



**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 449/07

**Marine casualty**

**Personal injury accident on the  
MV KATRINE KROG on 17 September 2007  
at Rüsterbergen pilot station**

17 December 2007

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.

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.

The present report should not be used in court proceedings or proceedings of the Maritime Board. Reference is made to Art. 19 Para. 4 SUG.

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

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## **1 Summary of the marine casualty**

On 17 September 2007 at around 0220 h<sup>1</sup> the general cargo vessel KATRINE KROG, sailing under Danish flag, was en route from Saint-Nazaire/France to Denmark. During the passage through the Kiel Canal the pilot was scheduled to change at Rüsterbergen pilot station. A pilot ladder was deployed, on which the step third to last was attached only to one side.

Freeboard of KATRINE KROG was approx. 3 m and the pilot ladder had been deployed to approx. 1 m above the waterline.

The German pilot pointed out the loose step to the crew of KATRINE KROG. When there was no response, he decided to leave out the damaged step by directly stepping onto the spreader above. As soon as he stood there with both feet, the ropes of the pilot ladder tore off on both sides above the top step. Thereupon the pilot fell down with the torn off pilot ladder onto the pilot launch, suffering injuries. He managed to embark without a pilot ladder and to pilot the vessel to “Alte Schleuse” locks in Kiel-Holtenau. KATRINE KROG continued her voyage after a stopover at the locks.

As a result of his injuries, the pilot was unable to work for three days.

Nobody else was injured. No damage to property occurred and no environmentally harmful substances were released.

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<sup>1</sup> All times within this report refer to Central European Summer Time = UTC + 2h

## 2 Scene of the accident

Type of event: Marine casualty, personal injury  
Date/Time: 17 September 2007, 0220 h  
Place: Rüsterbergen, Kiel Canal  
Latitude/Longitude:  $\phi$  54°14,6' N  $\lambda$  009°36,8' E

Detail of chart (21) 42 (INT 1366), Federal Maritime and Hydrographic Agency (BSH)

