Bundesstelle für Seeunfalluntersuchung
Federal Bureau of Maritime Casualty Investigation
Federal Higher Authority subordinated to the Ministry of Transport and Digital Infrastructure

Investigation Report 337/14

Very Serious Marine Casualty

Fatal accident on board the MV SILVER PEGASUS in the port of Brake on 20 September 2014

13 July 2016

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 – SUG) of 16 June 2002, amended most recently by Article 16(22) of 19 October 2013, BGBl. (Federal Law Gazette) I p. 3836.

According to said Law, the sole objective of this investigation is to prevent future accidents and malfunctions. This investigation does not serve to ascertain fault, liability or claims (Article 9(2) SUG).

This report should not be used in court proceedings or proceedings of the Maritime Board. Reference is made to Article 34(4) SUG.

The German text shall prevail in the interpretation of this investigation report.

Issued by:
Bundesstelle für Seeunfalluntersuchung – BSU
(Federal Bureau of Maritime Casualty Investigation)
Bernhard-Nocht-Str. 78
20359 Hamburg
Germany

Director: Volker Schellhammer
Phone: +49 40 31908300
Fax: +49 40 31908340
posteingang-bsu@bsh.de
www.bsu-bund.de

Table of Contents

1 SUMMARY 5

2 FACTUAL INFORMATION 6

2.1 Photo 6
2.2 Ship particulars 6
2.3 Voyage particulars 7
2.4 Marine casualty or incident information 8
2.5 Shore authority involvement and emergency response 9

3 COURSE OF THE ACCIDENT AND INVESTIGATION 10

3.1 Course of the accident 10
3.2 Investigation 10
3.2.1 Ladder 11
3.2.2 Occupational safety 13

4 ANALYSIS 14

5 ACTION TAKEN 15

6 SAFETY RECOMMENDATIONS 16

6.1 Ship's command of the SILVER PEGASUS 16
6.2 Owner of the SILVER PEGASUS 16
6.3 Federal Ministry of Transport and Digital Infrastructure 16

7 SOURCES 17

Table of Figures

Figure 1: Photo of the ship.. 6
Figure 2: Nautical chart – overall view.. 8
Figure 3: Scene of the accident... 9
Figure 4: Stowage plan showing the scene of the accident..................................... 10
Figure 5: Vertical steps at the aft edge of CH3.. 11
Figure 6: Spiral steps at the forward edge of CH3... 12

1 Summary

On the morning of 20 September 2014, the MV SILVER PEGASUS, sailing under the flag of Panama, was moored in the port of Brake to discharge her cargo of soybean meal. When cargo hold 3 (CH3) was empty, the watchkeeping second officer climbed down its ladder to check the compartment.
At about 0030[1], the able bodied seamen called the second officer on VHF but did not receive an answer. As a consequence of that, they looked down into the cargo hold and saw him lying there on the floor.
One able bodied seaman climbed down to provide first aid and the other went to the superstructure to inform the ship's command. The ship's command called an ambulance, which took the casualty to a hospital. Despite every effort made, the second officer passed away on the same evening.

[1] Unless stated otherwise, all times shown in this report are local = UTC +1.

2 FACTUAL INFORMATION

2.1 Photo

© Owner

Figure 1: Photo of the ship

2.2 Ship particulars

Name of ship: SILVER PEGASUS
Type of ship: Chip carrier (wood shavings)
Nationality/Flag: Panama
Port of registry: Panama
IMO number: 9343455
Call sign: 3ENT4
Owner: Kitaura Kaiun Co., Ltd.
Year built: 2004
Shipyard/Yard number: Oshima Shipbuilding Co., Ltd./10463
Classification society: NIPPON KAIJI KYOKAI
Length overall: 210.0 m
Breadth overall: 32.26 m
Gross tonnage: 43,621
Deadweight: 54,347 t
Draught (max.): 10.04 m
Engine rating: 7,815 kW
Main engine: Mitsubishi Heavy Industries, Ltd. Kobe
(Service) Speed: 14.2 kts
Hull material: Steel
Hull design: Double bottom
Minimum safe manning: 13

2.3 Voyage particulars

Port of departure:	Las Palmas (ES)
Port of call:	Brake (DE)
Type of voyage:	Merchant shipping, international
Cargo information:	Discharged/empty
Manning:	21
Draught at time of accident:	7.40 m
Pilot on board:	No
Canal helmsman:	No
Number of passengers:	0

