Bundesstelle für Seeunfalluntersuchung
Federal Bureau of Maritime Casualty Investigation

Investigation Report 343/22

Serious Marine Casualty

Allision with the Old Kattwyk bridge by FAIRPLAY 82 on 21 July 2022

20 December 2023

This 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 (Section 9(2) SUG).

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

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

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Amendments

Page	Amendment	Date

Contents

1 SUMMARY 7
2 FACTUAL INFORMATION 8
2.1 Photograph of the vessel 8
2.2 Ship particulars 8
2.3 Voyage particulars 9
2.4 Marine casualty information 10
2.5 Shore authority involvement and emergency response 11
3 COURSE OF THE ACCIDENT AND INVESTIGATION 12
3.1 Course of the accident 12
3.2 Investigation 12
3.2.1 Tug FAIRPLAY 82 13
3.2.1.1 Reversing data 14
3.2.1.2 Principle of the steering controls 14
3.2.1.3 Further technical information 15
3.2.1.4 Alarm event log 15
3.2.2 Crew 16
3.2.3 Course of the voyage 17
3.2.4 VHF recordings 23
3.2.5 The Kattwyk bridge 24
4 ANALYSIS 27
5 CONCLUSIONS 28
6 SOURCES 29
7 ANNEX 30

Figures

Figure 1: FAIRPLAY 82 8
Figure 2: Navigational chart showing the scene of the accident 10
Figure 3: Photograph 1 of the damage 12
Figure 4: Photograph 2 of the damage 13
Figure 5: Course of the voyage at 1810 17
Figure 6: Course of the voyage at 1815 18
Figure 7: Course of the voyage at 1816 18
Figure 8: Radar image at 1816 19
Figure 9: Course of the voyage at 1817 19
Figure 10: Course of the voyage at 1817 – allision with the bridge 20
Figure 11: Radar image at the time of the allision (1817) 20
Figure 12: Course of the voyage at 1824 21
Figure 13: Radar image at 1818 22
Figure 14: Radar image at 1819 22
Figure 15: Radar image at 1824 23
Figure 16: Schematic drawing of the old Kattwyk bridge involved in the allision 25
Figure 17: The Kattwyk bridges, which were also lowered at the time of the accident. 26

Abbreviations

AC/DC	Alternating current / direct current
BNWAS	Bridge navigational watch alarm system
CPP	Controllable pitch propeller
GLWSP	Joint Control Centre of the Waterway Police of the Coastal States in Cuxhaven
GMDSS	Global maritime distress and safety system
GT	Gross tonnage
HPA	Hamburg Port Authority
HVTC	Vessel Traffic Centre of the Port of Hamburg
kts	Knots
m	Metres
ME	Main engine
min.	Minute
PLSH, ODIW	Sensor designations
pp.	Pump
pt.	Port
s	Second
SOG	Speed over ground
SRP	Schottel rudder propeller
stb.	Starboard
STCW	Standards of Training, Certification and Watchkeeping for Seafarers
SYMAP	Brand name of a protective relay
V	Volts
VDR	Voyage data recorder
VHF	Very high frequency
WSP	Waterway police

1 SUMMARY

On 21 July 2022, the bulk carrier TANG LAND (sailing under the flag of Panama) shifted from the Norderelbpfähle [northern Elbe pilerow] to the Moorburg power station in the port of Hamburg with the assistance of tugs FAIRPLAY 82, FAIRPLAY IX and BUGSIER 9. At about 1730, the towed convoy passed the two open Kattwyk bridges in a south-easterly direction. After this passage, the lift bridges were lowered to enable rail and road traffic to cross again.

The FAIRPLAY 82 was the first tug to be stood down after the TANG LAND made fast at the berth of the Moorburg power station. The tug picked up speed and sailed at 6.5 kts towards the southern Alte Kattwykbrücke old bridge, which was still lowered. According to the AIS[1], the allision happened at 1817, during which the tug's wheelhouse was almost completely destroyed. The people there – the master and the chief engineer (Chief) – managed to escape with only minor injuries by kneeling just low enough. The third crew member, a ship mechanic, had just entered the superstructure. He fell down a stairway due to the sudden jolt that went through the vessel, also suffering minor injuries in the process.

Since the master of the FAIRPLAY 82 has not yet made a statement with regard to the course of the accident and the other witnesses did not contribute to identifying the cause of the allision, either, the BSU can only assume that the former was so distracted by steering the vessel that he did not notice he was sailing for the Kattwyk bridge unchecked.

[1] AIS: Automatic identification system

2 FACTUAL INFORMATION

2.1 Photograph of the vessel

Figure 1: FAIRPLAY 82[2]

2.2 Ship particulars

Name of ship:	FAIRPLAY 82
Type of ship:	Harbour tug
Flag:	Germany
Port of registry:	Hamburg
IMO number:	9693252
Call sign:	DIIH2
Owner (according to Equasis):	Fairplay Towage
Shipping company:	Bugsier-, Reederei- & Bergungs-GmbH & Co. KG
Year built:	2014
Shipyard:	Fassmer Lemwerder
Classification society:	Bureau Veritas
Length overall:	31.50 m
Breadth overall:	12.00 m
Draught (max.):	6.20 m
Gross tonnage:	440
Engine rating:	4,498 kW

[2] Source: Shipping company.

Main engine:	Schottel Tractor
Service speed:	13 kts
Hull material:	Steel
Minimum safe manning:	3

2.3 Voyage particulars

Port of departure:	Port of Hamburg at the Moorburg power plant
Port of destination:	Hamburg
Type of voyage:	Merchant shipping/ national
Cargo information:	None
Crew:	3
Draught at time of accident:	D_f = 5.70 m, D_a = 5.80 m
Pilot on board:	No

2.4 Marine casualty information

Type of marine casualty:	Serious accident, allision with a bridge by a tug
Date, time:	21/07/2022, 1817
Location:	Port of Hamburg, Kattwyk bridge
Latitude/Longitude:	Φ = 53°29.4'N, λ = 009°57.1'E
Ship operation and voyage segment:	Tug assistance completed, fairway mode
Place on board:	Amidships, wheelhouse
Consequences:	Three crew members with minor injuries, heavy damage to the tug's wheelhouse

