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

Summary
Investigation Report 218/09

Very serious marine casualty

Fatal accident while hauling in the gangway on the MV YOHJIN on 17 June 2009 in Bremerhaven

15 March 2010

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.

Issued by:
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1 Summary of the marine casualty

On 17 June 2009 at about 0635[1], a fatal accident occurred on board the car carrier YOHJIN, sailing under Panamanian flag, in Bremerhaven shortly before the vessel cast off. The Philippine bosun was occupied with preparing the starboard gangway for hauling in. He was standing unsecured on its upper platform while working there and suddenly lost his footing, at which he fell approximately 5.50 meters onto the quay wall. An ambulance with an emergency doctor arrived at the scene of the accident a few minutes after it occurred. In spite of the efforts of the doctor, it was not possible to save the life of the seaman, who was consciousness to begin with. He succumbed to his injuries at the accident site at about 0735 after all attempts at resuscitation had been unsuccessful.

[1] All times shown in this report are Central European Summer Time (CEST = UTC + 2 hours).

2 SHIP PARTICULARS

2.1 Photo

Figure 1: Photo

2.2 Particulars

Name of the vessel:	YOHJIN
Type of vessel:	Car Carrier
Nationality/flag:	Panama
Port of registry:	Panama
IMO number:	8300468
Call sign:	3FCR5
Owner:	Yohjin Shipping Limited
Year built:	1983
Shipyard/yard number:	Kanasashi Co., Ltd. Toyohashi Works/3001
Classification society:	Nippon Kaiji Kyokai (NK)
Length overall:	164 m
Breadth overall:	28 m
Gross tonnage:	29,933
Deadweight:	11,662 t
Draught (max.):	8.42 m
Engine rating:	7,943 kW
Main engine type/manufacturer:	MITSUBISHI – UBE 6UEC 60 HA, Ube Industries, Ltd. Ube Machinery Works
(Service) speed (max.):	14.6 kts
Hull material:	Steel

2.3 Voyage particulars

Port of departure:	Bremerhaven
Port of call:	Vigo (Spain)
Type of voyage:	Merchant shipping/international
Cargo information:	Motor vehicles
Manning:	12
Pilot on board:	Yes

2.4 Marine casualty information

Type of event:	Very serious marine casualty
Date/Time:	17 June 2009/0635
Location:	Bremerhaven, Ostkaje, Kaiserhafen II
Latitude/Longitude:	φ 53°33.8'N λ 008°34.0'E
Ship operation and voyage segment:	Shortly before casting off
Place on board:	Starboard gangway/quay wall
Human factors:	Lack of occupational safety, influence of alcohol, fatigue
Consequences:	Death of a crew member

Excerpt from nautical chart 2920, BSH[2]

Figure 2: Nautical chart

[2] BSH = Federal Maritime and Hydrographic Agency

2.5 Shore authority involvement and emergency response

Who was involved:	Waterway Police Bremerhaven See-Berufsgenossenschaft[3] Emergency doctor
Resources used:	Ambulance
Actions taken:	First-aid measures (attempts at resuscitation)
Results achieved:	It was not possible to prevent the casualty from succumbing to his injuries at the accident site

[3] With effect from 1 January 2010, the See-BG and the BGF (German road vehicle maintenance employers' liability insurance association) have merged to form the Ship Safety Division (BG Verkehr).

3 COURSE OF THE ACCIDENT

3.1 External events

The YOHJIN moored at the berth in Bremerhaven with her starboard side on 16 June 2009 at 1936. Vehicles were transferred during the hours that followed. At about 0550 on 17 June, the crew was ordered to make the vessel ready for departure. The bosun (the subsequent casualty) also participated in the preparations for the forthcoming casting off manoeuvre. At 0625, he reportedly informed the Master that no further action was outstanding with the exception of securing the starboard gangway. At about the same time, the Master was reportedly informed by the pilot that he reportedly wished to board the vessel on the seaward side via the pilot ladder. Reportedly, after this had happened, the Master reportedly instructed the bosun to haul in and secure the starboard gangway. The bosun then reportedly went to the gangway wearing the required protective clothing. The remainder of the deck crew was reportedly already positioned at the manoeuvre stations in order to observe the tug and assist the watermen in casting off the lines. At 0635, a waterman reportedly suddenly called in the direction of the bridge and said that a person had reportedly fallen in the area of the gangway. The Master reportedly immediately requested shore-based assistance via radio and initiated first-aid measures on-board. An ambulance with an emergency doctor arrived at the scene of the accident a few minutes later. The doctor then provided medical care to the seriously injured casualty. He did not succeed in stabilising the condition of the casualty, who was bleeding heavily. At 0735, the doctor discontinued attempts at resuscitation and recorded the death of the bosun.