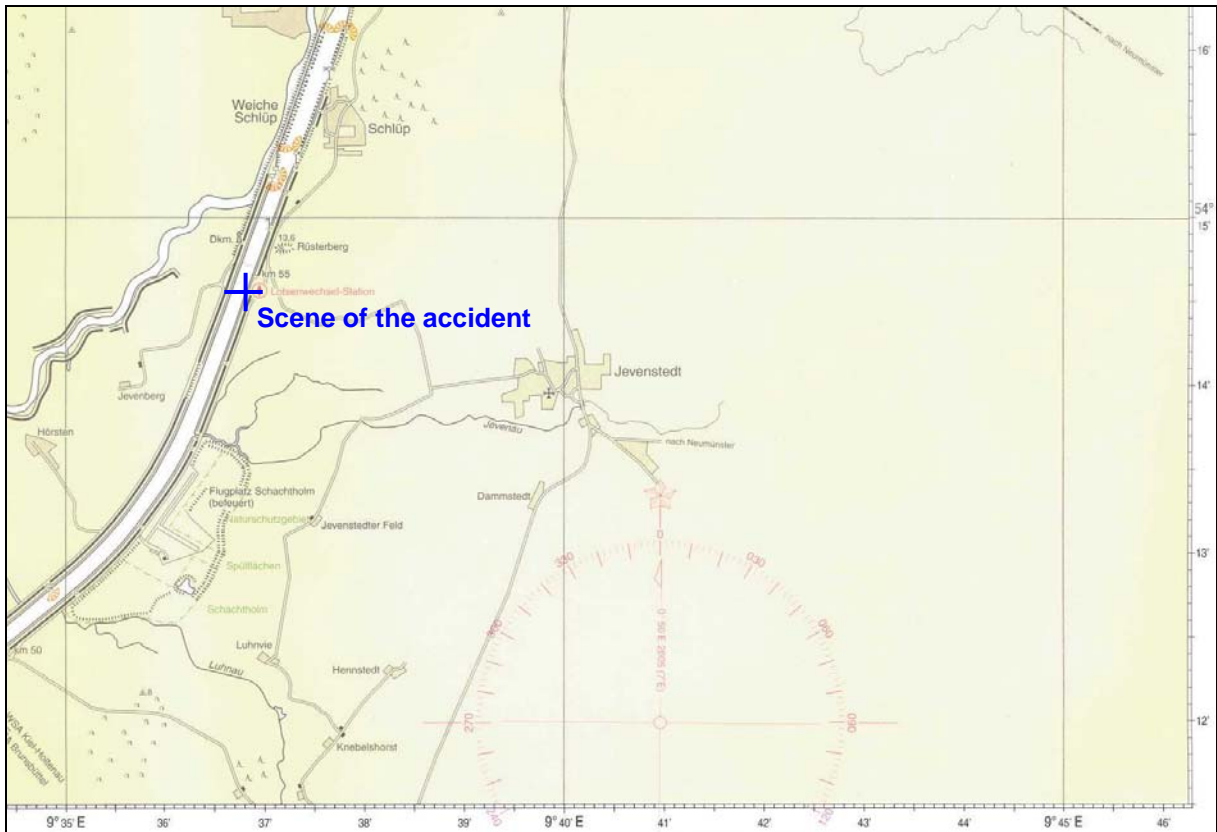


Figure 1: Nautical chart

### 3 Vessel particulars

#### 3.1 Photo



Figure 2: Photo of MV KATRINE KROG

#### 3.2 Particulars

Name of the vessel:	KATRINE KROG
Type of vessel:	General cargo vessel
Nationality/flag:	Denmark/DIS
Port of registry:	Frederiksværk
IMO number:	6922779
Call sign:	OXKC6
Owner:	Helge Pedersen, Denmark
Year built:	1969
Shipyard:	Frederikshavn Vaerft og Tordok A/S
Classification society:	Bureau Veritas S.A.
Length overall:	64.60 m
Breadth overall:	11.03 m
Gross tonnage:	399
Deadweight:	620 t
Engine rating:	700 kW
Main engine:	Wichmann 5AX
Service speed:	9 kts
Hull material:	Steel
Number of crew:	5 + 1 pilot

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

### **4.1 Accident**

On 17 September 2007 at around 0220 h the general cargo vessel KATRINE KROG, sailing under Danish flag, was en route from Saint-Nazaire/France to Denmark in ballast.

At the Northwestern Roads (NW-Reede) off Brunsbüttel a pilot embarked the vessel, who was then relieved by a colleague in Brunsbüttel locks. During the passage through the Kiel Canal the pilot was scheduled to change at Rüsterbergen pilot station. A pilot ladder was deployed, on which the step third to last was attached only to one side. The pilot transfer was secured on board by a crew member. The disembarking pilot stood by as well. The Danish Master was in his cabin and the Danish Chief Officer on the bridge.

Freeboard of KATRINE KROG was approx. 3 m and the pilot ladder had been deployed to approx. 1 m above the waterline.

The pilot launch carrying the next pilot came alongside. While approaching, the pilot and the skipper of the pilot launch had already noticed the ladder step hanging loose. The pilot pointed out the loose step to the crew of KATRINE KROG. When there was no response, he decided to leave out the damaged step by directly stepping onto the spreader above. As soon as he stood there with both feet, the ropes of the pilot ladder tore off on both sides above the top step. Thereupon the pilot fell down approx. 2 m with the torn off pilot ladder onto the pilot launch, suffering injuries. Afterwards he managed to embark KATRINE KROG via the pilot launch's rail. The other pilot disembarked using a hard ladder. KATRINE KROG was piloted to "Alte Schleuse" locks in Kiel-Holtenau by the injured pilot, who betook himself to medical treatment afterwards. KATRINE KROG continued her voyage after a stopover at the locks.

### **4.2 Injuries**

The pilot suffered contusions to the back and both legs. Additionally he was diagnosed with limited mobility of the pelvis. He was unable to work for three days.

### **4.3 Investigation by the Waterway Police**

The Waterway Police Kiel began investigating after the accident had occurred. The circumstances were investigated and witnesses were interrogated on board KATRINE KROG in "Alte Schleuse" locks in Kiel-Holtenau. The remaining part of the torn off pilot ladder was seized. Waterway Police in Rendsburg seized the part of the pilot ladder that had fallen onto the pilot launch, and provided a photographic documentation of both ladder parts. All investigation results were provided to BSU for further investigation.



