



**Bundesstelle für Seeunfalluntersuchung**  
**Federal Bureau of Maritime Casualty Investigation**  
Federal Higher Authority subordinated to the Ministry  
of Transport, Building and Urban Affairs

## **Summary**

### **Investigation Report 23/07**

**Very serious marine casualty**

**Person overboard**  
**on the MV LENA**  
**at the Elbe**  
**on 19 January 2007**  
**at 08:53**  
**resulting in death**

**15 August 2008**

The investigation was conducted in conformity with the law to improve safety of shipping by investigating marine casualties and other incidents (Maritime Safety Investigation Law/Seesicherheits-Untersuchungs-Gesetz, SUG) of 16 June 2002.

According to this, the sole objective of the investigation is to prevent future accidents and malfunctions. The investigation does not serve to ascertain fault, liability or claims.

This report should not be used in court proceedings or proceedings of the Maritime Board. Reference is made to § 19 paragraph 4 of the SUG.

The German text shall prevail in the interpretation of the Investigation Report.

Issued by:  
Federal Bureau of Maritime Casualty Investigation  
Bernhard-Nocht-Str. 78  
20359 Hamburg

Head: Jörg Kaufmann  
Tel.: +49 40 31908300  
posteingang-bsu@bsh.de

Fax: +49 40 31908340  
[www.bsu-bund.de](http://www.bsu-bund.de)

## Table of Contents

1	SUMMARY OF THE MARINE CASUALTY .....	5
2	SCENE OF THE ACCIDENT .....	6
3	VESSEL PARTICULARS .....	8
3.1	Photo .....	8
3.2	Particulars .....	8
4	COURSE OF THE ACCIDENT AND INVESTIGATION .....	9
4.1	Accident.....	9
4.2	Consequences of the accident .....	9
4.3	Determinations of the Waterway Police.....	10
4.4	Inspection of the LENA by the BSU.....	11
4.5	Forensic medical investigation .....	13
4.6	Weather conditions.....	13
4.7	Safety precautions.....	14
5	SUMMARY.....	16
6	SOURCES .....	17

## Table of Figures

Figure 1: Scene of the accident.....	6
Figure 2: Nautical chart - section enlargement .....	7
Figure 3: MS LENA.....	8
Figure 4: Subsequent demonstration of the mixed pilot ladder.....	10
Figure 5: Pilot ladder station .....	12
Figure 6: Maintained PoB position in GPS device .....	12
Figure 7: Illustration of the requirements of pilot ladders acc. to SOLAS Chp.5 .....	15

## 1 Summary of the marine casualty

On 19 January 2007, the bulk carrier LENA was sailing from London to Hamburg. Since the pilot was to come on board at the ELBE buoy, the bosun received an order around 08:00<sup>1</sup> to rig the pilot ladder on the starboard side.

The freeboard of the ballasted carrier LENA was approx. 11 m, so it was decided to rig the so-called "combined accommodation / pilot ladder". This comprises a classic rope ladder and a permanently installed gangway. Once the rope ladder was rigged, the gangway was lowered to an angle of 40° so that its landing rests next to the rope ladder. The stanchions were set up and the handhold stanchions secured. Then the bosun wanted to connect the end of the gangway with the rope ladder using a rope end.

No one saw him falling over board, but his shout was heard and the crew immediately instigated the necessary rescue measures.

The distress call to the Maritime Rescue Co-ordinating Center (MRCC) in Bremen activated different rescue units including a helicopter that sighted the accident victim at 09.18 and recovered him at 09:21. At 10:05 he was delivered to the hospital in Oldenburg. Due to being in the cold water for too long, he died in hospital on 23 January 2007.

---

<sup>1</sup> Times in CET = UTC + 1h

## 2 Scene of the Accident

Type of event: Very Serious Marine Accident, person overboard  
 Date/time: 19 January 2007 – approx. 08:53  
 Location: Außenelbe, near the Racon Buoy Elbe  
 Latitude/longitude:  $\varphi$  053°59.6'N  $\lambda$  008°05.1'E

Section from the chart INT 1413, BSH (Federal Maritime and Hydrographic Agency)

