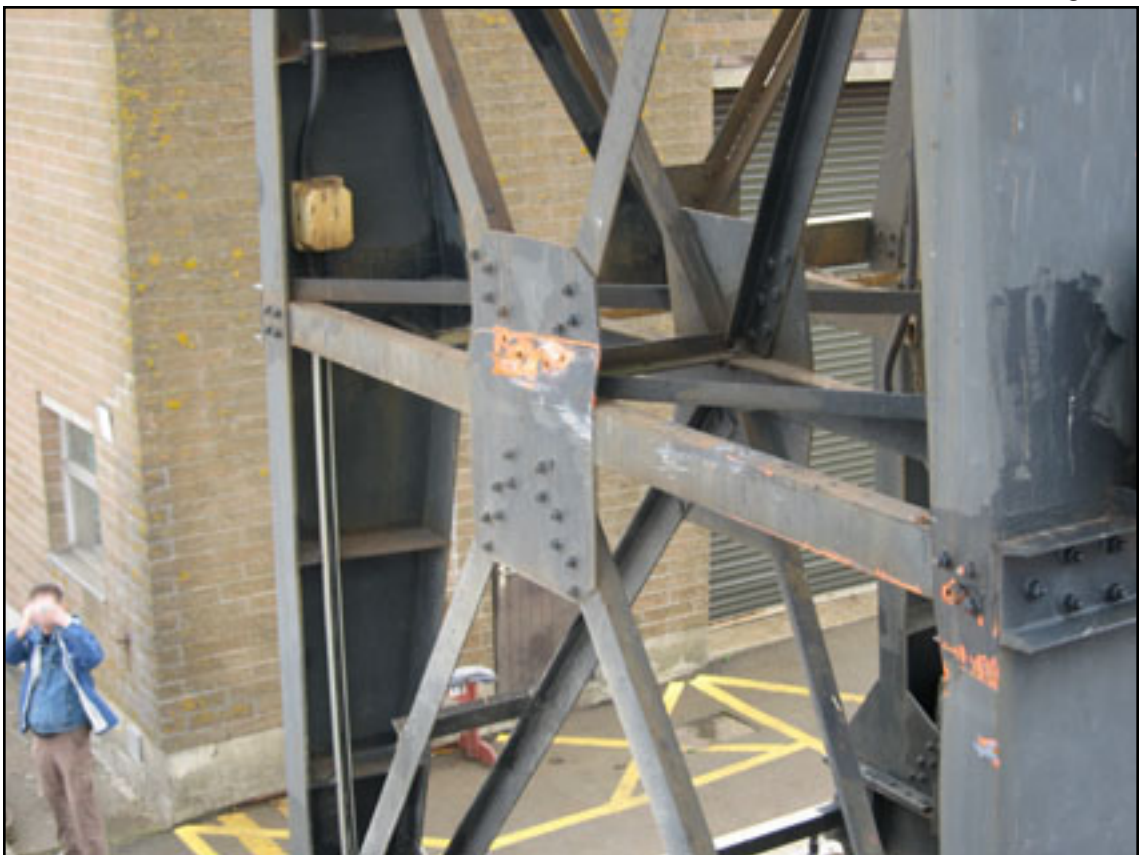
Marineco Toomai & Halcyon pushing on port quarter (image captured from video)

Figure 7



Damage to starboard bow of *Logos II*

Figure 8



Damage to shore crane

Figure 9



Stern of *Logos II* prior to contact with boats moored at London Berth
(image captured from video)

