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

Interim Report
to Investigation Report 52/18

Serious Marine Casualty

Allision between the container ship AKACIA and a lock gate on the Kiel Canal in Kiel-Holtenau on 19 February 2018

18 February 2019

Pursuant to the second sentence of Article 28(1) of the Law to improve safety of shipping by investigating marine casualties and other incidents (Maritime Safety Investigation Act – SUG) in conjunction with Article 14(2) of Directive 2009/18/EC of the European Parliament and of the Council of 23 April 2009 establishing the fundamental principles governing the investigation of accidents in the maritime transport sector, the Federal Bureau of Maritime Casualty Investigation publishes an interim report within a period of 12 months of a very serious or serious marine casualty if it is not possible to complete the corresponding investigation report within that period.

This interim 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 interim 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
Fax: +49 40 3190 8340
posteingang-bsu@bsh.de
www.bsu-bund.de

1 FACTUAL INFORMATION

1.1 Photograph of the ship

Figure 1: Photograph of the AKACIA

1.2 Ship particulars

Name of ship:	AKACIA
Type of ship:	Container ship
Nationality:	Portugal
Port of registry:	Madeira
IMO number:	9315020
Call sign:	CQIF
Operator:	DT-Bereederungs GmbH & Co. KG
Owner:	MS "AKACIA" Schiffahrtsgesellschaft mbH & Co. KG
Year built:	2004
Shipyard/Yard number:	J.J. Sietas Schiffswerft GmbH & Co. KG/1206
Classification society:	Germanischer Lloyd
Length overall:	149.14 m
Breadth overall:	22.5 m
Gross tonnage:	11,662
Deadweight:	13,713
Draught (max.):	8.7 m
Engine rating:	8,399 kW
Main engine:	MaK Caterpillar, 1x9M43
(Service) Speed:	18 kts
Hull material:	Steel
Hull design:	Double bottom
Minimum safe manning:	10

1.3 Voyage particulars

Port of departure:	Bremerhaven, Germany
Port of call:	St. Petersburg, Russian Federation
Type of voyage:	Merchant shipping, international
Cargo information:	Containers
Manning:	15
Draught at time of accident:	D_f = 7.9 m, D_a = 8.3 m
Pilot on board:	Yes
Canal helmsman:	Yes, two
Number of passengers:	Two

1.4 Marine casualty or incident information

Type of marine casualty:	SMC, allision with lock gate
Date, time:	19/02/2018, 2354
Location:	Kiel-Holtenau, Kiel Canal
Latitude/Longitude:	φ 54° 21.9'N λ 010° 8.6'E
Ship operation and voyage segment:	Harbour mode
Consequences:	Ship unstoppable due to damage to the controllable pitch propeller (CPP) system. She struck the Neue Südschleuse lock's seaward lock gate. This resulted in major damage to the lock gate and the ship's bow section. No people injured or water pollution

Extract from Navigational Chart (21) 42 (INT 1366),
Federal Maritime and Hydrographic Agency (BSH)