Extract from Navigational Chart INT 1663, BSH

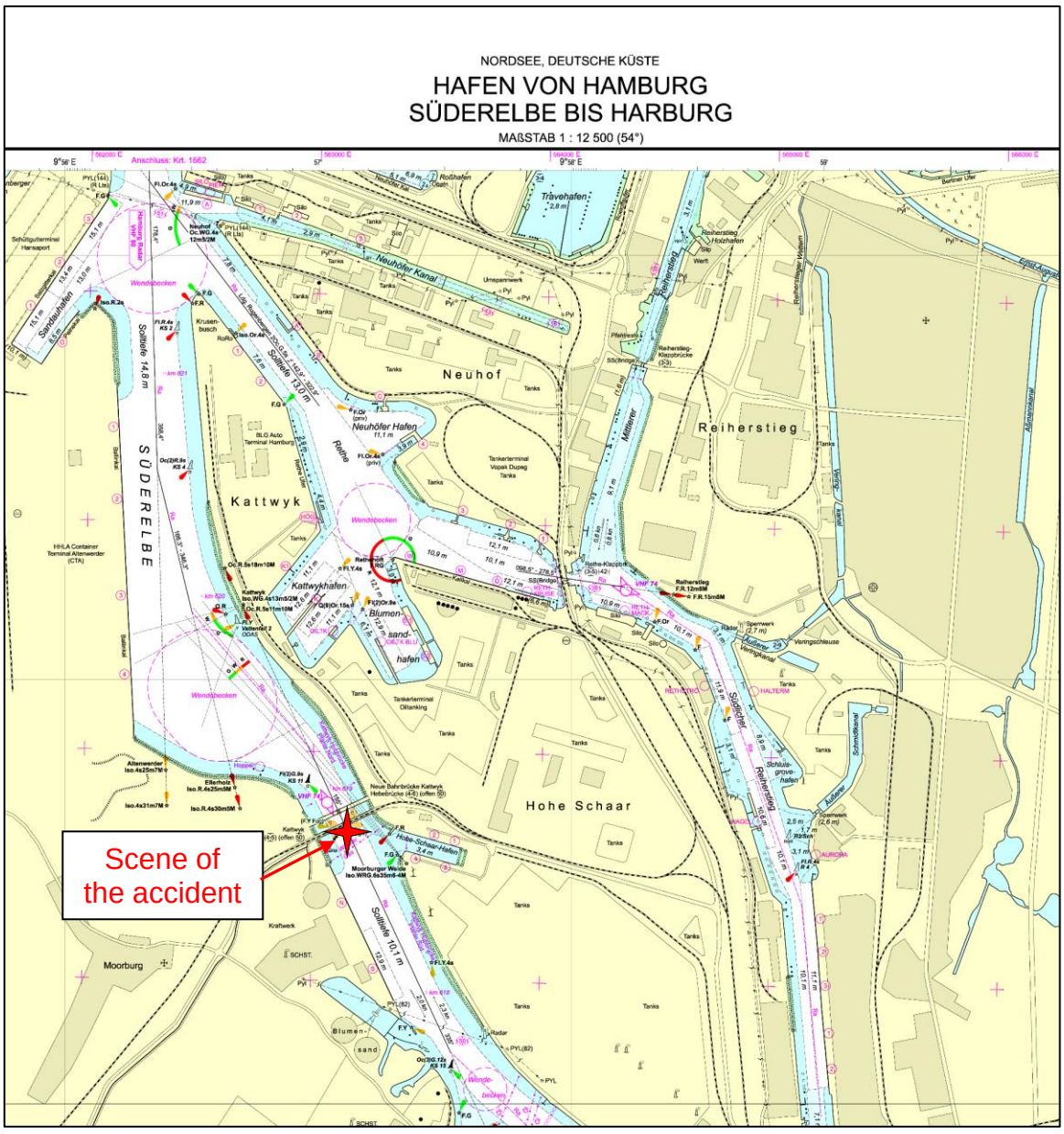

Figure 2: Navigational chart showing the scene of the accident

2.5 Shore authority involvement and emergency response

Agencies involved:	Bridge master of the Kattwyk bridge, Vessel Traffic Centre Hamburg, rescue services
Resources used:	Tug FAIRPLAY IX
Actions taken:	FAIRPLAY IX takes FAIRPLAY 82 alongside and tows the distressed vessel to the berth; first aid administered by requested ambulance; road and rail closed by bridge master

3 COURSE OF THE ACCIDENT AND INVESTIGATION

3.1 Course of the accident

On 21 July 2022, the seagoing vessel TANG LAND shifted from the Norderelbpfähle [northern Elbe pilerow] to the Moorburg power station in the port of Hamburg with the assistance of tugs FAIRPLAY 82, FAIRPLAY IX and BUGSIER 9. At about 1730, the towed convoy passed the two open Kattwyk bridges in a south-easterly direction. After this passage, the lift bridges were lowered again to enable rail and road traffic to cross.

The FAIRPLAY 82 was the first tug to be stood down after the TANG LAND made fast at the berth of the Moorburg power station. The tug picked up speed and sailed at 6.5 kts towards the lowered southern Alte Kattwykbrücke old bridge. According to the AIS, the allision happened at 1817, during which the tug's wheelhouse was almost completely destroyed. The people there – the master and the chief – managed to escape with only minor injuries by kneeling just low enough. The third crew member, a ship mechanic, had just entered the superstructure and fell down a stairway due to the sudden jolt that went through the vessel, also suffering minor injuries in the process.

3.2 Investigation

On the day that followed, a team from the BSU inspected the damage to the tug and spoke with the crew.

Figure 3 shows that the wheelhouse was torn off completely and tilted to the stern. The control stations and operating panels remained standing and the crew had already covered them with a tarpaulin.

Figure 3: Photograph 1 of the damage[3]

[3] Source: BSU.

Figure 4 illustrates with a view from aft how the upper half of the wheelhouse was torn towards the stern. The people in the wheelhouse only avoided being torn with it by kneeling down. They suffered only minor injuries, most of which were small cuts caused by the wheelhouse windows breaking into countless tiny shards, which flew into them.

Figure 4: Photograph 2 of the damage[4]

3.2.1 Tug FAIRPLAY 82

Fassmer GmbH & Co. KG expanded its shipbuilding portfolio for special-purpose vessels when it was commissioned with the development, production and delivery of two 32 m seaport assistance tugs for the Hamburg-based Bugsier-, Reederei- und Bergungs-Gesellschaft mbH & Co. KG.

Commissioned in 2014 with the names BUGSIER 7 and BUGSIER 8, the tugs with a length and breadth of 31.50 m and 11.30 m, respectively, can reach a speed of 13 kts. Their hull shape and propulsion system were optimised for a required bollard pull of at least 70 t. The vessels are designed for use in seaports and near the coast. The two tugs, each with an engine output of 2 x 2,249 kW and two powerful Schottel rudder propellers, are high-performing powerhouses. In each case, a bollard pull of 72 t was measured and certified in the presence of Germanischer Lloyd. The tugs offer sufficient space for a crew of six and are operated by three people.[5]

[4] Source: BSU.
[5] Source: Fassmer GmbH.

In June 2022, the BUGSIER 7 was renamed FAIRPLAY 82.

Due to her size, the tug does not need to be equipped with a VDR and the shipping company did not equip her with one for that reason.

On 8 September 2022, an investigation team from the BSU surveyed the vessel in the Fassmer-Werft shipyard, which carried out the repairs, and had the tug's propulsion system explained to them by staff of Schottel GmbH. The engineers also read out and interpreted the tug's alarm logs on this occasion.

Technical data and information on the FAIRPLAY 82's propulsion system, a double Schottel rudder propeller (SRP) follow:

3.2.1.1 Reversing data

- The systems have two options for controlling the speed and direction of travel:
  - controllable pitch propeller (CPP);
    10-15 s for 0-max. pitch
    21 s from full ahead to full astern and 23 s in the opposite direction (according to the specifications, i.e. from full astern to full ahead)
  - pivoting of the entire SRP;
    takes 12-15 s for 180° in the cycle (i.e. without the slight start-up delay)
- The closed-loop control works with both (both happening simultaneously, of course). Accordingly, it takes no more than 21 s to switch the propulsion system from full ahead to full astern.
- Since the times must be achieved in all operating conditions in the shipyard trials, they were no worse than planned for in the neutral weather and current conditions on the day of the accident.
- The entire propulsion system is completely redundant in every respect, meaning that each SRP can manoeuvre the tug alone.

