



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

Panama Maritime Authority
Directorate General of Merchant Marine
Marine Accident Investigation Department



Department of Merchant Shipping
Investigation of Marine Casualties
& Notices to Mariners Division
Subordinated to the Ministry of Communication and Works

Investigation Report 15/13

Serious Marine Casualty

**Collision between the MV CORAL ACE
and the MV LISA SCHULTE
at the Neue Weser Nord-roadstead
on 31 January 2013**

2 October 2014

The following is a **joint report by** the German Federal Bureau of Maritime Casualty Investigation as lead investigating authority, as well as the Panamanian and the Cypriot marine casualty investigation authorities. These bodies have conducted this investigation jointly and in accordance with the IMO Casualty Investigation Code (Resolution MSC.255(84)). The working language used for this joint investigation was English. The German text shall prevail in the interpretation of this report.

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, amended most recently by Article 1 of the Ordinance of 22 November 2011, BGBl. (Federal Law Gazette) I p. 2279. According to said Law, the sole objective of this investigation is to prevent future accidents and malfunctions. 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.

Issued by:
Bundesstelle für Seeunfalluntersuchung - BSU
(Federal Bureau of Maritime Casualty Investigation)
Bernhard-Nocht-Str. 78
20359 Hamburg
Germany

Director: Volker Schellhammer
Phone: +49 40 31908300 Fax: +49 40 31908340
posteingang-bsu@bsh.de www.bsu-bund.de

Table of Contents

1	SUMMARY	8
2	FACTUAL INFORMATION	9
2.1	CORAL ACE	9
2.1.1	Photo	9
2.1.2	Ship particulars	9
2.1.3	Voyage particulars	10
2.2	LISA SCHULTE	11
2.2.1	Photo	11
2.2.2	Ship particulars	11
2.2.3	Voyage particulars	12
2.3	Marine casualty or incident information	12
2.4	Shore authority involvement and emergency response	13
3	COURSE OF THE ACCIDENT AND INVESTIGATION	14
3.1	Approach to the roadstead on the previous day	14
3.2	Course of the accident	17
3.3	Action taken after the accident	20
3.4	Damage	22
3.4.1	CORAL ACE	22
3.4.2	LISA SCHULTE	23
3.5	Investigation	23
3.5.1	Survey of the CORAL ACE	23
3.5.2	Port State control inspections on the CORAL ACE	29
3.5.3	Crew of the CORAL ACE	30
3.5.4	Crew of the LISA SCHULTE	30
3.5.5	VDR recordings	31
3.5.6	Neue Weser Nord- roadstead	32
3.5.7	Weather report	33
3.5.7.1	Underlying data	33
3.5.7.2	Weather from 30/01 to 31/01/2013	34
3.5.7.3	Weather conditions in the area of 53°54.6N/007°53.25E at about 0037 CET on 31/01/2013	35
3.5.7.4	Navigational warnings	35
3.5.8	VHF recordings	36
4	ANALYSIS	39
4.1	Traffic situation and weather at the scene of the accident	39
4.2	Ordinary practice of seamen when anchoring	40
4.3	Communication after the collision	40
4.4	Other circumstances	41
5	CONCLUSIONS	42
5.1	Ordinary practice of seamen	42
5.2	Working language: English	42
5.3	Legibility of instructions at the anchor station	43

5.4	Voyage data recorder	43
6	SAFETY RECOMMENDATIONS	44
6.1	Owner of the CORAL ACE	44
6.2	Owner of the CORAL ACE	44
6.3	Owner of the CORAL ACE	44
7	SOURCES	45

Table of Figures

Figure 1: Photo of the CORAL ACE	9
Figure 2: Photo of the LISA SCHULTE.....	11
Figure 3: Nautical chart	12
Figure 4: Radar image of the CORAL ACE at 151011	14
Figure 5: Radar image of the CORAL ACE at 152156	15
Figure 6: Radar images of the CORAL ACE at 153311 and 153711	15
Figure 7: Radar images of the CORAL ACE at 153911 and 154041	16
Figure 8: Radar images of the CORAL ACE at 154441 and 154526.....	16
Figure 9: Radar images of the CORAL ACE at 154956 and 155226.....	16
Figure 10: Radar image of the CORAL ACE at 161011	17
Figure 11: Radar images of the CORAL ACE at 002311 and 002511	18
Figure 12: Radar image of the CORAL ACE at 002958	18
Figure 13: Radar image of the CORAL ACE at 003341	19
Figure 14: Radar image of the CORAL ACE at 003711 – time of the collision	19
Figure 15: Radar image of the CORAL ACE at 004356	20
Figure 16: AIS plot of the Maritime Security Centre in Cuxhaven at 004245	20
Figure 17: Damage on the port side of the CORAL ACE.....	22
Figure 18: Damaged cargo hold 3	22
Figure 19: Pressed in railing.....	22
Figure 20: Damaged bulbous bow of the LISA SCHULTE	23
Figure 21: Wheelhouse of the CORAL ACE	24
Figure 22: Wheelhouse of the CORAL ACE – chart tables	24
Figure 23: Wheelhouse of CORAL ACE – radar and ECS station.....	25
Figure 24: Wheelhouse of the CORAL ACE – radio station	25
Figure 25: Excerpt from Nautical Chart 3617 with ship positions plotted.....	26
Figure 26: ECS view on the day of the survey (13 February 2013)	26
Figure 27: Starboard windlass and anchor chain on the fore section of the CORAL ACE.....	28
Figure 28: Plates on the starboard windlass.....	28
Figure 29: Stockless anchors on the CORAL ACE	29
Figure 30: AIS plot of the CORAL ACE	31

Figure 31: AIS plot of GBT	33
Figure 32: Analysis by the DWD, 31/01/2013 – 0100	34
Figure 33: Infrared satellite image, 31/01/2013 – 0000	35

Table of Spreadsheets

Spreadsheet 1: VHF recordings of the vessel traffic service	38
---	----

Table of acronyms used

ARPA	Automatic radar plotting aid
Bft	Beaufort
BSH	German Federal Maritime and Hydrographic Agency
cbl	Cable
DWD	Germany's National Meteorological Service
ECS	Electronic chart system
GBT	Vessel Traffic Service Wilhelmshaven (German Bight Traffic)
GDWS Ast	Directorate-General for Waterways and Shipping, branch office
HFO	Heavy fuel oil
kN	Kilonewton
km	Kilometre
kts	Knots
m	Metre
MDO	Marine diesel oil
MLZ	German Maritime Emergencies Reception Center
OOW	Officer on watch
SOLAS	International Convention for the Safety of Life at Sea
STCW	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers
t	Tonnes
UTC	Coordinated universal time
VRM	Variable range marker
VTS	Vessel traffic service
WSA	Waterways and Shipping Authority
WSP	Waterway police

1 Summary

Early in the morning of 31 January 2013, two vessels laid up at anchor collided in heavy weather in the Neue Weser Nord-roadstead. The Panama-flagged bulk carrier CORAL ACE had discharged coal in the port of Nordenham on the previous day and then set her anchor in the roadstead. The Cyprus-flagged container ship LISA SCHULTE had already been laid up there at anchor for almost a week in ballast. The CORAL ACE anchored at a distance of about 7 cbl to the west of the LISA SCHULTE.

In the area of the German Bight, the wind picked up from midday of 30 January 2013 and was generally strong to gale force from the south-west. The gusts increased slightly in the evening and the wind veered towards the west. At 1800¹, the navigational warnings included a gale warning for the German Bight predicting 8 to 9 Bft.

After midnight, the CORAL ACE started to drift towards the LISA SCHULTE. Gusts of between 41 and 54 kts, equivalent to 9 to 10 Bft, were registered in the area of the roadstead. Significant wave height stood at 4 to 5 m with single waves possibly reaching 7 m. Visibility was between 5 and 10 km.

The officer on watch (OOW) on the LISA SCHULTE called his counterpart on the CORAL ACE on VHF when he noticed that her anchor was not holding her in position any more. The OOW on the CORAL ACE promised to arrange for the engine to be started. As opposed to that of the LISA SCHULTE, the CORAL ACE's engine was not on standby. The distance between the two ships had already dropped to 3 cbl. The CORAL ACE was parallel to the sea, about 90° to the wind, and rolling heavily. The collision occurred shortly afterwards.

Nobody came to physical harm. Water ingress occurred on both ships. Buoyancy was not adversely affected by this and there was no water pollution. The water pollution control ship MELLUM was ordered to proceed to the casualty vessels. It was not possible to take action at the scene because of the weather. As events unfolded, the German Central Command for Maritime Emergencies assumed overall control of the operation.

Escorted by the MELLUM, the CORAL ACE moved to the Südwestkai in Wilhelmshaven. The LISA SCHULTE moved to the Voslapp-roadstead.

¹ All times shown in this report are local = UTC + 1

2 FACTUAL INFORMATION

2.1 CORAL ACE

2.1.1 Photo



Figure 1: Photo of the CORAL ACE

2.1.2 Ship particulars

Name of vessel:	CORAL ACE
Type of vessel:	Bulk carrier
Nationality/Flag:	Republic of Panama
Port of registry:	Panama
IMO number:	9176266
Call sign:	3FJQ9
Owner:	Kawasaki Kisen Kaisha Ltd
Year built:	1999
Shipyard/Yard number:	Oshima Shipbuilding Co., Ltd/10237
Classification society:	Nippon Kaiji Kyokai (NKK)
Length overall:	185.73 m
Breadth overall:	31.00 m
Gross tonnage:	25,942
Deadweight:	47,286 t
Draught (max.):	11.778 m
Engine rating:	7,024 kW
Main engine:	Kawasaki Man B&W 6S50 MC-C

Ref.: 15/13

(Service) Speed:	16.2 kts
Hull material:	Steel
Minimum safe manning:	14

2.1.3 Voyage particulars

Port of departure:	Nordenham
Port of call:	n/a (Neue Weser Nord- roadstead)
Type of voyage:	Merchant shipping
	National
Cargo information:	In ballast
Manning:	22
Draught at time of accident:	D _f : 4.40 m, D _m : 5.31 m, D _a : 6.23 m
Pilot on board:	No
Number of passengers:	0

2.2 LISA SCHULTE

2.2.1 Photo

© Hasenpusch Photo-Productions



Figure 2: Photo of the LISA SCHULTE

2.2.2 Ship particulars

Name of vessel:	LISA SCHULTE
Type of vessel:	Container ship
Nationality/Flag:	Cyprus
Port of registry:	Limassol
IMO number:	9309277
Call sign:	C4LL2
Owner:	OCEAN Shipmanagement GmbH
Year built:	2006
Shipyard/Yard number:	Shanghai Shipyard & Chengxi Shipyard Co., Ltd/SS1109
Classification society:	DNV GL
Length overall:	230.90 m
Breadth overall:	32.20 m
Gross tonnage:	35,975
Deadweight:	42,106.199 t
Draught (max.):	12 m
Engine rating:	31,920 kW
Main engine:	MAN B&W 7K 90 MC-C
(Service) Speed:	22.2 kts
Hull material:	Steel
Minimum safe manning:	12