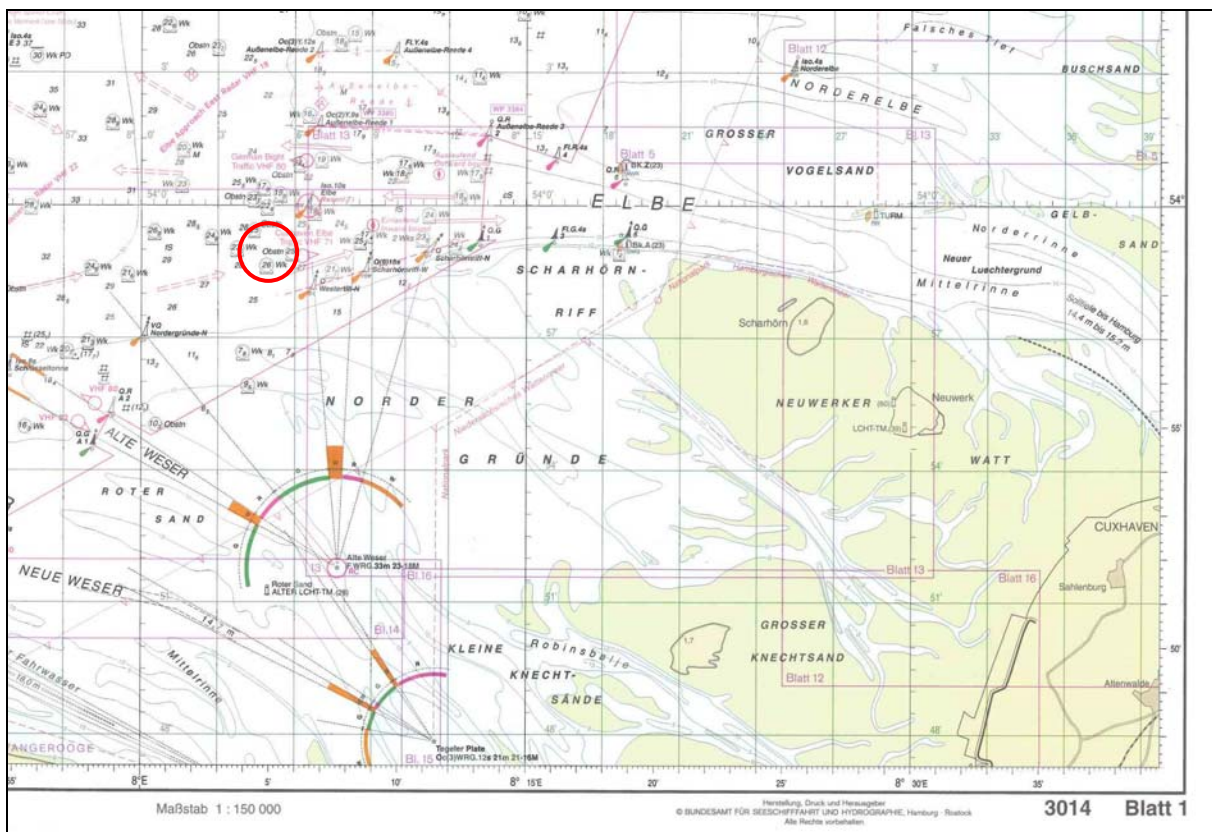


Figure 1: Scene of the accident

Section from the chart INT 1413, BSH (Federal Maritime and Hydrographic Agency)