3.2.1.2 Principle of the steering controls

- The control lever on the bridge is called 'the copilot'.
- The master uses the copilot to make a setting (direction, speed).
- The corresponding control signal is sent to the steering hydraulics.
- The corresponding hydraulic valves are pressurised and open in the required direction.
- The SRP pivots and the propeller's speed and pitch are changed.
- The copilot transmits the same signal for the pitch as for the SRP (propeller speed).
  There are various adjustable control options:

- linear characteristic curve for the rated speed and for the pitch, or
- first full pitch immediately, then an acceleration of the rated speed, or vice versa
    - this depends on the vessel's operating profile (tug: full pitch first, which transmits the most power at the highest possible speed),
    - as well as the propeller/engine combination
    - and is configured during commissioning at the customer's request.

- The electronic control unit with control panel is also redundant: once on the bridge, twice (once per system) in the engine room.

3.2.1.3 Further technical information

- The hydraulic pumps and all associated system components are designed with complete redundancy and complete system separation.
- There are two hydraulic pumps *per side* for **pivoting** an SRP. Only one pump runs at any one time during normal operation. A pressure switch monitors the system's pressure in the direction of both pumps. The other pump starts automatically if the pressure in the running system drops. If there are no problems, the two pumps are run in 'Monday-Tuesday operation' (alternating on a daily basis).
- These hydraulic pumps are each permanently flange-mounted to the travel motors and run at the same rated speed.
- There are two hydraulic pumps *per side* for **adjusting the pitch** of an SRP. Only one pump runs at any one time during normal operation. The other pump starts automatically if the pressure in the running system drops. If there are no problems, then these two pumps are also run in 'Monday-Tuesday operation'.
- There is only one valve block *per side* for 'distributing' the hydraulic oil volumetric flow rate for the pitch adjustment (always controlled by either pump I or pump II).

3.2.1.4 Alarm event log

The below conclusions can be drawn from the alarm event log for this incident[6].

- The first alarms issued do not concern the propulsion system but rather the failure of devices (at least involving a component like an antenna or operating panel) on the bridge or in the mast (e.g. GMDSS, navigating lights, fire alarm system, davit system, intercom). Several devices issue a loss of voltage alarm at the same time.
- The first alarm relating to the propulsion system concerns the CPP hydraulic pump in question's hydraulic oil pressure. At the same time, three of the five high-voltage fields failed.

[6] See point 7 Annex.

- The following alarms affecting the propulsion system can all be traced back to faulty power supply: AC/DC converter fault, lubricating oil pump fault, phase fault in the CPP hydraulic pump motors, hydraulic oil pressure also too low on the other CPP pump, CPP blade pitch adjustment does not follow (no hydraulic pumps without power, no oil pressure without hydraulic pumps, no rudder blade pitch adjustment on the CPP without oil pressure).
- On the other hand, the SRP's *control system* (i.e. the control electronics) did not fail at any time. There is no alarm for this at any time. The copilot's signal was therefore transmitted correctly at all times. The control signals are transmitted at 24 V and the alarms show that the failures only affected the high-voltage network. The Schottel engineer drew special attention to this fact, as the master had stated that the Schottel did not switch to ASTERN. Accordingly, technical evidence opposed this statement.
- Since the alarms caused by the signal mast being buckled and cables around the mast and wheelhouse being torn out preceded the SRP alarms, it is reasonable to assume that the torn out cables led to at least one short circuit that affected a large part of the vessel's power supply. This is because power supply alarms for units not located on the deck, e.g. compressors, separators, auxiliary diesel power management, etc. – and the SRP – subsequently became more frequent.
- The tearing out of the cables – due to the allision with the bridge – therefore occurred *before* the losses of voltage. Accordingly, the failures of the units, electronics and CPP hydraulics were not the cause but rather a consequence of the allision.

3.2.2 Crew

The master holds a certificate of competency in accordance with Regulation II/2 of the Annex to the STCW Convention and has many years of experience in various areas of seafaring, including at Hapag-Lloyd AG. He has been with Bugsier/Fairplay since 2007. He started as chief mate, later master, initially as a stand-in on all the fleet's tugs, including internationally, e.g. in the offshore sector. He had been the regular master of the BUGSIER 7/FAIRPLAY 82 for six years at the time of the accident.

There are usually three people on board the vessel when she is in harbour mode: master, chief engineer (Chief) and ship mechanic (Bosun). According to everyone involved, the relationship between the crew on the FAIRPLAY 82 was reportedly very 'informal'. The tug has a crew of six people at sea.

The Chief is a trained ship's engine room mechanic and holds a certificate of competency as chief engineer officer in accordance with Regulation III/2 of the Annex to the STCW Convention[7].

[7] Eighth Ordinance on Amendments to the Annex to the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, of 28 June 2013. Federal Law Gazette 2013, Part II No 18, published in Bonn on 4 July 2013.

The third member of the crew is a ship mechanic who has worked for this tug operator since 2004. He has worked with the master and chief officer on the FAIRPLAY 82 for about a year.

However, the colleagues have all known each other for many years.

3.2.3 Course of the voyage

Since the FAIRPLAY 82 had no VDR or other evaluable data on the course of her voyage, the BSU referred to the recordings of the Joint Control Centre of the Waterway Police of the Coastal States in Cuxhaven (GLWSP).

A recording is also available from the Vessel Traffic Centre of the Port of Hamburg (HVTC). In addition to the AIS data, this also includes the radar image recordings. This illustrates the course of events after the allision.

