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 507/11

Serious Marine Casualty

Collision between the MOL EFFICIENCY and the SPLITTNES on 22 November 2011 at 2013 on the Weser

28 January 2013

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 in the version applicable prior to 30 November 2011.

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 the aforementioned version of art. 19 para. 4 SUG.

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

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1 Summary

On 22 November 2011, the SPLITTNES was en route to Bremen on the Weser fully laden. The vessel's command, under pilot's advice, intended to reduce the speed as far as necessary to allow for the MOL EFFICIENCY, proceeding ahead of her, to turn and berth. There was a strong rising tide and visibility was very impaired due to fog.
At about 2009[1], the harbour pilot of the MOL EFFICIENCY proposed to the shore based radar guidance that the SPLITTNES pass before the MOL EFFICIENCY turns and berths after all. He was afraid that the SPLITTNESS would not be able to maintain her position. The sea pilot agreed and recommended his ship's command to accelerate his vessel again. During the attempt to steer the SPLITTNES back into the middle of the fairway, her starboard side collided with the aft port side of the MOL EFFICIENCY. The starboard side of the SPLITTNES was torn open so severely in the process that the vessel very quickly began to list and the crew had the impression she would founder. The severe list caused a number of crew members to panic and they abandoned the SPLITTNES in one of the lifeboats. However, the remainder of the crew on board managed to offset the list quickly by ballasting.
Considerable material damage was caused to both vessels. Nobody was injured. Minor water pollution could be remedied.

[1] Unless stated otherwise, all times shown in this report are local = CET = UTC + 1.

2 SHIP PARTICULARS

2.1 MOL EFFICIENCY

2.1.1 Photo of MOL EFFICIENCY

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Figure 1: Photo of MOL EFFICIENCY

2.1.2 Vessel particulars MOL EFFICIENCY

Name of vessel:	MOL EFFICIENCY
Type of vessel:	Container
Nationality/Flag:	Panama
Port of registry:	Panama
IMO number:	9251365
Call sign:	HQZY
Owner:	Mitsui OSK Lines Ltd.
Year built:	2003
Shipyard/Yard number:	Mitsubishi Heavy Industries Ltd./1246
Classification society:	American Bureau of Shipping (ABS)
Length overall:	294.09 m
Breadth overall:	32.2 m
Gross tonnage:	53,822
Deadweight:	63,160 t
Draught (max.):	13.5 m
Engine rating:	49,410 kW
Main engine:	Sulzer 9RTA96C
(Service) Speed:	25.45 kts
Hull material:	Steel

2.1.3 Voyage particulars MOL EFFICIENCY

Port of departure:	Felixstowe, Great Britain
Port of call:	Bremerhaven, Germany
Type of voyage:	Merchant shipping International
Cargo information:	Containers
Manning:	24
Draught at time of accident:	11.10 m
Pilot on board:	Yes

2.2 SPLITTNES

2.2.1 Photo of SPLITTNES

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Figure 2: Photo of SPLITTNES

2.2.2 Vessel particulars SPLITTNES

Name of vessel:	SPLITTNES
Type of vessel:	Bulk carrier
Nationality/Flag:	Antigua & Barbuda
Port of registry:	St. Johns
IMO number:	9101730
Call sign:	V2EA7
Owner:	HJH Shipmanagement GmbH
Year built:	1994
Shipyard/Yard number:	Kvaerner Kleven Leirvik AS/261
Classification society:	Germanischer Lloyd (GL)
Length overall:	166.20 m
Breadth overall:	20.50 m
Gross tonnage:	11,538
Deadweight:	18,964 t
Draught (max.):	9.52 m
Engine rating:	4,440 kW

Main engine:	Wärtsilä Diesel Oyj
(Service) Speed:	15.4 kts
Hull material:	Steel
Minimum safe manning:	11

2.2.3 Voyage particulars SPLITTNES

Port of departure:	Jelsa, Norway
Port of call:	Bremen, Germany
Type of voyage:	Merchant shipping International
Cargo information:	17,273 t of grit
Manning:	17
Draught at time of accident:	F: 9.50 m, A: 9.50 m
Pilot on board:	Yes

2.3 Marine casualty or incident information

Type of marine casualty/incident:	Serious marine casualty, collision
Date, time:	22/11/2011, 2013
Location:	Weser, buoy number 53
Latitude/Longitude:	φ 53°34.9'N λ 008°31.5'E
Ship operation and voyage segment:	Harbour mode/arrival/berth
Consequences (for people, vessel, cargo, environment, other):	Severe material damage to both vessels, no injuries, minor water pollution

Excerpt from Nautical Chart DE421060, BSH

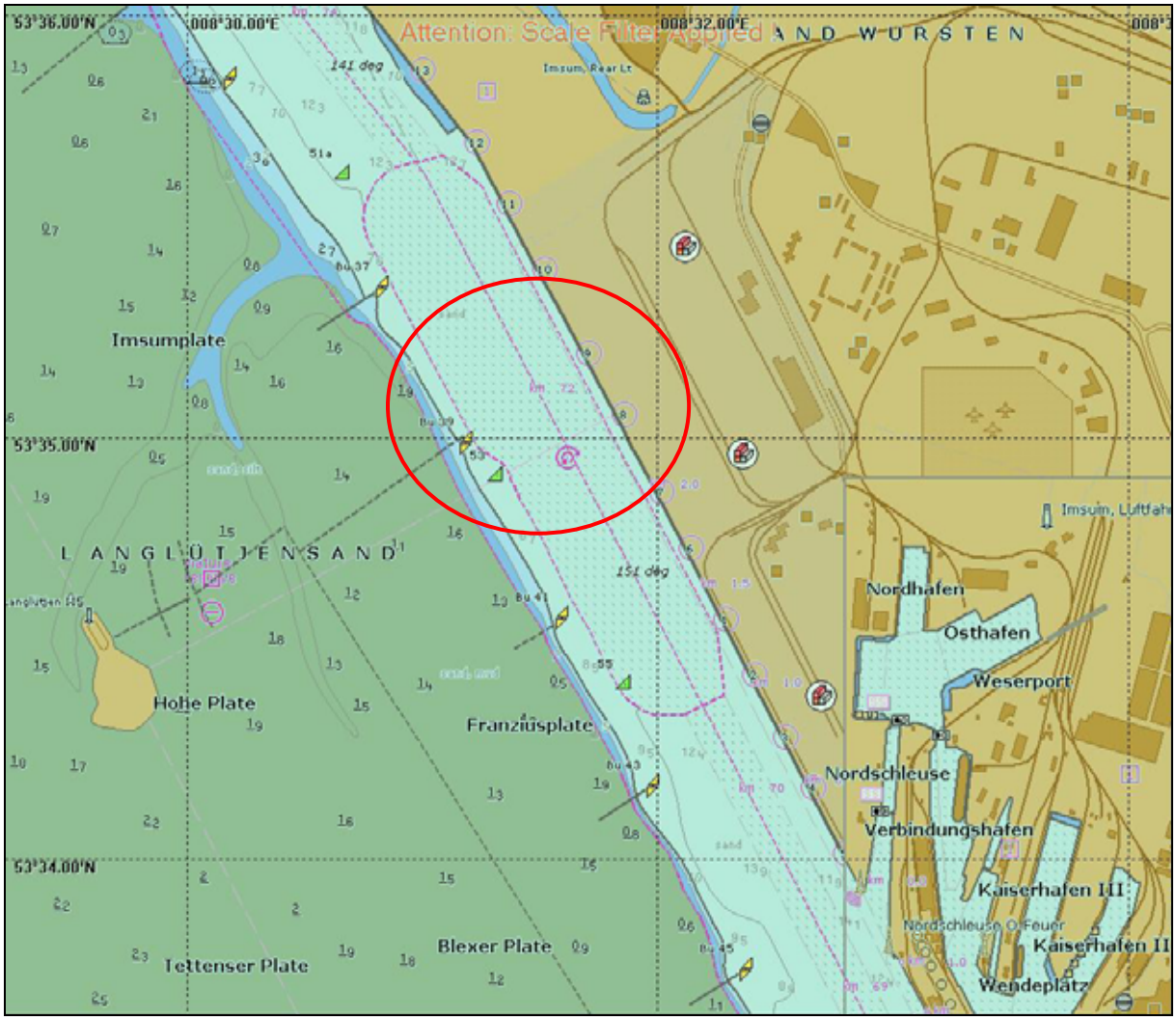

Figure 3: Nautical chart showing the scene of the accident

2.4 Shore authority involvement and emergency response

Agencies involved:	German Central Command for Maritime Emergencies (CCME), Vessel Traffic Service, Fire Brigade, Waterway Police
Resources used:	3 tugs, water pollution control vessel (GS) MELLUM
Action taken:	Towed to the pier, water pumped out, tears closed
Results achieved:	The SPLITTNES remained buoyant and was towed to a shipyard for repairs

3 COURSE OF THE ACCIDENT AND INVESTIGATION

3.1 Course of the accident

The SPLITTNES was en route from Jelsa, Norway to Bremen. She was fully laden with 17,273 t of grit and reached the Weser with a draught of 9.50 m on an even keel. At about 0950 in the morning of 22 November 2011, the SPLITTNES anchored in the Nord-Reede to wait for the next high tide. At 1646, the anchor was back on deck and the sea pilot boarded at 1715.
At the time of the accident, the bridge was manned by the master, third officer and a helmsman. These individuals were unable to speak German and thus unable to understand any plans the sea pilot made over VHF in German. Therefore, the pilot translated every plan made in German with the radar pilot at Blexen. The pilot of the SPLITTNES stood at the port radar, which was a Furuno X-band device. A rising tide of about 2 kts prevailed as the SPLITTNES proceeded along the Weser. Fog was very dense and visibility stood at less than 100 m in places.

