



Office of the Chief Investigator
Transport and Marine Safety Investigations

**Marine Safety Investigation
Report No 2006 / 04**

Near Grounding
Passenger Vessel MV Statendam
Port Phillip Heads
6 December 2006



TABLE OF CONTENTS

THE CHIEF INVESTIGATOR.....	5
1. EXECUTIVE SUMMARY.....	7
2. CIRCUMSTANCES.....	9
2.1 STATENDAM.....	9
2.2 CONSEQUENCES.....	10
3. FACTUAL INFORMATION.....	11
3.1 STATENDAM.....	11
3.2 PORT PHILLIP HEADS.....	13
3.3 PORT PHILLIP SEA PILOTS.....	14
3.4 PORT OF MELBOURNE CORPORATION.....	15
3.5 OTHER FACTUAL INFORMATION.....	16
3.6 ENVIRONMENTAL CONDITIONS.....	19
3.7 GOVERNING LEGISLATION, RULES AND GUIDELINES.....	20
4. ANALYSIS.....	21
4.1 THE INCIDENT.....	21
4.2 BRIDGE RESOURCE MANAGEMENT.....	22
4.3 POINT LONSDALE SIGNAL STATION.....	23
4.4 PILOT BOARDING.....	24
4.5 THE PREVALENT CULTURE.....	25
5. CONCLUSIONS.....	27
5.1 FINDINGS.....	27
5.2 CONTRIBUTING FACTORS.....	27
6. SAFETY ACTIONS.....	29
6.1 SAFETY ACTIONS TAKEN SINCE THE EVENT.....	29
7. APPENDIXES.....	31
APPENDIX A - SEQUENCE OF EVENTS.....	31
APPENDIX B - PORT PHILLIP HEADS.....	33
APPENDIX C - STATENDAM SHIP PARTICULARS AND NAVIGATIONAL EQUIPMENT.....	35
APPENDIX D - STATENDAM STABILISER.....	37

THE CHIEF INVESTIGATOR

The Chief Investigator, Transport and Marine Safety Investigations is a statutory position established on 1 August 2006 under Part V of the *Transport Act 1983*.

The objective of the position is to improve public transport and marine safety by independently investigating public transport and marine safety matters.

The primary focus of an investigation is to determine what factors caused the incident, rather than apportion blame for the incident, and to identify issues that may require review, monitoring or further consideration. In conducting investigations, the Chief Investigator will apply the principles of 'just culture' and use a methodology based on systemic investigation models.

The Chief Investigator is required to report the results of investigations to the Minister for Public Transport and / or the Minister for Roads and Ports. However, before submitting the results of an investigation to the Minister, the Chief Investigator must consult in accordance with section 85A of the *Transport Act 1983*.

The Chief Investigator is not subject to the direction or control of the Minister(s) in performing or exercising his or her functions or powers, but the Minister may direct the Chief Investigator to investigate a public transport safety matter or a marine safety matter.

1. EXECUTIVE SUMMARY

At about 0500¹ on 6 December 2006, the Dutch registered passenger vessel Statendam with about 1,700 persons on board arrived at Port Phillip Heads to berth at Station Pier in the Port of Melbourne.

In the process of picking up the pilot, the vessel altered its course to create a lee for the pilot vessel to come alongside. This action caused Statendam to head towards the shallow banks off Point Lonsdale.

As soon as the pilot was on board, the master turned the vessel towards its intended track through Port Phillip Heads. When the pilot arrived on the bridge he noted that Statendam was steering close to the shallow banks off Point Lonsdale.

The investigation found that Statendam was travelling over the recommended speed limit when it picked up the pilot well inside the pilot boarding ground and applied a slow rate of turn to get back on track causing it to enter shallow water.

It is likely that Statendam's port side stabiliser fin came in contact with some underwater obstruction causing it to have superficial abrasions at the outer tip and affecting its alignment in the shipside housing.

Since the incident, several safety actions have been initiated:

- Port of Melbourne Corporation has amended the Harbour Master's Directions and issued Notice to Mariners with regard to vessel arrival procedures;
- Port of Melbourne Corporation is also working with Port Phillip Sea Pilots to develop and implement safe operating practices for arriving and departing vessels; and
- Statendam has reviewed and amended its arrival port procedures to mitigate the chances of the vessel repeating the incident.

¹ All times are denoted in Australian Eastern Daylight Saving Time (UTC + 11 hours).

2. CIRCUMSTANCES

2.1 Statendam

The Dutch registered passenger vessel MV Statendam with about 1,700 persons on board departed Burnie in Tasmania on the evening of 5 December 2006 destined for Melbourne. The vessel had a static draught of 7.50 metres even keel.

The vessel contacted "Point Lonsdale Pilots" on VHF marine radio at about 0350 on 6 December 2006 to advise that its estimated time of arrival (ETA) at the pilot station to be 0500. At that time the pilot station advised Statendam to rig its pilot ladder on the starboard side.

At about 0414, on the master's instruction, the officer of the watch extended Statendam's stabiliser fins preparatory to its arrival and subsequent passage through the expected turbulent waters of Port Phillip Heads (the Heads).

The bridge team assembled soon after this. The team was comprised of the master, the chief officer, the second officer, the fourth officer and two quartermasters. The vessel had in place the generic passage plan downloaded from the Port Phillip Sea Pilots (PPSP) website, for the passage from the pilot station to the intended berth.

Statendam arrived at the outer limits of the Port of Melbourne at 0452 and proceeded to enter the port limits on the main leads of the Great Ship Channel at a speed of 15.9 knots². At about 0454 the pilot vessel contacted Statendam and advised her to steer a northerly course and maintain a speed of 10 knots.

Appendix A tables the following sequence of events detailing Statendam's position, course and speed at each event.

Statendam acknowledged the advice and altered course to 000⁰. The speed at this time was 16.0 knots. Statendam commenced reducing speed.

The pilot vessel came alongside Statendam's starboard side at 0458 and the pilot boarded the vessel through the shipside door. The course was 000⁰ and the speed was 11.6 knots.

