



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

Investigation Report 160/17

25 October 2018

Less Serious Marine Casualty

**Line accident with minor physical injury
on board the traditional ship WISSEMARA
at 1400 on 24 May 2017
in the port of Wismar**

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). According to said Law, the sole objective of this investigation is to prevent future accidents. 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: Ulf Kaspera
Phone: +49 40 3190 8300
posteingang-bsu@bsh.de

Fax: +49 40 3190 8340
www.bsu-bund.de

Table of Contents

1	SUMMARY.....	5
2	FACTUAL INFORMATION.....	6
2.1	Photograph of the ship	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.....	10
3	COURSE OF THE ACCIDENT AND INVESTIGATION	11
3.1	Course of the accident	11
3.2	Investigation	13
3.2.1	Ship	13
3.2.2	Damage.....	14
3.2.3	Crew	17
3.2.4	Wooden hawseholes	18
4	ACTIONS TAKEN	19
5	ANALYSIS.....	20
6	CONCLUSIONS.....	21
7	SAFETY RECOMMENDATIONS	22
7.1	Operator of the WISSEMARA: Förderverein Poeler Kogge e.V. (cleats)	22
7.2	Operator of the WISSEMARA: Förderverein Poeler Kogge e.V. (lines)	22
8	SOURCES	23

Table of Figures

Figure 1: WISSEMARA	6
Figure 2: Navigational chart showing the scene of the accident.....	8
Figure 3: Navigational chart – overall view	9
Figure 4: Berthing manoeuvre seen at the stern.....	11
Figure 5: Berthing manoeuvre seen at the bow	12
Figure 6: Destroyed wooden cleat (side view)	14
Figure 7: Destroyed wooden cleat (front view)	15
Figure 8: Wooden plank beneath the destroyed cleat	15
Figure 9: Example of an intact wooden cleat.....	16
Figure 10: Example of a wooden cleat in use.....	16
Figure 11: Wooden hawsehole with incision.....	18
Figure 12: Hawsehole with a metal edge.....	19

1 SUMMARY

The traditional ship WISSEMARA is a replica of a 14th century cog. She was built and is operated by Förderverein Poeler Kogge e.V., a Wismar-based friends' association. Day trips are regularly organised for interested visitors from all over the world.

One such day trip ended at about 1400¹ on 24 May 2017 with the seasoned berthing manoeuvre in the port of Wismar. This involved turning on the turning basin, so as to approach the pier sternward. The stern line was the first line to be passed ashore and made fast. While steaming in this line, an unexpected gust of wind occurred. Despite bow thruster, this gust turned the ship so far away from the pier that the load on the line became excessive. However, rather than the line parting, the wooden cleat that held the line on board broke.

Despite the crew members making repeated requests beforehand, one passenger failed to follow all the other passengers out of the danger area on the berthing side. She sat so close to the cleat that she was struck by flying wooden splinters and sustained minor injuries.

She was taken to hospital as a precaution after berthing. The injuries were only minor and she could be discharged after outpatient treatment, however.

Splinters also struck the leg of a crew member. These injuries did not require any complex medical treatment, either.

¹ Unless stated otherwise, all times shown in this report are local = UTC + 2 (CEST).

2 FACTUAL INFORMATION

2.1 Photograph of the ship



Figure 1: WISSEMARA

2.2 Ship particulars

Name of ship:	WISSEMARA
Type of ship:	Traditional ship
Nationality/Flag:	Germany
Port of registry:	Wismar
IMO number:	Not allocated
Call sign:	DB3747
Owner:	Förderverein Poeler Kogge e.V.
Year built:	2006
Shipyard/Yard number:	Wismar seaport shipyard
Classification society:	Ship Safety Division (BG Verkehr)
Length overall:	31.50 m
Breadth overall:	8.40 m
Gross tonnage:	176
Deadweight:	n/a
Draught (max.):	2.60 m
Engine rating:	255 kW
Main engine:	Volvo Penta
(Service) Speed:	8
Hull material:	Wood
Hull design:	Replica of a medieval cargo ship
Minimum safe manning:	10