The tug RT PETER cast off from the tug port in Bremerhaven at 1910 on 22 November to assist the incoming MOL EFFICIENCY together with the tug RT STEPHANIE. The harbour pilot was picked up by the RT PETER at the port entrance and taken to the MOL EFFICIENCY. During this voyage, the harbour pilot determined that the RT STEPHANIE would make fast at the forward centre and that rather than her usual position at aft port, the RT PETER would make fast at the aft centre due to the very poor visibility. After the harbour pilot had been transferred to the MOL EFFICIENCY, the tugs took up their positions.

The MOL EFFICIENCY and her two tugs were easily visible ahead on the radar and on the TRANSAS electronic chart system (ECDIS[2]). Originally the sea pilot recommended the ship's command of the SPLITTNESS to reduce her speed in order to enable the MOL EFFICIENCY to turn and berth. Accordingly, the SPLITTNES started to reduce her speed between buoys 49 and 51. At about 2009 the sea pilot recommended the master to change the plan. They would now be able to overtake the MOL EFFICIENCY on her port side; she would wait and then turn and berth at the pier afterwards.
Reportedly, the stern of the MOL EFFICIENCY became visible directly ahead of the bow of the SPLITTNES shortly afterwards and came ever closer until finally the aft port side of the MOL EFFICIENCY collided with the starboard side of the SPLITTNES. The vessels then scraped past each other over almost their entire lengths. The SPLITTNES heeled increasingly to starboard in the process. The harbour pilot of the MOL EFFICIENCY immediately ordered the aft tug RT PETER to tow to the west, ordered the engine to be set to AHEAD and the rudder to port. This allowed for both ships to separate shortly before the superstructure of the SPLITTNES could hit the MOL EFFICIENCY. After the collision the harbour pilot set the engine of MOL EFFICIENCY to astern, stopped the aft tug RT PETER and ordered the tug STEPHANIE, acting ahead, to tow to west. Thereby the MOL EFFICIENCY managed to get free from the SPLITTNES and further damage was avoided. Subsequently the Vessel Traffic Services was informed about the collision

[2] ECDIS – Electronic Chart Display and Information System

and the vessel's command started the turning manoeuvre in order to berth the MOL EFFICIENCY at the position required. Directly after the collision the SPLITTNES listed as far as some 20° at times; however, she straightened again and finally listed at about 7°. This could be reduced to 3° by ballasting. Repeated verification of draughts showed that the situation remained unchanged.

3.1.1 Damage to the MOL EFFICIENCY

The MOL EFFICIENCY sustained damage on the aft port side, the helm and the transom because of the collision. Two holes were created, each about 2 m long and 0.5 m wide. The frames below were fractured. The rudder post was bent and the rudder blade damaged. The repairs continued for several months.

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Figure 4: Hole in the transom of MOL EFFICIENCY

WSP Bremerhaven

Figure 5: Damage to the rudder area of MOL EFFICIENCY

3.1.2 Damage to the SPLITTNES

The starboard side of the SPLITTNES was heavily damaged by the collision. A 15 m long gash was sustained on the shell plating. This immediately led to a strong inrush of water, which, in turn, caused the vessel to list to about 20°. Above and beyond that, damage was sustained on the starboard side of the main deck from the forward edge of the superstructures to 40 metres in front. The guard rail was completely destroyed there.
Furthermore, hatch covers 5 and 6 were damaged amongst other things. The damage sustained amounted to more than EUR 1 million.
A day tank was also damaged. This caused diesel oil to escape, which resulted in minor water pollution over an area of about 100 m^2. Deployed oil booms made it possible to contain and capture the polluted water.

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Figure 6: Destroyed starboard guard rail on SPLITTNES

Nobody came to physical harm. According to statements made by certain crew members of the SPLITTNES, they saw similarities to the foundering of the sister vessel, ROCKNES[3], and understandably experienced moments of fear.

[3] See Investigation Report 18/04 on the marine casualty of 19 January 2004 involving the ROCKNES. This was a joint investigation report of the Department of Marine Services and Merchant Shipping Antigua and Barbuda W.I. and the BSU published on 1 March 2006.

BSU

Figure 7: Destroyed main deck on SPLITTNES

WSP Bremerhaven

Figure 8: Water ingress on the starboard side of SPLITTNES

3.2 Investigation

3.2.1 Environmental conditions

Germany's National Meteorological Service (DWD) compiled the following report for the BSU:
"The German National Meteorological Service has hourly measurements and observations from the surrounding stations at Bremerhaven, Nordholz, Cuxhaven, Wittmundhafen and Wangerland-Hooksiel at its disposal for the Bremerhaven area (Weser buoy 53). Moreover, analyses of the German National Meteorological Service in Offenbach and forecasts of the ECMWF (European Centre for Medium Range Weather Forecast, Reading, England) were drawn on when compiling this report. Satellite images were also analysed. Data on the sea state are based on buoy measurements and calculations made using the high resolution ESM model. Data on the current came from the Federal Maritime and Hydrographic Agency (BSH).

On 22 November 2011, the pronounced wedge of a high over the Balkans stretched across Eastern Europe and the Baltic Sea to northern Scandinavia. Northern Germany was situated on the western flank of this wedge in an area of very low differences in atmospheric pressure with weak southeasterly to southerly flows. A trough approached from the west; however, this did not reach the area under consideration until the following day.

At low wind speeds over the entire North Sea up to well into Lower Saxony, an area with very high humidity was able to form in advance of the trough approaching from the west. This was responsible for fog, including in the Weser estuary, with very low visibility in places throughout the day. Visibility only rose to 6 kilometres for a few hours in the morning during a period of haze. At the time of the accident, humidity stood at 100% and visibility at about 100 metres. Air temperature was slightly below 1° C and the water temperature between 6.5 and 7° C.
At this point, a southerly wind reaching 6 kts (2 Beaufort) at the Bremerhaven station prevailed. It can be assumed that 8 to 10 kts (3 Beaufort) were reached on the Weser. The wind was met by light swell from the northwest; however, this did not exceed 1-2 decimetres. Also from the north to northwest, the current was declining slightly and stood at almost 2 kts."

3.2.2 Analysis of the AIS data

The graphical display of the AIS data[4] was provided to the BSU by the 'Gemeinsame Leitstelle der Wasserschutzpolizeien der Küstenländer' (joint control centre of the waterway police of the coastal states). The audio recordings of the Vessel Traffic Services were provided by the Waterways and Shipping Office Bremerhaven.

At about 1944 on 22 November 2011, the harbour pilot was taken on board the incoming MOL EFFICIENCY level with fairway buoy 49 to provide assistance with the berthing manoeuvre at the Stromkaje at Bremerhaven.

[4] **A**utomatic **I**dentification **S**ystem; 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.

At 1957, the MOL EFFICIENCY was stopped and held in the western part of the Weser fairway level with fairway buoy 53 by two tugs to enable the OCEAN PEGASUS, which was sailing downstream, to pass first. The RT STEPHANIE assisted at the bow and the RT PETER at the stern.
VHF channel 7[5] was used for communication between the pilots on board and the shore-based radar pilot at Blexen Radar Station. According to the audio recording at 1956, the shore-based radar pilot at Blexen Radar Station advised the SPLITTNES of the fact that the MOL EFFICIENCY stopped and waited for the PEGASUS. The pilot of the SPLITTNES replied he "…stops".

At 2001 the pilot of MOL EFFICIENCY asked Blexen Radar to give SPLITTNES a warning that he stops here, whereupon Blexen Radar replied that SPLITTNES is already aware.

In spite of this the radar pilot called the SPLITTNES and reminded her that MOL EFFICIENCY waited ahead of her. The pilot of the SPLITTNES answered "…we are proceeding with minimum speed; we are stopping immediately and start an astern manoeuvre, if we are not slowing down shortly."

At 2004 Blexen Radar is again issuing information to all: "MOL EFFICIENCY is in the middle of the western fairway and proceeding with 1 kts or almost without any speed."

