



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

Summary
Investigation Report 551/10

Serious Marine Casualty

Collision west of Skagen
between the MV FRISIA ROTTERDAM
and the MV CLEANTEC
on 13 December 2010 at 0518

15 November 2011

The investigation was conducted in conformity with the law to improve safety of shipping by investigating marine casualties and other incidents (Maritime Safety Investigation Law - SUG) of 16 June 2002.

According to said act, the sole objective of this investigation is to prevent future accidents and malfunctions. This investigation does not serve to ascertain fault, liability or claims.

This report should not be used in court proceedings or proceedings of the Maritime Board. Reference is made to art. 19 para. 4 SUG.

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

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1 Summary

At 0518 on 13 December 2010, the FRISIA ROTTERDAM collided with the CLEANTEC west of Denmark. There was considerable material damage; however, neither people nor the environment were adversely affected.

The bulk carrier CLEANTEC, en route from Klaipėda to Paranaguá, was fully laden and had just passed Skagen as the container vessel FRISIA ROTTERDAM, en route from Aarhus to Bremerhaven and approaching from astern on the port side, struck the port side of the CLEANTEC with her bow. After the collision, each crew inspected the damage to its vessel and found that she was still buoyant. The two vessels were subsequently inspected by the Danish authorities and the classification societies. It was decided that the FRISIA ROTTERDAM should be permitted to continue to Bremerhaven. However, the CLEANTEC had to be towed to the shipyard in Odense due to the heavy damage she sustained. She was not able to continue her voyage until 10 January 2011.

2 SHIP PARTICULARS

2.1 Photo of the CLEANTEC



Figure 1: Photo of the CLEANTEC

2.2 Vessel particulars: CLEANTEC

Name of vessel:	CLEANTEC
Type of vessel:	Bulk carrier
Nationality/flag:	Hong Kong, China
Port of registry:	Hong Kong
IMO number:	9437418
Call sign:	VRFT6
Owner:	Adani Shipping (China) Co. Ltd.
Year built:	2009
Shipyard/yard number:	TAIZHOU MAPLE LEAF SHIPBUILDING Co. Ltd./MLBC32500-022
Classification society:	CHINA CLASSIFICATION SOCIETY
Length overall:	179.9 m
Breadth overall:	28.4 m
Gross tonnage:	20,763
Deadweight:	33,270 t
Draught (max.):	10.0 m
Engine rating:	6,480 kW
Main engine:	MAN B&W 6S42MC
(Service) Speed:	13.7 kts
Hull material:	Steel
Hull design:	Double hull, double bottom

2.3 Voyage particulars: CLEANTEC

Port of departure:	Klaipėda
Port of call:	Paranaguá
Type of voyage:	Merchant shipping, international
Cargo information:	30,749.6 t potash fertiliser
Manning:	24
Draught at time of accident:	F: 9.85 m M: 10.0 m A: 10.15 m
Pilot on board:	No
Canal helmsman:	No
Number of passengers:	0

2.4 Photo of the FRISIA ROTTERDAM



Figure 2: Photo of the FRISIA ROTTERDAM

2.5 Vessel particulars: FRISIA ROTTERDAM

Name of vessel:	FRISIA ROTTERDAM
Type of vessel:	Container vessel
Nationality/flag:	Germany
Port of registry:	Leer
IMO number:	9299032
Call sign:	DCGL2
Owner:	Hartmann Schifffahrts GmbH & Co. KG
Year built:	2004
Shipyard/yard number:	Aker MTW/102
Classification society:	Germanischer Lloyd
Length overall:	195.4 m
Breadth overall:	29.8 m
Gross tonnage:	25,406

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Deadweight:	33,784 t
Draught (max.):	11.4 m
Engine rating:	21,770 kW
Main engine:	MAN
(Service) Speed:	22 kts
Hull material:	Steel
Minimum safe manning:	20

2.6 Voyage particulars: FRISIA ROTTERDAM

Port of departure:	Aarhus
Port of call:	Bremerhaven
Type of voyage:	Merchant shipping, international
Cargo information:	Containers
Manning:	20
Draught at time of accident:	F: 8.8 m M: 9.2 m A: 9.6 m
Pilot on board:	No
Canal helmsman:	No
Number of passengers:	0

2.7 Marine casualty or incident information

Type of marine casualty/incident:	Serious marine casualty, collision
Date, time:	13/12/2010, 0518
Location:	West of Skagen
Latitude/Longitude:	ϕ 57°38'N λ 009°17'E
Ship operation and voyage segment:	Open sea
Place on board:	Forecastle
Human factors:	Yes, human error Yes, violation
Consequences (for people, vessel, cargo, environment and other):	No injuries or damage to the environment, extensive damage to both vessels