#### 4.4 Survey of MV KATRINE KROG by BSU

KATRINE KROG was surveyed by BSU investigators on 26 November 2007 in Hamburg. The vessels's command and crew were co-operative. Relevant vessel's documentation and certificates were inspected and copied. Photos were taken of the scene of the accident, which was also measured.

The pilot ladder, which had in the meantime been replaced by the command of KATRINE KROG, was also inspected and deployed by the crew for demonstration.

#### 4.5 Analysis by the BSU

##### 4.5.1 Pilot ladder

Both parts of the pilot ladder seized by the Waterway Polices Kiel and Rendsburg were united in Rendsburg. The ladder had been onboard KATRINE KROG since February 2005. The following figures 3 and 4 illustrate its general condition as well as the points of rupture.



Figure 3: General view of the pilot ladder from the top

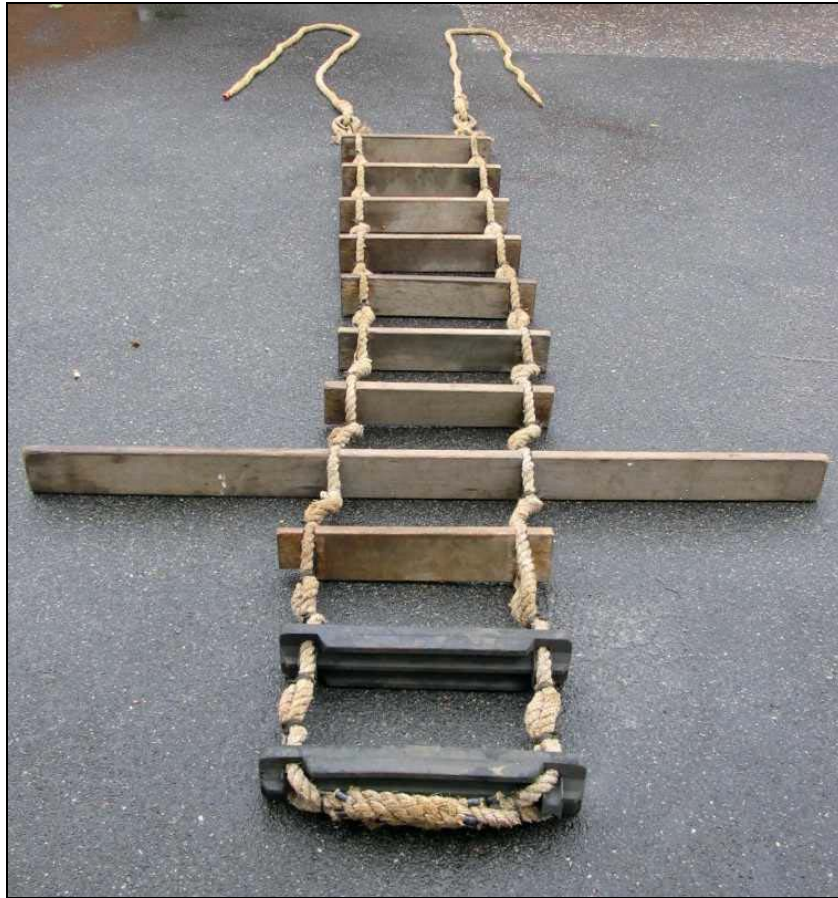


Figure 4: General view of the pilot ladder from the bottom

The pilot ladder has a total of 11 steps. One of these is a spreader preventing the ladder from twisting. Both two bottom steps are made of rubber, all other steps of knot-free hardwood.

The total length of the ladder is 6.30 m, the points of rupture are located 3 m from the bottom part of the ladder. The steps measure 550 mm in breadth, 30 mm in height, and are 120 mm deep.

The side ropes consist of non-coated natural fibres. The ropes were hawser-laid (z-lay). The ladder has two ropes on either side, which are separated above and below each step by plastic wedges. Both of these wedges are missing on one side of the step third to last, leaving this step unattached (cf. Fig. 5). Each wedge has a round seizing at the pointed end with threaded endings, which brings the ropes together again.