2.3 Voyage particulars

Port of departure:	Wismar
Port of call:	Wismar
Type of voyage:	Other shipping National
Manning:	10
Draught at time of accident:	F: 2.40 m, M: 2.60 m, A: 2.70 m
Pilot on board:	No
Canal helmsman:	No
Number of passengers:	60

2.4 Marine casualty or incident information

<p>Type of marine casualty:</p> <p>Date, time:</p> <p>Location:</p> <p>Latitude/Longitude:</p> <p>Ship operation and voyage segment:</p> <p>Place on board:</p> <p>Consequences (for people, ship, cargo, environment, other):</p>	<p>Less serious marine casualty (line accident)</p> <p>24/05/2017, 1405</p> <p>Wismar's Alter Hafen port</p> <p>$\phi 53^{\circ}54'N \lambda 11^{\circ}27'E$</p> <p>Arrival/berthing</p> <p>Stern</p> <p>One passenger and a crew member sustained minor injuries, slight damage to the vessel, no damage to the environment</p>
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Extract from Navigational Chart INT1361,
Federal Maritime and Hydrographic Agency (BSH)

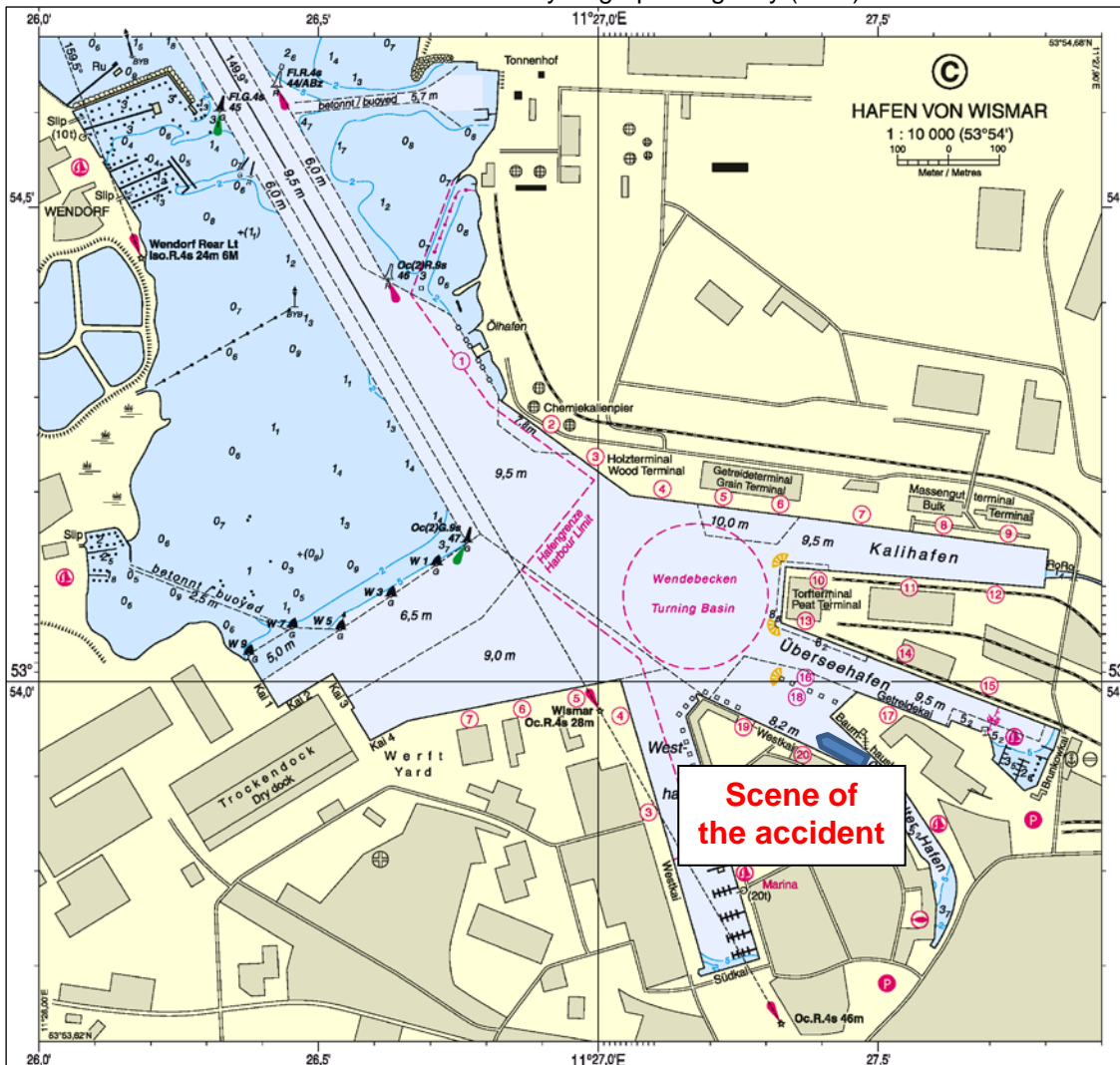


Figure 2: Navigational chart showing the scene of the accident

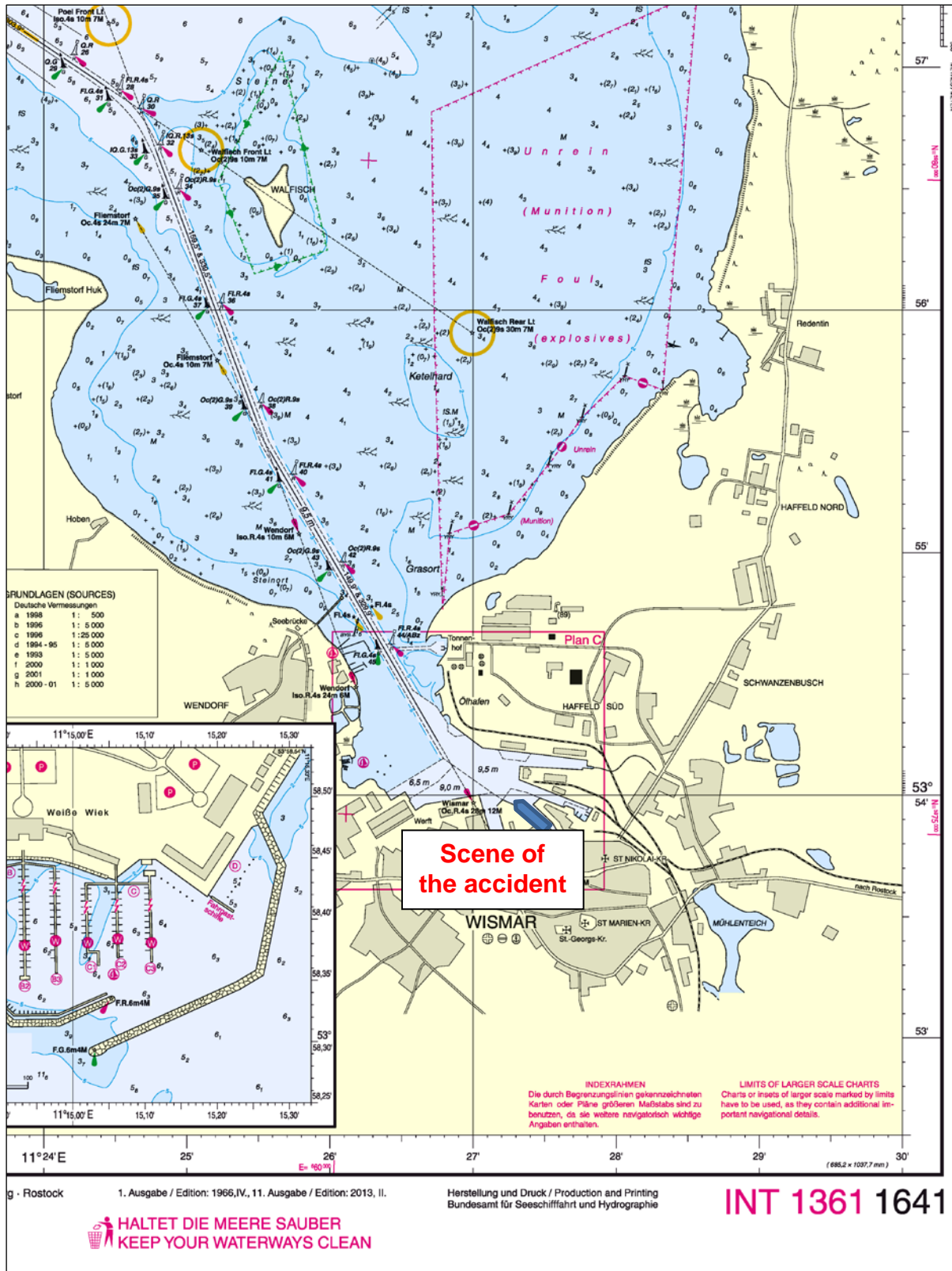


Figure 3: Navigational chart – overall view

2.5 Shore authority involvement and emergency response

Agencies involved: Waterway Police (WSP) Wismar, Rescue
Coordination Centre

Resources used: Ambulance

Actions taken: First aid and treatment in a hospital

Results achieved: Discharged from medical care with injuries dressed

3 COURSE OF THE ACCIDENT AND INVESTIGATION

3.1 Course of the accident