Figure 10

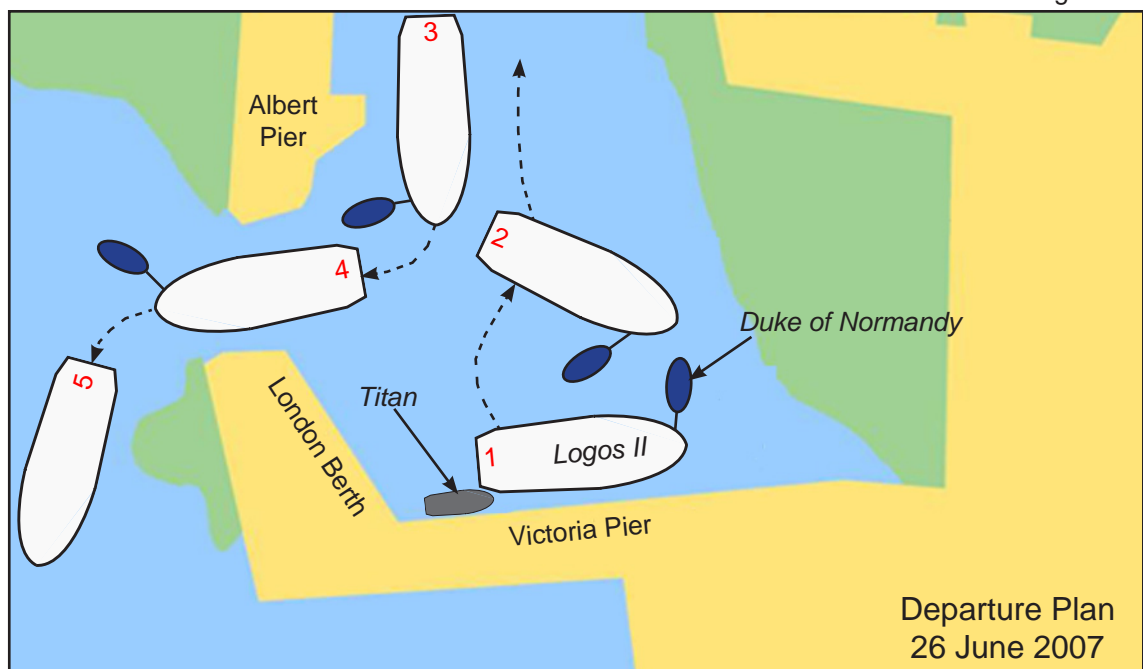


Diagram of the departure plan of *Logos II*

The AHM boarded *Logos II* at 1052 on 26 June 2007, but sailing was delayed while several small boats, which were again moored at the western end of Victoria Pier, were moved. In accordance with the AHM's departure plan, *Duke of Normandy* was secured to the bow of *Logos II* with a 56mm mooring rope provided by the visiting vessel. By 1148 all the mooring lines from *Logos II* had been let go and recovered back on board the vessel and the departure plan was then executed without problem until she was approaching the pier heads.

At 1054.53, *Logos II* was swinging to starboard through a heading of 191° as she altered towards the harbour entrance; her speed was 1 knot and *Duke of Normandy* was positioned just off her port bow. At this point, the AHM ordered the ship's engines to be put to dead slow ahead and immediately advised *Duke of Normandy* of his actions. This surprised the skipper of the tug, who understood that the ship's engines would not be used during this phase of the departure. One minute later, the AHM recognised that *Logos II* was turning closer to Albert Pier Head than intended, and instructed *Duke of Normandy* to pull the bow to the south. By now, *Logos II* was passing through 212° and her speed was 0.8 knot. At 1056.13, the AHM assessed that the ship was now approaching the entrance as planned, and advised *Duke of Normandy*:

'you have got it there...thanks a lot...just straight of us...in the middle.'

However, at 1056.58 *Logos II* was still closing Victoria Pier head at 1.3 knots on a heading of 223° and the AHM put the starboard engine of *Logos II* to half astern and immediately ordered *Duke of Normandy* to pull the bow up to the north. In complying with this order, the tow line between the tug and *Logos II* became slack momentarily, and at 1058.16, it suddenly came under tension and parted. After ordering *Duke of Normandy* to pull to the north, the AHM had used more power astern and the vessel's speed at the time the tow line parted had reduced to 0.7 knots.

Without the assistance of the forward tug, *Logos II* came to rest with her port bow on the Victoria Pier head (**Figure 11**) at 1200. Damage to the vessel was superficial, but damage to the concrete and railings on the pier head was more extensive (**Figure 12**). A tow line was quickly re-secured to *Duke of Normandy*, and *Logos II* was pulled clear of the pier head. The tow was then released to allow the ship to increase speed, but when the AHM attempted to alter course to the south, *Logos II* again failed to respond to the helm, and the assistance of *Duke of Normandy* was required to push her bow towards her intended heading. The vessel then completed her departure from St Helier without further incident.

The mooring line which had parted was later inspected on board *Logos II*, and found to be in a satisfactory condition. It is estimated that it parted between 2 and 3 metres from the eye secured to the towing hook of *Duke of Normandy*. The section of the rope which remained on board *Duke of Normandy* was described by the tug's crew as 'not old but well used and sun-damaged'.

Figure 11



Logos II in contact with Victoria Pier head

Figure 12



Damage to Victoria Pier head

1.3 ENVIRONMENTAL CONDITIONS

The port of St Helier experiences large ranges in tidal levels. Mean spring range is 9.6 metres and the mean neap range is 4.1 metres.