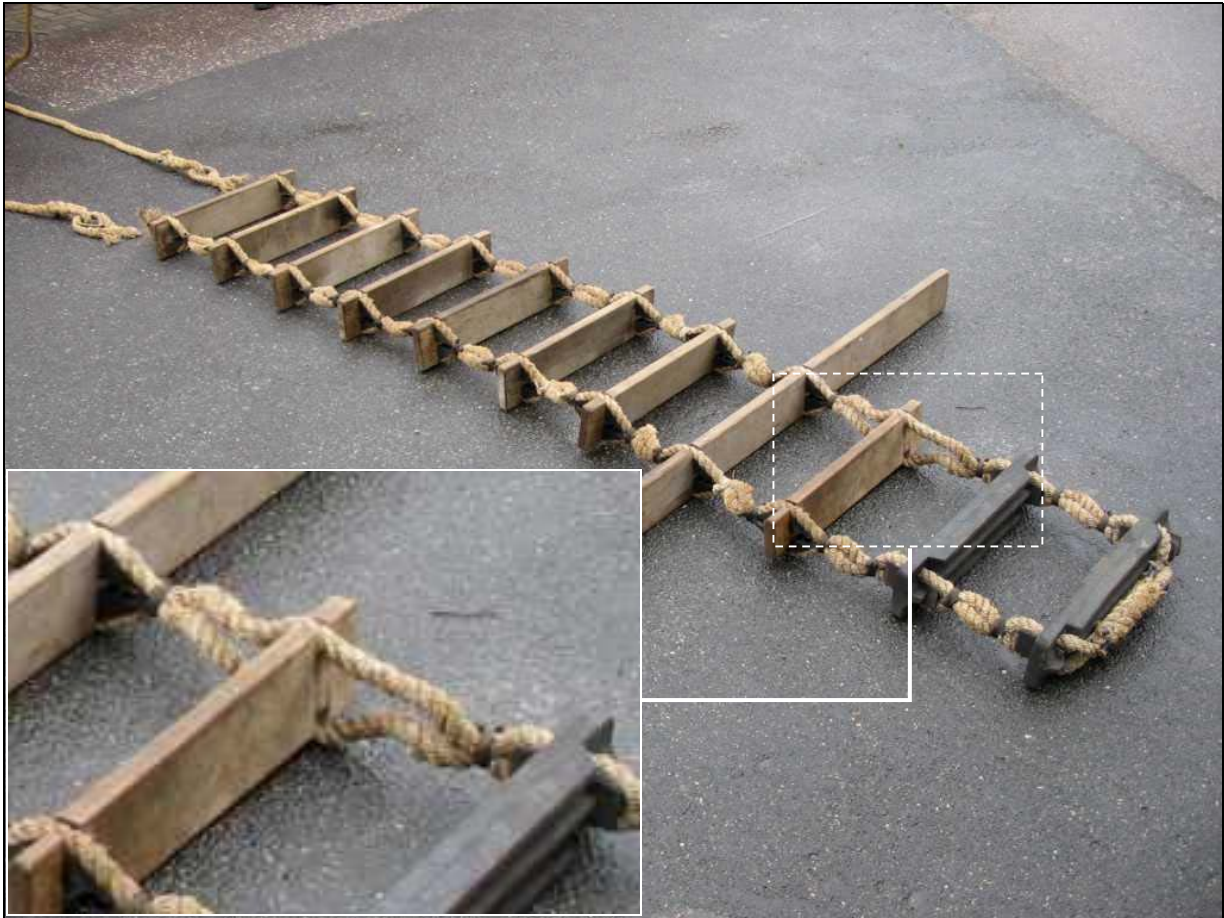


Figure 5: Damaged ladder step

Both the construction of the ladder and its dimensions meet the requirements for pilot ladders set out in Rule 17 of the International Convention for the Safety of Life at Sea (SOLAS) as well as those of the International Standard for Pilot Ladders pursuant to ISO 799, except for the damaged step.

Apart from the points of rupture above the top step, the ropes do not show any visibly damages.

#### 4.5.2 Statements

According to the crew of KATRINE KROG, the pilot launch, while pitching due to the prevailing weather conditions, had briefly become entangled with the pilot ladder during the earlier pilot transfer at the NW Roads off Brunsbüttel. This is assumed by the crew to be the reason for the rupture of the pilot ladder in Rüsterbergen.

#### 4.5.3 Scene of the accident

The pilot ladder was deployed amidships on KATRINE KROG's starboard side (cf. Fig. 6).