On Wednesday 24 May 2017, the traditional ship WISSEMARA returned to her berth at Wismar's Alter Hafen port at about 1400 after one of her typical day trips. The crew was briefed on the forthcoming manoeuvre while the ship was being turned on the turning basin, so as to move astern and berth. In addition, the passengers were asked to move away from the ship's starboard side.

A 4-5 Bft north-west wind prevailed. The WISSEMARA moved slowly astern to the pier. The stern line was passed ashore with the help of a heaving line. The passengers were once more requested to move away from the mooring area on the starboard side for safety reasons. After the stern line was made fast ashore, the rudder was set to hard to starboard, the main engine to dead slow ahead, and the bow thruster operated at 100% to starboard. A strong gust of wind occurred at that precise moment, which turned the bow of the WISSEMARA to port. The main engine was once more briefly set to astern, so as to then spring on the stern line again while moving slowly ahead. When the stern line was then loaded, the cleat holding it broke. The flying wooden splinters that ensued struck a female passenger, who was still sitting in the danger area of the aft manoeuvring station despite all requests. She sustained minor injuries on her forehead.



Figure 4: Berthing manoeuvre seen aft the stern



Figure 5: Berthing manoeuvre seen at the bow

A crew member who was also located there due to the berthing manoeuvre suffered minor injuries on his leg.

WSP officers who happened to be on the pier and the crew administered first aid to the two casualties immediately.