2.4 Marine casualty or incident information

Type of marine casualty:	Very serious marine casualty/ fatal accident
Date, time:	20/09/2014, 0030
Location:	Brake, South Pier, Bollard 55
Latitude/Longitude:	φ °53 19.9'N λ 008°29.3'E
Ship operation and voyage segment:	In port
Place on board:	Aft edge of CH3
Consequences (for people, ship, cargo, environment, other):	Fatal injuries caused by falling into the empty cargo hold

Excerpt from Nautical Chart INT 1043, BSH

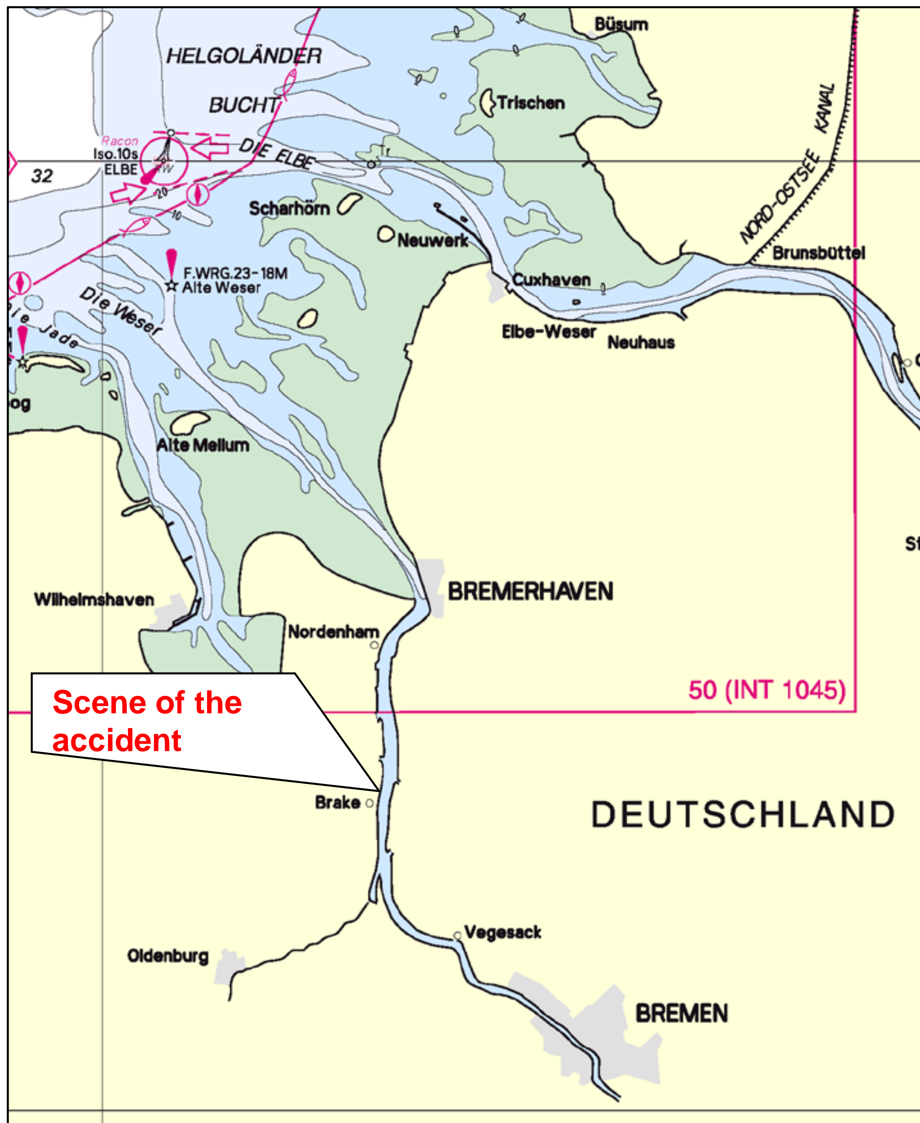

Figure 2: Nautical chart – overall view

Excerpt from Nautical Chart INT 1458, BSH

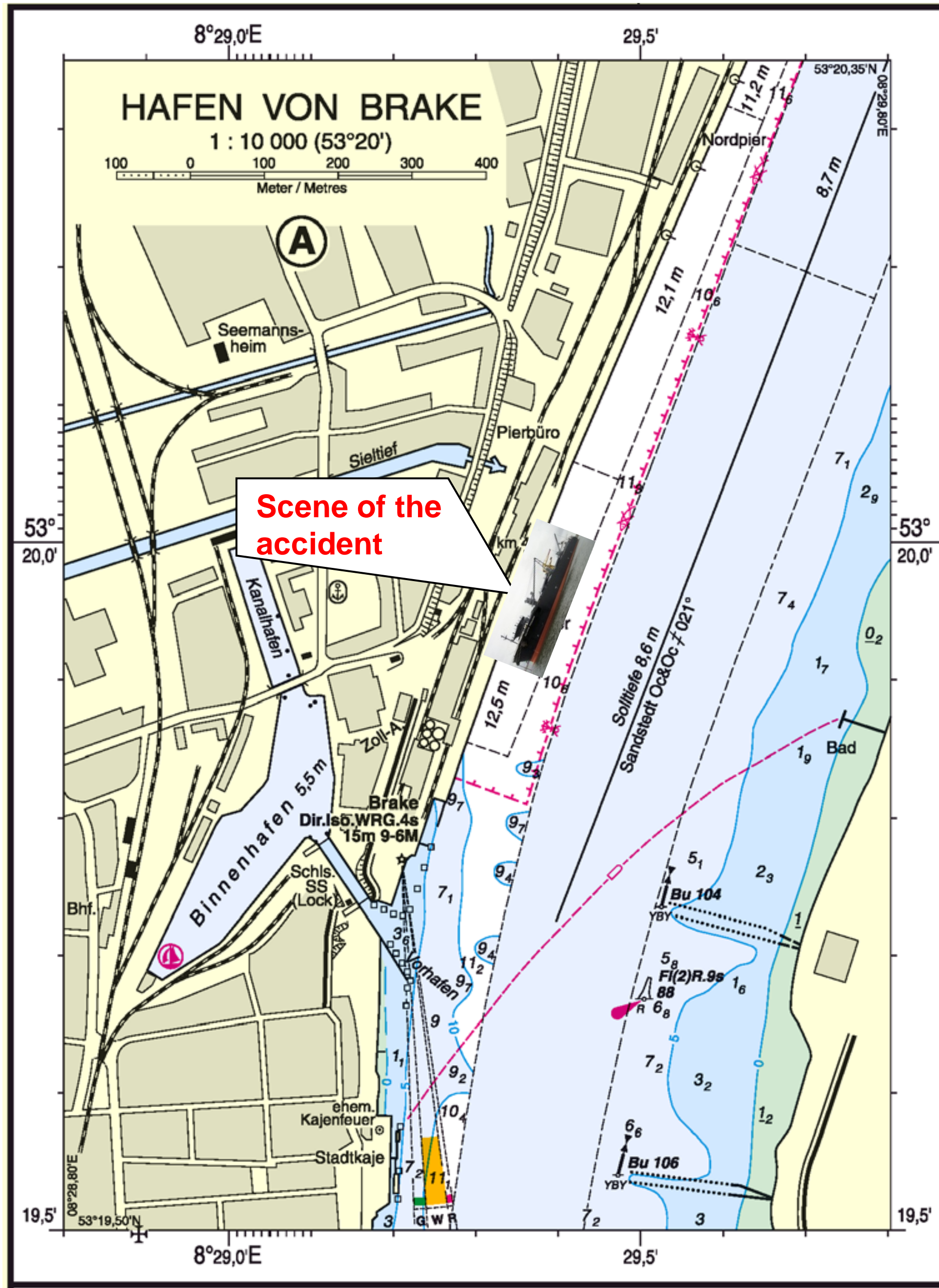

Figure 3: Scene of the accident

2.5 Shore authority involvement and emergency response

Agencies involved:	Port terminal, public rescue service, volunteer fire service
Resources used:	Crane belonging to the terminal, ambulance
Actions taken:	Casualty evacuated and taken to a hospital
Results achieved:	Later succumbed to his injuries

3 COURSE OF THE ACCIDENT AND INVESTIGATION

3.1 Course of the accident

The MV SILVER PEGASUS, sailing under the flag of Panama, had been situated at the South Pier of the J. Müller Terminal in the port of Brake since 16 September 2014. The loaded soybean meal was discharged completely. The cargo was discharged completely from CH3 on 20 September at 0000. The watchkeeping second officer had been tasked with checking each discharged cargo hold for damage. Therefore, he climbed down the ladder at the aft edge of CH3. Prior to that, he had instructed the able bodied seamen on watch to close the hatch cover of cargo hold 4. The second officer did not reply when they tried to confirm this was done on VHF. The able bodied seamen then searched for him and found him lying on the floor of CH3 at about 0030. While one able bodied seaman also climbed down and established the second officer's severe injuries there, the other ran to the cargo office to alert the master and crew. The crew hurried to the cargo hold immediately to provide first aid. The master called an ambulance via the terminal's staff. This arrived at the ship at 0110 and the emergency physician took charge of the medical treatment. The second officer was lifted out of the 24-metre deep cargo hold with the help of a crane belonging to the terminal at 0140 and placed on the pier. The ambulance took him to the nearest hospital. The injuries to the head and torso were so severe that the second officer succumbed to his injuries at 1742.