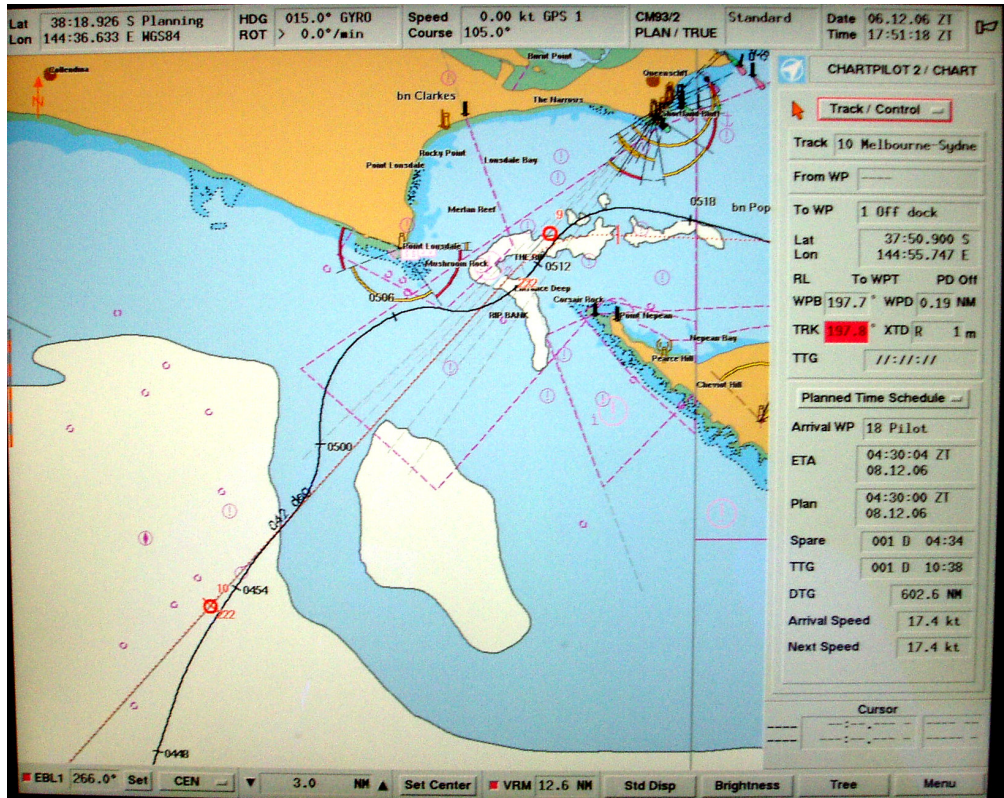
As soon as the pilot came on board, the master ordered the helmsman to alter course to 060⁰ at a rate of turn of 15⁰ per minute. Soon thereafter Statendam commenced increasing its speed.

After completing the mandatory security check, the pilot arrived on the bridge at 0503. As his eyesight became accustomed to the bridge layout and to the external visibility, he noted that Statendam was close to Point Lonsdale and the outlying reefs.

At 0505 Statendam momentarily steadied on course 060⁰. At that same time the pilot advised the master to alter Statendam's course to 090⁰. At 0507 the pilot requested a further course alteration to 120⁰.

With the assistance of the pilot, Statendam re-entered the Great Ship Channel and at 0511 entered the Heads.

² 1 knot is 1 nautical mile per hour or 1.852 kilometres per hour.



An overview of Statendam's progress through the Heads, as observed on it's Voyage Data Recorder (VDR). Appendix A tables the sequence of events.

Once inside the Heads and navigating in the South Channel the master ordered the stabiliser fins to be retracted. At this time, the bridge team noted that the starboard fin retracted normally but the port fin could not be retracted.

As a result Statendam berthed starboard side alongside at Station Pier. There was no further incident.

2.2 Consequences

An underwater inspection revealed that the outer tip of the port stabiliser fin suffered minor paint abrasion. The inspection also revealed that some fin holding bolts on the upper side of the shipside housing had broken, causing the stabiliser to misalign in its mounting.

There were no injuries to personnel and no noted environmental damage.

3. FACTUAL INFORMATION

3.1 Statendam

3.1.1 The vessel

MV Statendam is a passenger vessel registered in the port of Rotterdam in The Netherlands. At the time of the incident the vessel was classed with Lloyd's Register of Shipping. The vessel is owned and operated by Holland America Line, having their head office in Seattle, Washington, USA.

The vessel was built in 1992. It has an overall length of 219.3 metres, a breadth of 30.8 metres and 55,819 gross registered tonnes. At the time of the incident the vessel was on even keel with a static draught of 7.50 metres.

Propulsion power is supplied by two ABB motors (twin screw). Each motor has propulsion power of 12,000 kW driving an inward turning four bladed highly skewed variable pitch propeller, giving the vessel a service speed of about 20 knots.

The vessel's navigational equipment complied with the requirements of Chapter V of SOLAS 74 (the International Convention for the Safety of Life at Sea 1974). It included a Voyage Data Recorder (VDR) interfaced with the bridge navigational equipment to continuously record the vessel's courses, speeds, positions, underkeel depths and radar targets. The list of equipment interfaced with the VDR is included with the ship's particulars in Appendix C.

The VDR also includes a voice recorder however the microphones only recorded sounds in their immediate vicinity.

The stabiliser fin (see Appendix D) is five metres in length, housed two metres above the keel and when extended is inclined 20° below the horizontal. When extended, the fin has a linear horizontal extension of about 4.70 metres from the shipside and the tip lies at a height of about 0.30 metres above the keel.

The vessel has two echo sounders, one forward and one aft. Both transducers are installed on the centre line on the vessel.

The GPS interfaced with the VDR has its antenna installed on the centre line of the vessel.

Statendam commenced visiting the port of Melbourne in October 2006 and visited the port approximately every three weeks. The incident occurred on the vessel's fourth visit to the port.

3.1.2 The crew

The master and navigating officers in the bridge team at the time of the incident were of Dutch nationality. The vessel's bridge team management had the second officer in charge of navigation, the chief officer in charge of position monitoring and pilot boarding arrangements and the master overall in command. The bridge team complied with the STCW requirements for rest in the days leading up to the incident.

The master, chief officer and second officer held appropriate certificates of competency issued by The Netherlands Shipping Inspectorate in accordance with the provisions of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended in 1995 (STCW 95).

The master, chief officer and second officer had worked together as part of Statendam's bridge team since October 2006.

Master

The master commenced his seafaring career in 1978. He obtained a certificate of competency as Master in November 1990 and obtained his first command in January 2002 on a vessel similar to Statendam. He has visited the Port of Melbourne as Master of Statendam on the three previously mentioned occasions since October 2006.

At the time of the incident he held a certificate of competency as Master with no limitations.

Chief Officer

The chief officer commenced his seafaring career in 1991. He obtained a certificate of competency as Chief Officer with no limitations in September 1998 and was promoted to chief officer on Statendam in November 2006. He has visited the Port of Melbourne on two previous occasions as chief officer of Statendam and on six other occasions in 1998-1999, as watchkeeper on another vessel.

Second Officer

The second officer commenced his seafaring career in 1997. In May 2000 he was appointed as third officer and since that date has acted as watchkeeper on vessels similar to Statendam. He has visited the Port of Melbourne on three previous occasions as second officer on Statendam.

The second officer holds a certificate of competency as Master with no limitations.

Other members of the bridge team

The fourth officer departed the wheelhouse just prior to Statendam entering port waters and was stationed at the pilot ladder to receive the pilot. He then accompanied the pilot to the bridge and was not a witness to the circumstances immediately preceding the incident.