An ambulance was called without delay and took the injured passenger to a hospital. She was able to leave the hospital again after her injuries were dressed.

Hospital care was not needed for the injury to the crew member.

3.2 Investigation

Two investigators from the BSU surveyed the WISSEMARA on 31 May 2017 and gained an image of the ship and the association responsible for operating her.

3.2.1 Ship

The jetty at the port of Timmendorf was extended in 1998. This resulted in changes in the current pattern and a wreck was exposed. The State's institute of archaeology was made aware and organised a salvage operation. The wreck was a particular variant of a cog, which was still extremely well preserved. Investigations after the salvage in 1999 revealed that the ship had been built in about 1354. The hull showed clear similarities with ships of the Vikings and Slavs, meaning it can be seen as a special form of cog developed for the Baltic Sea, i.e. as a 'Baltic Cog'. The ship's length was about 31 m and her loading capacity was more than 200 tonnes. Ships of this size were the basis for the supra-regional transport of bulk goods typical of the Hanseatic period and thus the basis for the economic power and rise of the Hanseatic cities on the North Sea and Baltic Sea coasts.²

This wreck was used as a basis for the replica of a cog. A not-for-profit association was founded on 14 February 2000 and has since been responsible for operating the cog. Construction began in 2001 and was completed in 2006. Following her maiden voyage and scientific proof of her practical handling characteristics, the WISSEMARA is now available to all parties interested.