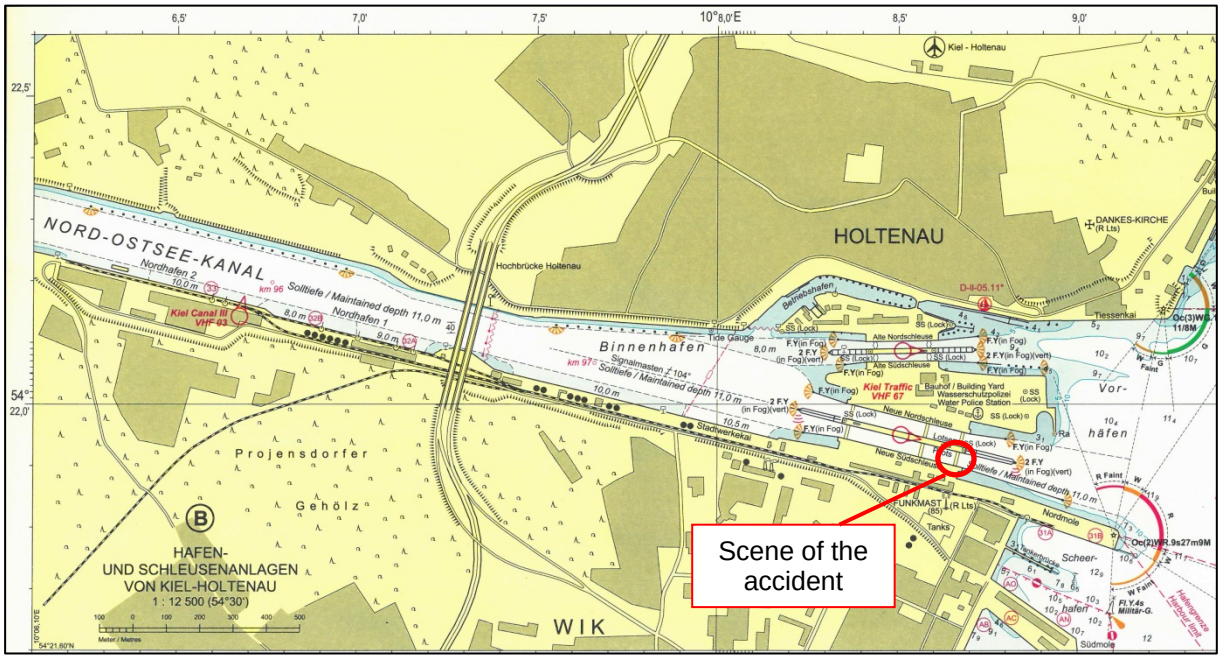

Figure 2: Navigational chart showing the scene of the accident

1.5 Shore authority involvement and emergency response

Agencies involved:	Kiel office of the Directorate-General for Waterways and Shipping, Waterway Police (WSP) Kiel
Resources used:	Diver for inspection of the lock gate and bottom of the lock and the ship
Actions taken:	Ship initially made fast with lines in the lock; ship subsequently pulled out of lock gate and towed to a berth; ship subsequently repaired. Lock gate subsequently completely cutted up, taken to shipyard for inspection and repaired there
Results achieved:	Ship back in service

2 COURSE OF THE ACCIDENT AND INVESTIGATION

2.1 Course of the accident

The account of the course of the accident is based upon written statements of the crew members working on the bridge, in the engine room and on the forecastle of the ship at the time of the accident. It is also based upon statements of the pilot and the canal helmsmen, as well as upon entries in the deck log book, the bell book and the engine room log. Information gained from the analysis of the voyage data recorder (VDR) is referenced for details. It is important to note at the same time that the recordings on the VDR did not contain any information about the rate of speed selected on the CPP system or pitch of the propeller blades.

2.1.1 Course of the voyage

The AKACIA, sailing under Portuguese flag, left Bremerhaven for St. Petersburg at midday on 19 February 2018. Her voyage there entailed entering one of the locks at Brunsbüttel to use the Kiel Canal (NOK) at 1648 (also on 19 February 2018). The voyage through the canal began at 1724 under pilotage and with two canal helmsmen. Due to her dimensions and draught, the ship was classified to Traffic Group 5 for the canal passage. The pilot transfer took place in Rüsterbergen at 2054. The new pilot was familiarised with the ship's fundamentals and controls in the usual manner by the master. The pilot and the helmsmen were familiar with the ship to the extent that this type of ship often transits the NOK. According to the deck log book, there was no wind. The pilot specified eastern winds of force 2 to 3 Bft.

The pilot used the right seat inside the bridge console, from where he operated the CPP's pitch controls to manage the speed of the ship. He used the X-band radar unit on the starboard side for orientation, which was set to the display mode off-centred north-up, relative motion at a range of 0.5-0.75 nm. The S-band radar on the port side was on standby. Each of the canal helmsmen sat on the left seat in the bridge console and steered the ship manually from there.