3.2 Presumable course of the accident

Information with respect to the position of the gangway at the time of the accident differs. Corresponding statements vary between the shipboard information, which indicates that this was reportedly lowered to the level of the pier, and information which indicates that the gangway was reportedly already 4/5s hauled in and was reportedly roughly horizontal to hull at the level of so-called gangway pocket[4]. Since the immediate course of the accident was only observed from ashore and there is no reason to doubt the information of the eyewitnesses there, it can be assumed that the gangway had actually been hoisted to the folding-in position in front of the hull.
It is clear that the fatally injured bosun was working alone and unsecured on the gangway. He had already removed the hand and safety ropes and loosened the safety net shore-side[5]. The gangway stanchions in the area of the steps of the companionway were still extended both shore-side and on board. The hand and safety ropes had still not been dismantled on board either. The gangway stanchions situated on the upper platform are of a plug-in design (see **Fig. 5** below). Due to their design, these are pulled out of their retention devices with a more or less inevitable jolting motion.

[4] Gangway pocket = recess in the hull to accommodate the gangway. This is hoisted into a horizontal position and then folded into the gangway pocket.
[5] The term 'shore-side' refers to the 'outer' limit of the gangway facing land. In contrast, 'on board' refers to the limit of the gangway facing the vessel.

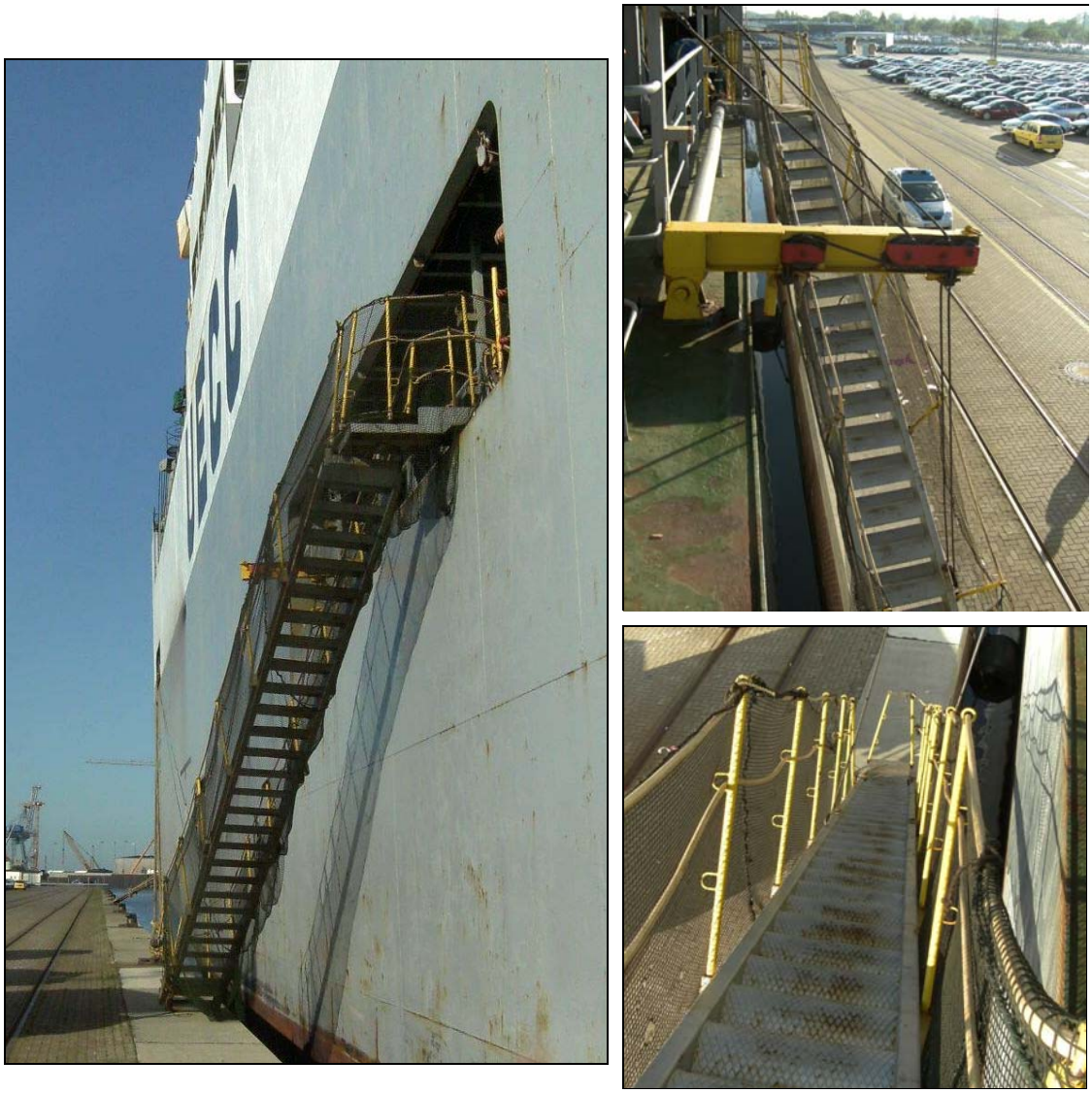


Figure 3: The gangway from different perspectives

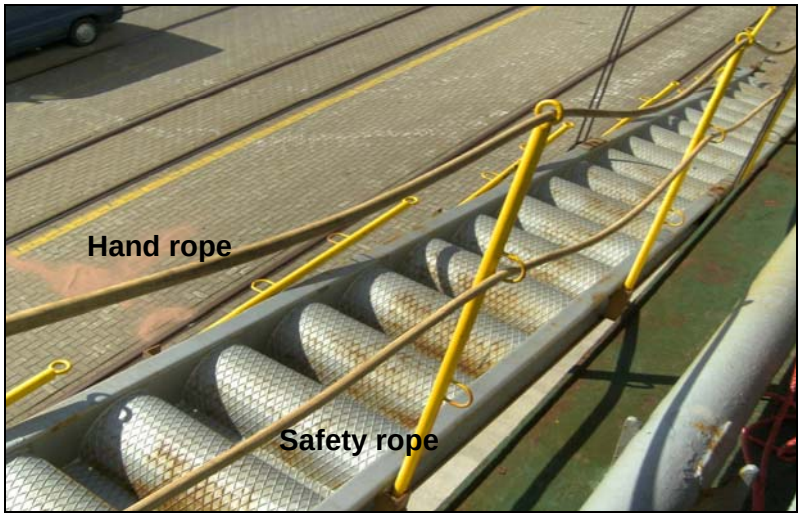


Figure 4: Folded outer gangway stanchions

Three of these plug-in platform stanchions were no longer in their retention devices after the accident. Two of them were in the immediate proximity of the casualty's position of impact on the pier. One of the two eyewitnesses onshore observed the bosun on the gangway platform working on the (outer) plug-in stanchions there immediately before he fell. It is assumed that in the process the seaman – possibly while jolting two stanchions, one with each hand, to release them – lost his balance and in the absence of a remaining handhold or of being secured fell (see reconstruction in **Fig. 6** with respect to the insufficient handholds).