The two quartermasters rotated the helmsman and look-out duties.

3.1.3 The pilot

The pilot is licensed by Marine Safety Victoria (MSV) to pilot vessels such as Statendam in the Ports of Melbourne and Geelong.

The pilot has more than 40 years of seafaring experience. He obtained a certificate of competency as Master (Foreign Going) in July 1970 and obtained command of a vessel in the same year. In April 1978 the pilot obtained his pilot's licence, issued by the Marine Board of Victoria. Since April 1978 he has been in continuous service with PPSP.

In October 1980 this licence was upgraded to "unrestricted", which permits the pilot to undertake pilotage duties on vessels of unrestricted size, type and draught in the Port of Port Phillip, which includes the Ports of Melbourne and Geelong.

The pilot was well rested prior to the incident, having resumed his rostered duty at 2300 on 5 December 2006 after a week's rostered leave. He piloted an outward bound tanker from about 2300 on 5 December to about 0300 on 6 December, then had a short rest at the pilot station at Queenscliff. Shortly before 0500 he departed in the pilot launch to attend Statendam.

3.2 Port Phillip Heads

Port Phillip Heads (see Appendix B) marks the entrance into Port Phillip from Bass Strait. The Heads is defined³ as an imaginary line joining Point Lonsdale and Point Nepean.

Port Phillip includes the port waters of Melbourne and Geelong. The Port of Melbourne is situated at the northern head of the bay and within the entrance of the River Yarra. The seaward limit of the Port of Melbourne is defined by a circle of radius three miles to seaward, centred on Point Lonsdale.

Pilotage is compulsory for all vessels of length 35 metres and over except for those vessels specially exempted.

There are five channels which lead larger vessels through the Heads into Port Phillip:

- the Great Ship Channel with a declared depth of 14 metres and width of 245 metres, lies midway between Point Lonsdale and Point Nepean. It also is referred to as the main shipping channel or main leads;
- to the east of the Great Ship Channel lies the Eastern Ship Channel of depth 11.9 metres and the Outer Eastern Channel of depth 10.0 metres;
- to the west of the Great Ship Channel lies the Western Ship Channel of depth 11.4 metres and the Outer Western Channel of depth 10.3 metres.

³ As defined in the Port of Melbourne's Harbour Master's Directions

The width of navigable water between Point Lonsdale and Point Nepean, for a vessel the size and draught of Statendam, is approximately 1065 metres. The recommended speed for vessels transiting the Heads is a minimum of 12 knots, to counteract the strong tidal streams and tidal rips that are predominant in these waters.

3.3 Port Phillip Sea Pilots

PPSP provide pilotage services to the Ports of Melbourne, Geelong and Hastings. The PPSP control station for the Heads is situated at Queenscliff and the pilot launch is moored in Queenscliff Harbour.

The PPSP website provides general information on the pilot boarding ground, pilot boarding procedures and a passage plan which vessels can download. The passage plan details the recommended route that vessels will take, to / from the pilot boarding point and the berths at Melbourne or Geelong.

3.3.1 Pilot boarding ground

The pilot boarding point is marked in position 38°20'South 144°34'East on navigational charts AUS 143 and AUS 144. This position lies outside the limits of the port, at about 3.4 nautical miles south-west of Point Lonsdale.

Generally pilots will board most vessels at the Inner Pilot Boarding Ground – three nautical miles south-west of Point Lonsdale. Tankers, dry bulk vessels and hampered vessels must take a pilot at the Outer Pilot Boarding Ground – five nautical miles south-west of Point Lonsdale, unless otherwise advised by the boarding pilot.

3.3.2 Pilot boarding procedure

Inbound vessels are required to make contact with the pilot station one hour prior to arrival on VHF channel 12. The pilot despatch officer at the station advises the vessel of pilot boarding requirements with regard to the pilot ladder arrangements.

Communication between the pilot station and the pilot launch is by direct landline telephone or by VHF channel 9. The pilot launch also monitors communications on VHF channel 12.

The pilot launch arranges its departure from Queenscliff Harbour approximately 30 minutes prior to the vessel's arrival, to pick up the pilot from the pilot station and to arrive at the pilot boarding ground at the same time that the vessel arrives.

When abeam of Point Lonsdale and in sight of the arriving vessel, the pilot launch provides final boarding orders to the vessel, including the course to steer to create a lee for the pilot launch. PPSP recommends a 10 knot speed for vessels picking up or dropping off a pilot.

The pilot then boards the vessel in the vicinity of the limits of the port, three nautical miles off Point Lonsdale.

3.4 Port of Melbourne Corporation

The Port of Melbourne Corporation (PoMC) is the port manager for the Port of Melbourne. PoMC is the owner of all land within port boundaries and is responsible for the port waters of Melbourne, pursuant to the *Port Services Act 1995* (Vic).

In accordance with the *Marine Act 1988*, PoMC must ensure that a harbour master licensed by MSV is at all times engaged for the port waters of Melbourne. The *Act* stipulates the extent of the functions and powers allotted to a harbour master.

All shipping movements within port waters are controlled by the harbour master through the Melbourne Shipping Management Centre (Harbour Control) and the Point Lonsdale Signal Station. The port uses a range of equipment to monitor ship movements including a Vessel Tracking System (VTS)⁴ radar incorporating Automated Identification System (AIS) and VHF radio as well as line of sight.

3.4.1 Function and power of the harbour master

The *Marine Act 1988* states that one of the functions of the harbour master is to control and direct vessels entering and leaving port waters including the time and manner of doing so.

The *Act* also provides the harbour master with the powers to make directions with respect to vessels entering or within port waters. To this effect the harbour master has compiled the "Harbour Master's Directions", which all masters and pilots must adhere to.

The harbour master's powers are delegated to the duty shipping control officer at Harbour Control by MSV consent.

3.4.2 Point Lonsdale Signal Station

Point Lonsdale Signal Station is situated at the base of Point Lonsdale Light House. The PoMC Operations Handbook states that Point Lonsdale Signal Station monitors and controls vessel movement in the southern section of Port Phillip, including movements at the Heads and the West and South Channels in Port Phillip.

Point Lonsdale is manned by communications officers. The principal role of the communications officer is to monitor and control vessel movements in the course of which he is required to relay traffic information and weather broadcasts and provide communications liaisons between the vessels, pilots and Harbour Control.

On 26 September 2006 PoMC formally requested MSV to delegate certain harbour master's powers to the communications officers to control and direct traffic. At the time of the incident approval had not been granted.

The Harbour Master's Directions require all inbound and certain outbound vessels to request permission from Point Lonsdale to proceed through the Heads. The Directions state that vessels shall not proceed until Point Lonsdale has given permission.