Excerpt from Nautical Chart 101, BSH

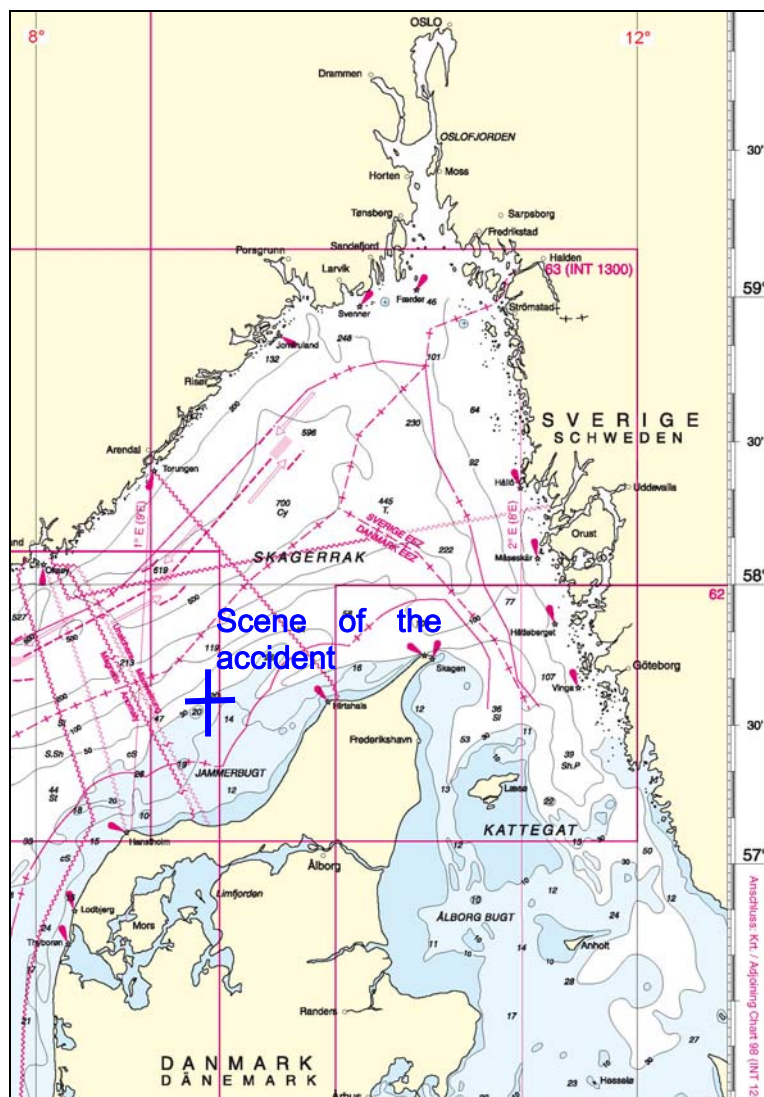


Figure 3: Scene of the accident

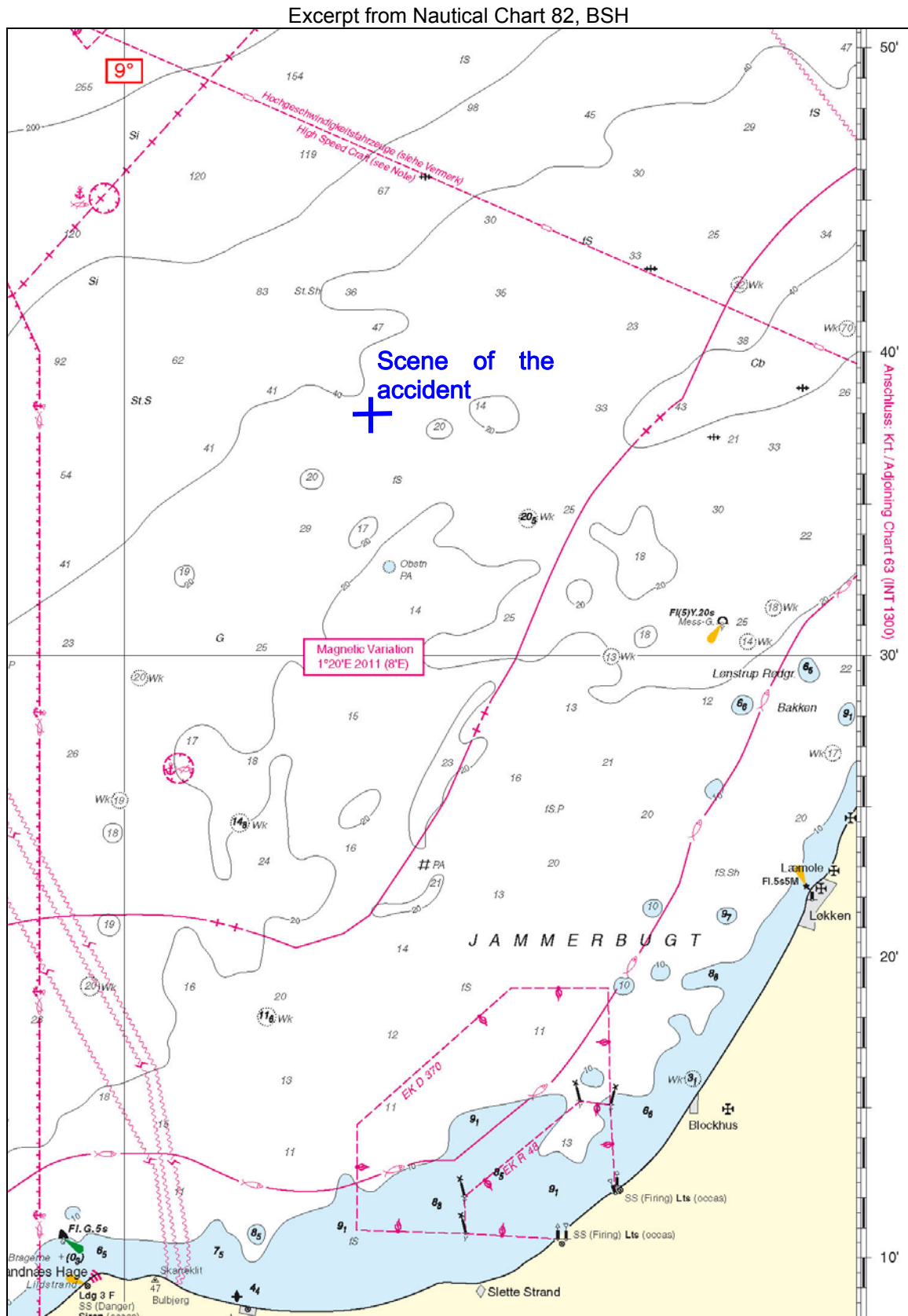


Figure 4: Nautical chart with scene of the accident in detail

2.8 Shore authority involvement and emergency response

Agencies involved:	SAR Lingby Radio, Danish Maritime Casualty Investigation Division, Danish Maritime Authority
Resources used:	Helicopter, rescue vessel, tug, divers
Actions taken:	Both vessels inspected by divers; CLEANTEC towed to shipyard by tug
Results achieved:	FRISIA ROTTERDAM was permitted to continue; CLEANTEC had to proceed to the shipyard in Odense

3 COURSE OF THE ACCIDENT AND INVESTIGATION

3.1 Course of the accident

The bulk carrier CLEANTEC was loaded with 30,749.67 MT of potash fertiliser and en route from Klaipėda (Lithuania) to Paranaguá (Brazil). The vessel passed Skagen at about 0030 on 13 December 2010 and altered course to 270°. The navigational watch changed at about 0345 and was manned by the chief officer and a rating on watch. Weather conditions were good and a north-easterly wind with visibility of about 10 nm prevailed.

At about 0410, the course was altered to 232°. The speed was 13.5 kts. The radar was operated at a range of 6 nm. At about 0500, the officer on watch reportedly noticed the FRISIA ROTTERDAM on the port side. She steered a course of 245° and was about 4 kts faster than the CLEANTEC. The CLEANTEC's officer on watch assumed that an overtaking manoeuvre would take place.

Since the FRISIA ROTTERDAM did not evade, the chief officer of the CLEANTEC reportedly ordered that the helm be set to hard to starboard at a distance of about 1 nm. However, she was no longer able to avoid the collision. At 0518, the bow of the FRISIA ROTTERDAM struck the port side of the CLEANTEC. After the collision, the crew of the CLEANTEC checked all tanks and found no water ingress. The only exception was water ballast tank 3.

Following that, the master sent a distress call on VHF channel 16 and made contact with Ålbæk Radio. After describing the situation, he was informed by the Search and Rescue Centre (SAR) that a lifeboat and a helicopter had been sent to assess the situation. The CLEANTEC was requested to remain at her position and await further instructions. At about 0910, a new instruction was given and she was to proceed into Ålbæk Bay and anchor there. The tanks were sounded regularly and no change was found during this period. There was no pollution.

The CLEANTEC reached her assigned anchorage at about 1600 and representatives of the Danish authorities boarded about an hour later.