On 20 June, the visibility was good. The height of tide was calculated to be 8 metres and high water was predicted to be at 2308. The wind was southerly at a speed of about 18 knots (Beaufort force 5).

On 26 June, the visibility was good. The height of tide was calculated to be 5.5 metres and high water was predicted to be at 1620. The wind was north westerly at a speed of about 14 knots (Beaufort force 4).

1.4 LOGOS II

1.4.1 Description

Originally named *Antonio Lazaro*, *Logos II* was built in 1968 by Union Naval Levante SA of Valencia, Spain. On entering service, she operated as a ferry plying between Spain and Morocco. The vessel was then purchased in 1989 by Educational Books Exhibits Ltd, a private non-profit charity registered in the UK. Her new role was to provide affordable literature on general and educational matters around the world, and since 1990 *Logos II* had been to 168 ports in 76 countries and had been visited by about 9 million people. Port stays were usually between 1 and 2 weeks. *Logos II* was managed by Gute Bucher fur Alle e.V in Germany, which also managed *M.V. Doulos* and *M.V. Logos Hope*, vessels engaged in a similar role to *Logos II*.

1.4.2 Bridge team

Logos II was manned by volunteers, who usually remained on board the vessel for 2 years. During the vessel's arrival at St Helier on 20 June 2007 and her departure on 26 June 2007, the bridge team comprised: the master; chief officer, and helmsman.

The master joined the merchant navy as a third officer after graduating from a marine academy in 1994. Serving mainly on board oil tankers, he progressed through the ranks and gained his first command in 2001. The master then sailed in various capacities on board Mercy Ships¹ during 2002 and 2003. He joined *Logos II* as chief officer in September 2005 for 9 months and returned in September 2006. He was promoted to master in November 2006. The master did not keep duties when in port.

1.4.3 Propulsion

Logos II was fitted with two slow speed diesel engines, capable of delivering a combined output of 6240 BHP through two inward turning controllable pitch propellers. The propellers were manoeuvred from the bridge via a combinator control system.

The combinator system was designed to control the vessel's propulsion power by altering the propeller pitch angle and engine revolutions simultaneously. However, the system had been modified, which had resulted in the shaft rotating at a constant speed. In addition, with the combinator control levers set to full ahead, the propeller rotated at 180 RPM rather than the original 220 RPM. This reduction in shaft revolutions for a set

¹ Charitable hospital ships providing health care to the poor in port areas around the world.

propeller pitch was similar when going astern and resulted in a reduction of available power during manoeuvring evolutions. The vessel was also fitted with a single balanced rudder fitted in the fore and aft line. She was not fitted with a bow thrust.

1.5 VICTORIA PIER

The inner harbour of St Helier is entered through Albert Pier head and Victoria Pier head (**Figure 1**). On entering the inner harbour, Victoria Pier is located to the south. It is 135 metres in length and is used mainly for general cargo operations and the discharge of cement. The largest ship to use this berth was *Logos II*, in September 2005, although it is occasionally used by vessels of up to 90 metres LOA. A small fixed floating pontoon used by small boats is sited at the western end of the pier. The unusually high harbour walls (**Figure 2**) provide good shelter from strong winds, particularly from the south.

1.6 PRE-ARRIVAL EVENTS

In accordance with usual practice, the port's pilots met informally before the arrival of *Logos II* to discuss the potential difficulties likely to be encountered. Experience of the vessel's manoeuvring characteristics had been gained during the vessel's previous visit in calm conditions. The pilots were aware of the potential difficulties caused by her lack of a bow thrust, the poor turning moment resulting from her inward turning propellers, and her high and long superstructure, and were apprehensive about the visit. However, as the nominated pilot for *Logos II*'s arrival had piloted the vessel during her last visit to St Helier, and the same tugs, *Titan* and *Duke of Normandy*, would again be available, no concerns were raised.

At the time of this meeting, *Duke of Normandy* was in refit but was expected to return into service on 15 June 2007 prior to *Logos II*'s scheduled arrival. However, the DHM was advised on 13 June 2007 that completion of the refit had been delayed and the tug would not be back in time to assist with the berthing of *Logos II*. The DHM expressed his concern about berthing *Logos II* without the assistance of *Duke of Normandy* to the HM, but it was considered to be unacceptable for the port not to accept *Logos II*. As a result, the DHM approached the skipper of *Marineco Toomai* to assist with the berthing.

1.7 JERSEY HARBOURS

1.7.1 General

The island of Jersey has two commercial ports, St Helier and Gorey. The management of both St Helier and Gorey, along with four leisure and fishing facilities, is the responsibility of Jersey Harbours.