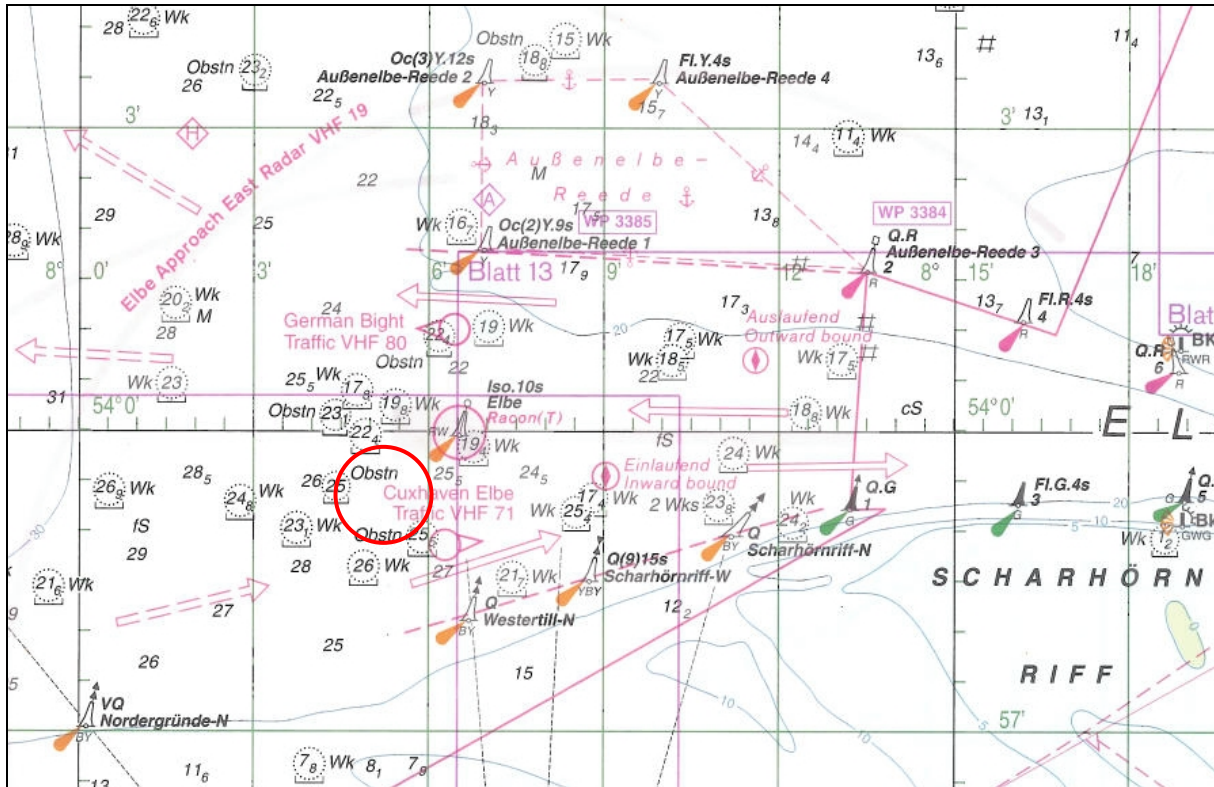


Figure 2: Nautical chart - section enlargement

## 3 Vessel Particulars

### 3.1 Photo



Figure 3: MS LENA

### 3.2 Particulars

Name of the vessel:	LENA
Type of vessel:	Bulk carrier
Nationality/flag:	Belize
Port of registry:	Belize City
IMO number:	8103846
Call sign:	V3IH3
Vessel operator:	Belka Shipping Ltd.
Year built:	1983
Shipyard:	Mitsubishi Heavy Industries Ltd.
Classification society:	Lloyd's Register
Length overall:	178.01 m
Breadth overall:	27.06 m
Gross tonnage:	20.432
Deadweight:	34,070 t
Draught at time of accident:	6.40 m
Engine rating:	10,800 HP
Main engine:	Mitsubishi UE, 6UEC / 150 H Max Rating
Speed at time of accident:	5 kn
Hull material:	Steel
Number of crew:	20



## **4 Course of the accident and investigation**

### **4.1 Accident**

On 19 January 2007, the ballasted bulk carrier LENA flying the Belize flag was sailing from London to Hamburg.

Since the pilot was to be taken on board at the ELBE buoy, the bosun received an order around 08:00 from the first nautical officer to rig the pilot ladder on the starboard side.

The freeboard of the ballasted carrier LENA was approx. 11 m, so it was decided to rig the so-called „combined accommodation / pilot ladder”.<sup>2</sup> This comprises a classic rope ladder and a permanently installed gangway about 4 m long. The bosun took two ordinary seamen with him for the work. Once the rope ladder was rigged, the gangway was lowered to an angle of 40° so that its landing rested next to the rope ladder about 2.50 m beneath the top deck. The railing supports were set up and the handhold stanchions secured. Then the bosun wanted to connect the end of the gangway with the rope ladder using a rope end. Both O/S advised him against this action, especially as this had never been done onboard before. Nevertheless, the bosun climbed onto the gangway. Since both O/S were reportedly already on their way back to the vessel's superstructure, no one observed how the bosun fell into the water. One ordinary seaman saw him climb onto the gangway, but he then turned away and shortly afterwards he heard a shout from the man falling into the water. He then saw him in the water and shouted "Person overboard" and ran up to the bridge. Once he had informed the vessel's command about the accident, the master immediately instigated the "Williamson turn" as a reversing manoeuvre and started the ship alarm for "Man overboard". At the same time, the first naut. officer threw the PoB buoy into the water. Then he looked for the bosun using binoculars and spotted him about 100 m astern. On instruction by the master, the first nautical officer then informed the pilot station and Cuxhaven Vessel Traffic Service about the accident via VHF. The VTS then passed on the emergency call to the Maritime Rescue Co-ordinating Center in Bremen.