Figure 5: The gangway platform with/without outer gangway stanchions inserted

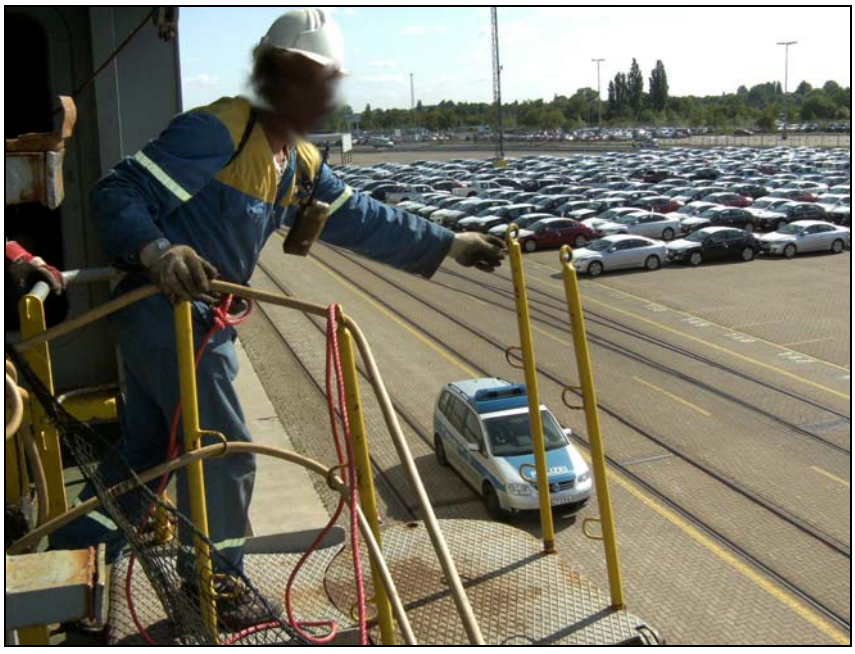
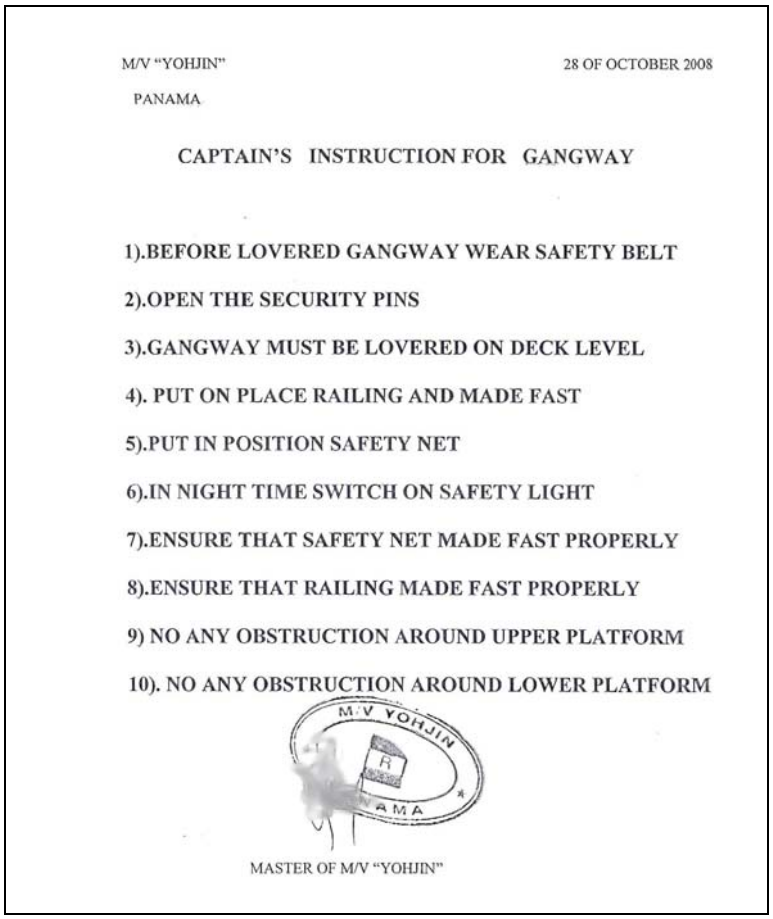


Figure 6: Risk of falling while removing the gangway stanchions

4 ANALYSIS

4.1 Procedure for clearing the gangway

A Master's order dated 28 October 2008 for handling the gangway exists on board the vessel (see **Fig. 7).** The instructions are very superficial and describe only a few aspects of safety in relation to deploying the gangway. Instructions were neither provided for hauling in and securing the gangway, nor was it specified how many crew members should carry out this task. However, it is probably no coincidence that the first instruction stipulates that a safety belt should be donned before the gangway is lowered. A literal interpretation of the instruction in question may lead one to limit its significance to the lowering procedure; however, the meaning and purpose of the instruction must surely be that personal protection is to be ensured for every task associated with handling the gangway, which involves a risk of falling.



M/V "YOHJIN" 28 OF OCTOBER 2008

PANAMA

CAPTAIN'S INSTRUCTION FOR GANGWAY

1).BEFORE LOVERED GANGWAY WEAR SAFETY BELT

2).OPEN THE SECURITY PINS

3).GANGWAY MUST BE LOVERED ON DECK LEVEL

4). PUT ON PLACE RAILING AND MADE FAST

5).PUT IN POSITION SAFETY NET

6).IN NIGHT TIME SWITCH ON SAFETY LIGHT

7).ENSURE THAT SAFETY NET MADE FAST PROPERLY

8).ENSURE THAT RAILING MADE FAST PROPERLY

9) NO ANY OBSTRUCTION AROUND UPPER PLATFORM

10). NO ANY OBSTRUCTION AROUND LOWER PLATFORM

M.V YOHJIN

MASTER OF M/V "YOHJIN"

Figure 7: Master's order for clearing the gangway

In contrast, it was not possible to provide operating instructions for or a technical description of the gangway. A technical survey of the gangway after

the accident by an inspector of the See-Berufsgenossenschaft[6] did not reveal any technical anomalies or defects.