The port of St Helier (**Figure 1**) lies on the east shore of Saint Aubin Bay and is the capital town and the largest port of Jersey, handling almost 99% of all imports into the island. Tanker berths are located in the La Collette Harbour which can accommodate tankers of up to 95 metres LOA. A passenger terminal is located in Elizabeth Harbour, which has two link spans used by passenger/ro-ro vessels of up to 127 metres LOA.

1.7.2 Organisation

Jersey Harbours employs 52 people and is headed by a Chief Executive Officer (CEO), who is also the harbourmaster within the meaning of article 2 of the Harbours (Administration) (Jersey) law 1961. The CEO has been in post since May 2004 and is

responsible for advising the Economic Development Department on all matters relating to the effective management of marine safety within the territorial waters of the island. He is also accountable for setting the strategic direction of the harbour in its transition to become a viable commercial and independent port.

Under the Harbours (Administration) (Jersey) law 1961, the DHM has powers and functions delegated to him by the harbourmaster to deal with any issues associated with the harbour. He is in charge of day to day maritime operations within the port and reports directly to the CEO regarding marine safety and conservancy issues. The DHM is also responsible for the management of safety of navigation and the port's vessel information service, and is the Director of Port & Coast Guard operations. In addition, the DHM heads the pilotage board, which examines pilots and candidates seeking pilotage exemption certificates (PEC) and is on the duty pilot, port duty officer and search and rescue co-ordinator rosters. The DHM is assisted by four AHMs and other staff who have responsibility for the management of specific areas; a diagram detailing the organisation of Jersey Harbours is at **Annex B**.

1.7.3 Pilotage

Pilotage is compulsory for vessels of over 50grt, although some vessels are exempt by law, such as vessels with masters or deck officers holding valid PECs. Until 1 January 2005, pilotage was provided by the Company of Town Pilots, which was privately owned. Since then, the pilotage service has been provided by Jersey Harbours. In 2006, 578 pilotage acts were carried out in the port, but the frequency of acts increased in March 2007 when a new ferry service was introduced.

The port employs four pilots, who also have other responsibilities within the harbour (**Annex B**). The AHM (marine operations manager) is the senior pilot, who conducts about 75% of all pilotage acts. He has been a pilot since 1979. The DHM worked as a master for 14 years on ferries operating from St Helier before becoming a pilot in St Helier with the Company of Town pilots in May 2000. He then joined Jersey Harbours in 2002 and was promoted to his present position in 2005. The AHM (enforcement and fisheries) has been a pilot in Jersey since 1990 and had piloted *Logos II* during her previous visit. The marine operations officer was the most recent pilot to join. He had recently completed his training in line with national occupational standards for marine pilots. None of the three experienced pilots had conducted any continual development training since being in post.

1.7.4 Marine communications

All vessels intending to enter a port in Jersey are required to call Jersey Radio on VHF channel 25 or 82 at least 1 hour before arrival. In St Helier, VHF channel 14 is the working channel used for communications between the port control and vessels arriving or departing. It is also used for controlling traffic within the port, and by pilots to communicate with tugs during mooring operations. The port also operates on VHF channel 18, which is an automated service broadcasting wind speed, direction and gust conditions on a continuous basis, and maintains a listening watch on VHF channel 16. UHF radio is used for communication between port control, the duty officers and the pilots.

1.8 SAFETY MANAGEMENT

1.8.1 Port Marine Safety Code (PMSC)

The PMSC was developed by the Department for Transport in consultation with wide ranging industry bodies, and was published in March 2000 for implementation by December 2001. The Code introduced the principle of a national standard for every aspect of port marine safety. Although not mandatory, the Department for Transport expected every competent harbour authority in the UK to comply with its requirements. Among the principal aims of the Code was the establishment of a system, covering all marine operations, to ensure that all risks are both tolerable and as low as reasonably practical, together with the creation of occupational standards for key port personnel including harbourmasters and pilots. Occupational standards for marine pilots were developed in 2000 and accredited in 2001. The Code is supported by '*A Guide to Good Practice on Port Marine Operations*', which was published by the Department of Transport in conjunction with the Code.

St Helier is not a UK port and therefore Jersey Harbours is not obliged to adopt the PMSC. However, it is legally bound by its legislature to facilitate the safe use of its harbours. To achieve this, and to promote best practice within its jurisdiction, Jersey Harbours adopted the PMSC on a voluntary basis.