Arriving vessels are also required to contact Point Lonsdale Signal Station VHF channel 12 about one hour prior to arrival, to advise their ETA. The pilot station also

⁴ As referred to in Port of Melbourne's 'Operations Handbook'.

monitors this channel. If the vessel requires a pilot, the pilot station will communicate with the vessel with regard to pilot boarding arrangements. If Point Lonsdale does not hear the pilot station make contact with the vessel, the communications officer will contact the pilot station by landline telephone to inform them about the pending arrival of the vessel.

In practice, it is not uncommon for arriving vessels to contact the pilot station directly. In such circumstances, the communications officer will note the conversation and record the vessel's ETA advice.

Usually, Point Lonsdale does not have any further communication with the vessel. Once the pilot boards the vessel, the pilot communicates with Point Lonsdale on behalf of the vessel regarding the intention to navigate through the Heads, the navigational channel to be used and the ETA at subsequent waypoints. Point Lonsdale will then provide the pilot with other pertinent traffic information.

3.5 Other factual information

3.5.1 Recorded data

A review of the data recorded on Statendam's VDR and Harbour Control's AIS indicate that Statendam did not stop at the pilot boarding ground and wait until a pilot had boarded. The vessel continued its inward passage on the main leads without a pilot.

The pilot boarded Statendam when it was about 1.80 nautical miles inward from the pilot boarding point and 1.4 nautical miles inside the limits of the port. At that point the vessel was about 1.25 nautical miles off the shallow water around Point Lonsdale and travelling at a speed of 11.6 knots towards it. The VDR and AIS indicate that the vessel commenced increasing speed as soon as the pilot boarded the vessel.

The VDR and AIS recordings indicate that just after 0505, whilst still outside the channel, Statendam appeared to steady on course 060⁰ (see Statendam's position in Appendix B), the course the helmsman was ordered to steer. At about the same time, the pilot recommended an alteration of course to 090⁰.

At 0507 Statendam's recorded the least under-keel clearance for the passage, of 2.6 metres.

The position of Statendam recorded at 0507 (38⁰18.00'South 144⁰37.10'East) indicates that the vessel was on or around the position of a shallow patch of water, of charted depth 8.3 metres (38⁰18.00'South 144⁰37.15'East). Navigational chart AUS 144 advises that charted objects in the vicinity of Point Lonsdale have position accuracy \pm 50 metres and depth accuracy = 1 metre + 2% of the depth.

3.5.2 Master's interview

In his evidence the master stated that the stabiliser fins were housed when Statendam arrived at Burnie. They were extended on his instructions, at 0414 on 6 December 2006 when the vessel was about 12 nautical miles from the pilot station, with no noted abnormality.

The master stated that he had visited the Port of Melbourne a number of times. He knew the port and did not think it necessary to wait at the pilot station for the pilot to board.

In his evidence the master stated that because of some delay by the pilot or pilot launch when boarding, Statendam had to stay on the lee course for somewhat longer than he previously estimated. Statendam could not take corrective action to get back into the channel whilst the pilot was boarding the vessel, as such action would have endangered the pilot.

When queried about the slow rate of course alteration to bring Statendam back into the channel, the master stated that it is customary for the vessel to control the rate of turn so as not to heel the vessel and inconvenience the passengers.

The customary master / pilot exchange of information was not carried out until much later, as the master on becoming aware of the situation was occupied with manoeuvring the vessel away from shallow water.

At 0526 the master ordered the stabiliser fins to be retracted and found that the port stabiliser could not be retracted. Once berthed, the master requested two of the ship's crew who held professional "Dive Master" certificates, to inspect the port stabiliser fin.

The master said that when he questioned the crew, the engineers on duty in the engine room reported that at about 0507 they heard a loud knock emanating from the port shipside, which at that time they attributed to the pilot vessel coming alongside Statendam. There was no other indication that the vessel may have touched the seabed.

Later, a professional dive company was contracted to inspect the stabiliser fin with a CCTV (closed circuit television) camera, so that the evidence could be viewed by the chief engineer and attending classification society surveyor.

3.5.3 Pilot's interview

The pilot stated in his evidence that when the pilot launch was abeam of Lonsdale rock, the launch master advised Statendam to steer a northerly course at 10 knots.

At that time Statendam's navigation lights were visible to the pilot launch however, in the dark it was not possible to determine Statendam's position with respect to the port limit.

The pilot boarded the vessel through the shipside doors. The boarding was routine. The passage to the bridge is enclosed in the hull of the vessel. The pilot did not have the ability to look outside to check the vessel's geographical position against known landmarks, as would have been possible if boarding on to an open deck.

On coming aboard the pilot had to complete the mandatory security check. This caused him a slight delay in reaching the bridge. When the pilot reached the bridge, he required some time to acclimatise himself for night vision and to accustom himself to the bridge layout and the vessel's geographical position. It was about five minutes from the time he boarded the vessel until he was ready to provide navigational advice.

The pilot also stated that he could not carry out the customary master / pilot exchange of information as his first priority on becoming aware of his surroundings was to provide advice to steer Statendam clear of the danger. The master / pilot exchange took place only when the vessel was proceeding safely in the South Channel.

In his evidence, the pilot stated that during the subsequent course alterations to 090⁰ and 120⁰, he noted that the helmsman controlled the rate of turn to under 20⁰ per minute. He stated that he made the bridge team understand that the vessel needed to make sharp and rapid turns without limiting the rate of turn which he states they complied with.

The pilot also mentioned that he is aware of some other occasions when vessels have entered the port limits prior to the pilot embarking.

3.5.4 Pilot launch master's interview

The pilot launch master has served as master on PPSP pilot launches continuously since October 1992. He holds a valid certificate of competency as Master Class 5 issued by the Marine Board of Victoria.

In his evidence, the launch master stated that it is normal practice for the launch master to advise vessels of the course to steer to create a lee for the pilot launch to get alongside and hold steady whilst the pilot embarks / disembarks.

The launch master stated that when approaching inbound vessels, the launch master will keep a check on the inbound vessel's position and will keep the pilot informed of its position. The launch master takes advice from the pilot whether he will board the vessel as and where the vessel lies or whether the pilot requires the vessel to turn around to a different boarding point.

In this incident the launch master stated that when the launch was alongside Statendam, he informed the pilot that Statendam was two miles from Point Lonsdale. There was no instruction from the pilot. In his interview, the launch master stated that this was a routine pilot boarding operation and that there was nothing different from other pilot boarding operations.

The launch master also stated that at the time of the incident PPSP had not provided instructions to launch masters on the action to take if vessels entered the port without a pilot on board.

3.5.5 Communication Officer's interview

The communications officer at Point Lonsdale has been an employee of the port for about 35 years serving in various capacities. For the last 29 years he has been a communications officer stationed at Point Lonsdale.

On 5 December 2006 he reported for duty at 1900. In accordance with the PoMC duty roster, he was the sole officer on duty at the station.