Extensive investigations were carried out on 15 December 2010. In the process, the underwater hull was inspected by divers to determine the damage. The classification society and the Danish authorities found that the vessel could proceed to Fredericia. The CLEANTEC reached the anchorage at Fredericia at 2224 under pilot guidance. The cargo was almost completely unloaded between 16 December 2010 at 1725 and 19 December 2010 at 1800. Following that, the vessel left the port and proceeded to Odense under pilot guidance; she arrived at the anchorage at about 2230. The CLEANTEC was put into dock on the morning of 20 December 2010 and the repair work started. The work was completed on the evening of 7 January 2011 and the vessel left Odense on the following morning. At midday, she reached Fredericia, where the loading work began in the evening. The CLEANTEC left Fredericia at 1107 on 10 January 2011 after the cargo was reloaded to continue the original voyage to Paranaguá.

The container vessel FRISIA ROTTERDAM left Aarhus (Denmark) at about 1818 on 12 December 2010 and was en route to Bremerhaven.

Here, too, the chief officer took over the navigational watch at about 0345 after resting since 2200. It was not possible to establish why a rating was not on watch. After the second officer handed over the watch, he left the bridge and the chief officer altered the course from 248° to 255° at 0405 to make more room for two vessels on the port side. He returned to the track (248°) 10 minutes later. At 0430, he plotted the vessel's position on the nautical chart. He reportedly identified the CLEANTEC visually and on the radar shortly before 0500. He was able to recall a bearing of 20° on the starboard side at a distance of 2.5 nm. She was moving at about 15 kts and would certainly have passed his vessel. Therefore, he reportedly entered the 0500 position on the nautical chart and in the logbook. At about 0520, he reportedly heard loud noises and realised a collision had occurred. He reportedly turned on the second steering gear pump immediately, then reportedly switched to manual steering and set the helm to hard to port. At the same time, he reportedly set the main engine from full ahead across half ahead to stop. He then reportedly informed the master and crew.

While entering the bridge, the master reportedly pressed the appropriate VDR switch in order to secure the data. At the same time, the general alarm was sounded. No injuries were found when the crew was assembled. The sounding of all the relevant areas of the vessel then started. In spite of heavy damage to the starboard side between bays 33 and 38, no water ingress was found. It appeared that the forepeak was taking on water via the bulbous bow; however, it remained in this area, meaning it did not appear to jeopardise the vessel's stability.