1.8.2 Port Marine Safety Management System (PMSMS)

In preparation for its compliance with the PMSC, Jersey Harbours commissioned the Warsash Maritime Centre to carry out initial risk assessments of the port operations in 2000. Its Port Marine Safety Management System (PMSMS), which was developed by the port users and incorporated these risk assessments, was then introduced in December 2001 as a working draft.

The draft contained a number of factual inaccuracies as well as omissions, and was not published within the port. Annexes B, C and E of this report are extracts from various versions of the working draft documentation.

The DHM is responsible for the PMSMS and the CEO is the designated person², reporting directly to the Economic Development Department (Duty Holder³). The principal roles within the PMSMS are defined at **Annex C**. In tandem with the PMSMS, Jersey Harbours also developed an Approved Code of Practice on Health and Safety in St Helier, supported by a Health and Safety Policy Document to cover the safe management of its land-based port operations. The duties of the HM and DHM detailed in the Health and Safety Policy Document are at **Annex D**.

A Memorandum of Understanding (MOU) was signed in February 2007 between the Economic Development Department and Jersey Harbours in order to define specific areas of responsibility with regard to the operation and administration of maritime compliance and regulation. The MOU required the Maritime Compliance Manager within the Economic Development Department to monitor and report on Jersey

² The PMSC requires a 'designated person' to be appointed to oversee the harbour authority's obligation in complying with its safety management system. The function of the designated person is to provide independent assurance directly to the 'duty holder' that the safety management system is working effectively and that the harbour authority is in compliance with the Code. This person must have an independent oversight of the operation of the safety management system, and at the same time must have direct access to the highest level of authority.

³ The Code also requires each harbour authority and its board members to hold themselves principally accountable for the discharge of their duties and powers, and thus it follows that they severally or collectively are the 'duty holder'.

Harbours' compliance with relevant legislation and to establish a programme of audits and inspections of activities including pilotage and harbour control, safety and administration.

Since 2002, a large number of measures have been undertaken to improve the safe management of the port. These include, but are not limited to: initiatives to improve safety culture; regular consultation with port user groups; the development of a corporate risk register; risk assessment training; reviews of accidents and incidents, pilotage service provision, pilot training, port control service and navigational aids; the development of standard operating systems for all critical operations, and the publication of an annual report detailing safety performance statistics. These initiatives were implemented using a controlled port letter system⁴.

Risk assessments for all port operations were recorded electronically, but these were not accessible from March 2007 following the expiry of the software licence for the system. No paper copies of the risk assessments were retained. All accidents and incidents, of which there were 803 in 2006 (excluding SAR incidents), were also recorded electronically. Although it was a requirement of the harbourmaster's initial draft policy statement in December 2001 (**Annex E**) that the PMSMS and its risk assessments be reviewed regularly and audited by an independent person at an interval not exceeding 2 years, no overall reviews or audits of the PMSC were conducted.

1.9 TUGS AND TOWAGE GUIDELINES

1.9.1 *Titan*

Titan was a privately owned, 11.2 m, category 3 work boat, capable of a 5 tonne bollard pull. The vessel was equipped to be operated single-handed and was contracted by Jersey Harbours to assist with mooring operations. She was only used in the 'push' mode.

1.9.2 *Duke of Normandy*

Duke of Normandy was a multi-purpose, 26.2 m tug, owned and operated by Jersey Harbours. She was capable of undertaking towing, mooring, buoy handling, fire-fighting, oil recovery and plough dredging operations. The vessel was licensed as a category 2 work boat and had a 28 tonne bollard pull.

Although *Duke of Normandy* was fitted with a towing hook and winch, she was usually employed in the 'push' mode during mooring operations in the inner harbour. On the occasions she was employed in the 'pull' mode, it was normal practice to use ships' lines to enable the quick release of the rope from the towing hook and allow the tug to quickly change the position of the tow if required.

The tug's skipper had worked on tugs in St Helier for 18 years, and qualified as a tug master in 2002. He had been involved in nearly all of the towage operations conducted in the harbour during that time, including arrival and departure of *Logos II* in 2005, and the towing of 5000t stone barges.

⁴ A method of communication the port uses to ensure its staff receive accurate and up to date operational information and for the distribution of operational instructions, safety management reports, minutes of meetings and amendments to procedures and manuals.

1.9.3 *Marineco Toomai*

Apart from being licensed as a category 1 work boat, and exerting a 30 tonne bollard pull, *Marineco Toomai* (**Figure 5**) was almost identical to *Duke of Normandy*. The vessel was on its delivery voyage to the Middle East and had stopped in St Helier to await a weather window to allow her to cross the Bay of Biscay. When her skipper was approached by Jersey Harbours to assist with the berthing of *Logos II*, he agreed with the proviso that the tug would only be used in a push mode as the vessel was not rigged for accepting tow lines.