2.2.3 Voyage particulars

Port of departure:	n/a (Neue Weser Nord- roadstead)
Port of call:	n/a (Neue Weser Nord- roadstead)
Type of voyage:	Merchant shipping
	National
Cargo information:	In ballast
Manning:	14
Draught at time of accident:	D _f : 5.80 m, D _a : 7.40 m
Pilot on board:	No
Number of passengers:	0

2.3 Marine casualty or incident information

Type of marine casualty:	Serious marine casualty, collision
Date, time:	31 January 2013, 0037
Location:	Neue Weser Nord-roadstead
Latitude/Longitude:	φ 53°54.59'N λ 007°53.40'E
Ship operation and voyage segment:	At anchor
Consequences:	Material damage to both ships

Excerpt from Digital Nautical Chart DE 421030, BSH

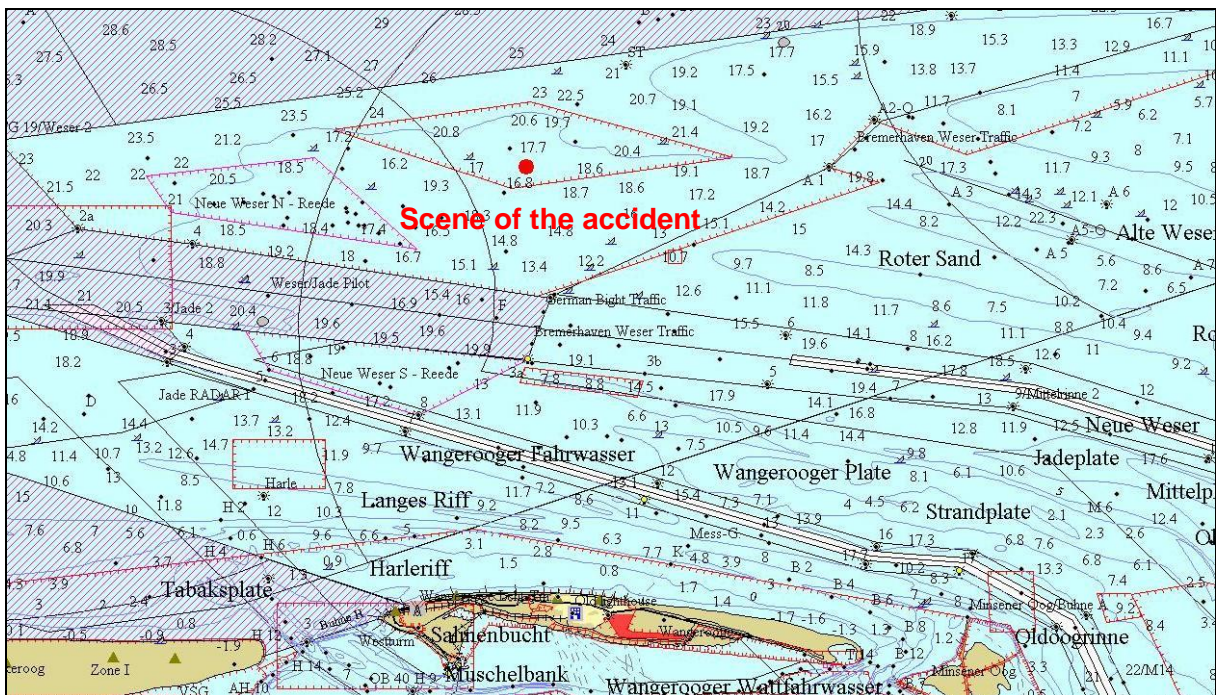


Figure 3: Nautical chart

2.4 Shore authority involvement and emergency response

Agencies involved:	Vessel Traffic Service Wilhelmshaven ('German Bight Traffic'), Water police Wilhelmshaven, Wilhelmshaven Waterways and Shipping Authority, German Central Command for Maritime Emergencies, Naval Command, Federal Police Sea
Resources used:	GS ² MELLUM Helicopter from the Naval Command
Action taken:	Situation at the scene secured
Results achieved:	Despite the prevailing storm, the two ships were able to move to inside the Jade under their own steam. There was no water pollution.

² Water pollution control ship

3 COURSE OF THE ACCIDENT AND INVESTIGATION

3.1 Approach to the roadstead on the previous day

At about 1100 on 30 January 2013, the CORAL ACE left the port of Nordenham, where she had discharged her cargo (coal), and headed for the Neue Weser Nord-roadstead. The CORAL ACE proceeded in ballast with approximately 13,750 m³ of ballast water on board. This was distributed across all the ballast tanks with the exception of tank 3, which was empty. The ship was first advised by a harbour pilot and then from 1145 by a sea pilot. In the area of the German Bight, the wind picked up from midday and was generally strong to gale force from the south-west. Numerous laid-up vessels were already at anchor in and to the east of the roadstead (see Figure 4; the time indicated on the radar images of the CORAL ACE deviates significantly from the actual time and is therefore not meaningful – see section 2.5.5).

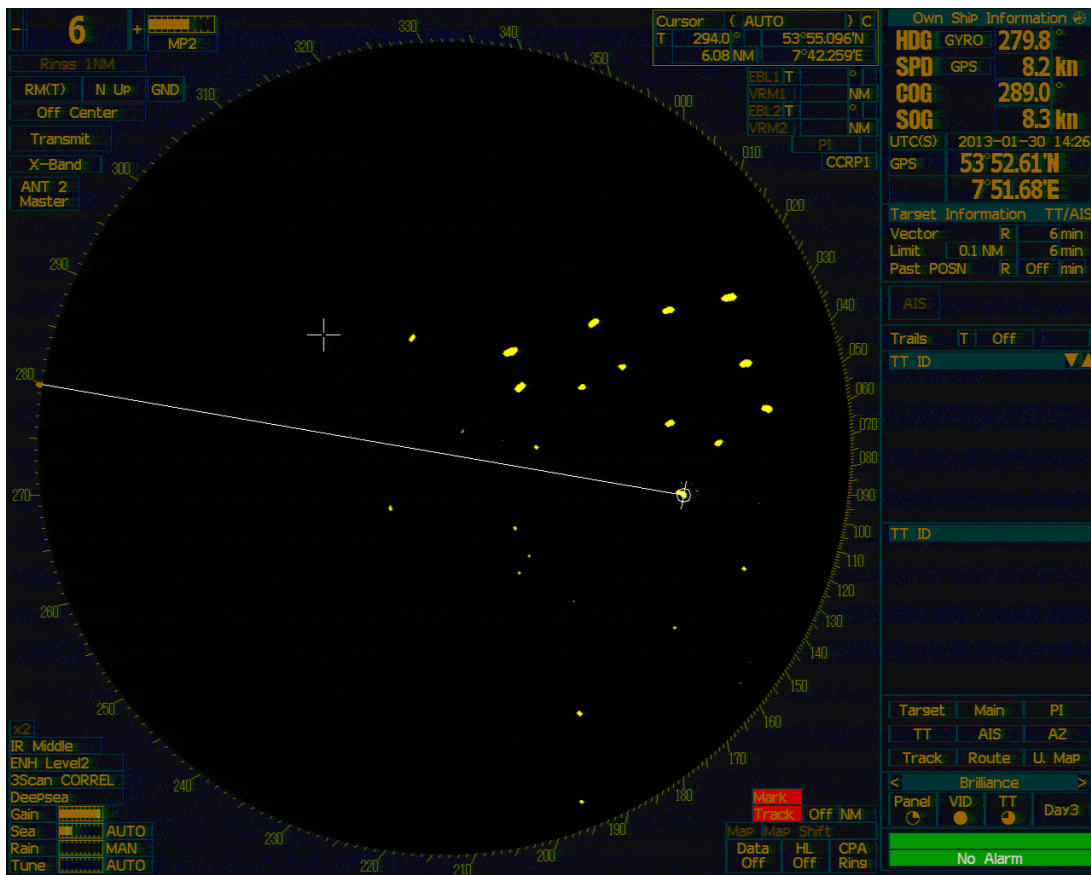


Figure 4: Radar image of the CORAL ACE at 151011

The sea pilot disembarked just short of the roadstead at 1512. The master and the second officer manned the bridge. From 1519 onwards, the CORAL ACE was shifted significantly towards the east by swell, wind, and current. This necessitated appropriate countersteering. The ship's command decided to proceed on a northerly course to the middle of the field of vessels laid up at anchor and anchor there roughly on the position of the anchor radar marker (see Figure 5).

Ref.: 15/13

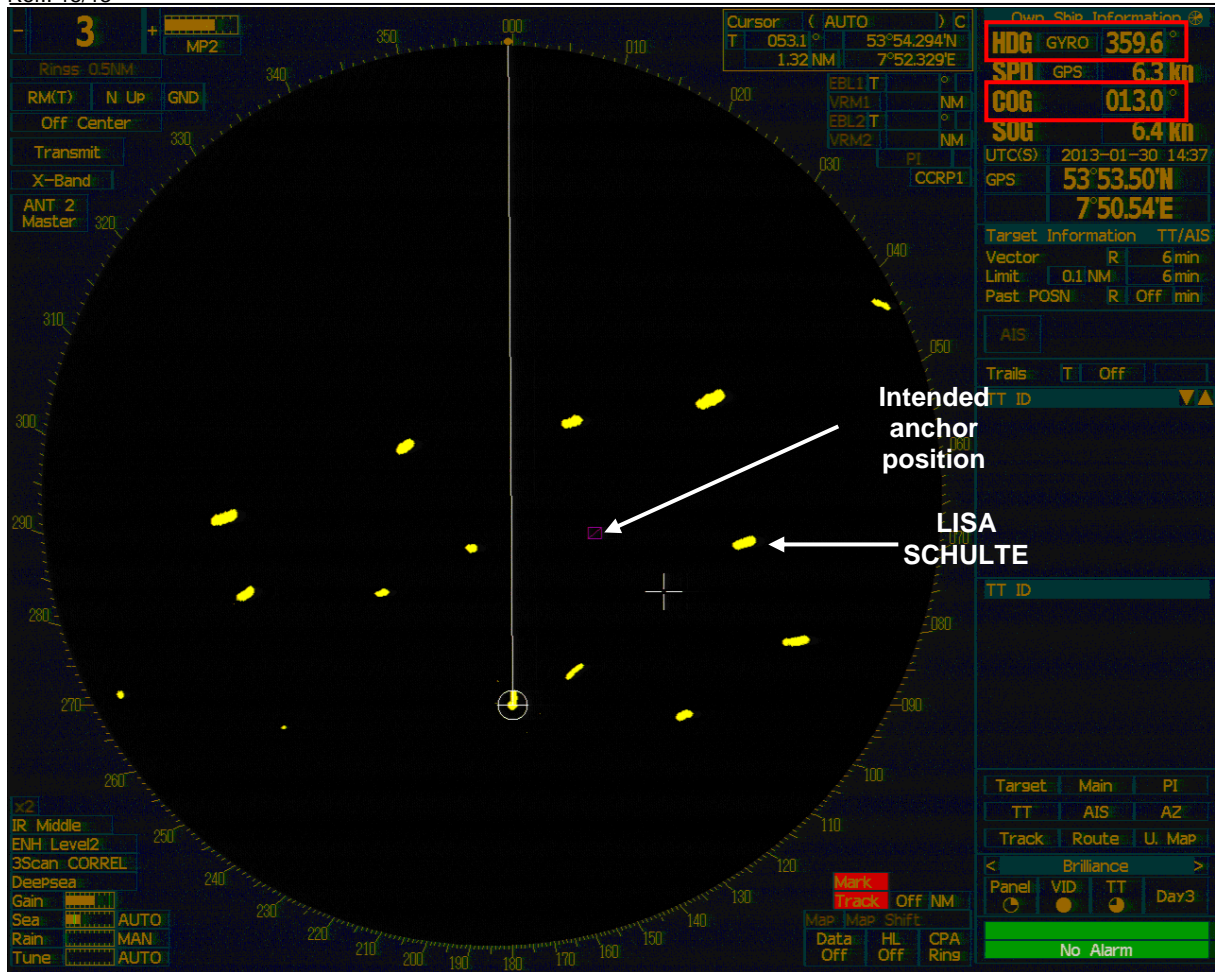


Figure 5: Radar image of the CORAL ACE at 152156

The CORAL ACE maintained her speed of 6.4 kts until she reached the intended anchor position and only then was the speed reduced.