The officer stated that he acknowledged Statendam's ETA advice at about 0350 and commenced tracking Statendam by 'tag naming' the vessel on the VTS radar. There were a number of vessel movements that morning. The officer stated that he was kept busy with other vessel movements from about 0330 until about 0430.

At 0430 there was a slight lull in traffic movements. The officer sat down at the controls. Since he was due to hand over the watch at 0700, he commenced completing his administrative paperwork.

The communications officer stated that he overheard via the radio conversation between the pilot launch and the pilot despatch office that the pilot had boarded the launch and was on his way to board Statendam. He also heard the pilot launch calling Statendam. He states that there was nothing to indicate that there was anything untoward and that he had no cause for alarm, so he continued his administrative paperwork and did not attempt to verify Statendam's arrival either by looking out of the window or at the AIS radar screen.

The position of the communications officer's chair at the controls is such that the pillar between the glass windows obscures vision of the pilot boarding ground. The officer did not notice Statendam's arrival until the vessel came into view from behind the pillar. At that time he noted that the vessel was very close and broadside to Point Lonsdale. He did not attempt to call Statendam to advise it of its position, but monitored its progress on the VTS radar.

The officer also stated that on some other occasions vessels have entered the limits of the port without a pilot. Communications officers usually do not interfere with the pilot station coordinating the arrival and pilot boarding procedures of vessels however, on a few occasions they have intervened to request that arriving vessels stay at a safe distance from Point Lonsdale and await the pilot.

The communications officer stated that his role is to monitor traffic at the Heads, relay communications and provide traffic and weather information as required. He stated that at the time of the incident he did not have any formal instructions regarding the action to take if vessels entered the port without a pilot on board.

The communications officer is aware of the Harbour Master's Directions that all inbound and certain outbound vessels must request permission to proceed through the Heads but also stated that he had not been given the authority to control and direct traffic.

In his interview, the officer also stated that there have been times when vessels' ETA advice to Point Lonsdale are missed, as when vessels call at the same time as his radio weather broadcasts. Sometimes the pilot despatch office takes the call and then informs Point Lonsdale and at other times the communications officer contacts the pilot office for an update. But there have been occasions when a vessel has arrived at the pilot boarding ground unbeknown to Point Lonsdale.

3.6 Environmental conditions

The time of the incident was just before dawn. The sky was overcast and visibility was clear. The wind was south-westerly at about 30 knots. The sea condition was moderate to rough with a wave height of about 1.5 metres.

The state of sea and wave height was as reported by the vessel and Point Lonsdale weather observations.

At the time of the incident, the tidal condition as calculated from the Victorian Tide tables indicates that the state of tide was in ebb at a rate of about 0.6 knots and the height of tide was about 0.94 metre above the charted depth.

3.7 Governing legislation, rules and guidelines

Section 96 of the *Marine Act 1988* specifies that a vessel must not enter or leave port waters or attempt to enter or leave port waters without using the services of a pilot.

Section 26D of the *Marine Act 1988* provides the harbour master with all the powers that are necessary and convenient to enable him or her to carry out the functions given to the harbour master.

Paragraph 3.4.1(5) of the Harbour Master's Directions stipulate that the master of an inward bound vessel must, when three miles from the entrance seek permission from Point Lonsdale to enter the fairway and shall not allow the vessel to proceed until Point Lonsdale has given permission.

The PPSP website advises mariners of the pilot boarding ground and advises vessels to navigate to the correct boarding ground position and follow directions given by the pilot launch.

Statendam's passage plan mentions that the "pilot boarding area is 3 nautical miles south-west of Point Lonsdale Lighthouse" and the "speed to make for taking over pilot is 10 knots". The passage plan also specifies that the "point of no return"⁵ is two nautical miles before Point Lonsdale.

3.7.1 ISPS Code

The International Ship and Port Facility Security (ISPS) Code has been adopted by the International Maritime Organisation (IMO) and came into effect on 1 July 2004.

The objective of this Code is to establish an international framework for cooperation between ports and ships to detect threats to security and to take preventative measures against incidents that may cause a security threat to the ship or the port.

The ISPS Code requires vessels to prepare and implement a Ship Security Plan approved by the flag state (government) of that vessel.

Statendam had an approved security plan in place. With respect to pilots embarking the vessel, the plan required the ship's security officer to check the identity of the pilot at the embarkation deck and have him sign the ship embarkation register.

⁵ The point of no return is the ultimate point after which the vessel is committed to complete its transit through the Heads ("no turning back").

4. ANALYSIS

4.1 The incident

The investigation found that Statendam entered shallow waters with a minimum charted depth of 8.3 metres off Point Lonsdale prior to proceeding through the Heads.

The height of tide was 0.94 metre at approximately 0507. The corrected depth should be read in conjunction with the zone of confidence for this area which equates to a tolerance of ± 1.18 metre.

The average wave height at that time was reported to be approximately 1.5 metre. The height of individual waves at the Heads can have height variations of up to $\pm 40\%$.

At the time of the incident Statendam had a static draught of 7.50 metres even keel with the tip of the port stabiliser fin 0.30 metre above the keel and 20.1 metres off its centre line.

The minimum recorded sounding by the vessel's echo sounder was 2.6 metres. The echo sounder transducer is situated on the centreline of the vessel and would not accurately record the clearance at the tip of the fin 20.1 metres off centre. The investigation has not been able to determine the calibration tolerance of Statendam's echo sounder or inherent instrument datum errors.

Static underkeel clearance may be reduced by a number of dynamic factors including squat resulting from the vessel's forward movement, sea induced motions such as roll, pitch and heave as well as heel resulting from turning.

Statendam controlled the rate of turn to just under 20° per minute. The stabilisers would have prevented excessive heeling during the turn. However, a one degree heel on Statendam corresponds to lowering the stabiliser fin tip by 0.35 metre.

Given the speed of the vessel at the time, the state of sea and the rate of turn, clearance at the port stabiliser fin tip would be expected to have been significantly reduced at a number of points in time during that passage.

On the balance of evidence provided, it is likely that Statendam's port stabiliser fin made contact with some object on or near to the seabed. This conclusion is further supported by the physical evidence of scraping at the fin tip, failure of the stabiliser housing bolts and the report of a knocking sound being heard from within the hull.

4.2 Bridge resource management

Bridge Resource Management (BRM) is a form of management taught to ship's officers. BRM provides a method of organising the best use of human and other resources on the bridge to reduce the level of operational risk. A key aspect of BRM is that it puts in place defences against 'single person errors'.

4.2.1 Passage planning

For ships engaged in regular short voyages where the nature of the trade is such that they are frequently under some form of pilotage, there may be a tendency to ignore through familiarity the need to constantly review and revise the passage plans. BRM should include a clear identification of all the bridge team members at all stages of the voyage, their relative duties and responsibilities, and the line of command including levels of authority in making, challenging or responding to decisions and instructions.