MRCC Bremen activated different rescue units including a helicopter that took off from Helgoland at 08:55 and was therefore first to arrive at the search area. At 09:18 the accident victim was sighted and by 09:21 he was in the helicopter. At 10:05 he was delivered to the hospital in Oldenburg.

### **4.2 Consequences of the accident**

After recovering the accident victim from the water without any detectable vital signs, they did manage to resuscitate him.

He suffered cerebral death as a consequence of a cardiac arrest in the water, and died on 23 January 2007.

---

<sup>2</sup> according to SOLAS Chp.V, see also Page 13

### 4.3 Determinations of the Waterway Police

The Hamburg Waterway Police (WSP) started investigations after the accident. The circumstances were established onboard the LENA at Hamburg port where witnesses were questioned about the accident.

On 21 January 2007, the WSP asked both AB-men to demonstrate how they had rigged the combined accommodation / pilot ladder. The rope ladder and gangway were in working order and no defects were apparent.



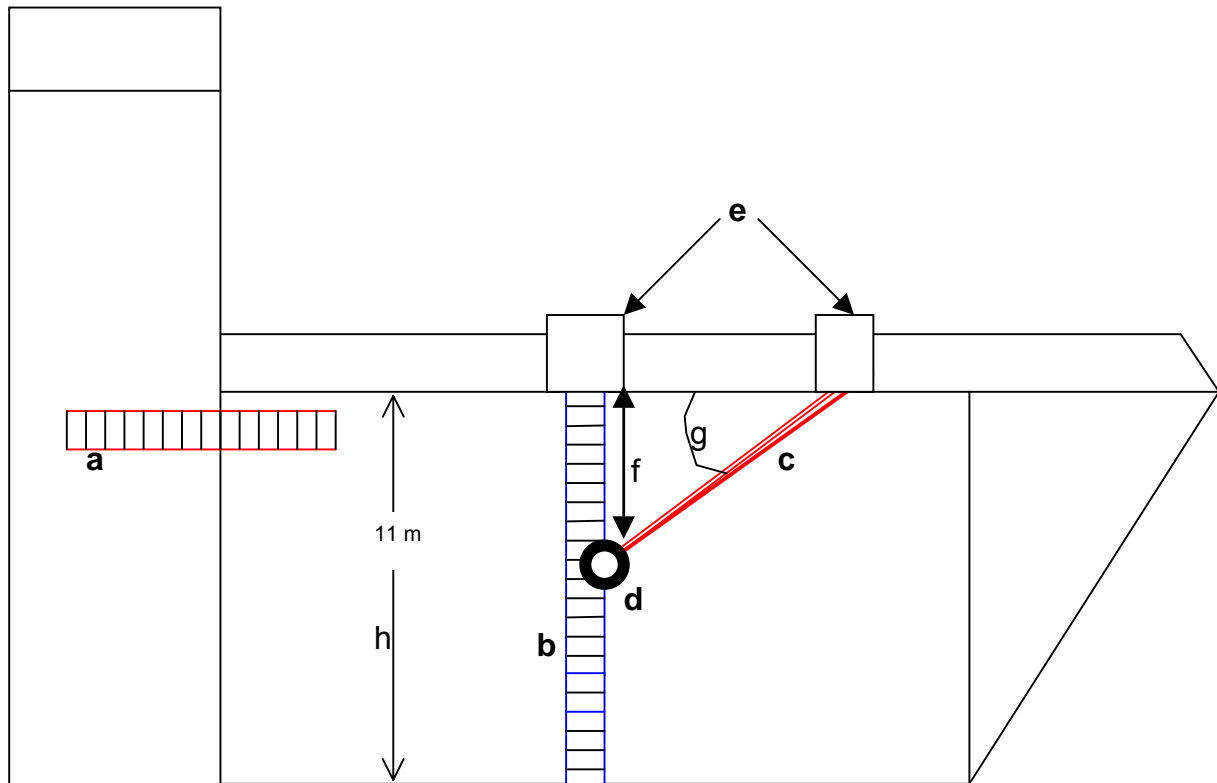
Figure 4: Subsequent demonstration of the mixed pilot ladder

The determination results were made available to the BSU for the accident investigation.