The ship's command established contact with the CLEANTEC, Lingby Radio, and the owner. The Danish authorities inspected the condition of the FRISIA ROTTERDAM from outside and gave her permission to proceed to Bremerhaven at about 1100.

3.2 Consequences of the accident

There were neither injuries nor environmental pollution. However, the damage to both vessels was considerable; see the following photos by way of example.

Figure 5 shows scarring on the forecastle of the FRISIA ROTTERDAM and Figure 6 the vessel's heavily damaged bulbous bow.

It appeared that the crack in Figure 7 was only on the shell plating. The crew did not detect water ingress inside the vessel.

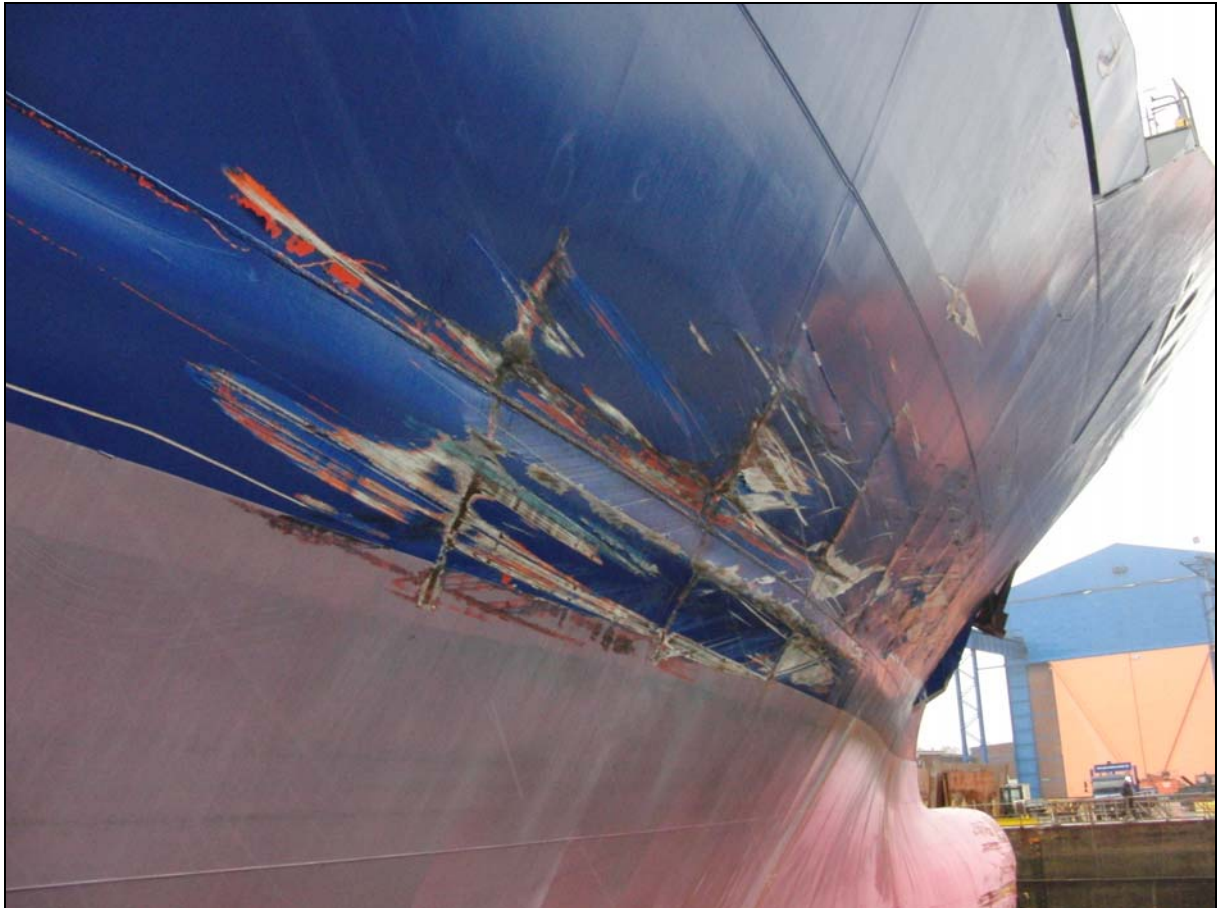


Figure 5: Damage photo 1 – FRISIA ROTTERDAM



Figure 6: Damage photo 2 – FRISIA ROTTERDAM



Figure 7: Damage photo 3 – FRISIA ROTTERDAM

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The damage to the CLEANTEC was considerably heavier. In making preparations for his crew to abandon the vessel, the master's actions were entirely appropriate. Initially, there was a risk that the vessel would founder. However, as the situation stabilised it became clear that the crew could remain on board and take the vessel into the nearest port.

Taken after the vessel was unloaded, Figure 8 shows the point of impact below the waterline.

In its report, the ship's command subsequently described the damage in the following manner: the port side was very heavily damaged between frames 120 and 135; quite a few stanchions broke on deck. On the port side, the deck superstructure was damaged up to the boat deck. Cargo hold 3 filled with water. The vessel heeled 3° to port and the bow dropped by one metre.