At about 2006, Blexen Radar once again questioned the pilot on the SPLITTNES, who confirmed that his vessel would wait until the MOL EFFICIENCY had turned and berthed. He reportedly had already half astern. Following that, the pilot on the MOL EFFICIENCY acknowledged that he overheard the plan. This point in time is shown in Figure 9; the SPLITTNES is sailing upstream on the Weser. The MOL EFFICIENCY's aft tug, RT PETER, is already visible on the lower edge of the image. The distance between the two vessels is approximately 2.2 nm. The MOL EFFICIENCY shows in the radar image of the SPLITTNESS a speed von about 0,5 kts astern and the SPLITTNES is gaining on her at about 6.1 kts.

The SPLITTNES is proceeding with 6,1 kts (SOG) at 2006 and with 5,0 kts at 200822. The starboard turn of the vessel could thus be attributed to the speed reduction. A left turning controllable pitch propeller, used by the SPLITTNES as propulsion system, causes a turn to starboard. However, the course alteration is mainly accounted for by the steering of the vessel's command. The audio recording of the VDR of the SPLITTNES shows that from 2005 on the vessel was turned to starboard with the rudder and the bow thruster. Simultaneously the vessel stopped, at times with zero pitch of the variable pitch propeller.

[5] This is a ship-shore-channel working in the duplex-method. Transmission and reception is being effected by two different frequencies. The transmission frequency of the sea radio communication centre(s) correspond to the reception frequency of the coastal radio communication centres and vice versa. That means that a direct ship to ship communication via this channel is impossible to technical reasons.

Figure 9: AIS display at 200601

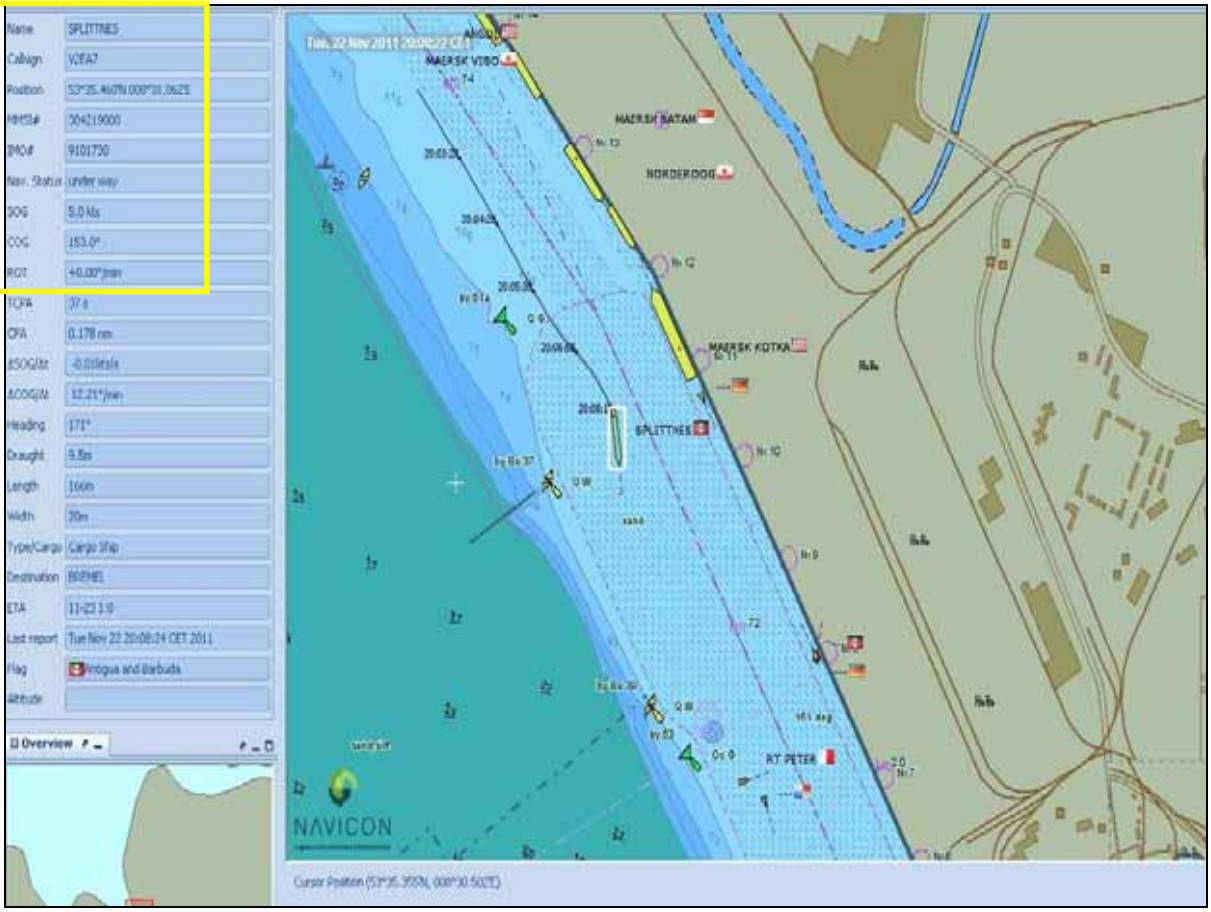

Figure 10: AIS display at 200822

Figure 10 shows the time (2009) at which the pilot of the MOL EFFICIENCY suggested that the SPLITTNES ought to pass when the OCEAN PEGASUS had passed and before the MOL EFFICIENCY began to turn after all. The shore-based radar guidance conveyed this suggestion to the SPLITTNES. The vessel's command of the SPLITTNES (under pilot's advice) agreed and then increased her speed again. This can be seen in figures 11 and 12.