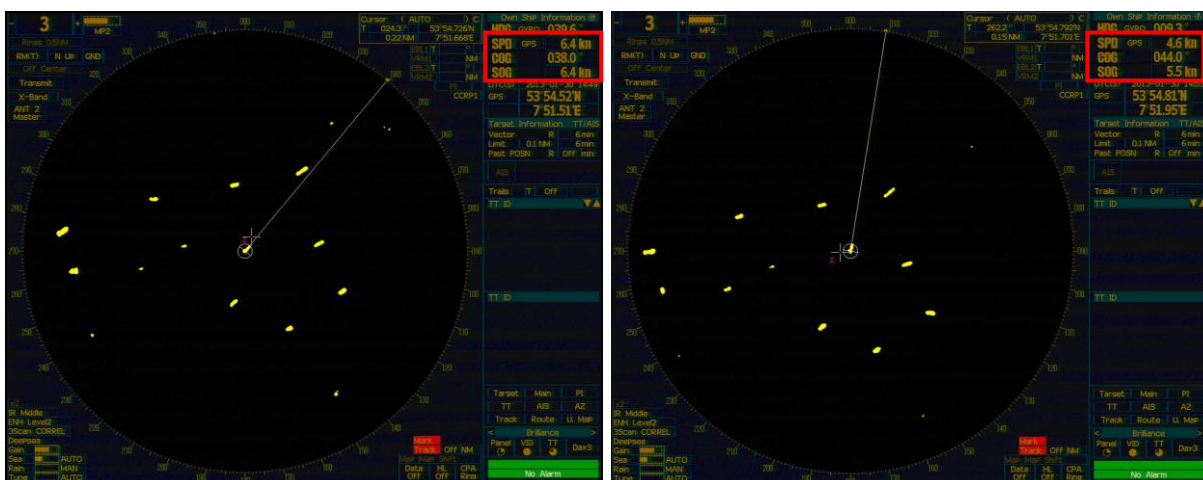


Figure 6: Radar images of the CORAL ACE at 153311 and 153711

Following that, while monitoring the distance to the LISA SCHULTE on the radar a port turning manoeuvre was initiated (see Figure 7). The LISA SCHULTE had already been laid up in the roadstead for several days.

Ref.: 15/13



Figure 7: Radar images of the CORAL ACE at 153911 and 154041

As indicated by the radar track recordings, the CORAL ACE was heavily influenced by wind and swell during the turning manoeuvre (see Figure 8 with course deviations of more than 50° between heading and course over ground at times).



Figure 8: Radar images of the CORAL ACE at 154441 and 154526

The manoeuvre took the CORAL ACE to a distance of up to about 2 cbl from a different laid-up vessel: the IRMA (see Figure 9).



Figure 9: Radar images of the CORAL ACE at 154956 and 155226

Eight starboard anchor shackles were deployed at 1600. According to the bridge log, the wind force stood at 6 Bft at this point. The CORAL ACE set anchor at a distance of 7 cbl from the LISA SCHULTE, which was anchored to the east (see Figures 10 and 11).

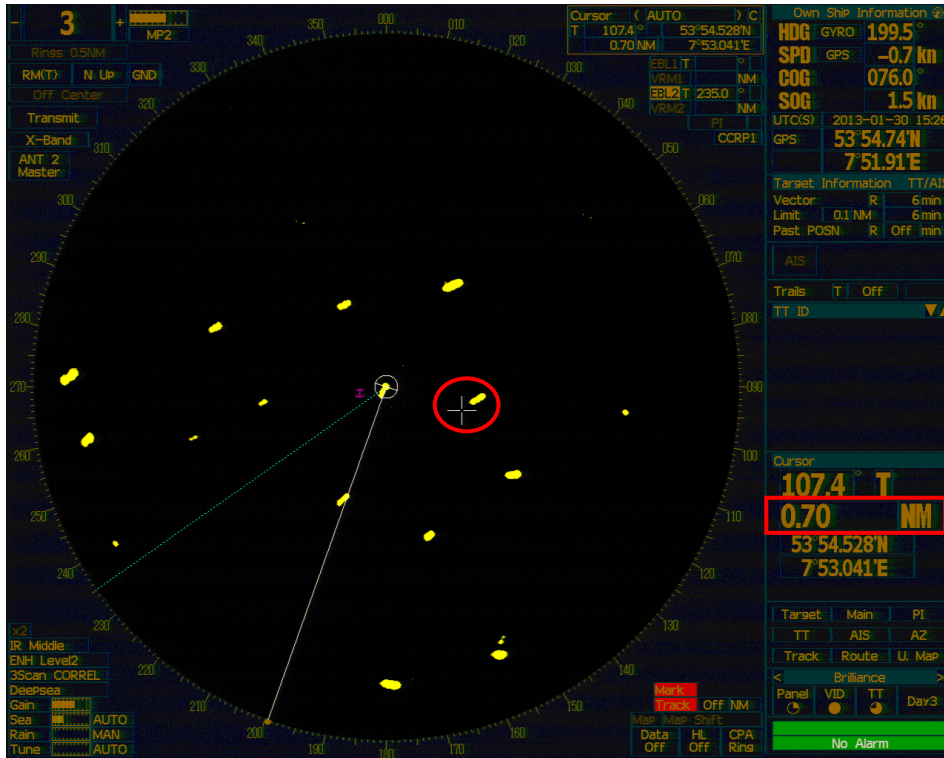


Figure 10: Radar image of the CORAL ACE at 161011

3.2 Course of the accident

The OOW on the CORAL ACE set variable range-markers (VRMs) around the anchor position on the X-band radar, which could be used to monitor the distance to the LISA SCHULTE (see Figure 11). An anchor alarm was not set. The S-band radar was set to a range of 0.75 nm. The position of the CORAL ACE was also monitored on the electronic sea chart (ECS) using the past position function. Unlike that of the LISA SCHULTE, the CORAL ACE's engine was not kept on 15-minute standby.

The A/B lookout on the CORAL ACE was additionally instructed to check the deployed anchor on an hourly basis. The anchor watch was carried out every half-hour on the LISA SCHULTE. Both ships were using anchor lights and the deck lighting was turned on.

The fuels and lubricants on board the CORAL ACE comprised 843.543 t HFO³, 46.528 t MDO, and 39,637 l lubricating oil. The LISA SCHULTE had 850.4 t HFO and 38.3 t MDO on board.

³ 243.967 t low sulfur fuel oil (LSFO) and 599.576 t high sulfur fuel oil (HSFO)

Ref.: 15/13

The gusts increased slightly in the evening and the wind veered towards the west. At 1800, the navigational warnings sent over NAVTEX⁴ included a gale warning for the German Bight predicting 8 to 9 Bft. The vessel traffic service, German Bight Traffic, issued a gale warning on VHF first in English and then in German in the hourly situation report, inter alia at midnight. This indicated that wind forces of 8 to 9 Bft with gusts of 11 from a southwesterly direction were expected. At 2345, the second officer and a lookout were watchkeeping on the bridge on CORAL ACE.

On the night of 31 January 2013, gusts of between 41 and 54 kts, equivalent to 9 to 10 Bft, were registered in the area of the roadstead. Significant wave height stood at 4 to 5 m with single waves possibly reaching 7 m. The CORAL ACE rolled heavily. From 0023 onwards, the anchor lost its grip and the CORAL ACE dragged towards the LISA SCHULTE (see Figure 11).



Figure 11: Radar images of the CORAL ACE at 002311 and 002511

The OOW on the CORAL ACE noticed the dragging at 0030 when the radar shadow of the LISA SCHULTE had already moved to within the inner range marker (see Figure 12).



Figure 12: Radar image of the CORAL ACE at 002958

⁴ Communication system for the distribution of safety and weather information (Navigational Text Messages)

Ref.: 15/13

The CORAL ACE moved astern towards the LISA SCHULTE at a speed of almost 1 kt. At first, no countermeasures were taken on the bridge of the CORAL ACE. The OOW on the LISA SCHULTE also noticed that the CORAL ACE was not being held in position by her anchor and called his counterpart on VHF channels 2 and 8 at 003208. There was no response. At 003257, the LISA SCHULTE called the CORAL ACE again. After a pause, the OOW on the CORAL ACE replied to the call and promised to arrange for the engine to be started. On the LISA SCHULTE, the master was notified of the convergence and that VHF contact had been made. The distance between the two ships had already dropped to 3 cbl at this point (see Figure 13). The CORAL ACE was parallel to the sea, about 90° to the wind, and rolling heavily. She dragged towards the LISA SCHULTE at almost 4 kts.



Figure 13: Radar image of the CORAL ACE at 003341

At 003436, the OOW on the CORAL ACE ordered that the engine be set to standby. The first engineer and an oiler were on engine room watch. At 003625, the master was called to the bridge and arrived there half a minute later at 003706. The collision occurred at virtually the same time.