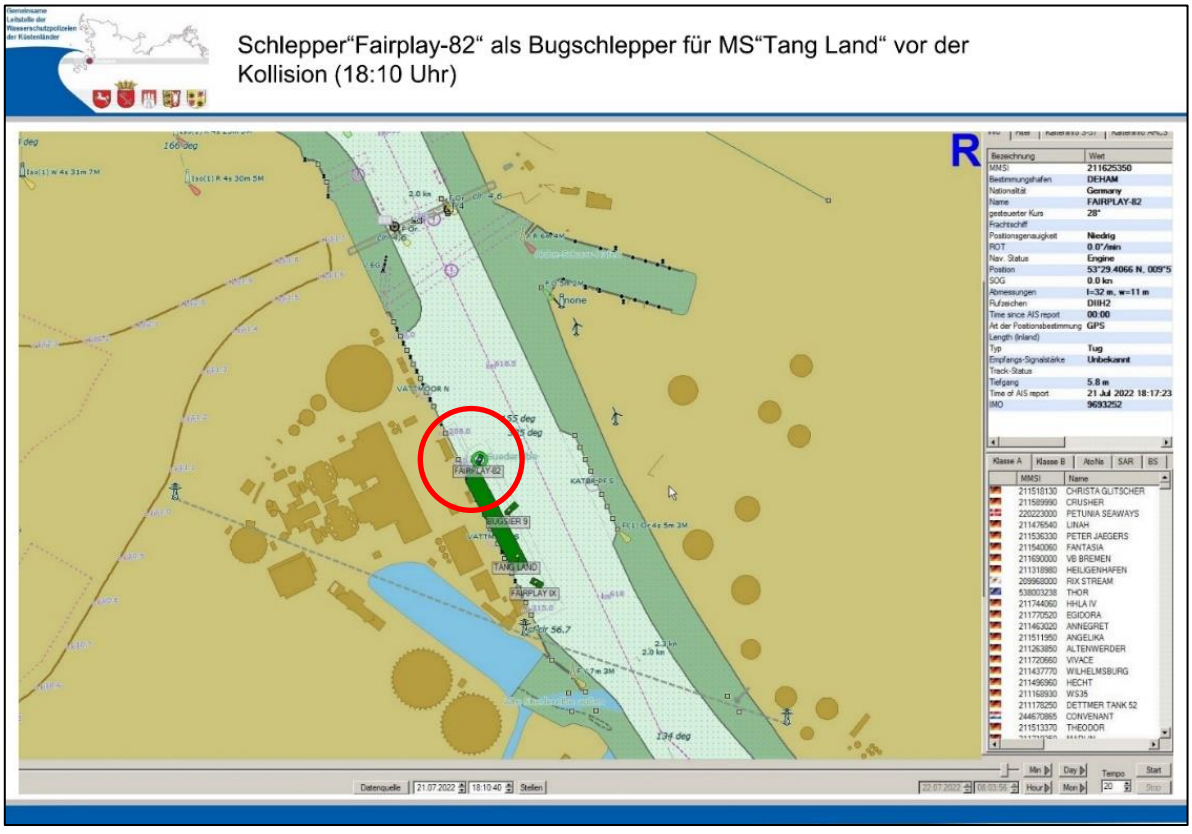

Figure 5: Course of the voyage at 1810[8]

The FAIRPLAY 82's involvement in the TANG LANG's berthing manoeuvre had finished by about 1810 and she left the berth at about 1814 to head for the Kattwyk bridge. Figure 6 shows the tug approach the bridge at increasing speed.

[8] Source: GLWSP.

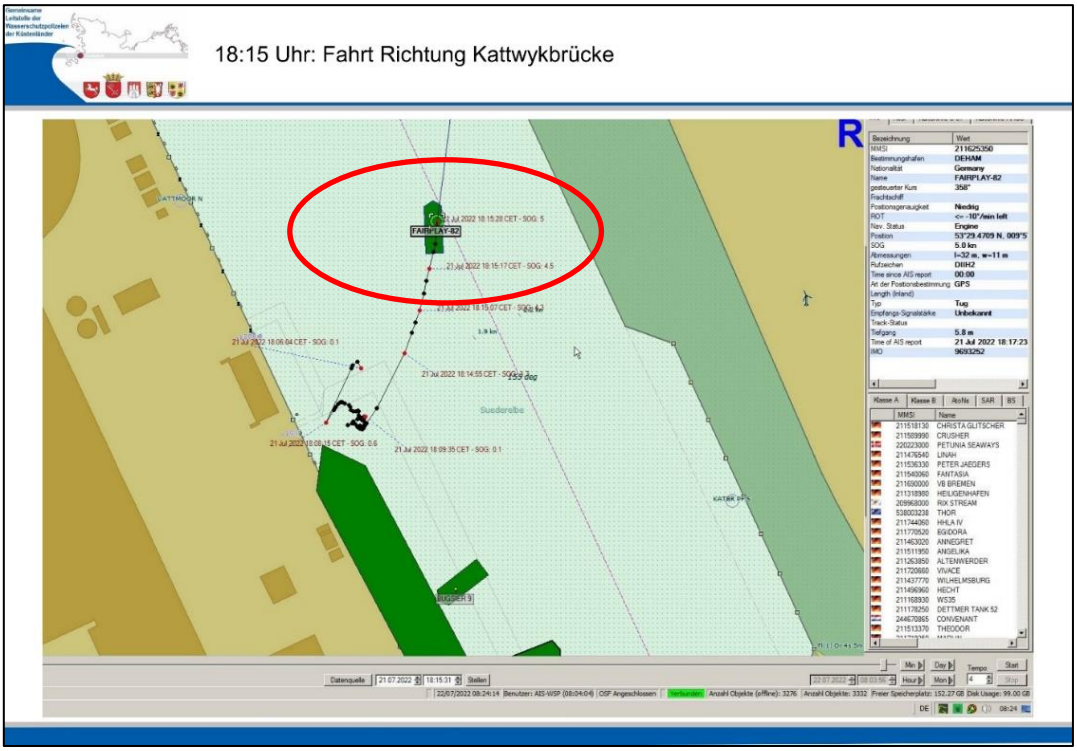

Figure 6: Course of the voyage at 1815[9]

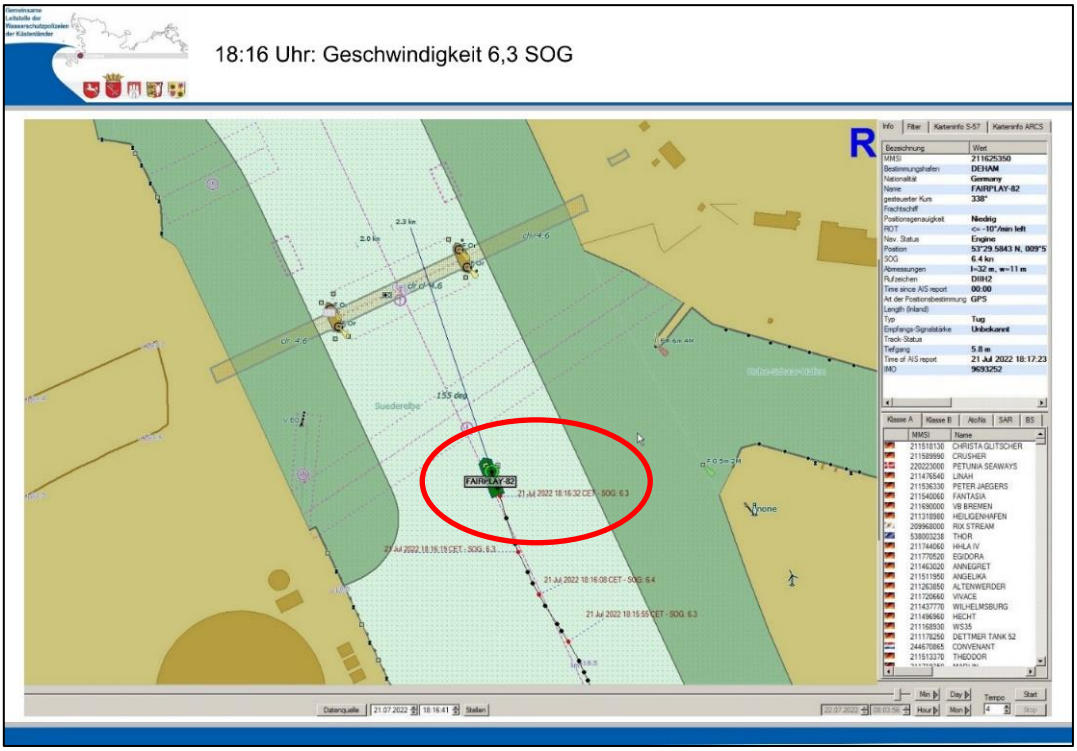

Figure 7: Course of the voyage at 1816[10]

Figure 7 and Figure 8 show the same content: FAIRPLAY 82 is now moving directly towards the Kattwyk bridge at 6.5 kts.