Figure 8: Damage photo 4 – CLEANTEC



Figure 9: Damage photo 5 – CLEANTEC



Figure 10: Damage photo 6 – CLEANTEC



Figure 11: Damage photo 7 – CLEANTEC

3.3 Investigation

3.3.1 Investigation by the waterway police

After the collision, the CLEANTEC initially anchored in the Danish Ålbæk Bay in order for the damage to be surveyed. After it was possible to ascertain that the vessel would not founder, she sailed to Fredericia for repairs on 16 December 2010. Despite the damage, the FRISIA ROTTERDAM was able to continue her voyage unaided after the accident and reached Bremerhaven at about 0900 on 14 December 2010. Waterway Police (WSP) Bremerhaven began their investigations immediately. Numerous photos were taken, documents inspected, witness accounts obtained and the technical records secured. It was not possible to read-out the VDR data because the backup was not performed correctly by the ship's command. Rudiments of data were later provided by the manufacturer of the VDR, Interschalt. The WSP coordination centre in Cuxhaven secured the recorded AIS data of the two vessels involved in the collision. The analysis by the WSP revealed that an overtaking manoeuvre was clearly evident. The FRISIA ROTTERDAM overtook the CLEANTEC in accordance with Rule 13 of the Regulations for Preventing Collisions at Sea (COLREG). The CLEANTEC complied with her obligation under Rule 17 COLREG and maintained course and speed. At a distance between the vessels of 0.45 nm, the CLEANTEC apparently changed course to port. It was not possible to determine the reason for this.

Only the officer on watch was on the bridge of the FRISIA ROTTERDAM. Accordingly, the bridge was not properly manned. According to his testimony, he identified the CLEANTEC shortly before 0500 at a distance of 2.5 nm on the starboard side. However, since he had reportedly seen that the passing distance was adequate, he did not continue to observe her up until the collision, but was reportedly distracted by entries in the chart and the log book. The BSU takes the view that since there are no witnesses and no technical evidence, any other situation is also possible.

3.3.2 Environmental conditions

The sky was overcast but there was no precipitation. Air temperature stood at 4°C and visibility was good. The wind blew from the north-east at 3 to 4 Bft.

3.3.3 AIS data

The Danish traffic safety and control system saves, inter alia, the AIS data¹ of vessels located in Danish waters. The BSU was provided with the relevant AIS data

¹ Automatic Identification System; introduced to improve maritime safety. All vessels equipped with this system continuously transmit data such as the position, course and speed as well as possibly other information, which can be made visible on a monitor, via VHF.

on the basis of European Directive 2009/18/EC, which lays down the principles governing the investigation of accidents in the maritime transport sector.²

The following figures illustrate the sequence of events surrounding this collision. Figure 12 shows how the course lines of the two vessels continuously converge at 0513. A change of course and speed by either vessel is not recorded up until the collision at 0518.