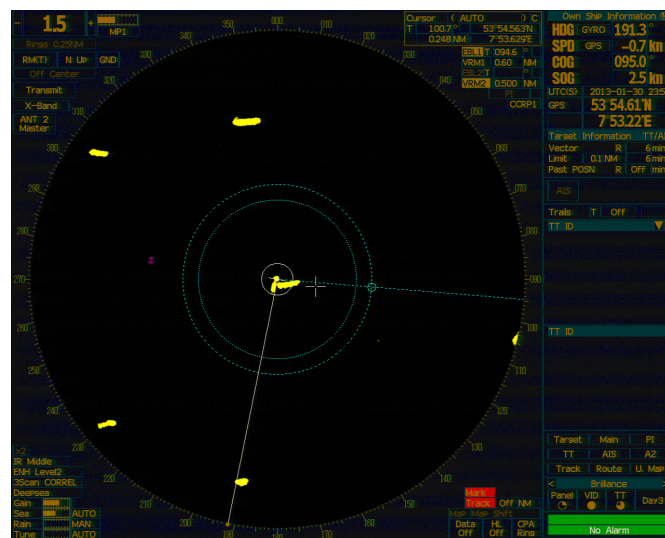


Figure 14: Radar image of the CORAL ACE at 003711 – time of the collision

Ref.: 15/13

Immediately after the collision, the LISA SCHULTE called the CORAL ACE again on VHF and inquired about the situation. There was no answer, whereupon the OOW on the LISA SCHULTE called and informed German Bight Traffic about the collision.

3.3 Action taken after the accident

Water ingress occurred on both ships because of the collision. The port side of the CORAL ACE had pushed into the bow of the LISA SCHULTE. The ships were initially wedged together (see Figures 15 and 16).

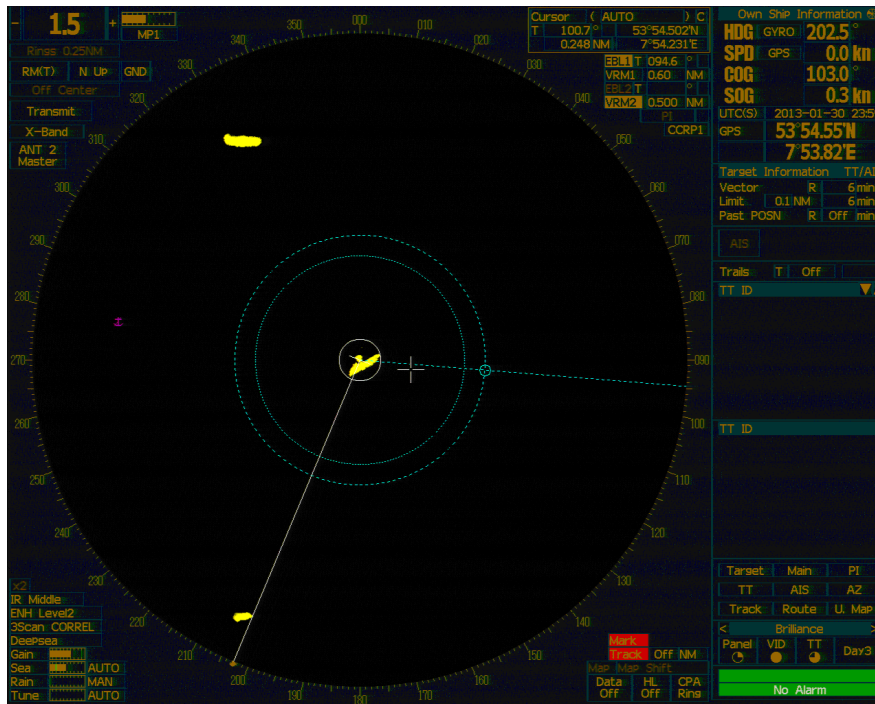


Figure 15: Radar image of the CORAL ACE at 004356

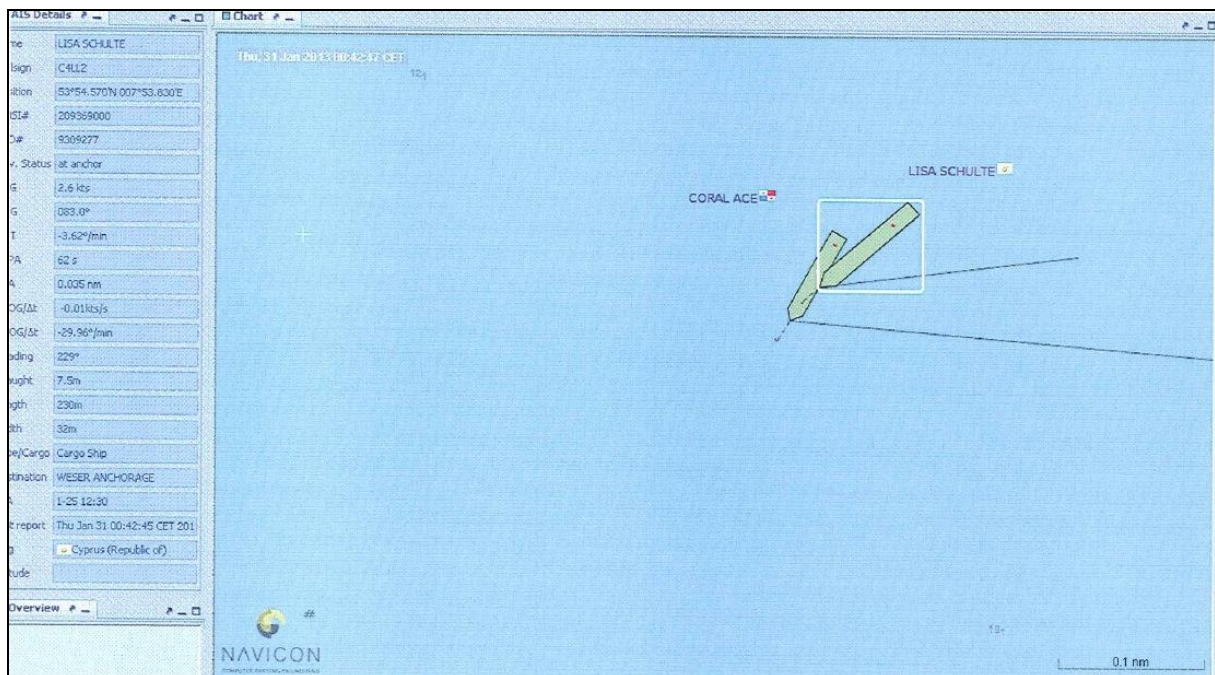


Figure 16: AIS plot of the Maritime Security Centre in Cuxhaven at 004245

In the meantime, the engine on the CORAL ACE had been started. The ship's command tried to part from the LISA SCHULTE by means of a full astern manoeuvre (004120) and shortly afterwards a full ahead manoeuvre with rudder hard to port (004255), but was unsuccessful. At 004330, the CORAL ACE called the LISA SCHULTE on VHF channel 8 and asked whether the LISA SCHULTE could move full astern. The intention on the CORAL ACE was to do another full ahead manoeuvre with rudder hard to port at the same time. Communication proved difficult (see more details in section 2.5.3).

German Bight Traffic (GBT) contacted both ships on VHF at 0048 and 0053, but there was still no specific information about the damage incurred available. Following that, GBT requested the water pollution control ship MELLUM to get more information about the extent of the collision at the scene. In addition, GBT informed MLZ about the accident.

At 0054, both ships parted from each other and weighed anchor. At 0124, the MELLUM reported to the LISA SCHULTE on VHF that using the searchlight two tears had reportedly been found on the bulbous bow. The chief officer, the bosun, and two other members of the deck crew had already reported to the bridge that there was slight water ingress in the fore section. The damage to the CORAL ACE was still unknown at this point.

At 0152, GBT issued both ships with a prohibition to leave on VHF channel 16 and ordered the casualty vessels to set anchor or remain in the vicinity for subsequent investigations. The MELLUM was ordered to investigate the two ships for further damage using the searchlight. The CORAL ACE dropped her anchor at 0224 close to the original anchor position. At 0236, the LISA SCHULTE anchored again, too, also close to her original anchor position. At 0248, GBT reported to MLZ that the MELLUM had reportedly found a leak of some 3 x 4 m in size on the CORAL ACE with water ingress. The MELLUM stayed close to the CORAL ACE. It was not possible to take action such as transferring pumps at the scene because of the weather. The Wilhelmshaven Waterways and Shipping Authority requested a pilot for the CORAL ACE to help the ship to move inside the Jade.

At 0436, the Central Command for Maritime Emergencies (CCME) assumed overall control of the operation at the request of the Wilhelmshaven Waterways and Shipping Authority. At 0450, a helicopter set the requested pilot down on the CORAL ACE. At 0715, the LISA SCHULTE advised GBT of a malfunction on the windlass and then also received permission to proceed to Wilhelmshaven. A pilot was ordered here, too. At the request of the CCME, the Federal Police Sea air patrol flew over the casualty vessels and provided images for further analysis of the emergency.

The LISA SCHULTE dropped anchor in the Voslapp- roadstead at 1150. Overall control of the operation by the CCME discontinued at 1427. Escorted by the MELLUM, the CORAL ACE moved to the Südwestkai in Wilhelmshaven, where she made fast at 1600.

3.4 Damage

3.4.1 CORAL ACE

The bulbous bow of the LISA SCHULTE tore a hole of 4 x 10 m in size in the CORAL ACE's shell plating on the port side level with cargo hold 3 (see Figures 17 and 18). The cargo hold filled with water to a height of 6 m.



© CCME

Figure 17: Damage on the port side of the CORAL ACE



© Panama DIAM; BSU

Figure 18: Damaged cargo hold 3

The railing was also pressed in (see Figure 19).



© Panama DIAM

Figure 19: Pressed in railing

3.4.2 LISA SCHULTE

During the collision, the bulbous bow of the LISA SCHULTE was torn laterally in two places and also heavily deformed (see Figure 20). The shell plating was also deformed level with the main deck.



Figure 20: Damaged bulbous bow of the LISA SCHULTE

3.5 Investigation

The marine casualty investigation authorities of the flag State of the CORAL ACE (Panama), the flag State of the LISA SCHULTE (Cyprus), as well as the coastal State (Germany) conducted the investigation of the marine casualty jointly. The Panamanian investigating authority sent its own expert on board the CORAL ACE. The BSU, which took the lead in the joint investigation after consulting with the two flag States, also conducted a survey on board the CORAL ACE. All findings and results of the investigation were shared and jointly evaluated.

Moreover, statements of the parties involved an official weather report, as well as the documents and records of the two ships, the CCME, Water police Wilhelmshaven, and Federal Police Sea were evaluated and analysed for the investigation.

3.5.1 Survey of the CORAL ACE

Before the repair work started, a representative of the Panamanian investigating authority surveyed the CORAL ACE in dock at Bremerhaven. Two investigators from the BSU went on board on 13 February 2013 when the repairs were nearly finished.

Any documents and certificates required by the CORAL ACE were valid at the time of the survey.

The bridge of the CORAL ACE was surveyed first (see Figures 21 to 24).



Figure 21: Wheelhouse of the CORAL ACE



Figure 22: Wheelhouse of the CORAL ACE – chart tables



Figure 23: Wheelhouse of CORAL ACE – radar and ECS station



Figure 24: Wheelhouse of the CORAL ACE – radio station

The official BSH Nautical Chart 3617 – Approaches to The Jade and Weser – (current issue and revision status) was used for navigation (see Figure 25).