[9] Source: GLWSP.
[10] Source: GLWSP.

Figure 8: Radar image at 1816[11]

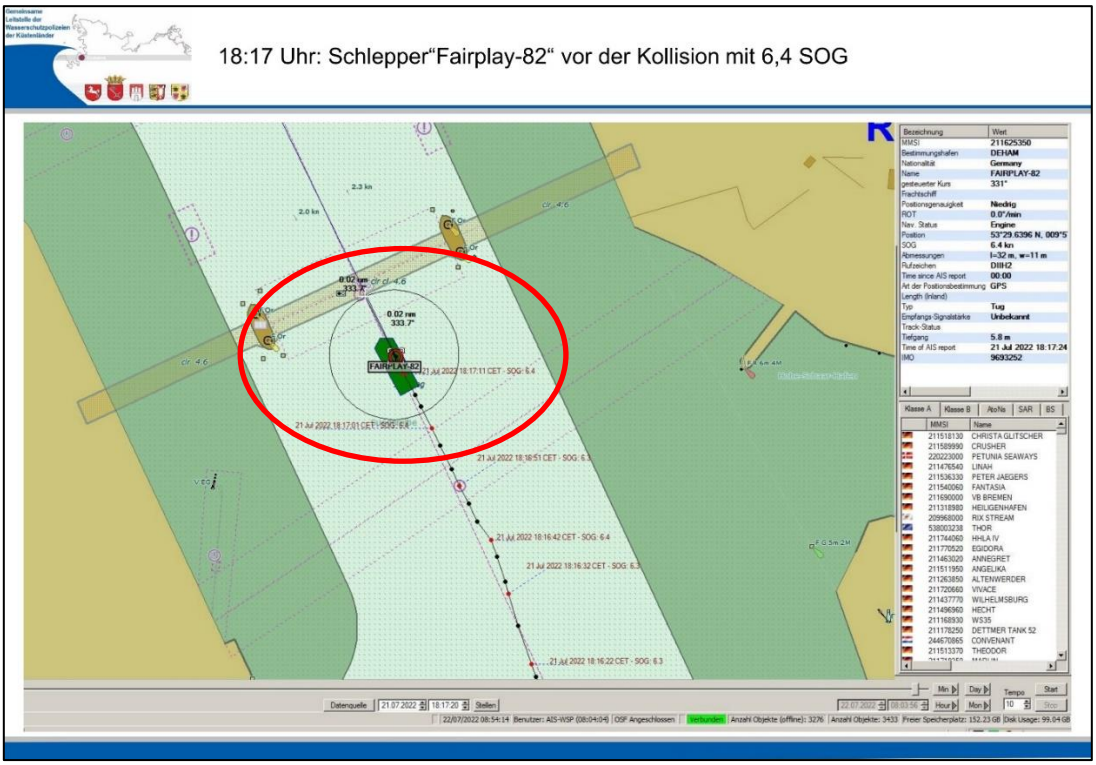

Figure 9: Course of the voyage at 1817[12]

[11] Source: HVTC.
[12] Source: GLWSP.

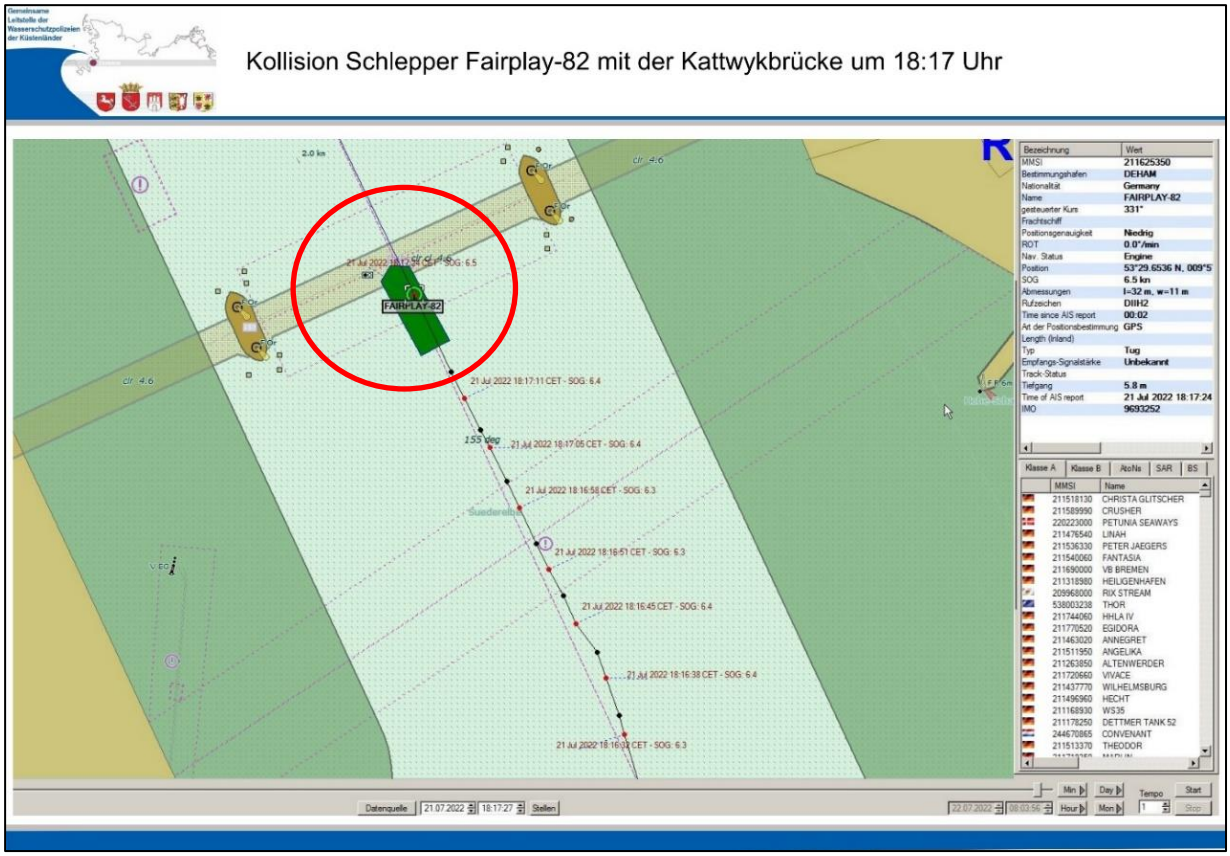

Figure 10: Course of the voyage at 1817 – allision with the bridge[13]

Figure 11: Radar image at the time of the allision (1817)[14]

[13] Source: GLWSP.
[14] Source: HVTC.

Figure 11 confirms the information on Figure 10. All subsequent images of the GLWSP are not credible, as they only refer to AIS signals. However, the FAIRPLAY 82's signal is no longer available due to the antenna being torn off. For this reason, more emphasis is placed on the HVTC's recording, which also includes the radar images.

While Figure 12 shows that the FAIRPLAY 82 is still below the Kattwyk bridge, the radar recording in Figure 13 clearly shows that the tug has long since moved astern under the bridge and out.