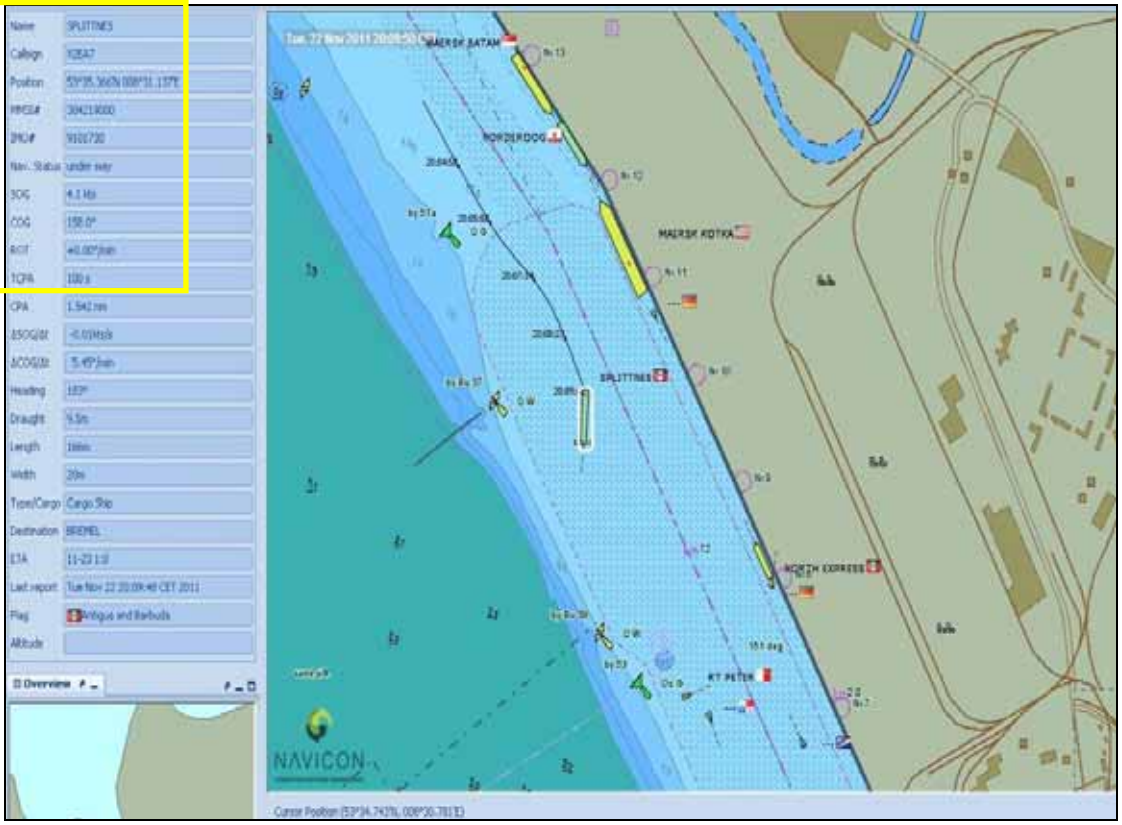

Figure 11: AIS display at 200950

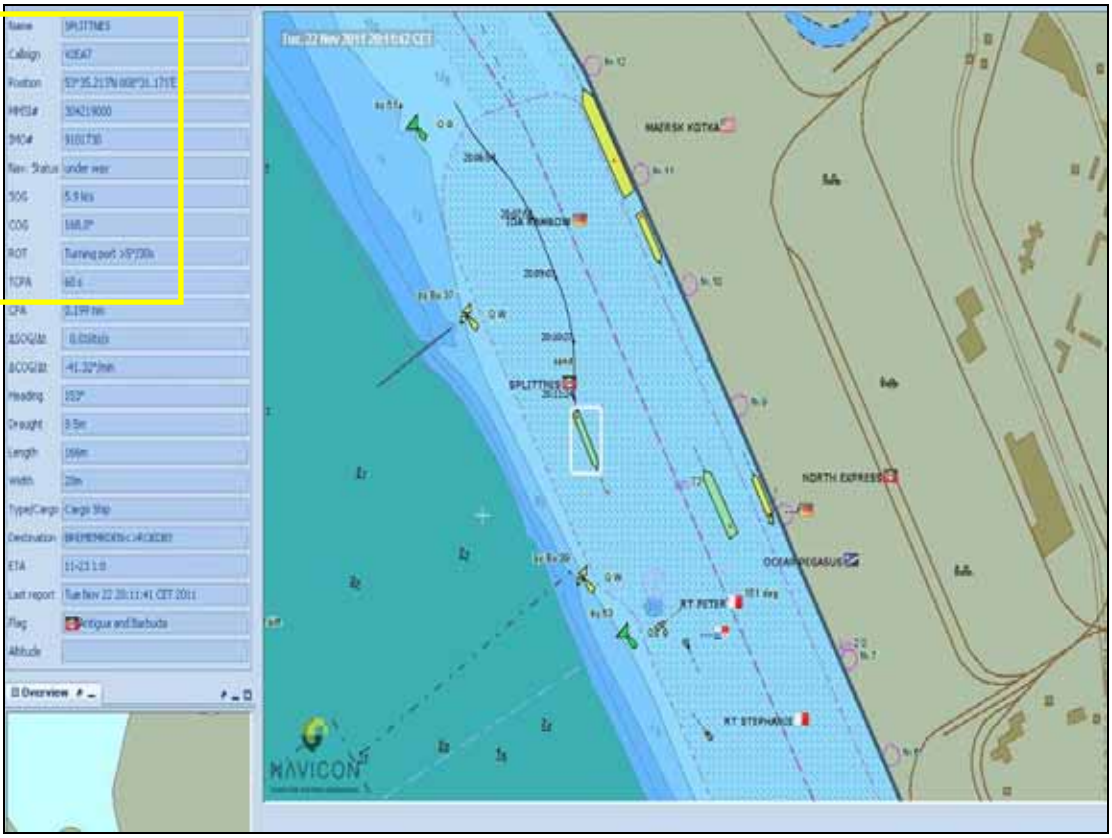

Figure 12: AIS display at 201142

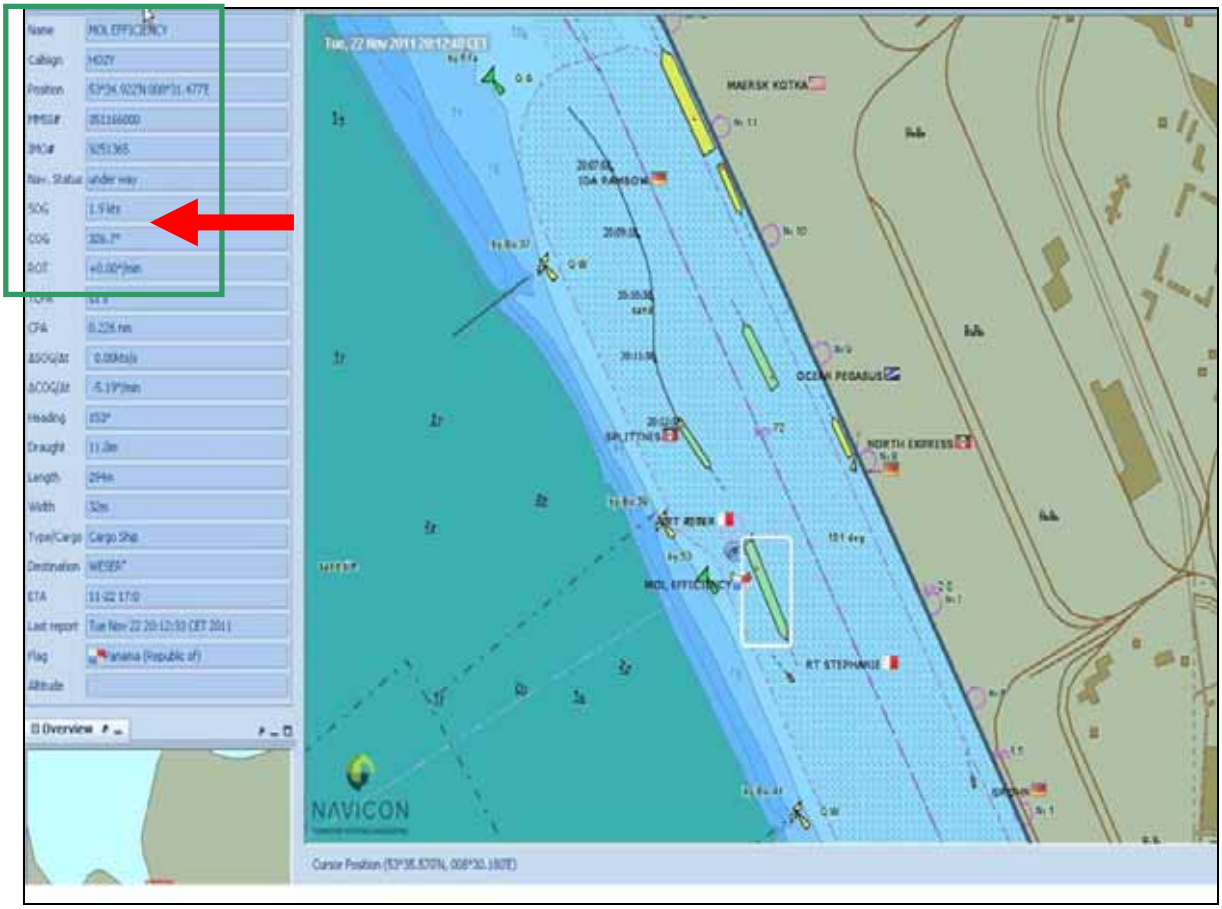

Figure 13: AIS display at 201240

Figure 13 shows the data of the MOL EFFICIENCY about one minute before the collision. Her speed over ground is about 2 kts in a northwesterly direction, i.e. astern. The ship's command and pilot of the MOL EFFICIENCY endeavour to keep the position of the large container vessel inside the turning circle.
Figures 14 to 19 below show the collision between the two vessels clearly.
At 201430, the pilot of the MOL EFFICIENCY reports the collision to the shore-based radar pilot at Blexen Radar. The MOL EFFICIENCY's accident position was at 053°34.948' N and 008°31.449' E.

Neither fog nor warning signals were sounded by any of the parties involved.

The aft tug, RT PETER, was able to move away from the collision in time by towing to west on instruction of the pilot; therefore, she did not sustain any damage.