The German Social Accident Insurance Institution for Commercial Transport, Postal Logistics and Telecommunication inspected the WISSEMARA in 2006 and she received a Safety Certificate for Traditional Vessels, which is valid until 24 January 2021. This certifies the vessel to carry 25 people, which can be extended to up to 75 through special permits that may be applied for under certain conditions. *Inter alia*, the additional permit states that day trips with a maximum duration of ten hours and a maximum distance from the coastline of 10 nm at medium high tide may be carried out in up to 5 Bft between sunrise and sunset in the months April to October with up to 75 people on board.

As regards life-saving appliances, there are three liferafts, each with a capacity of 25 people on board. There are also 75 lifejackets, plus children's lifejackets and work jackets for the crew. The storage locations are marked as required.

An inflatable with a 25 HP outboard engine is on permanent standby for possible person-overboard manoeuvres.

Fire protection equipment which includes a mobile fire pump is available as required and regularly maintained.

² Source: www.poeler-kogge.de/geschichte.html dated 17 July 2018.

The ship is equipped with a GMDSS³ appropriate for the A1 navigation area⁴ for communication in dangerous situations, in particular.

A first aid kit which is inspected and kept replenished is on board.

The crew gives all the assistant sailors/passengers a safety briefing at the beginning of each trip.

3.2.2 Damage

Flying wooden parts caused by the wooden cleat breaking struck a passenger on her forehead and a crew member on the shin. The injuries did not require intensive medical treatment.

On the WISSEMARA, a wooden belaying cleat was destroyed (see Figures 6 and 7).



Figure 6: Destroyed wooden cleat (side view)

³ GMDSS: Global maritime distress and safety system.

⁴ Coastal areas.



© WSP

Figure 7: Destroyed wooden cleat (front view)



© BSU

Figure 8: Wooden plank beneath the destroyed cleat

© BSU



Figure 9: Example of an intact wooden cleat

© BSU



Figure 10: Example of a wooden cleat in use

A cleat is a device for fastening lines. It consists of two horns opposite one another, around which the line is alternately placed.

As a result, the rope remains fastened to the cleat due to stiction with the horns and itself. A frictional force greater than the strength of the line normally develops after 2-3 'S' turns around the cleat. The turns are finished off with a cleat hitch, which also protects against accidental loosening.

Cleats are bolted or welded onto their base (the deck or mast). Cleats are available in different sizes and different materials, depending on intended use and the forces to be absorbed.

In response to an enquiry, the association stated that *metal cleats were less visible on deck than wooden cleats and no more effective, either. After all, in such extreme situations they are ripped out of the wooden deck*⁵.

There was no visible damage to the stern line and it remained in use. The association's administrative body assured that all mooring lines were assessed by the bosun and the ship's command on a weekly basis during the safety inspection and replaced immediately if deficiencies were found.

3.2.3 Crew

In addition to the 60 passengers, ten crew members were on board according to the crew list. The crew was made up of a skipper, a helmsman, a bosun, two engineers, four seamen and a cook.

As a general rule, each new crew member is briefed on the code of behaviour on board. This briefing is repeated regularly for all.

New crew members go on about three trips, where they are supervised and monitored by the bosun (a seaman with many years of service) and the ship's command. Each new prospective sailor may then decide whether she/he wishes to remain part of and all existing crew members are asked whether they wish to have her/him in the team.

The manning level in August 2018 comprised 52 women and men. The crew usually comprises ten people per trip.

⁵ In italics: Statement of the association.

3.2.4 Wooden hawseholes

It was found during the BSU's survey that the WISSEMARA's hawseholes were made of wood and therefore already damaged. It was clearly visible that the movement of the mooring lines had caused incisions in the hawseholes. Since modern technology was concealed throughout the ship by the 'charm' of the original cog, it is difficult to understand why the hawseholes and cleats were not installed according to current standards. It is unlikely that any passengers would be bothered if the internal parts of a hawsehole or cleat were made of metal. By contrast, this would increase the safety of everyone on board considerably.