The ship sailed on her own and without any major obstructions from Rüsterbergen to the Groß Nordsee siding, where she had to wait for two oncoming vessels. This involved reducing the speed to 2.7 kts at 2258 in the siding. There were no problems. The master, who had been out of the bridge for some time, had already reassumed command, which he retained up until the allision.

The pilot was informed in the Schwartenbek siding that the ship had been allocated the Südschleuse lock for exiting the NOK.

At 2340, the ship passed the Projensdorf Bunkering Station at just over 9 kts. The speed was reduced slightly when she sailed past. After that, the AKACIA encountered four westbound vessels waiting in the area of the Nordhafen port. A last transfer of the canal helmsmen took place shortly after. The ship then continued at a decreasing speed and passed the bridge at Holtenau at 7.6 kts. At 2348, the master contacted the crew members assigned to the ship's manoeuvring stations on VHF, instructing them to proceed there. The port side was to be used for berthing. In each case, the person in charge confirmed this immediately.

From about this point in time, the bridge was manned by the master, second and third officers, pilot, both canal helmsmen, and a surveyor from the classification society.

The AKACIA also passed the bridge at 2348. Her speed now stood at 7.1 kts. The master reported that the stern and bow thrusters were ready for use. The pilot began to set the CPP to astern at 2249. He told the master that the pitch was working. According to the pilot's statement, the pitch instruction was astern (with 30-40 % pitch).

The further reduction in speed resulted in the ship starting to veer slightly to starboard. Accordingly, the SOG[1] at 235028 stood at 5.9 kts and the HDG[2] at 107°.

Following that, the pilot set the pitch to zero and then to 20 % ahead to help the canal helmsman with steering. When the ship had returned to the canal course, the pilot set the pitch to 40 % astern again. The pilot was just in the process of reporting the astern manoeuvre to the lock master when he noticed that the speed was increasing. His visual impression was confirmed by the display of the speed on the radar unit. The pilot then checked the display for the actual pitch, which was now about 100 % ahead.

The VDR recorded an alarm tone on the bridge for the period 235042 to 235044. Shortly afterwards, the pilot pointed out to the master that something was reportedly wrong and a little later advised him that the speed of the ship was increasing (235055). A continuous alarm tone was heard on the bridge from 235059 onwards.

[1] SOG: Speed over ground.
[2] HDG: Heading.

The master first tried, unsuccessfully, to cancel the given pitch by setting it to astern again. He then pressed the button to enable the backup steering. Although the illuminated push button indicated it was enabled, the master could not adjust the pitch using the PITCH ASTERN push button, which was intended for that purpose.