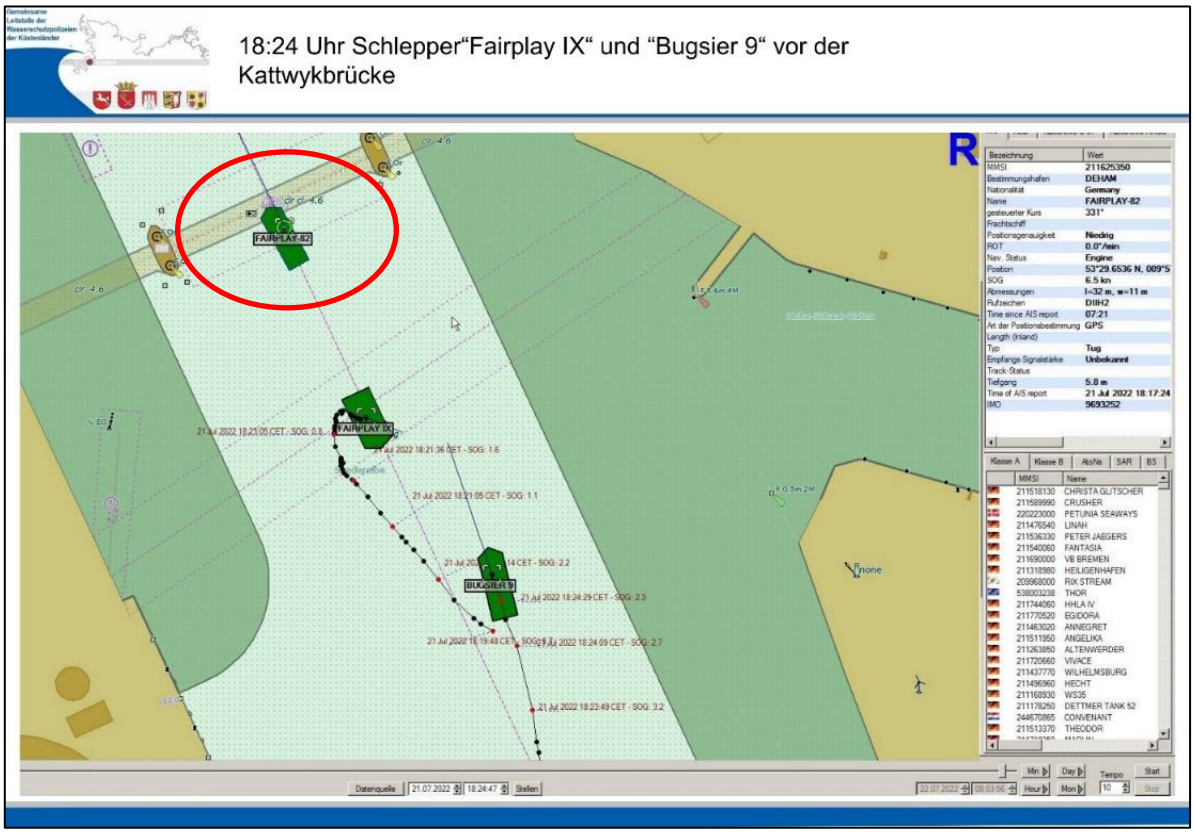

Figure 12: Course of the voyage at 1824[15]

[15] Source: GLWSP.

Figure 13: Radar image at 1818[16]

Figure 14: Radar image at 1819[17]

[16] Source: HVTC.
[17] Source: HVTC.

Figure 15 shows the actual situation at 1824: FAIRPLAY IX is already alongside FAIRPLAY 82 and towing her to the pier, while BUGSIER 9 is in the vicinity on standby.

Figure 15: Radar image at 1824[18]

3.2.4 VHF recordings

In addition to the AIS data, the HVTC also provides radar image and VHF call recordings, which are reproduced below analogously.

At 1815, BUGSIER 9 reported in to the Kattwyk bridge and requested that the bridges be opened for the return voyage of the three tugs. At 1817, the bridge master contacted the BUGSIER 9 and informed her that he reportedly first had to allow a locomotive to cross the bridge and would then start raising the bridges.

[18] Source: HVTC.

After the allision with the bridge by FAIRPLAY 82, the HVTC asked if all was well at 181825 on VHF channel 13. There was no reply.

At 181940, the bridge master of the Kattwyk bridge asked BUGSIER 9 if everything was under control. The tug replied that she was reportedly not in radio contact with the FAIRPLAY 82 and that both tugs were now proceeding to the distressed vessel. The bridge master replied that he would leave the bridge down for the time being until someone had inspected it.

At 182454, the HVTC enquired on channel 14 about the current situation. BUGSIER 9 replied that the FAIRPLAY IX was making fast the FAIRPLAY 82 alongside so as to tow her to the pier. It appears that the crew of the FAIRPLAY 82 has not suffered any injuries.

At 183345, the master of the FAIRPLAY 82 contacted the HVTC on channel 14 and stated that his Schottel had not switched to astern. That was reportedly why he had sailed his tug into the Kattwyk bridge. He confirmed that there had reportedly been no damage to the environment and that his tug's wheelhouse was reportedly completely destroyed. He reportedly did not want to make any commitments with regard to the damage to the Kattwyk bridge, which was reportedly so severe that he had reportedly given the bridge master a recommendation that vehicles be prohibited from driving over it for the time being. There were no personal injuries.

At 182745, BUGSIER 9 asked the bridge master on channel 13 when he would open the bridges so that she and the FAIRPLAY IX could leave the harbour basin.

At 183823, the FAIRPLAY 82's master contacted the HVTC on VHF channel 14, requesting that she be allowed to go to the pier of the Moorburg power station before the TANG LAND. This was granted.

3.2.5 The Kattwyk bridge

The Kattwyk bridges are two lift bridges in the port of Hamburg that cross the Süderelbe [southern Elbe]. The bridges link Moorburg with the Kattwyk peninsula to the east, which belongs to the Elbe island of Hohe Schaar (or Wilhelmsburg). At 290 m in length, the older bridge was originally a combined railway and road bridge but has only been used as a road bridge since September 2020. This Kattwyk bridge was opened on 21 March 1973 and with its 70-metre-high end portals, a lift height of 46 metres, as well as a clearance height and width of 53 and 96 metres, respectively, it was Germany's largest lift bridge. At the time of its construction, it was the world's biggest lift bridge. The new Kattwyk railway bridge, which opened in 2020, is now Germany's biggest lift bridge and its span of 130.85 m makes it Europe's longest lift bridge.[19]

[19] Source: Wikipedia, retrieved on 26 July 2023, refers to:
Franklin Kopitzsch, Daniel Tilgner (publ.), 'Hamburg Lexikon', 4th updated and expanded special edition. Ellert & Richter, Hamburg 2010, ISBN 978-3-8319-0373-3, p. 383, and 'Neue Bahnbrücke Kattwyk' at kl-ing.de. Klähne Bung engineering firm; retrieved on 26 December 2020.