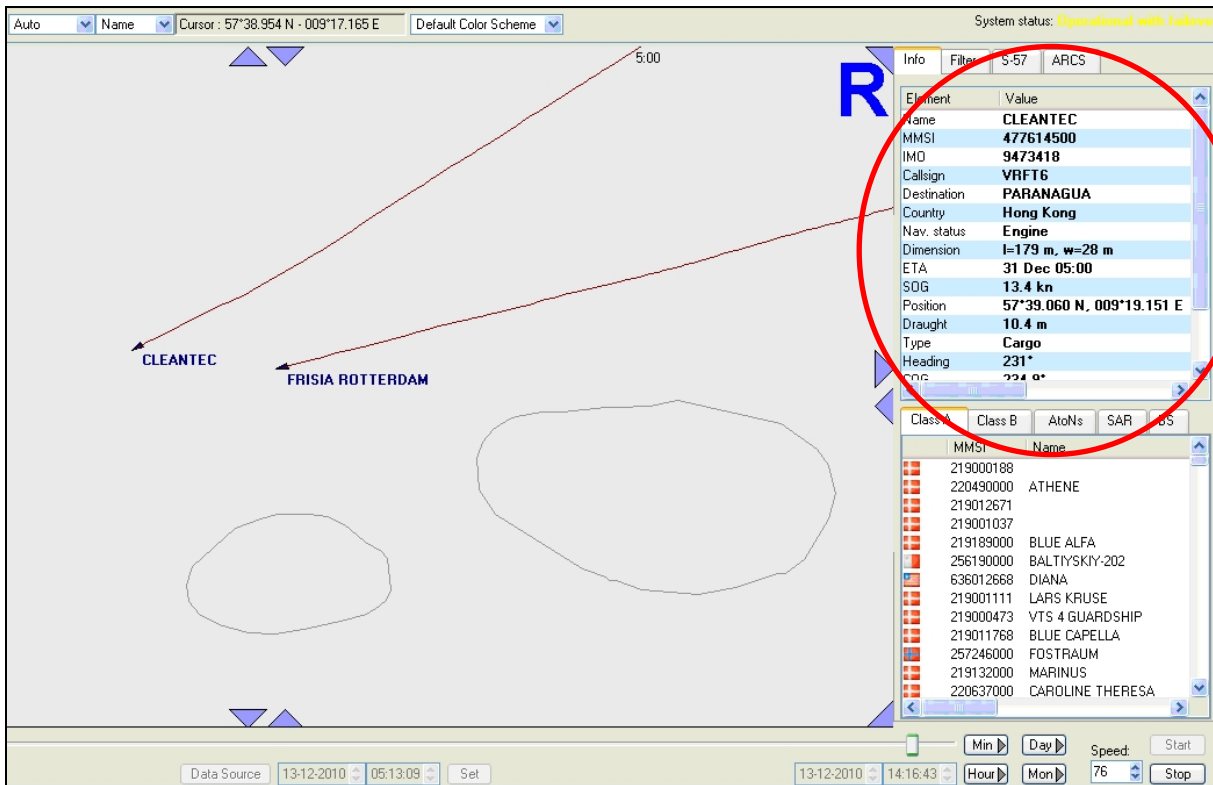


Figure 12: AIS recording of 051309

² With regard to the ongoing debate on the accuracy of transmitted GPS data and their graphic reproduction on screens as well as in print, it should be noted that the findings below only indicate the tendencies of the respective course of the voyage.

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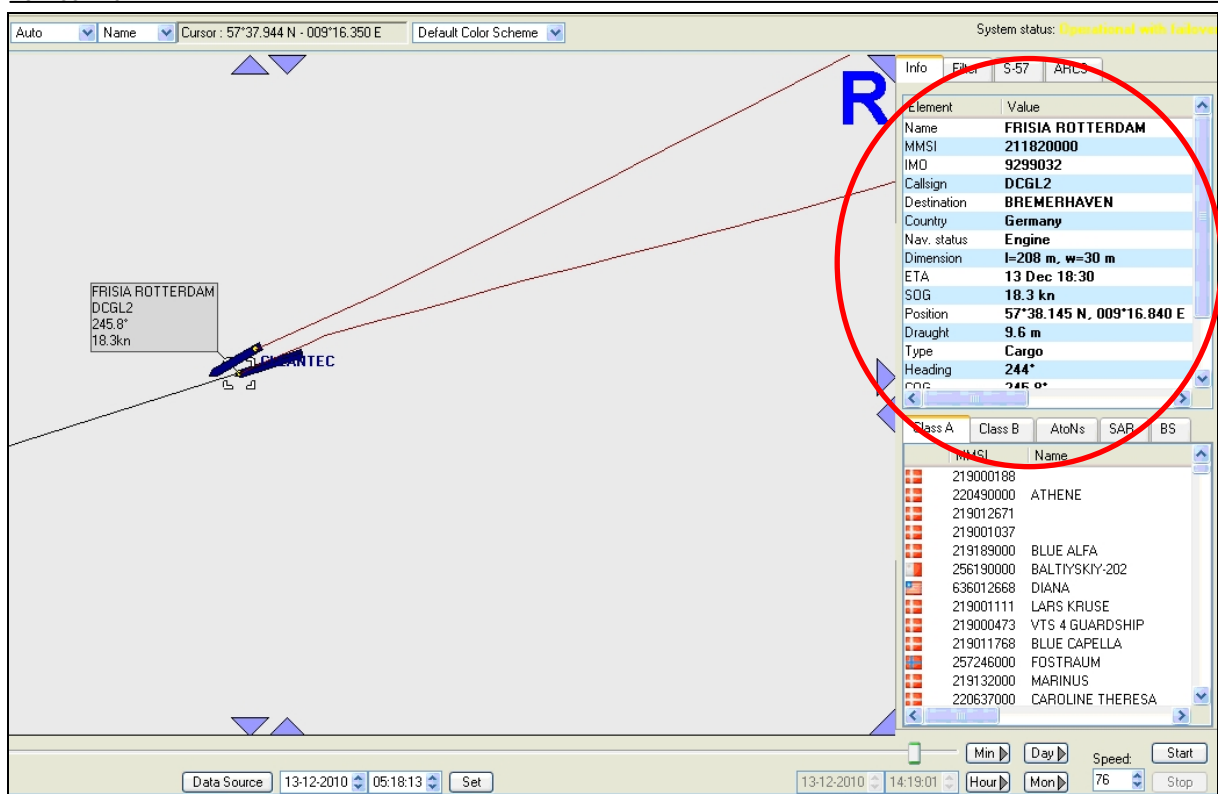