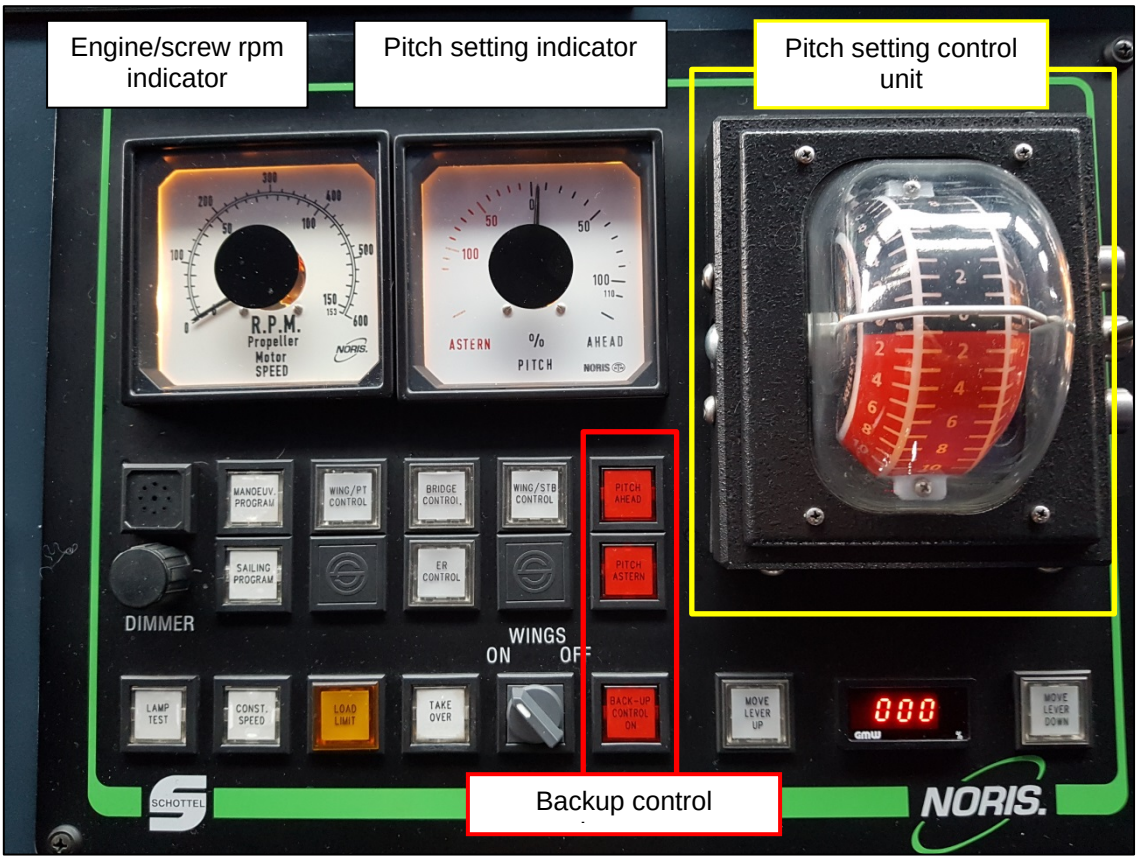

Figure 3: CPP system control panel

The speed of the ship continued to increase. Consequently, the pilot called the lock master at 235128 (call sign: Kiel Canal IV) and notified him of the problem on board the ship.

Since the master's recovery efforts were unsuccessful, the pilot suggested to the master at 235158 that they deploy both anchors quickly. The master complied with this suggestion immediately and instructed the crew members on the fore section by radio to drop both anchors. The master confirmed his instruction at 235209 at their request. The speed of the ship was now more than 9 kts. At 235215, the master said: "Okay, emergency stop!" He had evidently called the engine room crew by phone.

Since the crew on the forecastle stated that the anchors were ready for immediate deployment, only the band brakes had to be released. Accordingly, both anchors dropped immediately after the brakes were simultaneously released. The brakes were applied again after two shots of chain cable were paid out.

At 235222, a brief signal was sounded with the tyfon.

At 235227, the pilot ordered the linesmen to take cover in consultation with Kiel Canal IV, as the situation on board the ship was reportedly unchanged.

The lock's berthing jetty was passed at 235242 at about 10.7 kts. At 235316, the AKACIA was almost completely inside the Südschleuse lock. The speed at this point was 9.8 kts. Shortly beforehand, the master had once again issued an order by radio for both anchors to be dropped.

At 235358, shortly before the allision with the lock gate, the master once more ordered a crash-stop for the main engine. The allision with the Neue Südschleuse lock's seaward gate occurred at 235422 on 19 February 2018 at a speed of 8.1 kts. In the process, the AKACIA sailed several metres through the gate and damaged it severely. The ship also sustained heavy damage in the bow section. The bow thruster room was flooded. Nobody lost their life or was injured due to the allision. The water was not polluted.

Figure 4: The AKACIA and the damaged lock gate

2.1.2 Additional measures

After the allision, crew members were sent to the fore section to determine the extent of the damage. The ship later deployed lines on both sides to stabilise her position. A link with the land could be established on the starboard side with the ship's gangway. This enabled officers of the WSP to board for their initial measures.