#### 4.4 Inspection of the LENA by the BSU

The LENA was inspected by the BSU in Hamburg on the evening of the day of the accident. The vessel's command and crew members appeared cooperative. Relevant ship's documents and certificates were inspected and copied. The scene of the accident was photographed and measured.

Outline sketch (extremely schematic, not to scale)



- (a) Lowerable gangway for regular onboard operations (permanently installed port and starboard)
- (b) Pilot ladder (is stored rolled up on deck) brought out for each use and attached to the appropriate deck eyes on port or starboard side depending on requirements
- (c) Lowerable gangway exclusively for pilot transfer (permanently installed port and starboard)
- (d) Transfer point between ladder and gangway
- (e) Pilot's door in bulwark
- (f) Distance from connecting point to main deck approx. 3 to 4 m
- (g) Pivot angle of gangway approx. 30 to 40°
- (h) Freeboard at time of accident (according to master's statement)

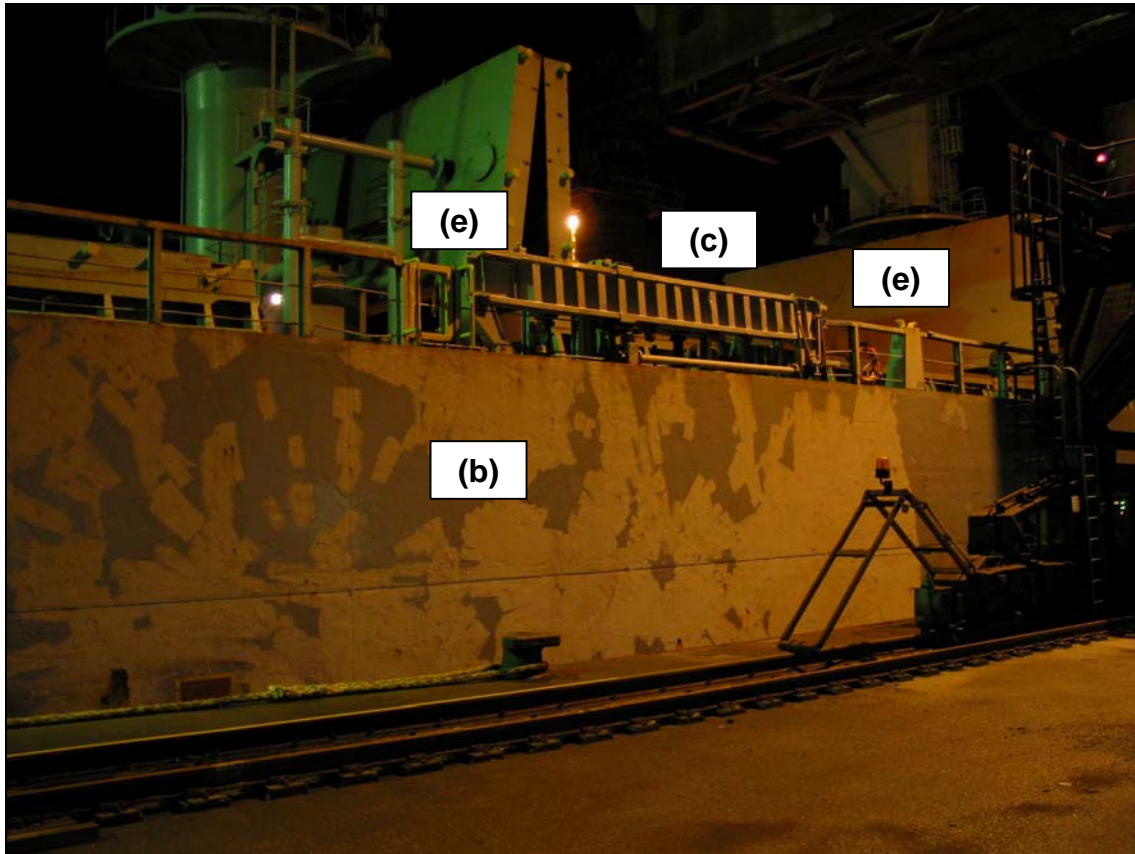


Figure 5: Pilot ladder station

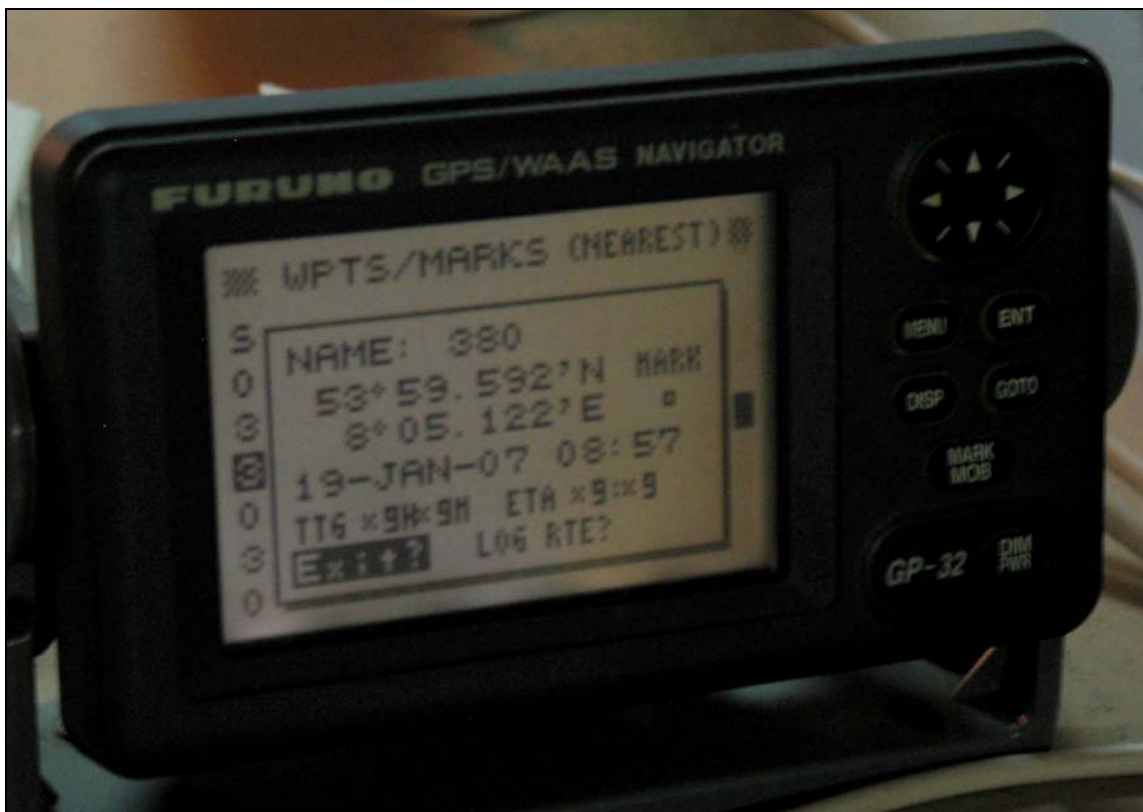


Figure 6: Maintained PoB position in GPS device

#### **4.5 Forensic medical investigation**

On 25 January 2007, a forensic medical examination took place and produced the following results:

- Cause of death: Cerebral death following cardiac arrest after drowning
- Diverse external abrasions indicating a fall on/over the gangway (no indication of external influence by another).
- An alcohol test was not carried out as the time of death was four days prior to the autopsy and any alcohol would have broken down by then.

#### **4.6 Weather conditions**

The weather data established at the location was as follows:

Wind: 6-7 Bft from the southwest

Sea-state: rough sea, force 5 – wave height approx. 2 m

Visibility: good, overcast

Ambient temperature: 8 °C

Water temperature: 6-7 °C

Sunrise: 08:31 local time

The official report produced by the German National Meteorological Service detailed the following:

During the night and morning of the 19 January 2007, it was cloudy to extremely overcast in the south German Bight; there were partial showers, locally heavy. The ambient temperature at night and in the morning was 9 °C. The water temperature was 7 °C. The horizontal range of visibility at night was over 20 km; in the early morning hours this declined to 8 to 10 km.