1.9.4 Towage guidelines

In relation to tugs, the PMSC states:

Where a need for tugs is found, harbour authorities should develop towage guidelines in their safety management system. The guidelines should be based on an objective assessment of safety, not on economic considerations. They should also take account of the physical conditions of the harbour and the characteristics of the vessels using it.....Towage guidelines, and related directions, should be used to ensure the use of tugs with appropriately trained and qualified pilots and crew. Competence standards developed for inshore tug personnel should be used for this purpose. The safety management system should provide wherever possible for tug crews to train with pilots and other port marine personnel.

Factors to be considered in developing towage guidelines, which are detailed in the 'Guide to Good Practice on Port Marine Operations', are at **Annex F**. Jersey Harbours identified a need for tug operations through its risk assessments, but had not developed towing guidelines.

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

Although the DHM assumed responsibility for the pilotage of *Logos II* at short notice on 20 June 2007, he had been following a day working routine and felt well rested. Similarly, *Logos II* had recently completed a 2 week visit to Falmouth, UK, during which the master did not undertake any duties. Therefore, given the circumstances of the incident on 20 June, it is considered unlikely that fatigue influenced the decision-making or actions of either the pilot or the master. Similarly, there is no evidence to indicate fatigue was a contributory factor to the incident which occurred during the departure of *Logos II* from St Helier on 26 June 2007.

2.3 SIMILAR ACCIDENTS

There have been 11 reported incidents involving contacts with quays or vessels in St Helier during the last 5 years. Most have been attributed to adverse weather, loss of power, or a combination of both. Four of these occurred with harbour pilots on board the vessels concerned; the remainder occurred when vessels were under the control of a PEC holder.

2.4 ACTIONS OF PILOTS

2.4.1 Arrival

After *Logos II* had stopped in the inner harbour, she was pushed bodily towards Victoria Pier by *Titan*, which was positioned on the port bow, *Marineco Toomai*, positioned just aft of amidships (**Figure 5**), and by *Halcyon* on the port quarter (**Figure 6**). As she neared the berth with her bow canted towards the quay as intended, it is highly likely that the speed of approach increased as the vessel came into the lee of the harbour wall (**Figure 2**), and the effect of the fresh southerly breeze was lost. The influence of *Halcyon* would have been minimal due to her size.

To reduce the rate at which the bow of *Logos II* was closing with the quay, *Titan* was instructed to stop pushing and *Marineco Toomai* was ordered to push at full power. This action was taken by the DHM on the assumption that *Marineco Toomai* was positioned on the port quarter, considerably aft of the vessel's pivot point. Had this been the case, it is highly likely that although the stern would have closed the quay more quickly, the closing rate of the bow would have reduced and the contact with the crane would have been avoided. However, because *Marineco Toomai* was positioned further forward than the DHM assumed, the vessel continued to be pushed towards the quay, bow first.

This was the first occasion *Marineco Toomai* had been used to assist with mooring operations within the port, and the DHM was not familiar with the tug or her crew. Likewise, the tug's crew were not familiar with the port or the pilot. Although the lack of familiarity with *Marineco Toomai* warranted frequent checks on her actions, the DHM did not verify the tug's position, either with her skipper or through the bridge team. Similarly, although the pushing by *Halcyon* as the vessel closed the quay was not contributory

to the contact, this action was neither requested by the DHM, nor was he aware it was taking place. Had the DHM taken steps to ensure the actions of the assisting vessels were monitored, *Marineco Toomai* could have been re-positioned, and the avoiding action taken prior to the contact with the quay would have probably been successful.

With the engines at full astern on impact it was not surprising the vessel soon gathered sternway. The DHM quickly ordered half ahead, but there was insufficient distance to the small vessels astern for this action to be effective in avoiding contact. Although the engine power available was less than indicated on the vessel's pilot card (**Annex A**) and was therefore potentially misleading, a lack of power is not considered to have been a contributory factor on this occasion.

2.4.2 Departure

The advancement of the time of departure in view of the height of tide and forecast wind conditions indicated the departure was well considered by the pilot. Indeed, the intended plan (**Figure 10**) worked well until the vessel approached the gap between the pier heads. Given the difficulty experienced by the AHM to turn *Logos II* away from Victoria Pier head, which was probably due to the poor manoeuvring characteristics of the vessel, his instruction to *Duke of Normandy* to pull the bow to the north was logical. It was unfortunate that the tow line parted as the tug attempted to manoeuvre on to the starboard bow of *Logos II*.