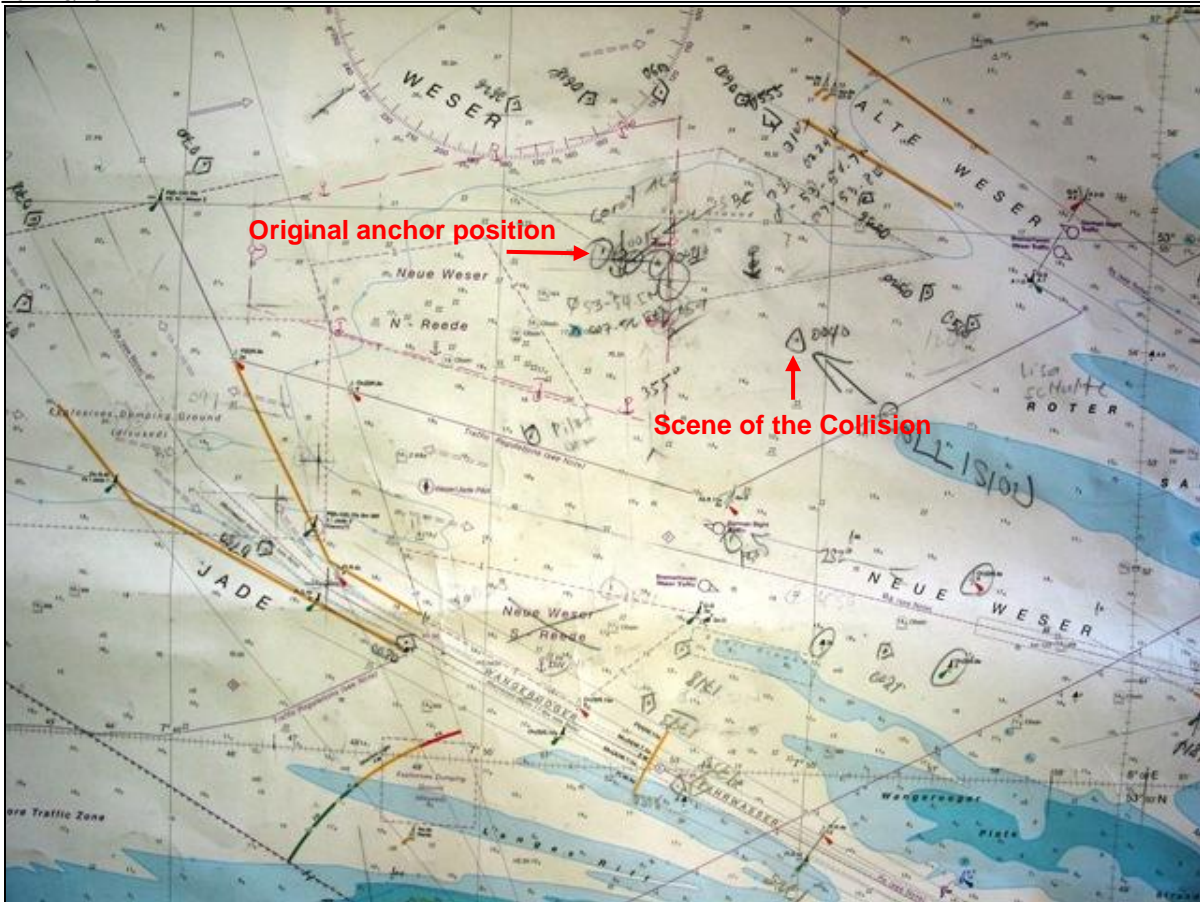


Figure 25: Excerpt from Nautical Chart 3617 with ship positions plotted

Although the ECS used for reference purposes was operable (see Figure 26), it was not possible to save data.



Figure 26: ECS view on the day of the survey (13 February 2013)

The bridge log contained the following entries, inter alia:

- 30 January 2013:
(...)
 - 1000: Wind WSW 3
 - 1200: Wind WSW 4/5
 - 1400: Wind WSW 6
 - 1600: Wind WSW 6; at anchor
 - 1800: Wind SW 7
 - 2000: Wind SW 8; Stb anchor 8 shackles in the water
 - 2200: Wind SW 8; A/B duty carried out safety and fire patrol. All's well.
 - 0000: Wind WSW 8; at anchor; maintained security and anchor watch; checked position reg. and no sign of dragging found. Keep watch on VHF Ch 16/80; watch moved to 2/O. All's well.
- 31 January 2013:
 - 0040: Vessel dragging and collided it to MV LISA SCHULTE, Port side hull and railings sustained damaged with hole in hull upper part of water line
 - 0200: Wind SW 8
 - 0400: Wind SW 8(...)

The handwriting of one of the officers of the navigational watch was illegible, meaning the entries in the bridge log could not be fully evaluated.

The night order book contained the following entries for 1900 on 30 January 2013:

- Anchor watch to be maintained all times; any sign of dragging, advise E/R (*engine room*) to SBE (*standby engine*) then call master.
- Closely monitor other ships anchored or passing nearby, call their attention if necessary.
- Continue monitoring VHF Ch. 16/80 for the German Bight Traffic control.
- Take weather forecasts at scheduled transmission.
- Fire & safety patrol to be carried out in usual manner without fail.
- Don't hesitate to call me any time when doubt.
- Wake me up if weather becoming bad then advise E/R to standby engine.

All the officers of the navigational watch countersigned the orders of the master.

According to the information in the bridge log, eight starboard anchor shackles (see Figure 27) were lowered into the water on 30 January 2013.

Ref.: 15/13



Figure 27: Starboard windlass and anchor chain on the fore section of the CORAL ACE

The plates containing warnings and characteristics on the starboard windlass and anchor chain were illegible (see Figure 28).



Figure 28: Plates on the starboard windlass

The investigators also viewed the class approval for the two anchors and anchor chains. The two stockless anchors (see Figure 29) made of carbon steel⁵ were categorised as 'High holding power KHAC-14' and had a total weight of 5,840 kg each. On 2 March 1999, load testing at a proof test load of 861 kN was rated 'good' by the classification society, NKK, in a certificate.



Figure 29: Stockless anchors on the CORAL ACE

NKK also tested the anchor chains. At the time of the test on 18 February 1999, the port anchor chain comprised 12 lengths of chain connected with 11 kenter shackles and three anchor shackles. One length of chain (or one shackle) is equal to a length of 25 m. The starboard anchor chain had 10 lengths of chain connected with nine kenter shackles and three anchor shackles. Both chains were tested at a breaking test load of 3,300 kN and a proof test load of 2,310 kN. According to the class certificate, they passed 'good'. During the survey in dry dock, the investigators found that the lengths of anchor chain were consistent with those on the class certificates. Consequently, the starboard anchor used on the day of the accident could be used with up to 10 lengths of chain.

3.5.2 Port State control inspections on the CORAL ACE

Port State control inspections have been carried out regularly on board the CORAL ACE since 1999. The last inspection before the accident took place on 18 May 2012 in Taranto, Italy; two deficiencies were identified:

- Oil record book not properly filled
- Nautical publications not updated

⁵ KSC42

On the same day, a statutory inspection was carried out by the Panama Maritime Administration. In addition to the deficiencies found during the port State control inspection, this revealed a violation of SOLAS⁶. After the accident, the CORAL ACE was inspected in Wilhelmshaven. The following deficiencies were found:

- Fire doors/openings in the fire resisting division not as required
- Voyage plan missing
- Hull damage impairing seaworthiness, holed
- Steam pipes and pressure pipes, not as required
- Other safety in general.

The last port State control inspection was carried out on 22 April 2013 in Brazil. No deficiencies were found.

3.5.3 Crew of the CORAL ACE

All the crew members on the CORAL ACE are Philippine nationals. The master has a valid certificate of proficiency for navigating ships with a gross tonnage of 3,000 or above (STCW⁷ II/2). He has been employed in seagoing service since 1973 and as master since 3 January 2012. He has served as master on the CORAL ACE since October 2012.

The second officer, who was in charge of the navigational watch at the time of the accident, has a valid certificate of proficiency for serving as an officer of the navigational watch on ships with a gross tonnage of 500 or above (STCW II/1). He has been on board since 22 June 2012 and served as second officer there since 22 October 2012.

English is the official working language on board the CORAL ACE. However, communication between the investigators and the crew of the CORAL ACE proved difficult due to a lack of English skills on the part of the crew members. With regard to the course of the accident, the ship's command referred to the written statement of facts available in tabular form. The crew tried to answer questions beyond that to the best of their ability. In the process, it transpired that the same interviewee often answered a repeated question differently. Consequently, it was not possible to verify the scale chosen for monitoring the anchor position on the ECS, for example. Furthermore, the use of ARPA⁸ functions remained in doubt.

3.5.4 Crew of the LISA SCHULTE

The crew on the LISA SCHULTE consists of Russian, Estonian, Ukrainian, Montenegrin, and Philippine nationals.

⁶ International Convention for the Safety of Life at Sea

⁷ International Convention on Standards of Training, Certification and Watchkeeping for Seafarers

⁸ Automatic radar plotting aid

Ref.: 15/13

The master has a valid certificate of proficiency and been employed in seagoing service for 21 years. He has been a master since 2009. He has served as master on the LISA SCHULTE since November 2011.

The second officer was in charge of the navigational watch at the time of the accident and also has a valid certificate of proficiency. He has been an OOW since 1999. He joined the LISA SCHULTE on 24 January 2013, one week before the accident.

The good English skills of the crew made for smooth communication. The crew provided extensive written statements for the investigation.

3.5.5 VDR recordings

Recordings by the CORAL ACE's voyage data recorder were available for the investigation. This was a simplified voyage data recorder (S-VDR), which does not record data to the same level of detail as the VDR type (in particular, weather data are not saved by an S-VDR). The S-VDR installed on board the CORAL ACE is a type JCY-1850 made by Japan Radio Co., Ltd (JRC). The emergency data backup was activated by the ship's command at 0600 on 31 January 2013. An official from the Water police Lower Saxony's centre of excellence read out the data on the same day as the accident. The backup comprised data for the period 0700 UTC on 26 January 2013 to 0500 UTC (0600 local time) on 31 January 2013. The audio backup comprised 12 hours: the period 1700 UTC on 30 January 2013 to 0500 UTC on 31 January 2013. Consequently, audio data were available for the period relevant to the accident, but not for the anchor manoeuvre on 30 January 2013.

The CORAL ACE's S-VDR recordings were limited to the X-band radar plots and AIS plots (see Figure 30) with relevant information on the ship's position, courses and speeds, steering gear data, as well as bridge microphone and VHF audio recordings.