In the first half of the night, the wind blew from the northwest in the south German Bight with an average force of 6 to 8 Bft, in gusts of up to 10 Bft. In the second half of the night, the wind turned to the west and calmed somewhat to an average of 5 to 7 Bft with gusts of up to 8 Bft. Between 8 and 10 CET there was a west wind blowing at the Elbe mouth with an average force of 5 to 6 Bft with gusts of up to 8 Bft.

The wind force values in Beaufort (Bft) refer to the 10 minute average of wind speeds, measured at a height of 10 m.

There were unfortunately no ship's observations for the wave heights from the south German Bight and the Elbe mouth. Nevertheless, we can estimate the significant wave height of the sea from the ratios between wind force, effective wind duration and fetch length. An average wind from a stable direction sustained over 6 hours at a force of 6 Bft can generate a wind sea with significant wave heights of 2.2 m with periods of 5 s when deep water conditions are undisturbed. Taking into account the observed westerly wind direction in the specified area of the south German Bight, we can assume undisturbed meteorological and marine conditions.

The sea-state plots of the aforementioned weather prediction models for the times 00 UTC and 12 UTC on the 19 January 2007 gave sea-state values between 2.0 and 3.0 m in the south German Bight. Between 06 and 12 UTC on 19 January, significant wave heights of between 2.5 and 4.0 m with periods between 7 and 9 s were

measured at the "Helgoland" measuring buoy located at position 54° 09.45'N 007° 53.65'E with a 20 m water depth. For the period in question, there are unfortunately no measured values available from the "Elbe" measuring buoy located at position 54° 01.00'N 008° 06.83'E with a 25 m water depth.

The aforementioned wave height values refer in principle to the significant wave height. It corresponds to the arithmetic mean calculated from the upper third of the wave heights during a period of observation. This means that a number of individual waves are higher than the significant wave height. In rare cases, individual waves can exceed the significant wave height by 70 % to 100 %.

#### **4.7 Safety precautions**

In spite of the rough weather and the consequent movements of the ship, the bosun and both O/S had neither life jackets on nor were they secured by safety lines during their work on deck. The bosun should have secured himself at the latest when he decided to climb down onto the gangway. In addition, at least one of the two ordinary seaman should have supported him.

The decision by the vessel's command to rig a combined accommodation / pilot ladder is in accordance with the instructions in SOLAS Chp. 5 Regulation 23 No. 3.3:

*"Safe and convenient access to, and egress from, the ship shall be provided by either"*

...

*2. an accommodation ladder in conjunction with the pilot ladder, or other equally safe and convenient means, whenever the distance from the surface of the water to the point of access to the ship is more than 9 m. The accommodation ladder shall be sited leading aft. When in use, the lower end of the accommodation ladder shall rest firmly against the ship's side within the parallel body length of the ship and, as far as is practicable, within the mid-ship half length and clear of all discharges..."*

Contrary to SOLAS Chp. 5 Regulation 23 No. 2.2:

*"The rigging of the pilot transfer arrangements and the embarkation of a pilot shall be supervised by a responsible officer..."*

there was no officer on deck to supervise the rigging of the mixed pilot ladder.

# REQUIRED BOARDING ARRANGEMENTS FOR PILOT

In accordance with I.M.O. requirements and I.M.P.A. recommendations  
**INTERNATIONAL MARITIME PILOTS' ASSOCIATION**  
 H.Q.S "Wellington", Temple Stairs, Victoria Embankment, London WC2R 2PN Tel: +44 20 7240 3973 Fax: +44 20 7240 3518

**RIGGING FOR FREEBOARDS OF 9 METRES OR LESS**

- HANDHOLD STANCHIONS:** Min. diam. 32mm, 130cm above bulwark, min. 70cm, max. 80cm - 85cm
- MAN-ROPE:** without knots, min. diam. 28mm
- SPREADER:** Min. 180cm long, Max. 8 steps between, 5th step must be a spreader
- HEIGHT:** Height required by pilot

**SHIPS WITH HIGH FREEBOARD (MORE THAN 9M)**

- PILOT LADDER:** Must extend at least 2 metres above lower platform
- ACCOMMODATION LADDER:** Should rest firmly against ship's side, Maximum 55° slope, Rigid handrails preferred
- PILOT LADDER COMBINED WITH AN ACCOMMODATION LADDER:** is usually the safer method of embarking or disembarking a pilot on ships with a freeboard of more than 9 metres
- RECOMMENDED 9 metre mark:** 2m above pilot launch and height of swell, 2 to 7 metres depending on swell
- STERN** and **BOW** directions indicated