Figure 13: AIS recording of 051813 – FRISIA ROTTERDAM

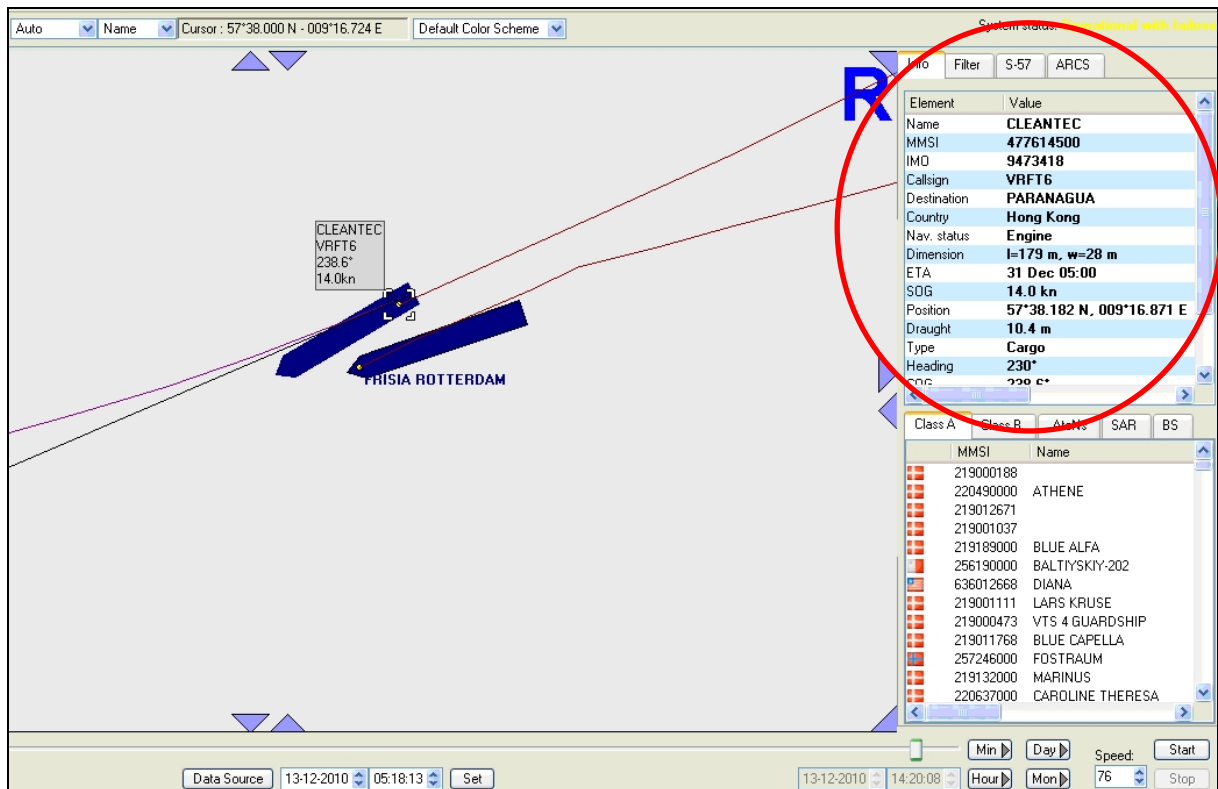


Figure 14: AIS recording of 051813 – CLEANTEC

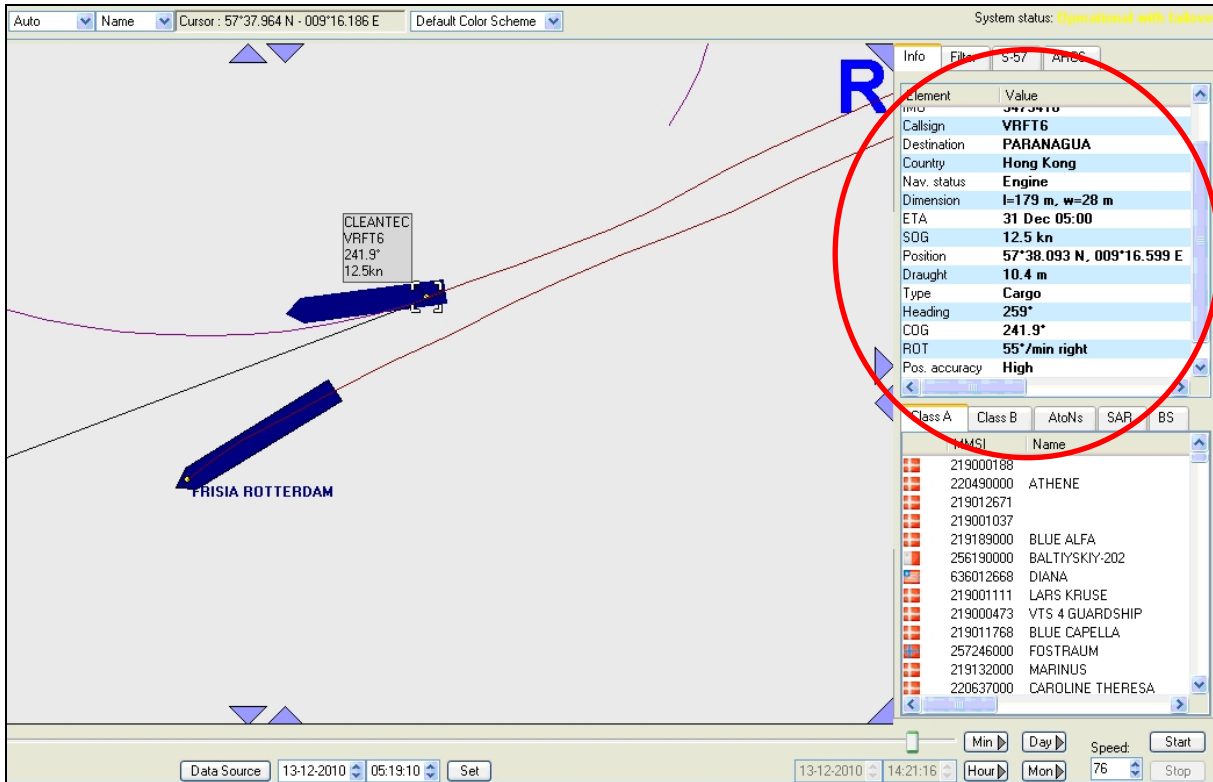


Figure 15: AIS recording of 051910 – CLEANTEC

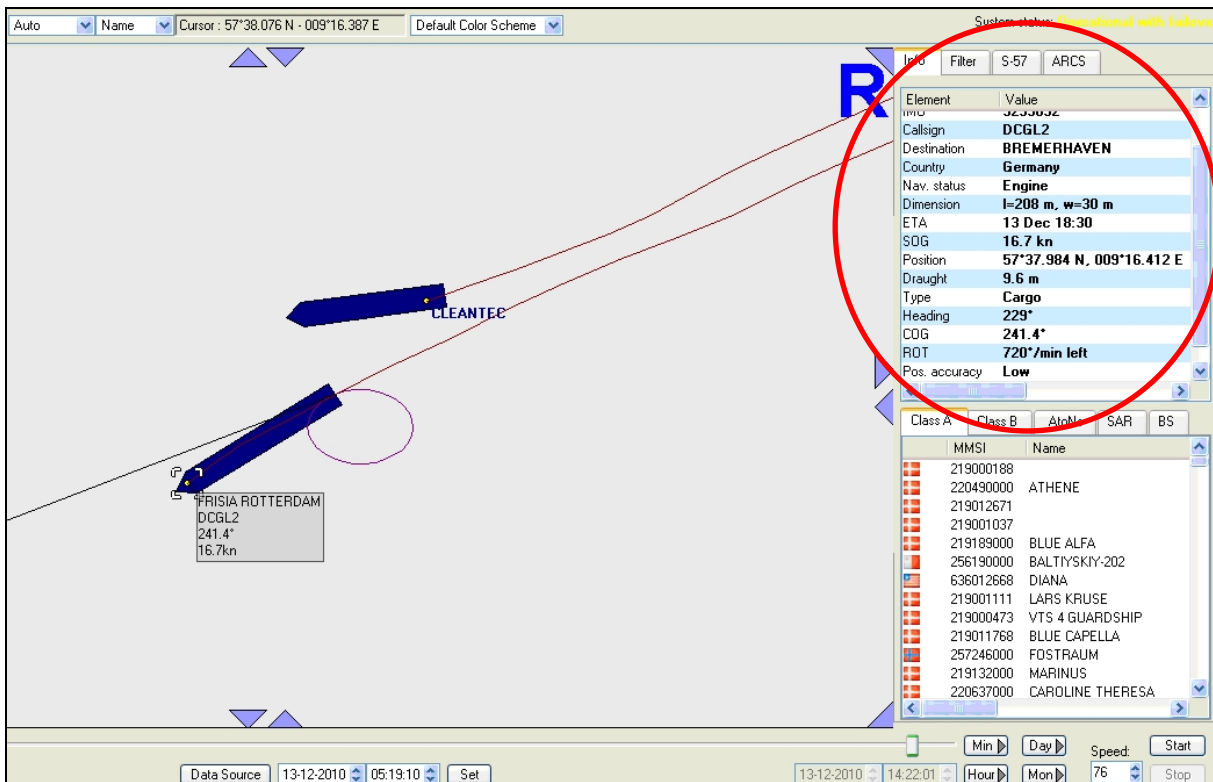


Figure 16: AIS recording of 051910 – FRISIA ROTTERDAM

The following table contains part of the AIS data:

Time	CLEANTEC		FRISIA ROTTERDAM	
	Course	Speed	Course	Speed
UTC + 1				
0501	228°	13.5 kts	250°	20.0 kts
0510	228°	13.3 kts	247°	19.9 kts
0515	234°	13.4 kts	249°	19.9 kts
0518	230°	14.0 kts	244°	18.3 kts

The last row refers to the time of the accident.

3.4 Voyage data recorder (VDR)

A VDR was on board both vessels. The representatives of the CLEANTEC assured the BSU that unfortunately no data on the accident were available. The reasons for this were not known.

The master of the FRISIA ROTTERDAM operated the emergency backup of his VDR. However, he was not aware that he had to press for a few seconds to actually start the recording process. A complex data recovery on the device's hard drive did not deliver any results, either.

In conclusion, it remains to be noted that information was available from neither of the two VDRs after the collision.

4 ANALYSIS

In all likelihood, it would have been possible to trace and explain the accident from start to finish with the help of the VDR data. All the same, the AIS recordings of the coastal stations were available, which clearly show that both vessels do not change their courses and speeds up until the collision.

In behaving as it did, the ship's command of the FRISIA ROTTERDAM contravened the COLREGs in that it did not maintain an adequate passing distance, it did not observe its obligation to give way, and it caused harm to other traffic. Due to the absence of a lookout, the bridge was not properly manned. It is likely that diligent use of the radar equipment would have prevented the collision.

The ship's command of the CLEANTEC did not assist in preventing the collision by taking last-moment action.

Assessment of all the information gathered does not enable the BSU to arrive at sound safety recommendations because it was not possible to establish the reasons for the two ship's commands acting as they did.

However, it is clear that this marine casualty did not reveal any new findings of particular importance to safety at sea. Therefore, the Federal Bureau of Maritime Casualty Investigation is concluding the investigation of this marine casualty with a summary investigation report.³

³ See art. 15 para. 1 SUG in conjunction with art. 18 para. 4 FIUUG.

5 SOURCES

- Investigations by the waterway police (WSP)
- Written statements
 - Ship's command
 - Owner
 - Classification society
- Witness accounts
- Nautical charts and vessel particulars, Federal Maritime and Hydrographic Agency (BSH)
- AIS recordings of the Danish Maritime Authorities (DMA)