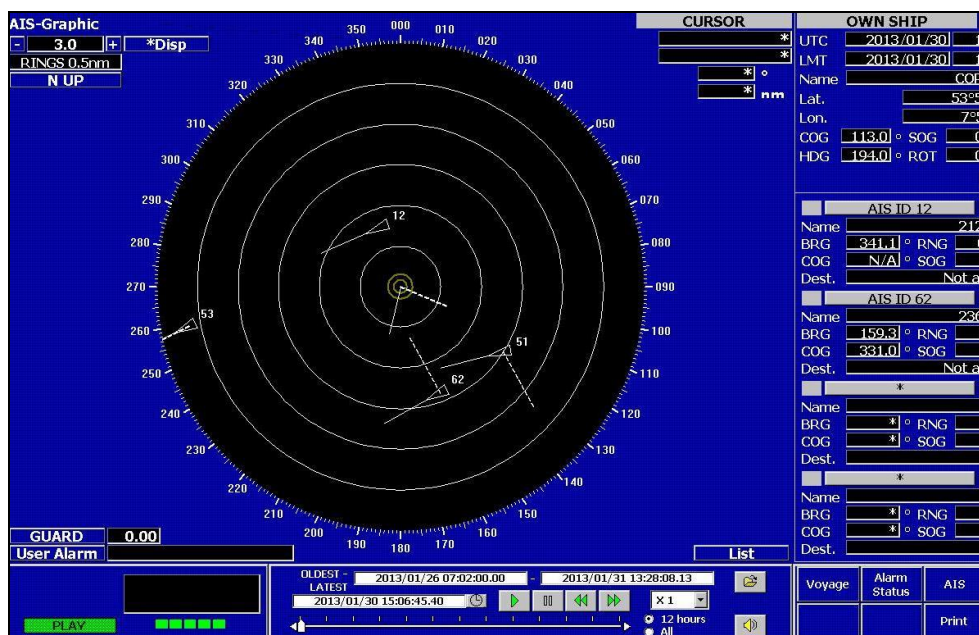


Figure 30: AIS plot of the CORAL ACE

The time indicated on the radar images deviates from the S-VDR's system time by 16 minutes (see Figures 4 to 15), which was verified as an indication of the definitive time by means of the reference periods in the VHF channel recordings of GBT.

The S-VDR audio recordings were of sufficient quality to analyse the accident. It was evident from the audio files that Filipino was more or less the only language spoken on the bridge. Only helm commands were issued in English. The mood was relaxed after the change of watch shortly before the accident. They listened to music and held isolated brief conversations.

The situation report by the vessel traffic service at midnight on the operating channel (80), as well as other VHF traffic, especially on channels 2 and 8, were received loud and clear on the bridge. No reaction could be heard on the bridge of the CORAL ACE after the gale warning in English by GBT. The warning was not commented on and no movement heard.

No usable VDR data could be secured from on board the LISA SCHULTE. The type VER3000 VDR made by Broadgate yielded no readable data because of a hard-disk error. The attempt to read out the data by a certified service company of the manufacturer at the scene via the serial port was unsuccessful. Following that, the hard disk was removed and an attempt made to create an image of the stored data ashore. The data obtained in this manner could not be converted to a data format the S-VDR replay software was able to read because it was corrupted. The most recent annual performance test on the VDR system on board the LISA SCHULTE took place in Germany on 24 January 2013 just a week before the collision. No irregularities or malfunctions were found during this test.

3.5.6 Neue Weser Nord- roadstead

The Directorate-General for Waterways and Shipping (GDWS), branch office Northwest, assisted in the investigation with remarks on the traffic situation and specific nature of the Neue Weser Nord- roadstead. With the CORAL ACE, 12 ships were at anchor in and to the east of the roadstead on 30 January 2013 (see Figure 31).

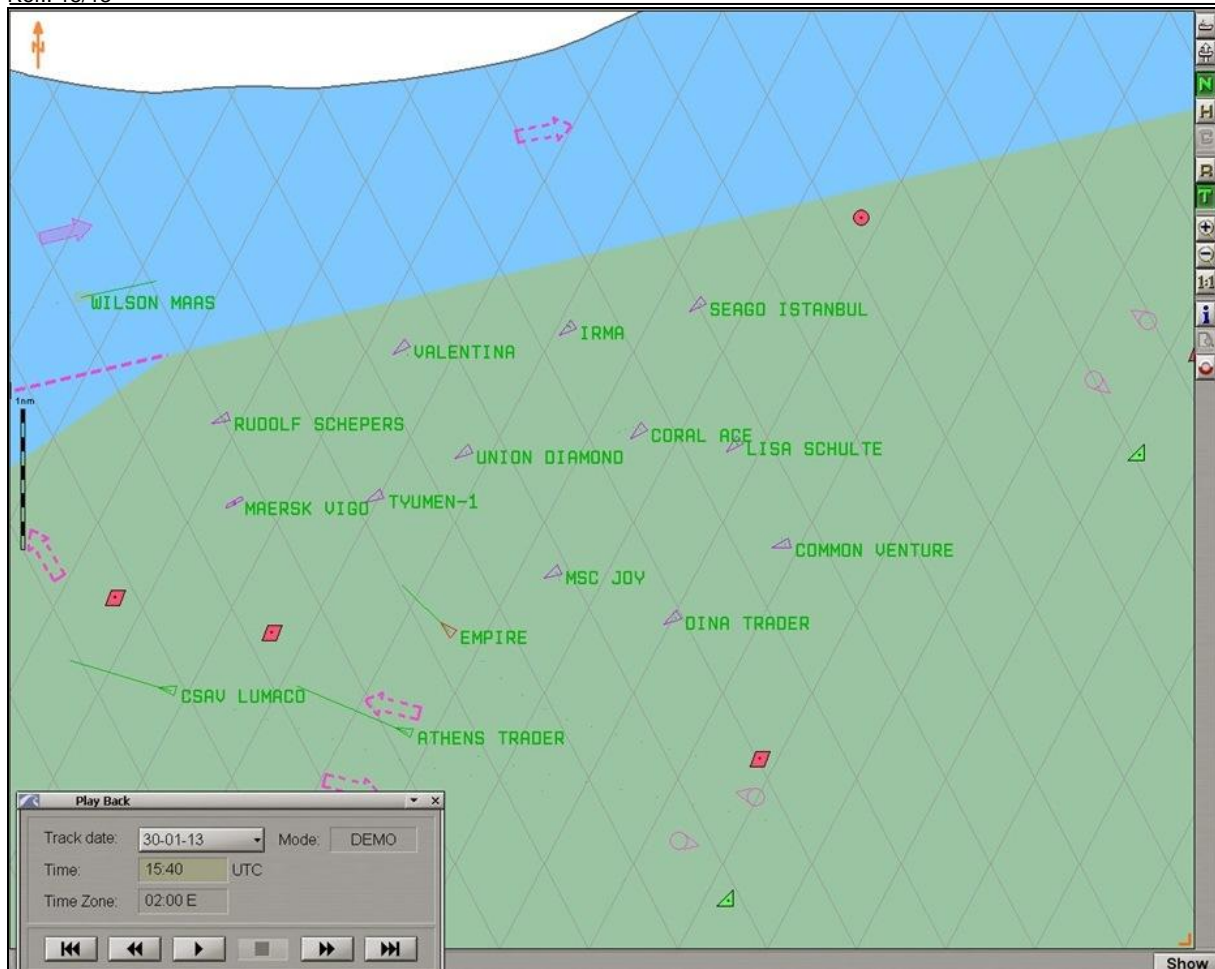


Figure 31: AIS plot of GBT

The depth of water in the area where the CORAL ACE dropped anchor is between 16 and 18 m. GDWS Northwest describes the roadstead ground as morphologically position stable. GDWS Northwest, whose duties include supervising the vessel traffic services, did not express any concerns about the fact that several ships, including the CORAL ACE and the LISA SCHULTE, anchored to the east of the actual roadstead.

3.5.7 Weather report

The BSU requested a maritime weather report for the area of the accident from the DWD. The entire report is reproduced below.

3.5.7.1 Underlying data

The DWD has measurements and observations from the surrounding stations at Wittmundhafen, Wangerland, Helgoland, Alte Weser, Bremerhaven, Nordholz, Büsum, and Cuxhaven at its disposal for the area of the accident. Some of these stations are not manned permanently. Ship reports and buoy measurements from the southern part of the German Bight were also taken into account. Analyses of Germany's National Meteorological Service in Offenbach and the UK Met Office were used for the account of the weather.

The forecasts of the ECMWF's (European Centre for Medium Range Weather Forecast, Reading, England) global weather forecast model, the German National Meteorological Service's GME global weather forecast model, the COSMO-EU and COSMO-DE regional weather forecast models of Germany's National Meteorological Service, and the sea state models derived from that were considered. Satellite images and rawinsondes were also analysed.

3.5.7.2 Weather from 30/01 to 31/01/2013

The casualty area was affected by a low-pressure storm system at the time of the accident. The centre of this system moved from the southern Norwegian Sea to the south of Norway on the evening of 30/01, and then joined a newly formed low-pressure system centred over northern Scandinavia. The cold front of the low-pressure system had already crossed the German Bight in a southeasterly direction by midday of 30/01. After the cold front passed through, the wind increased in the area of the German Bight and was generally strong to gale force from the south-west. With the approach of a high wedge from the west, the pressure differences in the area of the German Bight once again intensified in the late evening of 30/01 and the gusty wind increased slightly and veered towards the west.