The investigation has not found evidence that the bridge team challenged the master's decision to enter the port without a pilot on board, or to query Statendam's speed when in close proximity to land. Whilst the role of each member of the bridge team was identified, there is no evidence of monitoring of the vessel's passage into port limits or of a situational awareness of Statendam's position, course and speed when picking up the pilot and resuming its passage through the Heads.

The bridge team did not have a contingency plan for picking up the pilot off the main leads. There is no evidence of 'forward planning' to indicate an appreciation of the vessel's position with regard to the amount of sea room available to perform the subsequent manoeuvres when navigating through the Heads.

It is reasonable to expect a vessel in this situation to limit its speed to 10 knots or less and on picking up the pilot, where a quick and rapid alteration to starboard is not practicable, to instead make an alteration of course to port to bring the vessel around 360° and back on the main leads.

4.2.2 Master / pilot information exchange

The master / pilot information exchange is another integral part of good BRM practice. The pilotage passage plan will need to be discussed between the master and the pilot as soon as the pilot comes on board. Any amendments to the plan should be agreed, and any consequential changes in individual bridge team responsibilities made, before pilotage commences.

Where pre-arrival exchange has not taken place, extra time and sea room may need to be allowed before pilotage commences in order to discuss the plan fully. In this incident, the pilot boarded Statendam after it had passed its 'point of no return' and did not have the time to conduct a proper exchange of information.

Information obtained in the course of the investigation indicates that in a number of instances pilotage commences before pre-arrival exchange has been completed, as the vessel is already committed to transiting the Heads.

4.3 Point Lonsdale Signal Station

The PoMC Operations Handbook states that Point Lonsdale Signal Station monitors and controls vessel movements in the southern part of Port Phillip including the Heads. The station is manned continuously to effect the coordination of port services and dissemination of relevant information to ensure safe and efficient port operations.

Although the harbour master has directed arriving vessels not to enter port limits unless Point Lonsdale has given permission to do so, the investigation has found that the communications officers have not been provided with working instructions on appropriate procedures if:

- vessels do not request permission to enter port limits; and / or
- vessels enter port limits without a pilot on board.

In the absence of instruction, the communication officers consigned themselves solely to monitoring vessels entering and transiting the Heads although at times, if danger was readily apparent, the communications officers use their initiative to provide positional information to vessels.

4.3.1 The role of the communications officer

The role of the communications officer needs to be properly defined by PoMC and understood by the officers. In the absence of formal instruction or delegation, it appears that monitoring of vessels transiting the Heads is carried out by the communications officers on a casual basis.

For purposes of clarification and to re-enforce of the of the communications officer's role, PoMC applied MSV to delegate the harbour master's powers to control and direct traffic, to the communications officers. At the time of the incident MSV approval had not been received.

In this incident, the communications officer heard the pilot launch calling Statendam at 0454, assumed that there was nothing untoward and did not attempt to sight the vessel either visually or by radar.

About ten minutes later Statendam became visible to the communications officer only when it appeared from behind the pillar and was broadside to Point Lonsdale. This would have been at about 0505 or shortly thereafter, at the time the pilot requested a course alteration to 090⁰.

The investigation has not been able to establish whether the communications officer would have intervened in this incident, had he sighted Statendam at 0454 at about three miles off, entering port limits at about 16 knots, with the pilot launch still in the proximity of Point Lonsdale.

4.4 Pilot boarding

The PPSP website instructs masters to navigate the vessel to the correct boarding ground and follow directions given by the pilot launch. The pilot launch directed Statendam to steer a northerly course at a speed of 10 knots.

In this incident, the pilot launch did not fully appreciate Statendam's geographical position or its speed, when advising it to change its course to create a lee.

Although it is the master's responsibility to verify the safety of the vessel before complying with the advice, in practice there is a presumption on the part of masters that "the pilot knows best" and will in most cases accept the advice of the pilot without question.

The master stated that there was some delay in the pilot boarding the vessel, which caused Statendam to remain on the lee course longer than was necessary. The evidence of the pilot the pilot launch master indicates that this was a routine boarding manoeuvre, from the time the pilot launch came alongside Statendam until the pilot boarded the vessel, and did not take any longer than any other pilot boarding manoeuvre in similar conditions. A review of the recorded radio communications also indicates that there was no delay in the pilot boarding Statendam.

Information obtained in the course of the investigation has established that on some occasions when vessels have entered the port without a pilot, the pilot has ordered the vessel to turn around and lay off at a safer boarding point. In this incident, the launch master advised the pilot that Statendam was two nautical miles off Point Lonsdale but the pilot did not advise Statendam to turn around and proceed to a safer boarding area.

A review of radio communications between arriving vessels and PPSP / Point Lonsdale indicates that except in very rare instances, vessels were not provided with information regarding the pilot boarding point or the position the vessel should steam to, to embark the pilot.

This incident highlights the need to reassess the pilot boarding point. Pilotage must commence before the vessel enters port waters. The pilot will need to take account of the time required to complete the security checks and the exchange of information as well as the distance of the pilot ladder from the wheelhouse and the time of day or night when determining where to board the vessel.

4.5 The prevalent culture

Historically, there has been a 'deference culture' towards the pilots from officers of lesser maritime qualifications. Communications officers, shipping control officers and pilot launch masters have been known to shy away from discussing operational and safety issues with the pilots, which they fear may be construed as 'advising a person of senior rank'.

Information obtained during the course of this investigation has revealed that this deference culture has reduced in recent years, giving way to more open discussion but is still present on some occasions. The keynote to a successful safe operating practice is for staff of all grades to engage in 'frank and fearless' discussion on operational practices and safety issues, which must be addressed by PPSP and PoMC when developing their joint and individual operating practices.

The harbour master, PoMC, and its employees are responsible for the safety of vessels and vessel operations within PoMC waters and have the legislated authority to do so whereas PPSP and the pilots are employed to safely navigate vessels in those waters.

5. CONCLUSIONS

5.1 Findings

1. There was a lapse in bridge resource management on Statendam.
2. Statendam's entry into port waters without a pilot on board went unchecked and unchallenged by all parties to this incident.
3. The pilot launch was not at the pilot boarding ground when Statendam arrived.
4. There was a time lag from the time the pilot boarded the vessel until he was ready to provide pilotage advice.
5. Port of Melbourne Corporation did not have operating procedures in place to address issues regarding vessels entering port limits without permission or without a pilot on board.
6. Pilot launch masters were not provided with instructions on the safe operating procedures to be implemented if vessels arrived inside the port limits to pick up a pilot.
7. The prevalent "culture" of the system inhibits the communications officers and pilot launch masters from exercising safety initiatives or questioning the actions of seniors.