Figure 11: Wooden hawsehole with incision

4 Actions taken

In August 2018, the association stated that all hawseholes now had metal edges.



Figure 12: Hawsehole with a metal edge

Furthermore, the crew was instructed to insist that passengers leave the berthing side of the WISSEMARA.

5 ANALYSIS

During a standard berthing manoeuvre, the mooring line was subjected to such a heavy load that it destroyed the cleat to which it was fastened. This resulted in injuries to one crew member and one female passenger. It must be noted that a cleat should withstand greater loads than a mooring line. This principle of shipbuilding has apparently not been adhered to here. The operating association attaches great importance to the authenticity of the cog and thus predominantly to her equipment with wooden components. The BSU fully understands this intention but also notes that hidden compromises between the original design of the cog from the Middle Ages and modern technology of today have already been identified and installed, making it even harder to understand why modern cleats made of metal were not fitted.

The destroyed wooden cleat shows that one side of it was so heavily loaded that a horn tore off. Therefore, it is also quite possible that the line was fastened to the cleat improperly.

The injury to the female passenger could only have happened because the crew was not assertive enough when it came to instructing all passengers to keep away from the ship's berthing side.

The BSU noted during the local survey that hawseholes made of wood had been used up until that point. The movement of the mooring lines had already caused clear incisions in them. The operating association arranged for the hawseholes to be fitted with a metal edge in accordance with the advice of the investigators.

The BSU does not approve of the fact that the stern line which destroyed the wooden cleat due to its heavy load is still in use.

6 CONCLUSIONS

Cleats and hawseholes made of wood have been used on board the WISSEMARA up until now. Accordingly, the hawseholes were already damaged and the association fitted them with metal edges.

The destroyed wooden cleat was replaced by a cleat made of wood again, even though it was precisely such a cleat made of wood that had failed. The BSU does not believe that a professionally installed metal cleat can be torn out of the deck. Even though traditional ships like the WISSEMARA are not necessarily bound to applicable shipbuilding regulations and it may be slightly more complicated to attach a metal cleat to the deck, it is still possible to learn from an accident, even if and not least because the damage was fortuitously minor in this case.

This is already evident from the fact that the operating association has given a written assurance that the crew is now more assertive toward passengers, especially with regard to the passenger-free berthing side.

In closing, the BSU draws attention to its investigations into accidents involving broken mooring lines, which show that lines no longer have the tensile strength expected after exposure to a load, even if the line has no visible damage. Accordingly, careful consideration should be given to whether a mooring line can still be used after a particular load or whether it would be better to replace it.⁶

⁶ See the investigation reports concerning the NORTHERN FAITH https://www.bsu-bund.de/SharedDocs/pdf/EN/Investigation_Report/2009/Investigation_Report_302_07.html and the MAERSK KURE https://www.bsu-bund.de/SharedDocs/pdf/EN/Investigation_Report/2017/Investigation_Report_43_16.html.

7 SAFETY RECOMMENDATIONS

The following safety recommendations do not constitute a presumption of blame or liability in respect of type, number or sequence.

7.1 Operator of the WISSEMARA: Förderverein Poeler Kogge e.V. – cleats

The Federal Bureau of Maritime Casualty Investigation recommends that the Förderverein Poeler Kogge e.V. promptly replace all wooden cleats used when making fast with metal cleats with a higher holding force.

7.2 Operator of the WISSEMARA: Förderverein Poeler Kogge e.V. – lines

The Federal Bureau of Maritime Casualty Investigation recommends that the Förderverein Poeler Kogge e.V. inspect loaded mooring lines critically and renew them in cases of doubt.

8 SOURCES

- Enquiries of the WSP
- Written explanations/submissions
 - Ship's command
 - Owner
- Witness testimony
- Nautical charts and ship particulars, BSH
- Documentation, Ship Safety Division (BG Verkehr)
 - Accident Prevention Regulations (UVV See)
 - Guidelines and codes of practice
 - Ship files