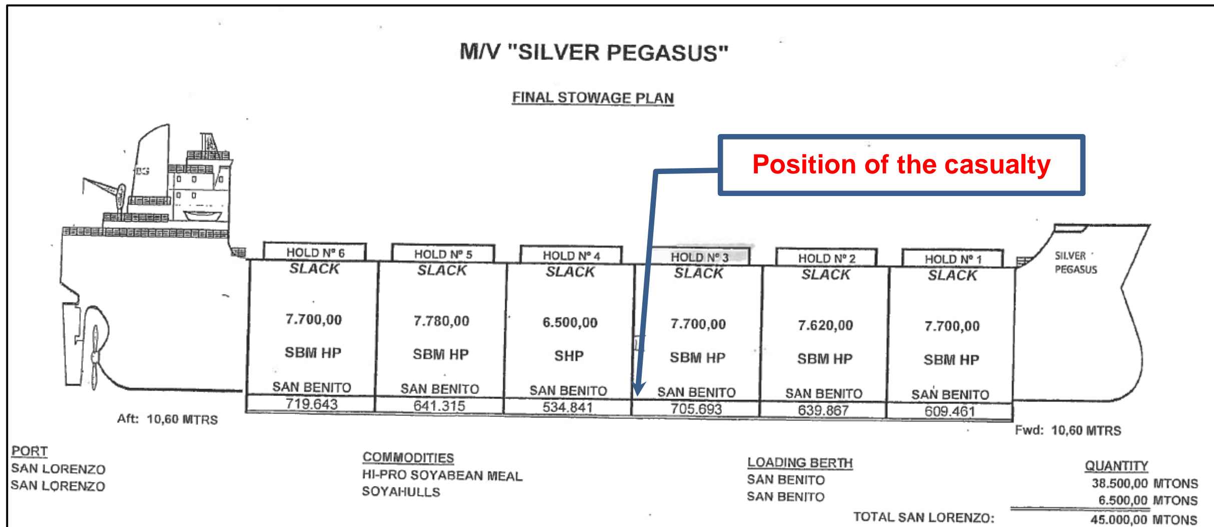

Figure 4: Stowage plan showing the scene of the accident

3.2 Investigation

The SILVER PEGASUS was carrying 38,500 mt of soybean meal and 6,500 mt of soya hulls in her six cargo holds. CH3 contained 7,700 mt of soybean meal.
Prior to the accident, a damp layer of meal dust had settled throughout the area of the cargo holds, including the ladders within them, because of the high level of humidity during the discharge operation. This made it difficult to gain a safe foothold.

Numerous rescuers had used the cargo hold ladder, which prevented a precise collection of physical evidence and an analysis. No characteristic signs could be found that would indicate the point at which the casualty slipped, for example.
The 29-year-old second officer was Vietnamese. His professional experience spanned five years. At the time of the accident, he had been on board the SILVER PEGASUS for four months. Witnesses stated that he had reportedly been in the seamen's club until about 2130 on the previous evening. Subsequent investigations have revealed that he was not under the influence of alcohol at the time of the accident. It was not possible to determine whether the second officer had slept before his night watch, which began at 0000 and was scheduled to continue until 0600.

3.2.1 Ladder

The depth of CH3 is 24 metres. It is accessible via one ladder at the forward edge and one at the aft edge.
Since the casualty was lying on the floor at the aft edge, it is reasonable to assume that he fell from this ladder. This is also supported by the fact that he had previously instructed his two able bodied seamen on watch to close cargo hold 4. The ladder is fixed to the cargo hold wall vertically and separated by three platforms, which are positioned at regular intervals to one another. The ladder does not have any safety measures, such as a safety cage or handrails. Towards the bottom, at a height of three to six metres from the floor, the ladder runs along the wall at an angle and is then vertical again for the last few metres to the floor.

Figure 5: Vertical steps at the aft edge of CH3

Since no buckling was evident on the platforms or their railings, it is very likely that the second officer fell after he had climbed through the opening on the lowest platform. If he was higher up when he fell, then he would have to land on one of the platforms or buckled the railing there significantly. He would have succumbed to his injuries immediately if he fell unimpeded from a greater height.

The companionway at the forward edge of CH3 consists of spiral steps fitted with a railing and changes to a vertical ladder without protection six metres above the floor.