5.2 Contributing factors

1. Statendam did not follow directions to obtain permission prior to entering port limits and entered port without a pilot on board.
2. Statendam's progress into port limits was not challenged by Point Lonsdale or by the pilot.
3. There was a lapse in situational awareness by Statendam's bridge team and bridge resource management failed at a critical point in the vessel's passage.
4. The pilot launch advised Statendam to alter course without fully appreciating the vessel's position, course and speed and Statendam accepted the pilot launch advice to change course without fully appreciating the risks involved.
5. Statendam's slow rate of turn to resume its passage through the Heads resulted in it entering shallow waters.

6. SAFETY ACTIONS

6.1 Safety actions taken since the event

Since the incident, the chief investigator has been informed of the following safety actions taken by:

6.1.1 Port of Melbourne Corporation

1. Liaised with PPSP to demarcate an area between 3.5 and 5.5 nautical miles south west of Point Lonsdale as the pilot boarding ground.
2. Undertaken further development of PoMC 'safe operating procedures' for vessels arriving and departing through the Heads and operating instructions for communications officers, addressing issues regarding vessels entering port limits without permission or without a pilot on board.
3. Entered into discussion with PPSP to develop a common "safe operating practice" with regard to the procedures for embarkation and disembarkation of pilots.
4. Amended the Harbour Master's Directions and issued a notice to mariners identifying the amended pilot boarding ground, amended the time requirement for ETA notices and reworded the direction for vessels not to enter port limits unless there is a pilot on board.
5. Commenced software installation to establish an alarm system within the AIS to alert officers to vessels entering port limits and vessels deviating off course during their passage through the Heads.
6. A 'stand alone' AIS has been installed at Point Lonsdale.
7. Finalised an ergonomic layout plan for the control desk at Point Lonsdale that will ensure a clear line of sight of the pilot boarding ground. The plan is currently being implemented.

6.1.2 Port Phillip Sea Pilots

1. Demarcated an area between 3.5 and 5.5 nautical miles as the pilot boarding ground and commenced providing firm instruction to vessels to remain four nautical miles off Point Lonsdale and await the pilot.
2. Commenced development of PPSP 'pilotage safety management system' for all pilotage operations including vessels entering and departing through the Heads.
3. Entered into discussion with PoMC to develop a common "safe operating practice" for embarkation and disembarkation of pilots.

6.1.3 Statendam

1. The vessel and its managers have reviewed and amended Statendam's arrival port procedures to effect two sets of watchkeepers within the bridge team to monitor the pilot embarkation process and to maintain control the vessel's navigation during this period.
2. Enforced speed restrictions as part of its safe operating practice when embarking a pilot.
3. Introduced Bridge Resource Management refresher courses for its officers.

6.1.4 Marine Safety Victoria

1. Marine Safety Victoria formally approved the delegation of certain harbour master's functions to the communications officers, to control and direct traffic.