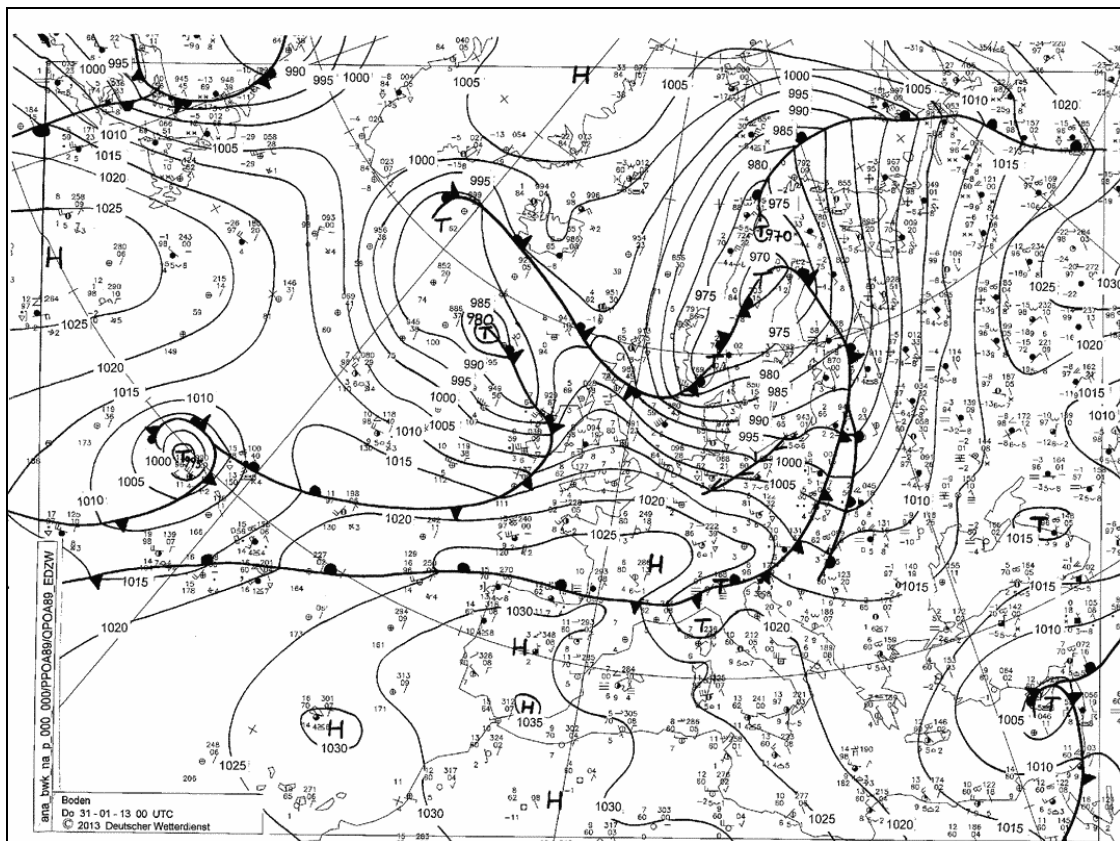


Figure 32: Analysis by the DWD, 31/01/2013 – 0100

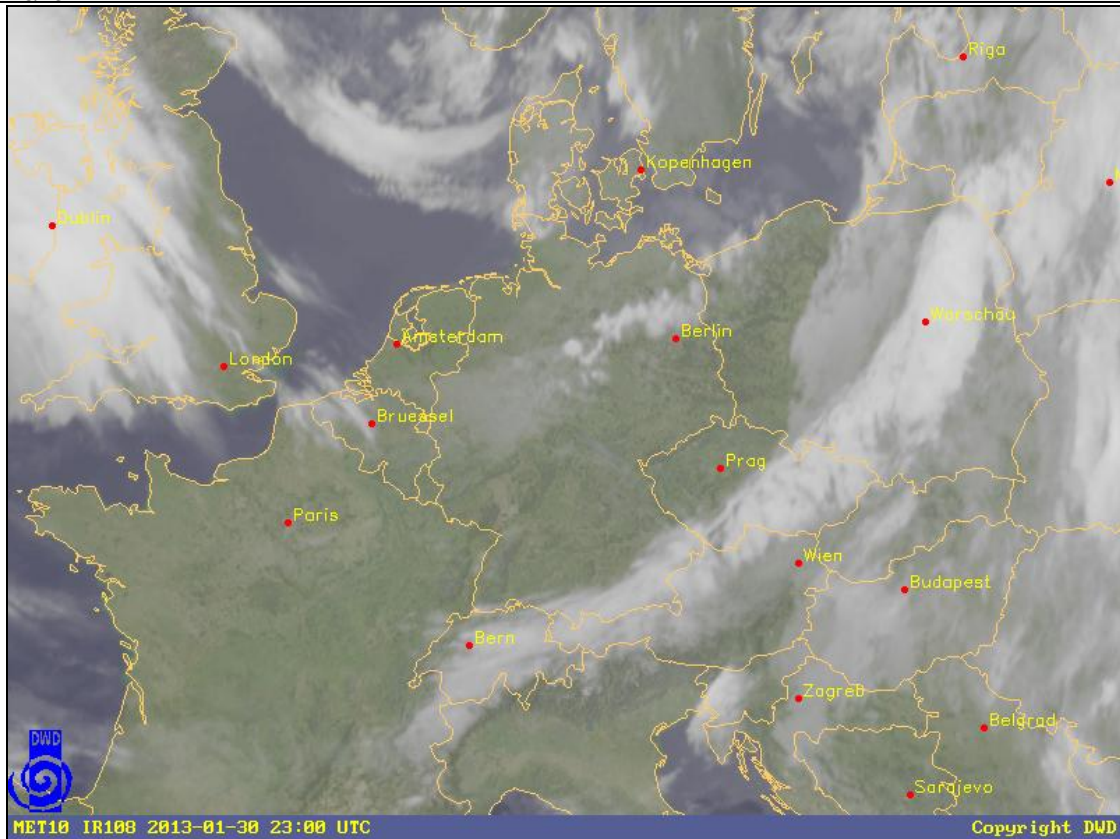


Figure 33: Infrared satellite image, 31/01/2013 – 0000

3.5.7.3 Weather conditions in the area of 53°54.6N/007°53.25E at about 0037 CET on 31/01/2013

Wind: In the period shown above, west to southwesterly wind of 35 to 40 kts, equivalent to 8 Bft, prevailed in the damage zone. Gusts of between 41 and 54 kts, equivalent to 9 to 10 Bft, were registered in the area of the accident.

Significant sea state: At the time of the accident, the significant wave height was between 4 and 5 m. It was increasing slightly with a west-northwesterly direction of incidence. Single waves may have reached a height of 7 m. The level of swell stood at 0.5 to 1 m, thus only playing a secondary role.

Weather: Cloud cover was variable and there was no precipitation.

Visibility: Visibility was between 5 and 10 km.

Temperature: The air temperature was 5 to 6 degrees Celsius.

3.5.7.4 Navigational warnings

Inter alia, the following warnings were issued in the period relevant to the accident:

Navigational warnings of 30/01/2013, 09 UTC

Ref.: 15/13

warning for German Bight, Western Baltic and Southern Baltic
 issued at 29.01.2013 16:15 UTC

German Bight:
 near gales southwest 14 m/s to 16 m/s (7 bft).
 (...)

Navigational warnings of 30/01/2013, 17 UTC
 warning for German Bight, Western Baltic and Southern Baltic
 issued at 30.01.2013 14:20 UTC

German Bight:
 gales southwest to west 17 m/s to 24 m/s (8 bft to 9 bft).
 (...)

3.5.8 VHF recordings

The vessel traffic service of the Wilhelmshaven Waterways and Shipping Authority provided the recording of VHF channels 2, 7, 8, 9, and 12, as well as the operating channel (80) for the period 0000 to 0800 on 31 January 2013 for the investigation. This recording was logged by the Wilhelmshaven Waterways and Shipping Authority and checked against the available VDR audio recordings.

The dialogues relevant to the accident investigation are reproduced in the following table (highlighting and notes in italics by the BSU).

Time	Calling party	Message
003208	LISA SCHULTE	CORAL ACE, CORAL ACE, Motor Vessel LISA SCHULTE. - No response -
003257	LISA SCHULTE	CORAL ACE, CORAL ACE, Motor Vessel LISA SCHULTE.
003317	CORAL ACE LISA SCHULTE CORAL ACE LISA SCHULTE CORAL ACE	Ahm, this is calling CORAL ACE. Motor Vessel LISA SCHULTE, I am vessel astern of you. You are dragging on the anchor! Okay, okay, okay, I ... know. I will start my engine. Over. Do that immediately, because we have a three cable distance. You are extremely close to us. I know, I know, I know. I will start my engine. Over.
- Collision -		
003715	LISA SCHULTE	CORAL ACE, CORAL ACE, this is LISA SCHULTE. How is the situation? - No response -
004020	LISA SCHULTE GBT LISA SCHULTE GBT	German Bight Traffic, German Bight Traffic, LISA SCHULTE, C4LL2 LISA SCHULTE, German Bight Traffic. Good morning. Here is C4LL2, LISA SCHULTE, calling German Bight Traffic. We just come in collision with Motor Vessel CORAL ACE, which was broken away, which was dragging anchor and hit our vessel in forward. We keep this vessel by our forward area and they hit in the area of cargo hold... two. We now prepare our engine, too, and will start to heave up anchor to come out of this vessel. You start to pick up anchor and start to go out of this area. Okay?

Ref.: 15/13

	LISA SCHULTE	Thank you. Yes... understood. So, ahm, I will make also urgency call.
004330	CORAL ACE LISA SCHULTE CORAL ACE LISA SCHULTE CORAL ACE LISA SCHULTE CORAL ACE LISA SCHULTE	Can you astern your engine? CORAL ACE, CORAL ACE, LISA SCHULTE. Can you astern your engine? ... I will full I now engine, full. Okay, go, go with the engine full ahead. We will also prepare our anchor, then we will try to come out of you. Ahm, ahm, CORAL ACE, let me know, if you... you will need assistance. Yes, I will full ahead engine now, my engine is full ahead now. Okay, thank you. Can you full astern engine? Yes, I understood. We will move engine full astern.
004451	CORAL ACE LISA SCHULTE CORAL ACE LISA SCHULTE CORAL ACE LISA SCHULTE CORAL ACE LISA SCHULTE	(Inaudible) Yes sir, I will work now astern. Okay, I will full ahead, then I will go port, hard port. CORAL ACE, CORAL ACE, LISA SCHULTE. (Inaudible) Ja ja, go ahead. Yes, we will, will work ... now astern. I will ... now astern. Ja, ahm... I will go ahead. Okay, you are going now ahead. Okay, very well, then ahm go ahead. I will stay in position. I will stay in position. Our engine is ready, just in case. Let me know, if you need any assistance.
004559	GBT	LISA SCHULTE, LISA SCHULTE, C4LL2, German Bight Traffic. LISA SCHULTE, LISA SCHULTE, C4LL2, German Bight Traffic. - No response -
004633	GBT CORAL ACE LISA SCHULTE CORAL ACE LISA SCHULTE CORAL ACE LISA SCHULTE CORAL ACE LISA SCHULTE	CORAL ACE, CORAL ACE, 3FJQ9, German Bight Traffic. - No response - Are you... now astern? My engine is going ahead... You astern? CORAL ACE, CORAL ACE, LISA SCHULTE, you going ahead? Ja, continue going ahead. Okay, continue, continue, you will continue going ahead. I will continue going ahead. Yes, please continue going ahead to avoid to catch my cable. Continue going ahead. I will not, I will stop. Otherwise you will catch my cable ahm by your rudder. Ahm, I will continue, I continue ahead, full ahead. Very good, thank you.
004656	GBT	- Orders the MELLUM to proceed to the casualty vessels -
004839	GBT CORAL ACE GBT CORAL ACE GBT CORAL ACE	CORAL ACE, CORAL ACE, 3FJQ9, German Bight Traffic. Yes, German Bight Traffic, CORAL ACE. Ja, CORAL ACE, have you had a collision with the LISA SCHULTE? Ahm, little bit, a little bit. Now I will go ahead with my engine... (stammers)... my engine is go ahead. Ja, CORAL ACE, that means your anchor is still on the ground? Yes, sir, ahm now my anchor in the ground and I will clear... my