The Shipping Administration took the precaution of deploying an oil boom afterwards.

2.2 Investigation

2.2.1 Start of the investigation

WSP Kiel notified the person on call at the BSU of the incident at 0710 on 20 February 2018. Two investigators arrived at the scene of the accident at about 1030 and began their initial investigation, by which time the WSP had already secured the data on the VDR. A copy was given to the BSU. The crew members interviewed gave a rough account of the course of events. The owner's legal counsel sent a more detailed statement to the BSU afterwards. Since the initial findings indicated a technical malfunction, the first engine room data were also saved.

2.2.2 AKACIA

The AKACIA is a Sietas 168-L full container ship without cargo gear. Her storage capacity is 1,008 TEU[3]. The ship's superstructure is located aft. The ship has a completely enclosed bridge without open wings. Despite the deck cargo, visibility was not restricted any more than usual at the time of the accident.

Figure 5: View ahead from the AKACIA's bridge

The AKACIA has been managed by the current shipping company since November 2017. The ship is used for container feeder service between ports in the North Sea and Baltic Sea.

[3] TEU: Twenty-foot equivalent unit.

Two accidents are recorded for the AKACIA[4] in the BSU's[5] database (2013 and 2015). Neither accident was related to technical faults in the machinery or propulsion system.

2.2.3 Manning

The ship's crew consisted of 15 people (eight with Philippine citizenship, as well as one with Estonian, Lithuanian, Russian, Romanian, Polish, Ukrainian and German citizenship, respectively) when the voyage under investigation occurred. The language used on board was English.

The watchkeeping officers practised a three-watch system (four on, eight off). The master was generally not on watch. Since machinery operation was automated, the engineers were not subject to a watch system during normal operation. At the time of the accident, the chief technical officer (CTO) and second engineer were in the engine room in accordance with requirements for manoeuvring.

The Estonian master started service as a third officer in 1973. He has served as a master on cargo ships since 1987. He boarded the AKACIA on 1 January 2018.

At the time of the accident, the second and third officers were on the bridge, as the third officer was to be relieved at the end of the watch. Neither of them had any influence on ensuing events.

The Polish CTO obtained his certificate of technical proficiency in 2003. He has served on the AKACIA since 2013 (as CTO since 2016). He boarded for the current contract on 1 February 2018.

The Ukrainian second engineer has served as engineer on board ships since 1994. He qualified as a CTO in 2017 and has worked for the shipping company since 2005. He boarded for the current contract on 6 December 2017.

Shortly after arrival, the WSP carried out voluntary breathalyser tests on the master, the watchkeeping officers present, the pilot and the two canal helmsmen. Each test returned 0.00‰.

2.2.4 VDR and other technical recordings

The ship is equipped with a S-VDR G4 simplified voyage data recorder made by Interschalt. This VDR does not record machinery data or data relating to the CPP system. Accordingly, only data relating to the steering gear, the radar system used, the AIS of ships in the area and the audio recording of the communication in the bridge and on VHF were available for the investigation. Alarms relating to the engine could thus only be identified by their audible signals on the bridge in comparison with the entries in the other technical recordings.

[4] Including the period from 11/2004 to 01/2013 under the name BLACK SWAN.
[5] Accidents involving ships flying the German flag anywhere in the world or ships flying a foreign flag in German territorial waters are recorded.

Due to the age of the main engine, there were no recording options available in an electronic logbook or fault memory. Consequently, the investigation is based upon faults recorded within the CCP's control system and upon the limited data from the machinery's alarm printer.

2.3 Progress of the investigation

The further course of the investigation was and remains dependent upon the analysis of findings relating to the technical conditions, which has yet to be completed. Consequently, it is not possible to adhere to the time limit of one year for publishing an investigation report set by the European Union and transposed into national law by the Federal Republic of Germany. The public is informed on the progress of the investigation through publication of this interim report.