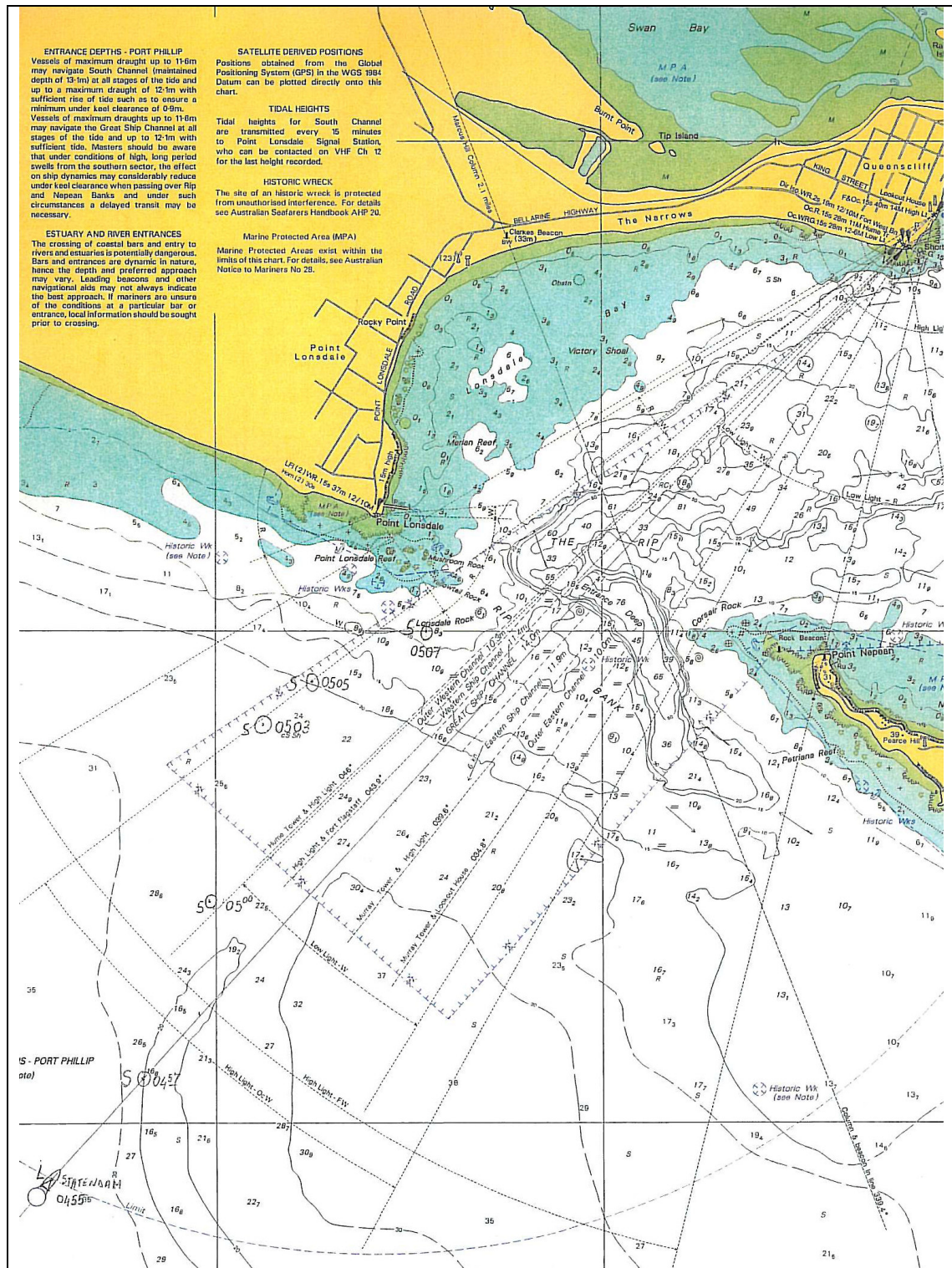
7. APPENDIXES

Appendix A - Sequence of Events

Time	Statendam's Position	Course	Speed	Event
0350				Statendam calls "Point Lonsdale Pilots" to advise ETA.
0414	16 nm from pilot boarding ground			Stabiliser fins extended.
0452	On main leads on Great Ship Channel	038 ⁰	15.9 knots	Statendam entered port limits.
0454		042 ⁰	16.1 knots	Pilot vessel advised Statendam to steer course 000 ⁰ and maintain speed of 10 knots.
0455	38 ⁰ 19.82' South 144 ⁰ 35.62' East		16.0 knots	Statendam commenced altering course to 000 ⁰ and reducing speed.
0458	38 ⁰ 19.098' South 144 ⁰ 35.95' East	000 ⁰	11.6 knots	Pilot boarded Statendam. Master ordered alteration of course to 060 ⁰ at rate of turn 15 ⁰ per minute. Statendam commenced increasing speed.
0503	38 ⁰ 18.38' South 144 ⁰ 36.25' East			Pilot arrived on the bridge.
0505	38 ⁰ 18.2' South 144 ⁰ 36.5' East	060 ⁰	14.9 knots	Pilot advised alteration of course to 090 ⁰ .
0507	38 ⁰ 18.00' South 144 ⁰ 37.10' East	090 ⁰	13.8 knots	Underkeel depth of 2.6 metres recorded. Engineers heard knocking sound emanating from port ship side. Pilot advised further course alteration to 120 ⁰ .

Appendix B - Port Phillip Heads

(extract from navigational chart AUS 144)



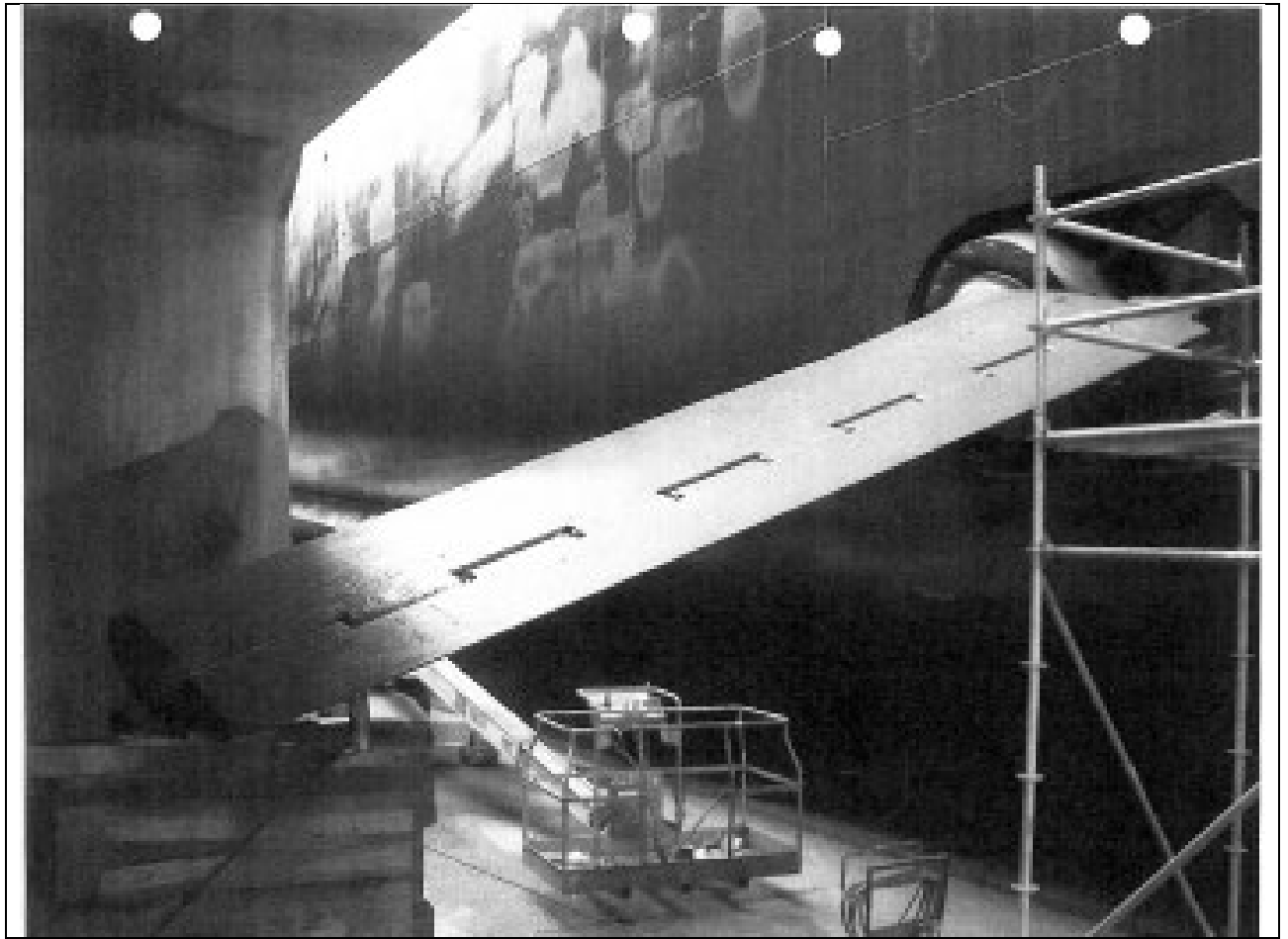
Appendix C - Statendam Ship Particulars and Navigational Equipment

IMO Number	8919245
Flag	Netherlands
Port of Registry	Rotterdam
Classification Society	Lloyd's Register
Ship Type	Passenger
Builder	Fincantieri Shipyard, Monfalcone, Italy
Year built	1992
Ship Operators	Holland America Line
Gross Tonnage	55,819
Net Tonnage	26,279
Light Displacement	24,885 tonnes
Length overall	219.3 metres
Length between perpendiculars	185.0 metres
Moulded breadth	30.8 metres
Moulded depth	13.6 metres
Engines Sulzer Diesel	2 x 12 cylinders of 8,640 kW each 3 x 8 cylinders of 5,760 kW each
Bow thrusters	2 x 1720 kW

Bridge Equipment - Voyage Event Recorder consisting of:

- Chart pilot 9330 (NACOS);
- STN SAM Radarpilot 1000 marine radars, one three centimetre and one ten centimetre, each with an automatic radar plotting aid;
- Anschutz gyro compasses with digital and analogue repeaters;
- Rate of turn indicators;
- STN Atlas Dolog 23 Doppler speed log with bottom and water track;
- KaMeWa joystick controls and manoeuvring recorder;
- GPS one Magnavox MX200, one Leica MX420 and one Leica MX412;
- ECDIS – SAM / Atlas Chart Pilot / Radar Pilot 1000;
- Two Skanti VHF radios;
- Sperry Marine ES5100 / 388 depth sounder.

Appendix D - Statendam Stabiliser



Manufacturer: Fincantieri Shipyard, Monfalcone, Italy
Housing: 2 metres above the keel
Distance from bow: 130 metres
Extension: 5 metres
Inclination: 20° downwards from horizontal