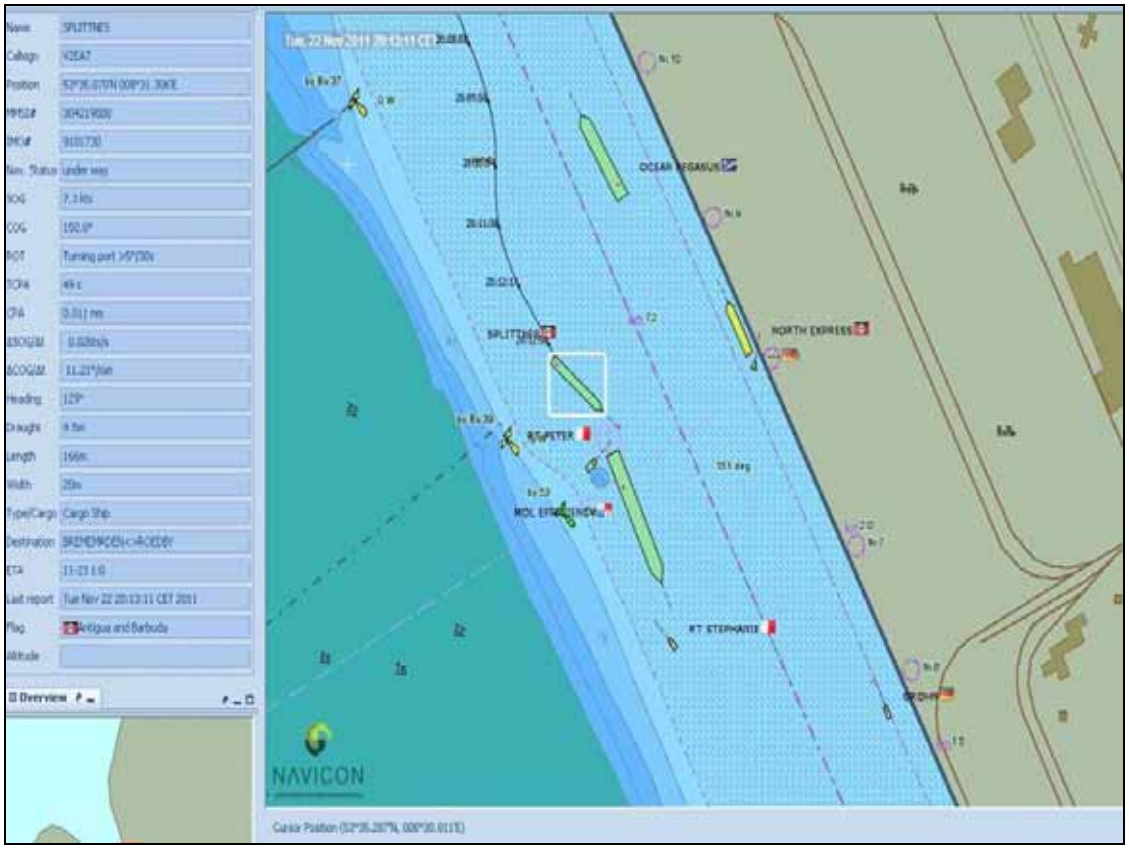

Figure 14: AIS display at 201311

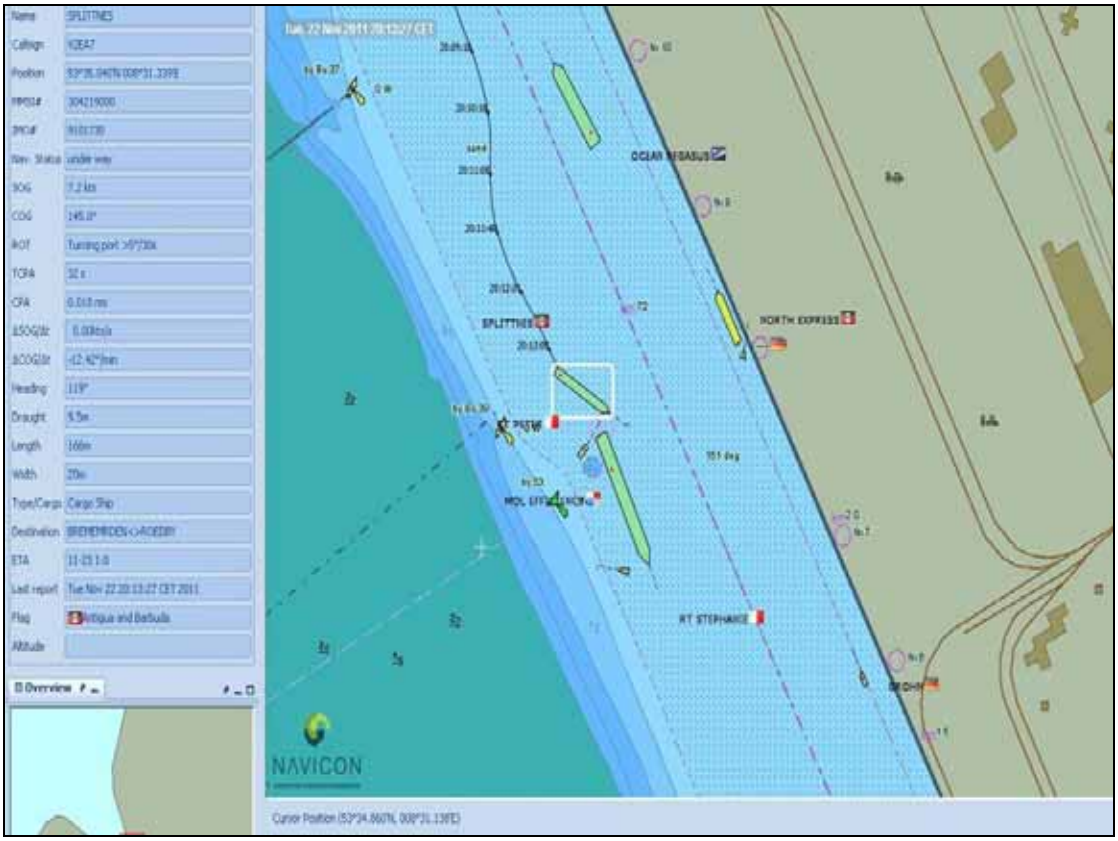

Figure 15: AIS display at 201327

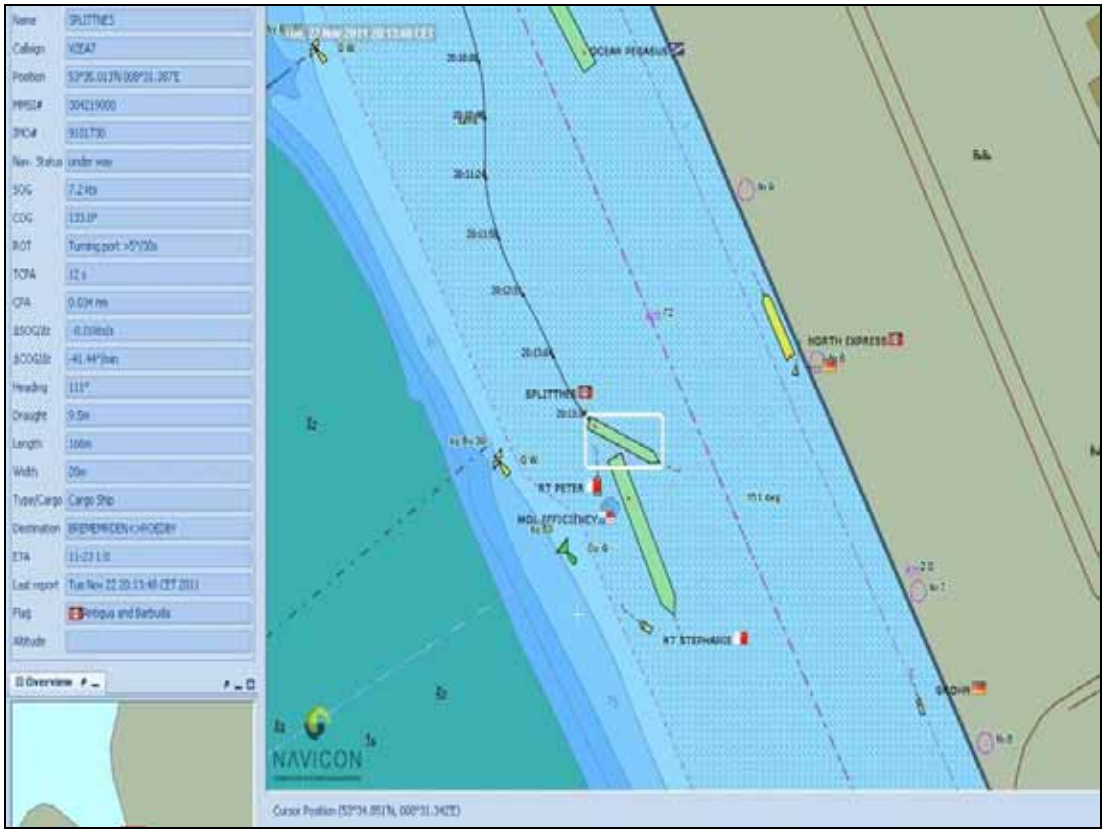

Figure 16: AIS display at 201348

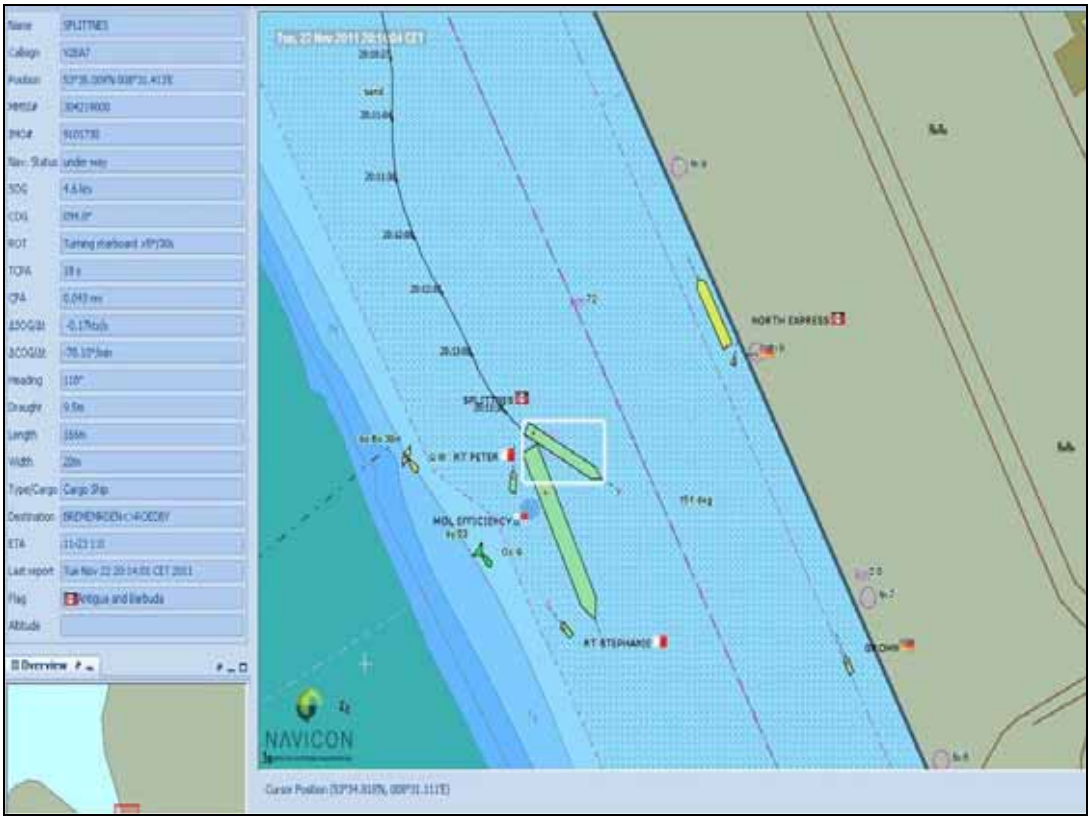

Figure 17: AIS display at 201404

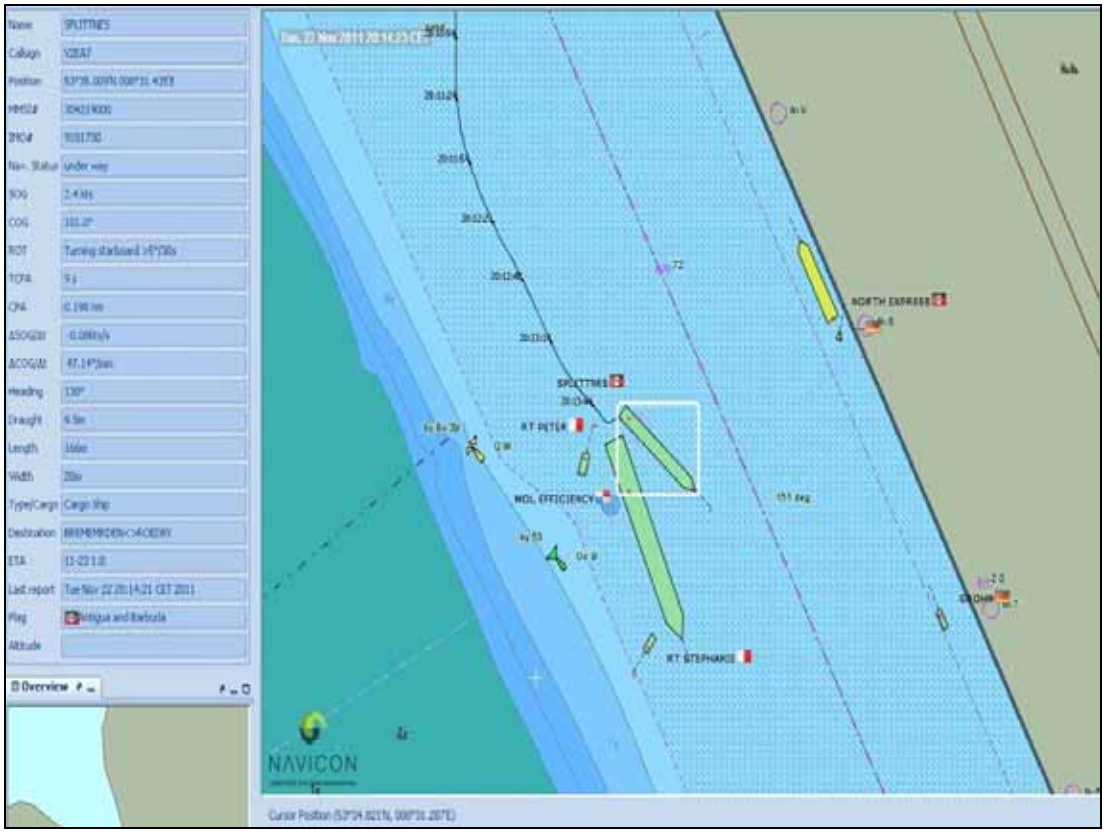

Figure 18: AIS display at 201423

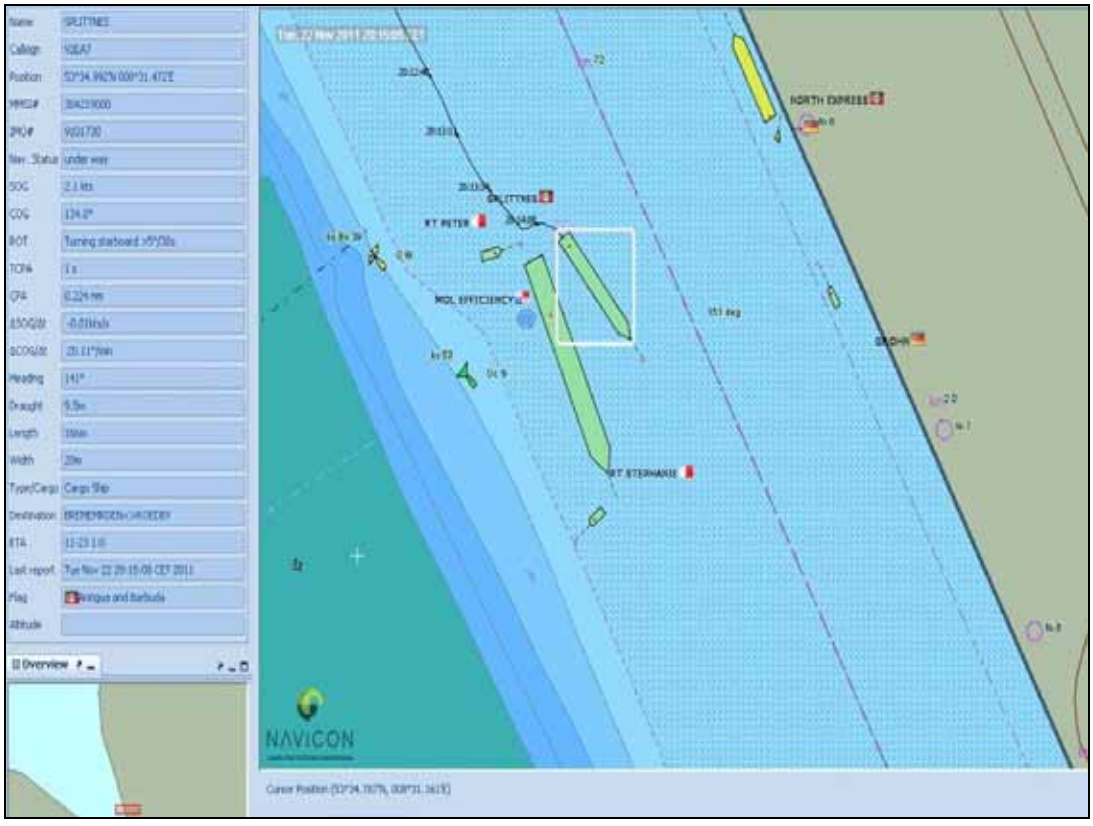

Figure 19: AIS display at 201505

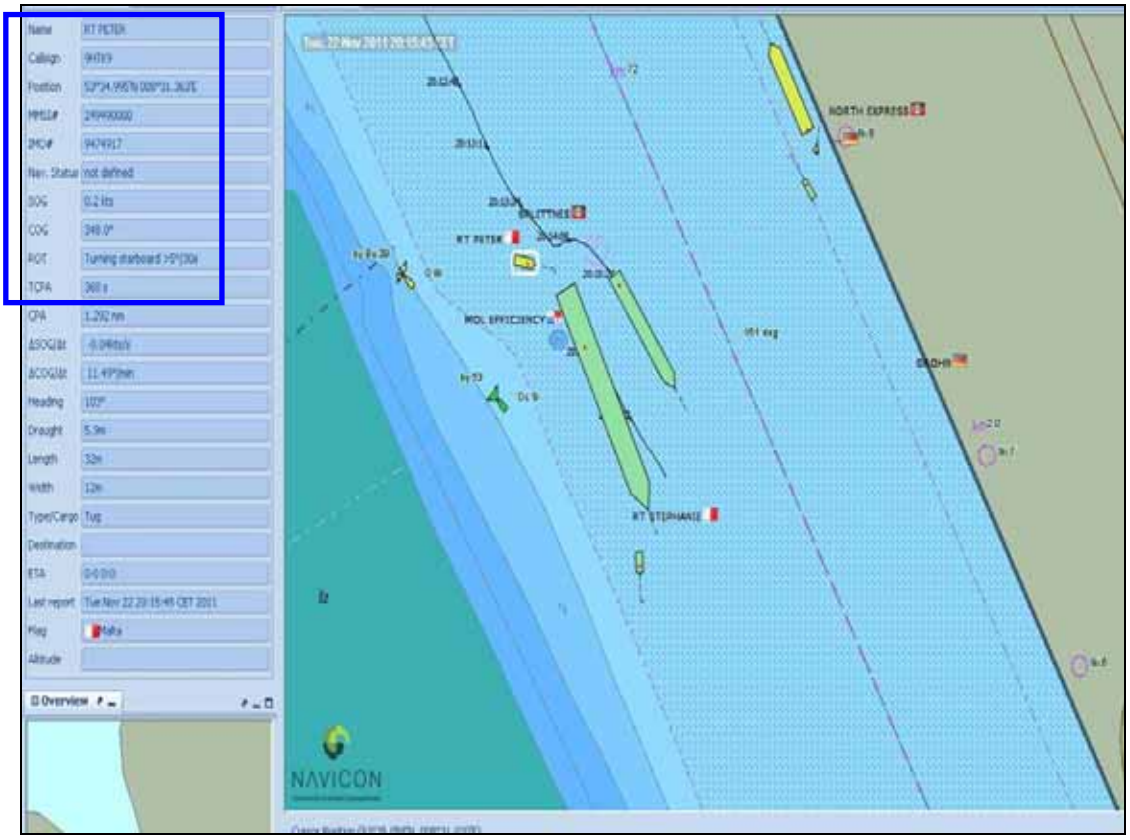

Figure 20: AIS display at 201543