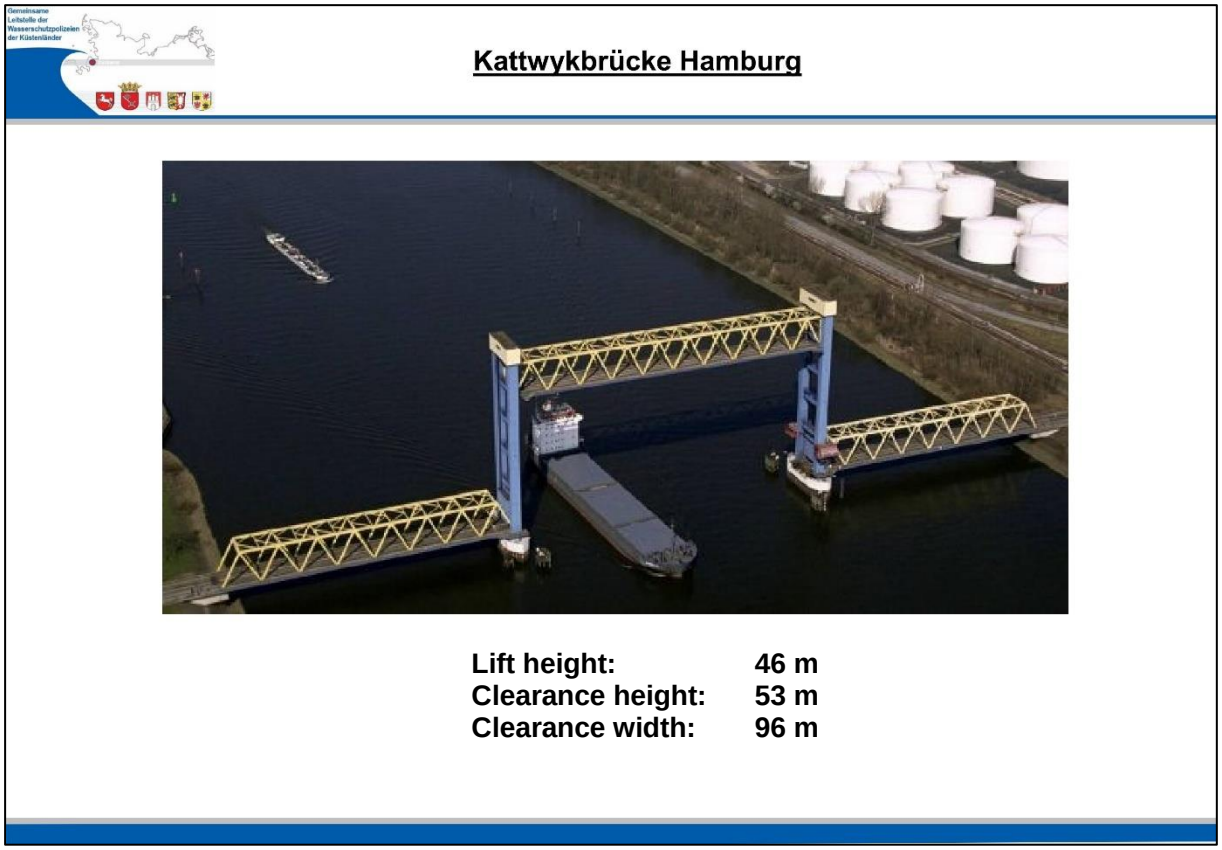

Figure 16: Schematic drawing of the old Kattwyk bridge involved in the allision[20]

Bridge operation is continuously ensured by HPA personnel. The foreman responsible for water management facilities at the time of the accident stated that he had started work in the control station at 1230. There was a registration for the passage of the TANG LAND for 1730. To that end, he started opening the bridges at 1722. From his control station, he was able to watch as the three tugs turned the TANG LAND in the turning basin and then towed her stern first through the two open Kattwyk bridges to her berth at Moorburg power station. After passing the bridges, the pilot contacted him and he was able to lower the bridges again.

[20] Source: GLWSP.

Figure 17: The Kattwyk bridges, which were also lowered at the time of the accident.[21]

At about 1815, the BUGSIER 9 reported in to the bridge control station on VHF, requesting the passage of the three tugs back outside. This was relayed to the stationmaster at Hohe Schaar, who stated that a locomotive would first cross the bridge. The bridge master informed the BUGSIER 9 of this on VHF. Shortly after, he noticed a tug that was already about 20 m from the Alte Kattwyk bridge. He thought nothing more of this, as it was reportedly quite common for tugs to move this close to the bridge early on when waiting for it to open. The bridge master was just setting the opening height of the bridges to 20 metres when he heard a loud crash. He looked out of the window and saw that the tug was already under the Alte Kattwyk bridge. The tug's superstructure had evidently just struck the southern side of the Alte Kattwyk bridge, which was still lowered. Shortly after, he was able to see the tug between the Alte and Neue Kattwyk bridges and noted that the vessel's superstructure was heavily damaged. The tug then apparently sailed astern at full speed in a southerly direction back under the Alte Kattwyk bridge, coming to a halt a few metres further on.

The bridge master asked on VHF if all was well. He received no reply from FAIRPLAY 82. BUGSIER 9 said she would take care of the distressed vessel. The bridge master then watched the BUGSIER 9 take the FAIRPLAY 82 alongside and tow her to the pier.

He could not see the damage to the Kattwyk bridge from his control station. When the FAIRPLAY 82's master contacted him on VHF and recommended that the bridge be closed, the bridge master arranged for it to be closed to road traffic. It transpired in the course of the evening that the bridge was only slightly damaged and its closure would not have been necessary.

[21] Source: Waterway Police Hamburg.

4 Analysis

After analysing the limited evidence available, it has not been possible to identify the cause of the allision.

The master of the FAIRPLAY 82's only statement on the matter was made in the heat of the moment, as it were, on VHF to the Vessel Traffic Centre of the Port of Hamburg a few minutes after the incident. Presumably still in a state of shock, he explained that the Schottel had not switched to astern and that his tug had therefore reportedly struck the Kattwyk bridge unchecked.

The investigations of the staff of Schottel GmbH in the shipyard later demonstrated that the opposite was the case. The engine's error logs[22] showed very clearly that everything worked properly until one alarm after another was issued due to the allision and associated destruction of the wheelhouse.

None of the other witness statements contained any indication of the cause of the course of the voyage.

[22] See point 7 Annex.

5 CONCLUSIONS

A technical failure can be ruled out as the cause of the accident. Although there was no VDR, which explains the lack of internal technical recordings for the course of the tug's voyage, the engine alarm logs show that everything worked perfectly from a technical point of view until damage (resulting in numerous error messages in the vessel) occurred during the collision.

Furthermore, a statement from the master on the course of the accident is still outstanding and the other witnesses were not able to contribute anything illuminating to identify the cause of the collision, either. Therefore, the BSU can only assume it was a case of human error. It was not possible to clarify the reason for this failure – which could have been indisposition, microsleep, an intense conversation or even the use of a mobile phone, for example.

Due to these conclusions, the BSU is dispensing with the publication of safety recommendations.

6 SOURCES

- Investigations by Waterway Police (WSP) Hamburg
- Written explanations/submissions
  - Crew
  - Shipping company
- Testimony of the bridge master
- Navigational charts and ship particulars, Federal Maritime and Hydrographic Agency (BSH)
- AIS, radar and VHF recordings, HVTC and GLWSP
- Elaborations and statements by engineers from Schottel GmbH

7 ANNEX

An extract from the FAIRPLAY 82's seized error log follows. Alarms issued when/after the allision with the Kattwyk bridge occurred are highlighted yellow.