As soon as the tow line parted, there was little action the pilot could take to avoid the ship's bow coming to rest on Victoria Pier head. In view of the influence of the north west wind, along with the poor handling characteristics of the vessel and the close proximity of the pier heads, attempts to manoeuvre *Logos II* clear might have resulted in more serious damage.

2.5 COMPLIANCE WITH THE PMSC

2.5.1 Risk assessment

The cornerstone of a good safety management system is a harbour authority's appreciation of risk in operating its port. This is achieved by adopting a positive and analytical approach while considering past events and accidents as well as examining potential dangers and the means of avoiding them. Although the recording of accidents and incidents appears to have been undertaken in a very diligent manner, as shown by the number recorded in 2006, the failure of the port to undertake a formal risk assessment for the arrival of *Logos II*, an unusually large vessel with known difficulties in manoeuvring, indicated that Jersey Harbours' management of risk was more reactive than proactive.

In this case, a formal risk assessment procedure, rather than an informal discussion between the pilots, might have helped the identification of hazards in various conditions and the control measures required. As Victoria Pier is 135m in length, *Logos II* was 110m and known to have poor manoeuvring characteristics, and *Marineco Toomai* had never been used in the port, it would certainly have identified the potential danger to all of the small vessels moored in the west corner of Victoria Pier and the south end of London Berth. This would have allowed their removal in good time and prevented the damage caused to them on 20 June along with the delay in sailing on 26 June. Furthermore, it is probable that a risk assessment would have also identified the hazards of differing wind conditions and the shelter provided by the harbour walls at

the various stages of the tide. This might have prompted greater consideration of how the available tugs could be best utilised and the scheduling of the vessel's arrival and departure.

2.5.2 Towage guidelines

As indicated in paragraph 2.4, the positioning of *Marineco Toomai* on 20 June and the parting of the tow line secured to *Duke of Normandy* on 26 June were significant contributory factors in the resulting contacts. It is probable that the likelihood of these occurrences would have been reduced if towage guidelines had been developed in accordance with the PMSC.

First, *Marineco Toomai* was similar in capability to *Duke of Normandy*, but the port had no indication of the competence of her crew, and there had been no cross-training or interaction with the port's pilots and other port marine personnel. The tug was also not capable of operating in the 'pull' mode.

Second, when a tug is required to change positions or direction of pull in confined waters, maintaining constant tension in the tow line and avoiding 'snatching' can be very difficult and requires close co-ordination and good communication between the pilot and the tug. On this occasion, the skipper of the tug was not made aware of the AHM's use of astern power just before the tow line parted. Although this only had a small effect on the vessel's speed, an awareness of this action might have possibly assisted the tug's skipper when adjusting his position onto the starboard bow of *Logos II*. Also, the surprise of *Duke of Normandy*'s skipper at the AHM's use of main engines indicates that the departure plan had either not been properly briefed or had been misunderstood.

Finally, while *Duke of Normandy* preferred to take a ship's line when operating in the 'pull' mode, this is not common practice within UK ports. The strength of such lines is usually much less than tow lines manufactured for this purpose and which are also often designed to allow sudden increases in tension to be absorbed. In addition, although a ship's line might appear to be in a satisfactory condition, there is no way of assessing its quality or the effect of factors such as how it has been used or stowed.

Had Jersey Harbours developed towage guidelines, taking into account the factors detailed at **Annex F** and in paragraph 1.9.4, not only would *Marineco Toomai* have been identified as an unsuitable replacement for *Duke of Normandy*, it is probable that the required levels of cross-training between pilots and tug skippers, and the use of ship's lines, would also have been more critically considered.

2.5.3 Responsibility

The HM, as the designated person, was responsible for auditing Jersey Harbours' compliance with the PMSC, and responsibility for the implementation and operation of the PMSMS rested with the DHM. However, a number of departures from the requirements of the PMSC indicate that these responsibilities were not fully met. These included: the PMSMS has remained a draft document and had not been reviewed following its launch in 2001; no audits to verify the port's compliance with the PMSC were undertaken; risk assessments had not been accessible since March 2007; there was no programme of continuing professional development training for pilots, and; no towage guidelines were in place. Such departures do not necessarily indicate a lack of

commitment to safety. Indeed, the measures and initiatives identified in paragraph 1.8.2 reflect a positive outlook in this respect. Nevertheless, the departures do indicate that compliance with the PMSC was not given a sufficiently high priority.