While Figure 20 shows the position of the aft tug, RT PETER, shortly after the collision, Figure 21 shows the position of the forward tug, RT STEPHANIE, at 2016. The two vessels involved in the collision have just separated. Figure 22 shows the final stages of the collision. At this point, the SPLITTNES is already taking on so much water that she is heeling heavily to starboard. The ship's command takes focused action to keep the vessel afloat and get her to the pier as quickly as possible.

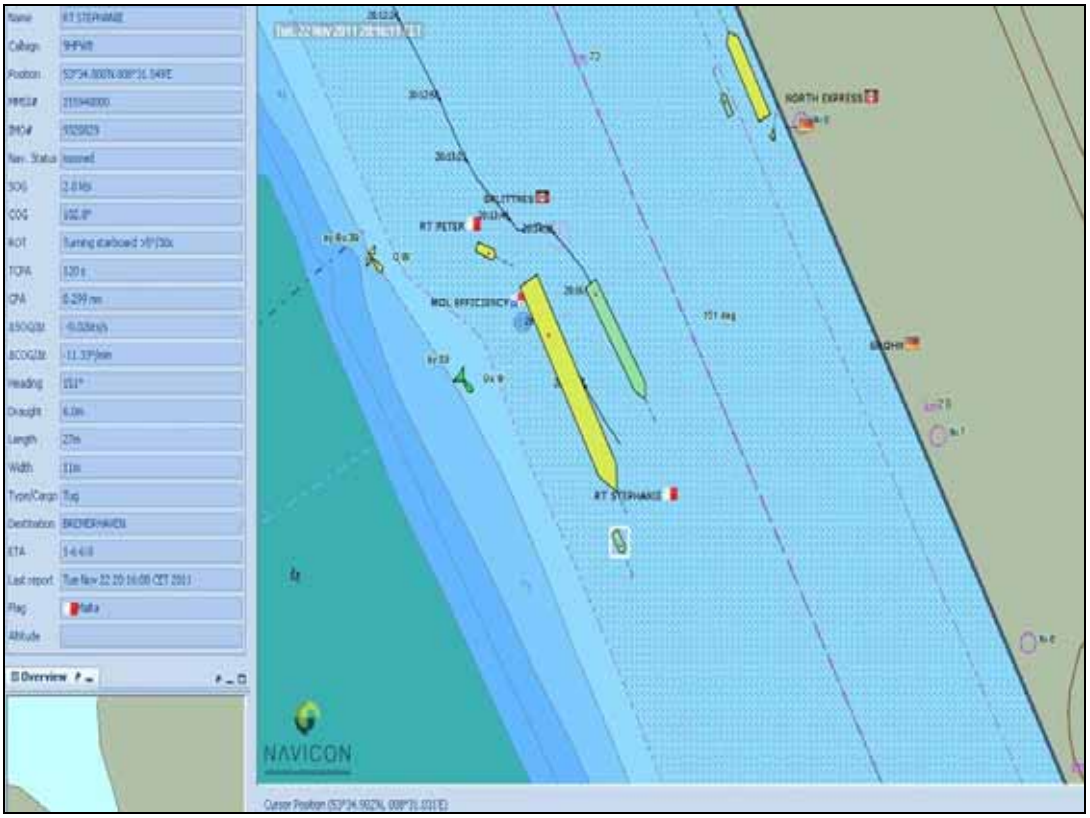

Figure 21: AIS display at 201611

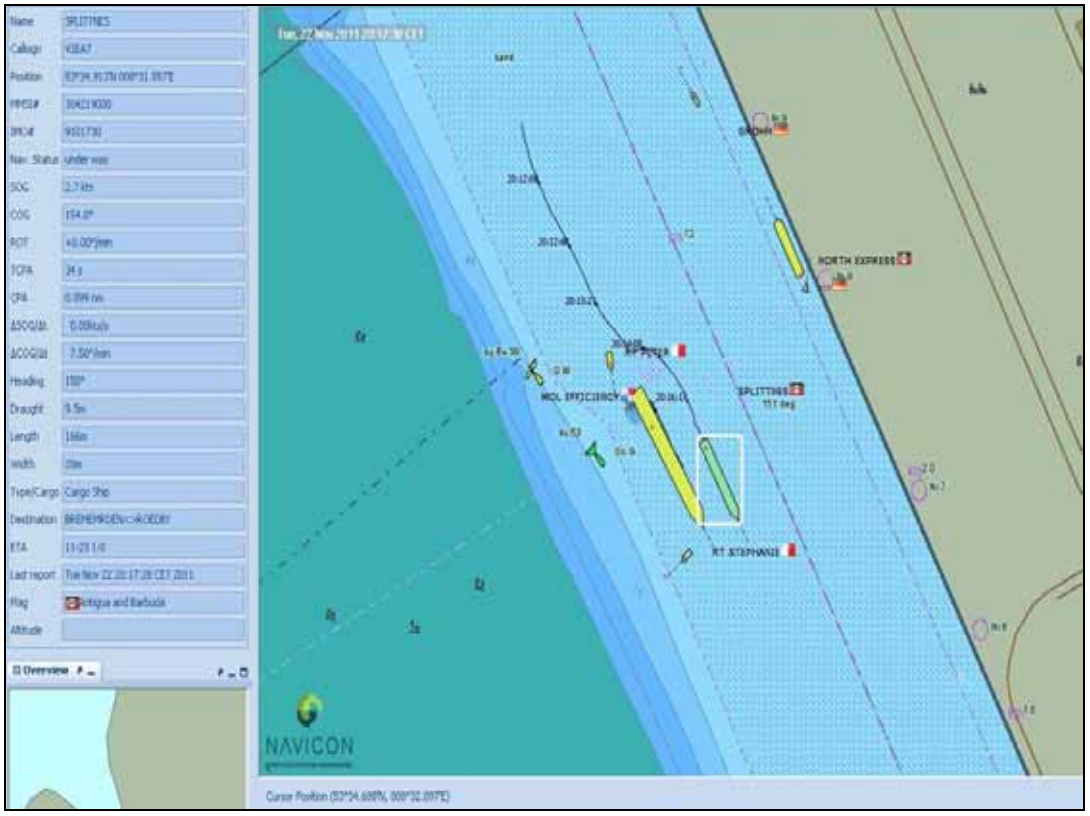

Figure 22: AIS display at 201730

3.2.3 VDR recording of the SPLITTNES

A type VR5000 VDR made by Furuno was on board the SPLITTNES. This recorded the course of the accident with no errors and could be analysed by the BSU.

The radar image of the X-band radar set used – according to several witness statements – by the pilot was recorded by the VDR. Since no manual changes are indicated throughout the incident, it can be assumed that the pilot did not modify the radar settings during the entire period. Consequently, the radar set was set to north up, off-centre, at a range of 1.5 nm until the collision.