Figure 6: Spiral steps at the forward edge of CH3

Both ladders were consistent with the requirements of the classification society. NIPPON KAIJI KYOKAI (NKK) stated in this regard that although there were requirements in SOLAS Chapter II-1, they were not mandatory in the present case because the SILVER PEGASUS is not operated as a tanker or bulk carrier, but as a chip carrier due to her different design. Implementing the two mandatory access points to the cargo hold in the form of two different ladders, where the spiral steps are regarded as the actual companionway and the vertical ladder as the emergency exit, was long-standing practice and fully in line with the relevant technical rules adopted under SOLAS, however. That a vertical ladder makes up the lowest six metres of the spiral steps is based on point 3.13.2 of Resolution MSC.158(78) and SOLAS II-1. In the case of this ship, it is understood as a recommendation and implemented.

3.2.2 Occupational safety

The waterway police (WSP) seized the second officer's working shoes, gloves, and hard hat. The WSP was unable to find a way of having this personal protective equipment assessed and therefore passed it on to the BSU. Despite extensive research, it was not possible to find a qualified expert who felt able to make specific investigations and statements.

In principle, it can be concluded that the working shoes were consistent with the usual requirements. The sole of each shoe had hardly any wear. The gloves were made of wool. Accordingly, they were absorbent and gripped better than other models. The hard hat was also consistent with the usual requirements. Witnesses stated that the casualty's hard hat had to be taken off. Despite that, no damage was found on the hard hat. The serious injuries to the second officer's skull were caused by the hard hat's plastic shell recoiling. Due to the extreme load, the material of the hard hat was forced inwards and sprung out again in a single motion. Consequently, the skull was injured in spite of the hard hat.

Personal fall protection equipment is neither mandatory nor available.

4 ANALYSIS

Having considered all the evidence, the course of the accident is reconstructed as follows.

After the cargo was discharged, the watchkeeping second officer was tasked with checking the condition of the cargo hold. To that end, he climbed down into the 24-metre deep CH3. It is no longer possible to ascertain whether he lost his footing while descending or ascending. It is very likely that the cause is to be found in the damp meal dust. This had settled all over and made everything extremely slippery, including the ladders. Given that the spiral steps at the forward edge provide far more stability and thus safety, it is difficult to understand why he apparently used the vertical ladder at the aft edge of the cargo hold.

The second officer's personal protective equipment was consistent with the usual provisions and did not merit any criticism.

The vertical ladder at the aft edge is consistent with the regulations of the ship's classification society. A section towards the bottom is at an angle and represents an additional hazard, however.

The spiral steps at the forward edge are also consistent with requirements. It is difficult to understand why the last six metres is continued with a vertical ladder, however. This is also considered a hazard, which could have been avoided by a continuation of the spiral steps to the cargo hold floor.

5 Action taken

On 1 December 2014, the owner sent a communication to its fleet. This described the accident and contained instructions for the behaviour of crews when working at height in the future. It also stated that a daily risk assessment is required during the organisation of work with appropriate consequences. Furthermore, the crews were urged to use existing spiral steps at all times when entering a cargo hold in the future. Moreover, at least one crew member must always maintain a deck watch and keep under observation crew members working in a cargo hold or other enclosed compartments in the future.

6 SAFETY RECOMMENDATIONS

The following safety recommendations do not constitute a presumption of blame or liability.

6.1 Ship's command of the SILVER PEGASUS

The Federal Bureau of Maritime Casualty Investigation recommends that the ship's command of the SILVER PEGASUS instruct its crew to use only the spiral steps when entering cargo holds.

6.2 Owner of the SILVER PEGASUS

The Federal Bureau of Maritime Casualty Investigation recommends that the owner of the SILVER PEGASUS consider installing personal fall protection equipment on the cargo hold ladders to arrest a fall.

6.3 Federal Ministry of Transport and Digital Infrastructure

The Federal Bureau of Maritime Casualty Investigation recommends that the Federal Ministry of Transport and Digital Infrastructure advises the International Maritime Organization to check whether the SOLAS convention should be amended by a requirement to use a personal fall arrest system on entering an empty cargo hold when a certain height is reached.

7 SOURCES

- Enquiries of WSP Brake, including photographs
- Written statements
  - Ship's command
  - Owner
  - Classification society
- Witness testimony
- Nautical charts and ship particulars, Federal Maritime and Hydrographic Agency (BSH)
- Documentation, Ship Safety Division (BG Verkehr)
  - Accident Prevention Regulations (UVV See)
  - Guidelines and codes of practice
  - Ship files