Figure 6: Accident scene on board, taken on 26 November 2007

On the day of the accident, the pilot ladder hung entirely outboard. Two eyes, on which a pilot ladder can be secured, are welded onto the deck on the right side of the bulwark opening for pilot transfers on board KATRINE KROG (cf. Fig. 7).

Figures 6 and 7 show the new pilot ladder, which is of the same construction as the ladder used on the day of the accident.

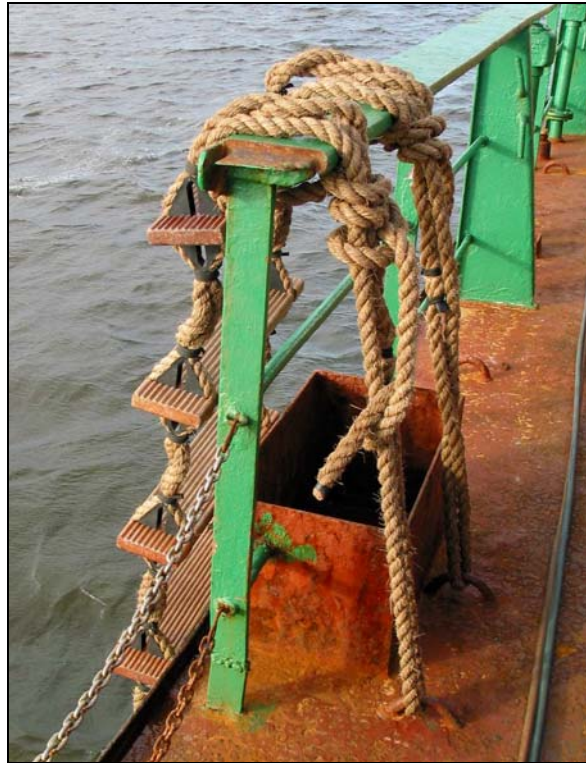


Figure 7: Eyes for securing the pilot ladder

No sharp-edged rail areas, which could have promoted a rupture of the pilot ladder, have been identified at the scene of the accident on board KATRINE KROG during BSU's survey (cf. Fig. 8).



Figure 8: Detail view of the rail

## 5 Summary

This marine casualty is due to the use of a damaged pilot ladder. Significant material stress due to a preceding entangling of a pilot launch could with hindsight neither be verified nor ruled out. But apart from any previous damages the ladder was not ready for use on the day of the accident due to the damaged step third to last, as it was in no proper and secure state according to para. 5 of the Pilotage Ordinance<sup>2</sup> in conjunction with SOLAS Chapter V Regulation 23.

BSU had already investigated into the use of a damaged pilot ladder on the occasion of the pilot injury on board MV EMUNA<sup>3</sup> in May 2007. Unlike the marine casualty then, the ladder used on board KATRINE KROG did not visually show any damages - apart from the damaged step - which could have prompted the crew to replace the ladder. Even considering its age, the ladder was generally usable. However, the ladder's ropes did not resist the usual impacts during a pilot transfer. This leading to the assumption the ropes had been previously stressed once or more in such a way, that the remaining extension was too low for further use.

KATRINE KROG's command immediately replaced the pilot ladder. As a result of the accident, the entire crew was sensitised to the issues of material stress on pilot ladders.

The BSU therefore does not find it appropriate to issue further safety recommendations.

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<sup>2</sup> Kiel Canal Pilotage Ordinance (Verordnung über die Verwaltung und Ordnung der Seelotsreviere Nord-Ostsee-Kanal I und Nord-Ostsee-Kanal II/Kieler Förde/Trave/Flensburger Förde) of 8 April 2003

<sup>3</sup> The investigation report has been published on 1 September 2007 (Ref. 190/07) and is available on the internet at [www.bsu-bund.de](http://www.bsu-bund.de).

## 6 Sources

- Statements of the crew of KATRINE KROG, the injured and the pilot on board as well as the Master of the pilot launch
- Excerpt from the bridge log of 17 September 2007
- Invoice for the pilot ladder
- Investigation reports and photographic documentation of the Water Police Kiel and Rendsburg
- Medical report for the injured
- Nautical chart of the Federal Maritime and Hydrographic Agency