4.2 Accident factors, alcohol/fatigue

When the first-aid measures were carried out, it was already evident that the casualty was under the influence of alcohol. It was possible to ascertain from witness statements and entries in the gangway log that the bosun left the vessel on 16 June at 2235 and then, after a brief stop in a supermarket, visited a bar, where he consumed an unknown quantity of alcoholic beverages during the hours that followed. He was back on board at 0300 on the morning of the day of the accident. He was then woken at 0530 to participate in the preparations for the vessel's departure. During an inspection of the bosun's quarters after the accident, it was noted that he had vomited while lying in his bed in the period before starting work. The forensic examination revealed that at the time of the accident the casualty's BAC level[7] was of 1.19 parts per thousand. When one considers that a person with a BAC level of 1.10 parts per thousand is absolutely unfit in terms of driving a vehicle, it becomes clear that the perception, assessment and response capacity of the bosun was severely restricted at the time of the accident due to the influence of alcohol.

Added to this is the fact that he had been exposed to an average workload of approximately 10 hours per day[8] for a continuous period of nearly two years on board. On the day before the accident, he worked from 0800 to 1200 and then again from 1500 to 2000, after which he can only have rested, if at all, for about two hours and after returning from his visit ashore only slept for a maximum of 2.5 hours.

On balance, it becomes clear that the weakened physical condition of the bosun must have contributed to the accident in a manner that was not insignificant. In contrast, inexperience in dealing with the gangway can be excluded because in his two years on board the vessel the 40-year-old bosun had cleared it on countless occasions and was regarded as an experienced seaman in other respects.

[6] See comment in Footnote 3 above.
[7] **B**lood **A**lcohol **C**oncentration.
[8] Source: Time sheet for the period 1 June 2009 to 16 June 2009.

5 CONCLUSIONS

The Federal Bureau of Maritime Casualty Investigation (BSU) issued an investigation report on 1 November 2007 concerning the fatal fall of a crew member while deploying the gangway on board the German container vessel 'HEINRICH S'.[9] That also concerned a crew member who stumbled and fell onto the pier from a height of about 5 meters while handling gangway stanchions without a safety belt or fall prevention equipment. The investigation of the accident revealed that depending on the design of the vessel, structural conditions in the area of the gangway can, in certain cases, make it very difficult to ensure that effective protection against falling exists. **Figure 8** illustrates this problem in relation to the gangway of the YOHJIN.

Figure 8: Work on the gangway with personnel protective equipment

It is evident that the red safety line would be only suitable for preventing the fall of the seaman who was working on the gangway to a very limited extent. The boom-construction for hoisting/lowering the gangway is a problem in terms of creating an obstacle when it comes to guaranteeing continuous and not too complicated personal protection. In addition, the illustrated safety methods urgently require the presence of an attendant who focuses on safety.

The same structural deficit affecting personal safety existed on the gangway system of the 'HEINRICH S'. In response to the accident, the shipping company installed a safety wire below the boom, which ran parallel to the folding-in position of the

[9] See Investigation Report 28/06: Very serious marine casualty 'Fatal occupational accident on board the 'MV HEINRICH S' in the port of Koper on 25 January 2006'.

gangway. Crew members could connect to this using a snap hook link before carrying out work on the gangway.

In safety recommendation 7.1 of the aforementioned investigation report, the BSU recommended that operators of sea-going vessels implement structural measures to facilitate uncomplicated use of fall prevention equipment in the area of the gangway. The enduring relevance of the other safety recommendations in the aforementioned report is also sadly demonstrated by the accident on board the YOHJIN. Therefore, at this point it should be stressed once again just how important an actively embodied culture of occupational safety on board is.[10] Moreover, the recommendation that an unambiguous operating procedure is provided for handling the gangway, which also includes any safety aspects to be observed, is explicitly referred to at this point. In order to give a sound basis to the formulation of such an operating procedure as well as to be able to respond adequately to technical problems experienced on board with the gangway, it should also be ensured that the technical documentation of the manufacturer of the gangway system is also kept on board.

The accident on board the YOHJIN is in all likelihood largely due to the deceased seaman's alcohol level and weakened condition due to sleep deficit. Each factor speaks for itself and requires no specific safety recommendation. This and the fact that the course of the accident – as far as the problem of inadequate occupational protection and structural issues is concerned – was already the subject of an investigation by the Federal Bureau of Maritime Casualty Investigation has led the BSU to conclude the investigation of this marine casualty with a summary report.

[10] With respect to fatal accidents involving catastrophic deficiencies in occupational safety on board, see also summary investigation reports 642/08 and 114/09 issued on 15 January 2010 in relation to fatal occupational accidents on board in the area of a suspended load and falling into a cargo hold.

6 Sources

- Investigations by Waterway Police (WSP) Bremerhaven
- Witnesses' accounts
- Nautical chart No. 2920, Federal Maritime and Hydrographic Agency (BSH)
- Photo, Dietmar Hasenpusch Maritime Photo-Productions and Agency
- Internet research (Equasis, ClassNK)