Ref.: 15/13

	GBT	vessel first, before I heave up my anchor.
	CORAL ACE	Ja, okay, of course, then clear up the vessel and then heave up the anchor and then let us know regarding any damages on your vessel. Especially if there's some water intake or if there's some oil leakage or something like that, or some person injured.
	GBT	Ahm, nothing, nothing now. Only a railing, little, little damage railing and now all crew is okay, and now my engine is still go ahead, over.
	CORAL ACE	Ja, only a railing damage. Anyway, you check the situation and give us further updates, please. (Pause) And of course, CORAL ACE, if you need some assistance, let us know immediately, yes?
	GBT	(Stammers) I will check any damage and ahm until I will heave up anchor... (inaudible)
	CORAL ACE	Ja, okay, you will pick up your anchor then. Ja okay, that's understood. I will not ... you know you have to do there. Okay, but anyway, stand by on the channel please, as well 80 and 16.
	GBT	Yes sir, I will check my damage if only railing, if ... we have not checked berth, I will ...
	GBT	Ja okay, good so, good watch.
005308	GBT	LISA SCHULTE, LISA SCHULTE, German Bight Traffic.
	LISA SCHULTE	German Bight Traffic, LISA SCHULTE.
	GBT	Ja, LISA SCHULTE, ja I have heard, you have had a collision with the CORAL ACE there. Can you say something about the damage on your vessel, on the amount of damage, are there some persons injured or so?
	LISA SCHULTE	Sir, ahm, standby, standby for a moment. I have chief officer and go some forward. I will check regarding the inspect of the damage and if could be possibility with the oil leakage. Standby, sir, I will call you back something.
	GBT	Ja, okay, we are standing by.
	LISA SCHULTE	Thank you, LISA SCHULTE over and I will call you back something.
	GBT	- Orders the MELLUM to gain an overall view of the damage at the scene, also the LISA SCHULTE; MELLUM confirms -
- As events unfold, reports on specific damage are relayed to GBT by the MELLUM -		

Spreadsheet 1: VHF recordings of the vessel traffic service

4 ANALYSIS

4.1 Traffic situation and weather at the scene of the accident

Eleven other ships were already anchored in the area of the Neue Weser Nord-roadstead when the CORAL ACE arrived there on 30 January 2013. The choice of anchor position by the ship's command of the CORAL ACE, as well as the manoeuvre to get to it, are considered unnecessarily dangerous by the investigating authorities. A force 6 Bft west-south-west wind prevailed and specific gale warnings had been issued for the area of the German Bight since early in the evening of 30 January 2013. From a navigational perspective, rather than proceeding in the middle of the field of vessels laid up at anchor and performing turning manoeuvres there, taking her to within 2 cbl of other ships, on a weather-induced deviating course of at times more than 50°, it would have been safer to anchor to the east of the LISA SCHULTE. Since the ship's command of the CORAL ACE was not available for questioning beyond the information contained in the master's statement afterwards, it remains unclear why so much emphasis was placed on anchoring exactly on the anchor symbol in the radar image.

Legally, the obligation to select a suitable anchor position is incumbent on the master of a ship. Several factors had to be taken into account when choosing the anchor position, which include:

- the location of the roadstead in an open, tidal sea area;
- the extent of use of the roadstead, and
- the ship's own swinging circles and those of the surrounding ships at anchor based on the predicted passage of a low-pressure storm system.

Overall, the selected range of 7 cbl to the LISA SCHULTE does not merit any criticism from a navigational or regulatory perspective. However, appropriate maritime precautions were required to ensure a safe anchoring because of the predicted storm. The master of the CORAL ACE and the OOWs knew about the expected meteorological conditions at sea on the night of 31 January 2013 due to NAVTEX and navigational warnings. Indeed, this knowledge was reflected in the master's instruction to inform him as soon as the weather deteriorated in the night order book. However, basic practices of seamanship were ignored as regards implementation of the procedures for anchoring (see section 3.2).

The predicted increase in wind started at 2000. Although this was registered on the bridge and entered in the bridge log ('SW 8') by the OOW, neither the previous OOW nor the one who relieved him at midnight complied with the instructions in the night order book. An order to put the engine on standby was not issued, nor was the master advised on the deterioration of the weather.

4.2 Ordinary practice of seamen when anchoring

Basically, the CORAL ACE's starboard anchor was adequately dimensioned to hold the ship in position, even in heavy seas. However, eight lengths of chain were quite obviously not sufficient. The distance of at least 7 cbl to the surrounding ships at anchor would have enabled deployment of the 10 available lengths of chain without any complications.

From a maritime perspective and having regard to the external conditions, it is difficult to understand the decision, made by the ship's command on the CORAL ACE, not to keep the main engine and all necessary auxiliary machinery on standby at the latest on receipt of the gale warning at 1800. Combined with an anchor watch performed only on an hourly basis and quarter-hourly verification of the ship's position by the OOW, they were deprived of the opportunity to respond promptly to instances of dragging.

Immediate action was not even taken after the dragging was noticed on the bridge of the CORAL ACE. The bridge microphones recorded some brief obscenities at 0030. After that – even when the OOW on the LISA SCHULTE tried to warn the CORAL ACE two minutes later on VHF – nothing happened. The CORAL ACE moved towards the LISA SCHULTE for more than four and a half minutes before the OOW contacted the engine control room to order that the engine be set to standby. At a distance of less than 3 cbl, no more time was available to take effective action to prevent a collision. Moreover, the crew of the CORAL ACE was only alerted by general alarm when the master reached the bridge a few seconds before the collision.

4.3 Communication after the collision

Communication between the ships involved, as well as with GBT was significantly hampered after the collision due to limited English skills on the part of the ship's command of the CORAL ACE, and failure to comply with international standard marine communication phrases. The recorded VHF traffic revealed the considerable difficulty experienced by the ship's command of the LISA SCHULTE and the nautical supervisor on duty at GBT when trying to assess the extent of damage sustained by the CORAL ACE and coordinate further action. After interviewing part of the crew of the CORAL ACE and assessing the dialogue recorded on the night of the accident, the investigators believe that the conditions for English as the working language on board pursuant to SOLAS were not given.

Due to the difficulties in communicating, the actual extent of the damage was still unknown one hour after the collision, until the MELLUM arrived at the scene of the accident. Although the significant water ingress in cargo hold 3 of the CORAL ACE had been noticed in the meantime, it was not reported to GBT. In retrospect, GBT's decision to permit the MELLUM to proceed to the casualty vessels despite the difficult maritime weather conditions, and even though the only damage reported by that point was a buckled railing, can only be viewed as farsighted and necessary. Ultimately, it is due to the relatively forgiving course of the collision that no fuels or

lubricants were spilled and the buoyancy of the ships involved was not impaired. Despite the concentration of resources and coordination by the CCME, the prevailing weather conditions would have made it difficult, if not even impossible, to combat the consequences of the accident at the scene had they been more significant.

4.4 Other circumstances

The time difference found between the actual time and that displayed on the CORAL ACE's stored radar plots (difference of 16 minutes) is unusually high. It can be assumed that this system time was entered manually. The difference complicated the investigation because the AIS and radar times stored in the S-VDR differed to such an extent that verification using data stored ashore was necessary.

Although the investigation was not significantly affected by the fact that, because of a technical failure of the hard disk, no VDR data from on board the LISA SCHULTE could be analysed, it would have been helpful to obtain details of the maritime weather conditions at the scene, in particular.

5 CONCLUSIONS

Fortunately, the collision in heavy weather between two vessels laid up at anchor, the CORAL ACE and the LISA SCHULTE, did not give rise to injuries or marine pollution despite the unfavourable overall conditions.

5.1 Ordinary practice of seamen

The ship's command of the CORAL ACE ignored basic practices of seamanship. The choice of anchor position in conjunction with the decision to deploy only eight of the 10 lengths of anchor chain was subsequently shown to be the cause of the accident. In the predicted and prevailing 9 to 10 Bft and swell of 4 to 5 m, the eight lengths of chain in the water were unable to hold the CORAL ACE in position.

In view of the gale warnings, the CORAL ACE's engine should undoubtedly have been kept on standby. However, it should be noted that even a 15-minute standby would not have been sufficient to prevent the collision with the LISA SCHULTE. This standby period would have only ensured that control of the engine could be transferred from the engine control room to the bridge within 15 minutes. Since only seven minutes passed between realising the CORAL ACE was dragging and the collision, this period would not have been sufficient to make the engine ready and initiate effective manoeuvres under any circumstances. Even if the dragging motion had been noticed immediately, i.e. at 0023, the remaining 14 minutes until the collision would not have been sufficient to prevent it.

Whether precautions that were more effective (10 lengths of anchor chain, selection of a different anchor position) would have been taken had the OOW advised the master on the deteriorating weather as from 2000 remains questionable. After all, the master was aware of the gale warning when he entered instructions in the night order book. Nevertheless, he did not find it necessary to secure the anchor position of the CORAL ACE with two additional lengths of chain and an engine on standby. The investigating authorities were unable to establish the motive behind that decision.

5.2 Working language: English

Neither the master nor the OOWs on the CORAL ACE had the requisite knowledge of English, the working language specified by the owner, to make contact with the LISA SCHULTE or the vessel traffic service, GBT, when the accident was on the horizon. Furthermore, the inadequate language skills complicated the provision of information on VHF, as well as interviews by the BSU in the aftermath of the accident. The crew of the CORAL ACE did not observe the standard marine communication phrases recommended by the IMO⁹ for radio traffic. This greatly impaired the assignment of individual VHF radio messages from the CORAL ACE, as well as the understanding of the information provided.

⁹ International Maritime Organization

5.3 Legibility of instructions at the anchor station

Warnings and operating instructions on plates at the two windlasses on the fore section of the CORAL ACE were no longer legible. For safe operation of the windlasses by the deck crew, it is essential to replace the plates with ones that are legible. This is especially true in view of the fact that the length of the anchor chain is different on the two anchors.

5.4 Voyage data recorder

Voyage data recorders represent a crucial source of information for an investigation in terms of tracing the events on board relevant to an accident. It is the responsibility of the owner to ensure that the voyage data recorder used on board is fully functional in accordance with the international standards.

6 SAFETY RECOMMENDATIONS

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

6.1 Owner of the CORAL ACE

The investigating authorities recommend that the owner of the CORAL ACE train the master and officers in charge of the navigational watch in respect of effective precautionary measures and ordinary practice of seamen when setting anchor in an open sea area.

6.2 Owner of the CORAL ACE

The investigating authorities recommend that the owner of the CORAL ACE train the crew in English, the working language required on board, in particular in respect of the IMO's standard marine communication phrases for VHF radio traffic.

6.3 Owner of the CORAL ACE

The investigating authorities recommend that the owner of the CORAL ACE replace the existing plates containing warnings and operating instructions at the windlasses with ones that are legible.

7 SOURCES

- Ship documents and certificates
- Investigation by the waterway police
- Accident log of the CCME
- Surveys of the CORAL ACE
- Written statements by the ship's commands
- Damage reports by the classification societies
- Nautical chart of the Federal Maritime and Hydrographic Agency
- Official weather report by Germany's National Meteorological Service
- AIS recordings by the vessel traffic service German Bight Traffic
- S-VDR recordings of the CORAL ACE