Date	Time	Event	Text	Value	Alarm type
2022-07-21	030559.000	New alarm	ME pt. overload 102% (PLSH.1)	1	alarm min
2022-07-21	030602.000	Request audible ack.			
2022-07-21	030602.000	Request audible ack.			
2022-07-21	030602.000	Audible ack.			
2022-07-21	030609.000	Request visual ack.			
2022-07-21	030609.000	Request visual ack.			
2022-07-21	030609.000	Visual ack.			
2022-07-21	030609.000	Alarm ended	ME pt. overload 102% (PLSH.1)	0	
2022-07-21	095149.000	Alarm ended	Davit system fault	0	
2022-07-21	172430.000	New alarm	ME pt. overload 102% (PLSH.1)	1	alarm min
2022-07-21	172432.000	Request audible ack.			
2022-07-21	172432.000	Request audible ack.			
2022-07-21	172432.000	Audible ack.			
2022-07-21	172433.000	Request visual ack.			
2022-07-21	172433.000	Request visual ack.			
2022-07-21	172433.000	Request visual ack.			
2022-07-21	172433.000	Request visual ack.			
2022-07-21	172433.000	Visual ack.			
2022-07-21	172456.000	Alarm ended	ME pt. overload 102% (PLSH.1)	0	
2022-07-21	181625.000	New alarm	Echo sounder shallow water alarm	1	alarm min
2022-07-21	181625.000	New alarm	GMDSS AC loss of voltage alarm (collective alarm)	1	alarm min
2022-07-21	181626.000	New alarm	Intercom system power supply fault	1	alarm min
2022-07-21	181628.000	New alarm	Davit system fault	1	alarm min
2022-07-21	181628.000	New alarm	Fire alarm system fault	1	alarm max

2022-07-21	181632.000	New alarm	Navigating lights, display fault	1	alarm min
2022-07-21	181634.000	New alarm	BNWAS system error	1	alarm min
2022-07-21	181638.000	New alarm	GMDSS AC loss of voltage alarm	1	alarm min
2022-07-21	181647.000	New alarm	GMDSS battery charger voltage fault	1	alarm min
2022-07-21	181650.000	New alarm	SRP pt. CPP hydraulic oil pressure pp. 2 min.	1	alarm min
2022-07-21	181650.000	New alarm	Air conditioning compressor fault	1	alarm min
2022-07-21	181650.000	New alarm	Anchor/warping winch fault	1	alarm min
2022-07-21	181650.000	New alarm	Towing winch fault	1	alarm min
2022-07-21	181650.000	New alarm	Loss of voltage: 400/230V, field 1	1	alarm min
2022-07-21	181650.000	New alarm	Loss of voltage: emergency busbar, field 1	1	alarm min
2022-07-21	181650.000	New alarm	Loss of voltage: 400/230V, field 5	1	alarm min
2022-07-21	181650.000	New alarm	Loss of voltage: sockets, field 5	1	alarm min
2022-07-21	181650.000	New alarm	Activation of crash-stop, field 1	1	alarm min
2022-07-21	181650.000	New alarm	Loss of voltage: 400/230V, field 3	1	alarm min
2022-07-21	181651.000	New alarm	SRP pt. AC/DC converter fault	1	alarm min
2022-07-21	181651.000	New alarm	SRP pt. CPP hydraulic oil pressure pp. 1 min.	1	alarm min
2022-07-21	181651.000	New alarm	SRP pt. lubricating oil pump fault	1	alarm min
2022-07-21	181651.000	New alarm	SRP pt. phase fault: CPP hydraulic pump 1	1	alarm min
2022-07-21	181651.000	New alarm	SRP pt. phase fault: CPP hydraulic pump 2	1	alarm min
2022-07-21	181651.000	New alarm	ME pt. oil in cooling water (ODIW1)	1	alarm min
2022-07-21	181651.000	New alarm	ME stb. oil in cooling water (ODIW1)	1	alarm min
2022-07-21	181651.000	New alarm	SRP stb. AC/DC converter fault	1	alarm min
2022-07-21	181651.000	New alarm	SRP stb. CPP hydraulic oil pressure pp. 1 min.	1	alarm min
2022-07-21	181651.000	New alarm	SRP stb. CPP hydraulic oil pressure pp. 2 min.	1	alarm min
2022-07-21	181651.000	New alarm	SRP stb. lubricating oil pump fault	1	alarm min
2022-07-21	181651.000	New alarm	SRP stb. phase fault: CPP hydraulic pump 1	1	alarm min
2022-07-21	181651.000	New alarm	SRP stb. phase fault: CPP hydraulic pump 2	1	alarm min
2022-07-21	181651.000	New alarm	Collective alarm: separator	1	alarm min
2022-07-21	181651.000	New alarm	Fault in box cooler external power supply	1	alarm min
2022-07-21	181651.000	New alarm	Risk of frost: AC heat exchanger	1	alarm min
2022-07-21	181651.000	New alarm	Collective alarm: waste water system	1	alarm min

2022-07-21	181653.000	New alarm	SRP stb. fault: CPP hydraulic pump 1	1	alarm min
2022-07-21	181653.000	New alarm	SRP stb. fault: CPP hydraulic pump 2	1	alarm min
2022-07-21	181654.000	New alarm	SRP pt. fault: CPP hydraulic pump 1	1	alarm min
2022-07-21	181654.000	New alarm	SRP pt. fault: CPP hydraulic pump 2	1	alarm min
2022-07-21	181655.000	New alarm	Emergency power system fault: battery charger 1	1	alarm min
2022-07-21	181655.000	New alarm	Battery charger, automation fault	1	alarm min
2022-07-21	181656.000	New alarm	Starting air pressure, auxiliary diesel 2	11.7193746566772	alarm min
2022-07-21	181656.000	New alarm	Collective fault: HD 2	1	warning max
2022-07-21	181656.000	New alarm	SRP pt. position dep. prop. – pitch adjustment does not follow	1	alarm min
2022-07-21	181705.000	New alarm	Collective fault: HD 1	1	warning max
2022-07-21	181705.000	New alarm	Starting air pressure, auxiliary diesel 1	7.12758350372314	alarm min
2022-07-21	181709.000	New alarm	HD2, SYMAP (power management) fault	1	alarm min
2022-07-21	181710.000	New alarm	Activation non-essential consumers	1	alarm min
2022-07-21	181710.000	New alarm	Harbour diesel, SYMAP (power management) fault	1	alarm min
2022-07-21	181710.000	New alarm	HD1, SYMAP (power management) fault	1	alarm min
2022-07-21	181827.000	New alarm	EngCall (2 min)	1	alarm min
2022-07-21	182124.000	New alarm	Satellite compass	1	alarm min
2022-07-21	182128.000	New alarm	Collective fault: autopilot	1	alarm min
2022-07-21	182132.000	New alarm	Low starting air pressure < 18 bar	1	alarm min
2022-07-21	182301.000	Request audible ack.			
2022-07-21	182301.000	Audible ack.			
2022-07-21	182301.000	Audible ack.			
2022-07-21	182301.000	Audible ack.			
2022-07-21	182301.000	Audible ack.			