The organisational structure of the port of St Helier is unique. In addition to managing the day to day operations as harbourmaster, the DHM has numerous other wide-ranging roles and responsibilities including enforcement, search and rescue and pilotage. Also, unlike many UK ports, which frequently have port facility managers or equivalents, the DHM is also responsible for the land estates and assets of the port, as well as key responsibilities with regard to land-based health and safety procedures (**Annex D**). In such circumstances, although the DHM is assisted by other managers with specific responsibilities to the port's operation, it is highly likely that the ability of the DHM to allocate sufficient time and personal resource to marine safety management has been adversely influenced by his other work commitments.

2.6 COMMUNICATIONS

The use of a common VHF channel for pilot and tug operations and routine reporting, although not a contributory factor to the accidents involving *Logos II*, had the potential for critical messages between the parties involved in the berthing operation to be lost or distorted by the interference of third parties. Similarly, the requirement for a pilot to use both VHF and UHF radios when communicating with tugs and shore-based personnel had the potential to unnecessarily burden the pilot.

SECTION 3 - CONCLUSIONS

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

1. Although the port had introduced a number of initiatives to improve marine safety, its safety management system had remained in draft form since its introduction in 2001, and no audits to verify compliance with the PMSC had been undertaken. [2.5.3]
2. Compliance with the PMSC has not been given a sufficiently high priority, and it is highly likely that the ability of the DHM to allocate sufficient time and personal resource to marine safety management has been adversely influenced by his other work commitments. [2.5.3]

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

1. The lack of familiarity with *Marineco Toomai* warranted frequent checks on her actions. However, the DHM assumed she was in her intended position; he did not verify the tug's position, either with her skipper or through the bridge team. [2.4.1]
2. The available engine power indicated on the ship's pilot card (**Annex A**) was potentially misleading. [2.4.1]
3. The failure of the port to undertake a formal risk assessment for the arrival of *Logos II*, an unusually large vessel with known difficulties in manoeuvring, indicated that Jersey Harbours' management of risk was more reactive than proactive. [2.5.1]
4. A formal risk assessment would have identified the potential danger to the small vessels moored at London Berth and allowed their removal in good time. It is also likely to have prompted greater consideration of how the tugs available could be best utilised and the scheduling of the vessel's arrival and departure. [2.5.1]
5. The positioning of *Marineco Toomai* on 20 June and the parting of the tow line secured to *Duke of Normandy* on 26 June were significant contributory factors in the resulting contacts. It is probable that the likelihood of these occurrences would have been reduced if towage guidelines had been developed in accordance with the PMSC. [2.5.2]
6. Risk assessments within St Helier were not periodically reviewed and had not been accessible since March 2007. [2.5.3]
7. There was no programme of continuing professional development training for the port's pilots. [2.5.3]
8. The use of a common VHF channel for pilot and tug operations and routine reporting, although not a factor on these occasions had the potential for critical messages between the parties involved in the berthing operation to be lost or distorted by the interference of third parties. [2.6]
9. The requirement for a pilot to use both VHF and UHF radios when communication with tugs and shore-based personnel had the potential to unnecessarily burden the pilot. [2.6]

SECTION 4 - ACTION TAKEN

Jersey Harbours has:

- Commenced a review of its Port Marine Safety Management System.
- Developed a plan to audit its safety management system.
- Developed a procedure for the initiation of a risk assessment and a detailed passage plan when accepting unusual vessels into port.
- Commenced the development of towage guidelines in which the risk arising from the use of ship's lines will be assessed.
- Implemented a review of pilot training requirements.
- Commenced researching the acquisition of a new computer software package to record risk assessments and accidents and incidents.
- Initiated the use of VHF communication between the pilot, duty officer and other parties involved in mooring operations.
- Stated its intention to consider using a dedicated VHF channel, other than channel 14, for mooring operations.

Gute Bucher fur Alle e.V has:

- Circulated an incident report circular to its masters and senior officers highlighting the lessons learnt from these incidents.
- Amended the pilot card to reflect the correct power of engines.

SECTION 5 - RECOMMENDATIONS

The States of Jersey Economic Development Department is recommended to:

2008/101 Arrange periodic, independent verification of Jersey Harbours' compliance with the Port Marine Safety Code by the Maritime and Coastguard Agency, or similar competent authority.

Jersey Harbours is recommended to:

2008/102 In consultation with the States of Jersey Economic Development Department, review and revise its management structure with the aim of providing a greater focus on Port Marine Safety and compliance with the Port Marine Safety Code.

Marine Accident Investigation Branch
January 2008