**MECHANICAL PILOT HOIST**

- Two man-ropes ready for immediate use, Min. diam. 28mm
- Guard ring
- Rigid part
- Flexible part

**AT NIGHT**

- Pilot ladder and ship's deck lit by forward shining overboard light

**NO! WARNINGS:**

- No shackles, No knots, No splices
- The steps must be equally spaced
- The steps must be horizontal
- Spreaders must not be lashed between steps
- The side ropes must be equally spaced
- The loops are a tripping hazard for the pilot and can become foul of the pilot launch

**Other Safety Notes:**

- A pilot hoist made and rigged in accordance with SOLAS Chapter V, together with a pilot ladder rigged alongside for immediate transfer, may be used subject to agreement between the Master and the Pilot. It should be noted that the distance between the nearest side ropes of the pilot hoist and pilot ladder will be at least 1.4 metres.
- Two handhold stanchions rigidly secured to ship's structure
- Lifebuoy with self-igniting light
- Responsible officer
- NO OBSTRUCTIONS
- Bulwark ladder secured to ship
- Very dangerous ladder too long

March 2001

Approved by I.M.O.

© Copyright Witherby & Co Ltd.

Figure 7: Illustration of the requirements of pilot ladders acc. to SOLAS Chp.5

## 5 Summary

This marine casualty incident is due to a lack of safety awareness.

The intention by the bosun to connect the gangway platform with the rope ladder is not prescribed according to SOLAS. However, especially when the vessel is experiencing extreme movement, it is part of good seamanship and is welcomed by pilots.

However, the bosun should have fitted himself out with a life jacket and a safety line in order to be secured against falling over board during this work. Furthermore, an ordinary seaman should have secured him and an officer should have supervised the entire procedure for rigging the pilot ladder.

Due to the frequency of PoB accidents on board German vessels and the proven very low probability of survival by persons who have fallen over board, the Federal Bureau already published a safety recommendation on 15 February 2007.<sup>3</sup> This addressed owners and operators of all seagoing vessels and recommended that their vessel commanders implement the following:

**"If it should be absolutely necessary to send persons on deck during heavy weather, then these persons must be protected against falling over board by a safety line in addition to wearing personal safety gear such as working shoes, gloves, hart hat and survival suit. This safety measure must be covered by personnel. Furthermore, measures must be carried out in line with good seamanship. (Reduction of speed, heaving-to of the vessel, communication between all participants, etc.)."**

There are no complaints regarding the conduct of the crew after the accident. All measures were taken with due care and speed to save the bosun who had fallen overboard.

Since this marine casualty, in spite of its tragic nature, does not provide any **new** investigation results of significance for safety at sea, the Federal Bureau of Maritime Casualty Investigation concludes its investigation with a summary investigation report.<sup>4</sup>

---

<sup>3</sup> According to § 9 Section 2 No. 2; § 15 Para. 1 and 10 of the Maritime Safety Investigation Law (See-sicherheits-Untersuchungs-Gesetz - SUG) from 16 June 2002 in conjunction with § 19 of the law relating to the Investigation into Accidents and Incidents Associated with the Operation of Civil Aircraft (Flug-Unfall-Untersuchungs-Gesetz/FIUUG) from 26 August 1998:

<sup>4</sup> See § 15 Section 1 SUG (Maritime Safety Investigation Law) in conjunction with § 18 Section 4 FI-UUG (law relating to the Investigation into Accidents and Incidents Associated with the Operation of Civil Aircraft).



## 6 Sources

- Findings of Waterway Police (WSP) Hamburg
- Written declarations by the vessel's command
- Witness accounts
- Section of the nautical chart INT 1413 and vessel data from the Federal Maritime and Hydrographic Agency (BSH)
- Official weather expertise by the German National Meteorological Service (DWD)
- Radar and VHF recordings from Cuxhaven Vessel Traffic Service
- Figures 4 and 5: BSU
- Figure 3: Hasenpusch
- Figure 6: IMO
- Documents
  - from the MRCC Bremen
  - the Glücksburg fleet command
  - Ship's documents