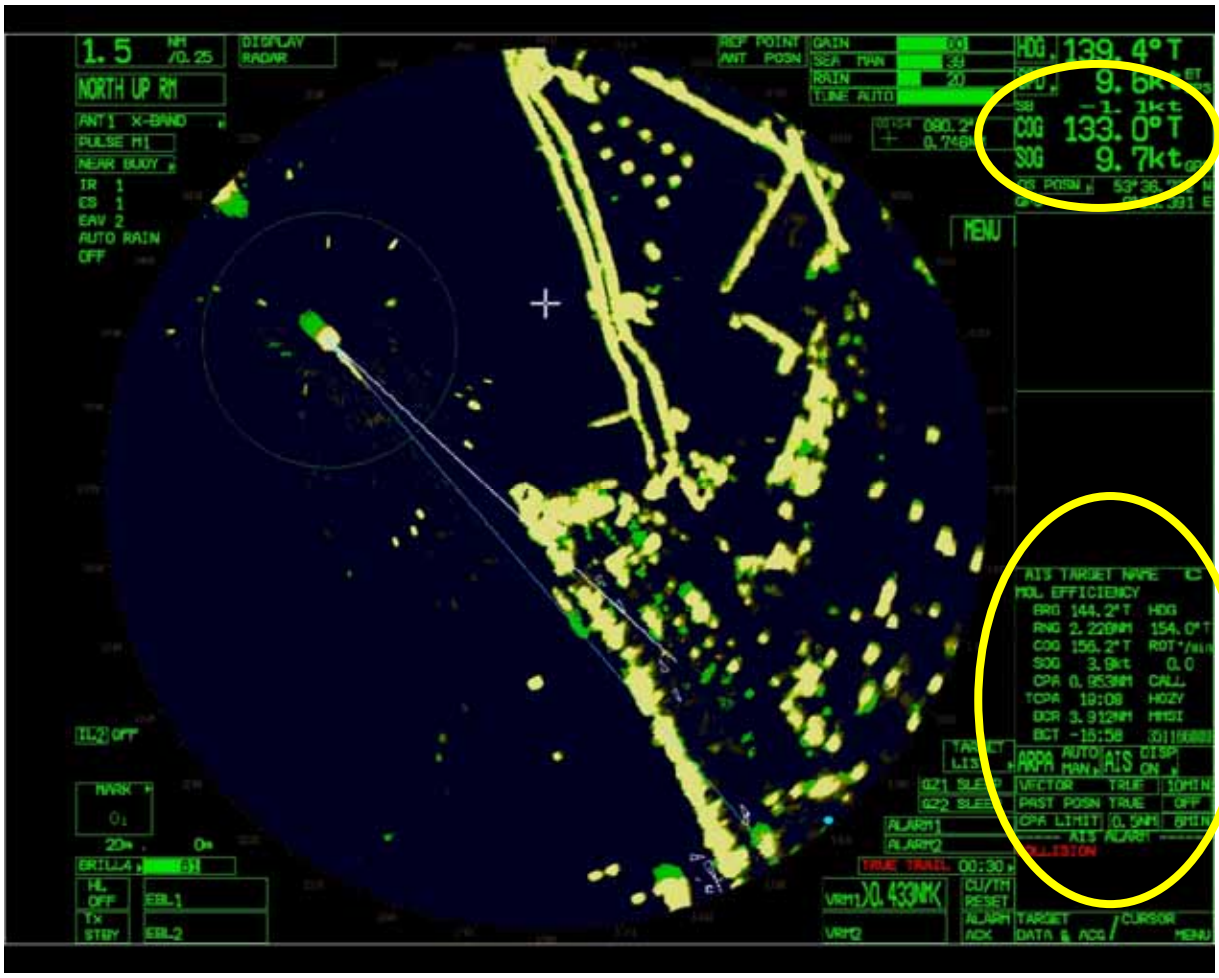

Figure 23: Radar image of the SPLITTNES during the planning at 2006

Figure 23 shows the radar image of the SPLITTNES as available to the pilot when the plan was made on VHF that he would stay behind the MOL EFFICIENCY until she had berthed. Following that, the speed (shown top right as speed over ground – SOG) of 9.7 kts is reduced considerably, as can be seen in Figure 24. During the second round of planning at 2009, the SPLITTNES moved forward at only 4.4 kts. The MOL EFFICIENCY's data are displayed at the bottom right and thus available to the pilot of the SPLITTNES at all times.

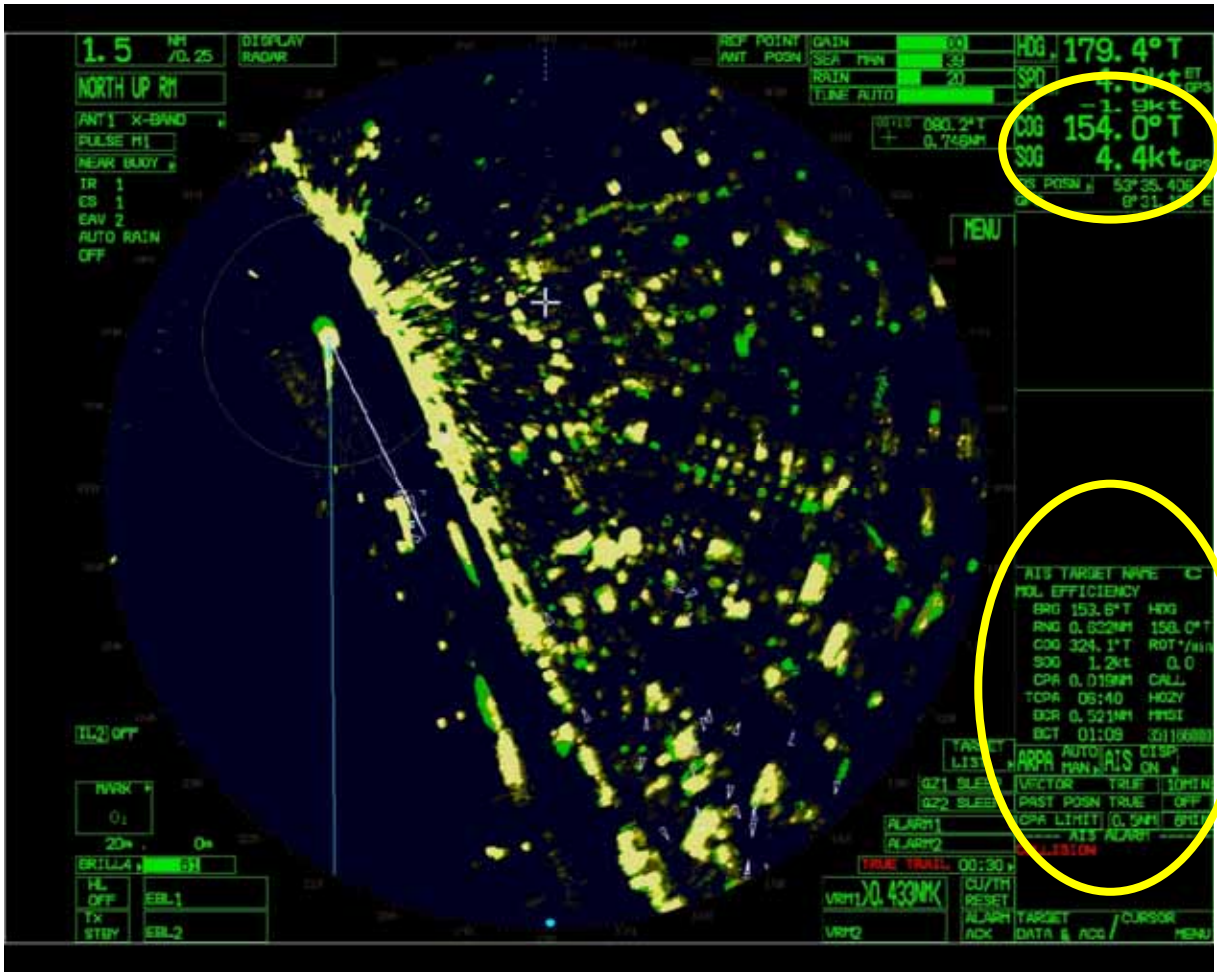

Figure 24: Radar image of the SPLITTNES during the second round of planning at 2009

After the pilot of the MOL EFFICIENCY suggested that the SPLITTNES could overtake after all, as the OCEAN PEGASUS had passed, the SPLITTNES accelerated again to overtake the MOL EFFICIENCY – now relatively close (RNG about 0.6 nm) ahead of her – on the eastern side. The audio recordings of the VDR indicate that at 'PORT 20' and 'HALF AHEAD', the pilot had made a firm decision to implement an evasion manoeuvre since she had turned to starboard due to stopping.

The AIS data of the MOL EFFICIENCY are still displayed at the bottom right. At this point, it can be seen that the MOL EFFICIENCY is proceeding with a speed over ground (SOG) of 1.2 kts and course over ground (COG) of 324.1°. This means that she is moving astern towards the SPLITTNES.

Figure 25 shows that the SPLITTNES is finding it difficult to turn to the east. Her speed is slowly increasing. The distance to the MOL EFFICIENCY is only a few metres (RNG: 0.29 nm = approx. 500 m).
The two vessels collided at 201330 (Figure 26 andFigure 27).

Figures 25, 26 and 27 each reveal a false echo similar to an oncoming vessel. The BSU has marked the false echoes in the interest of clarity.

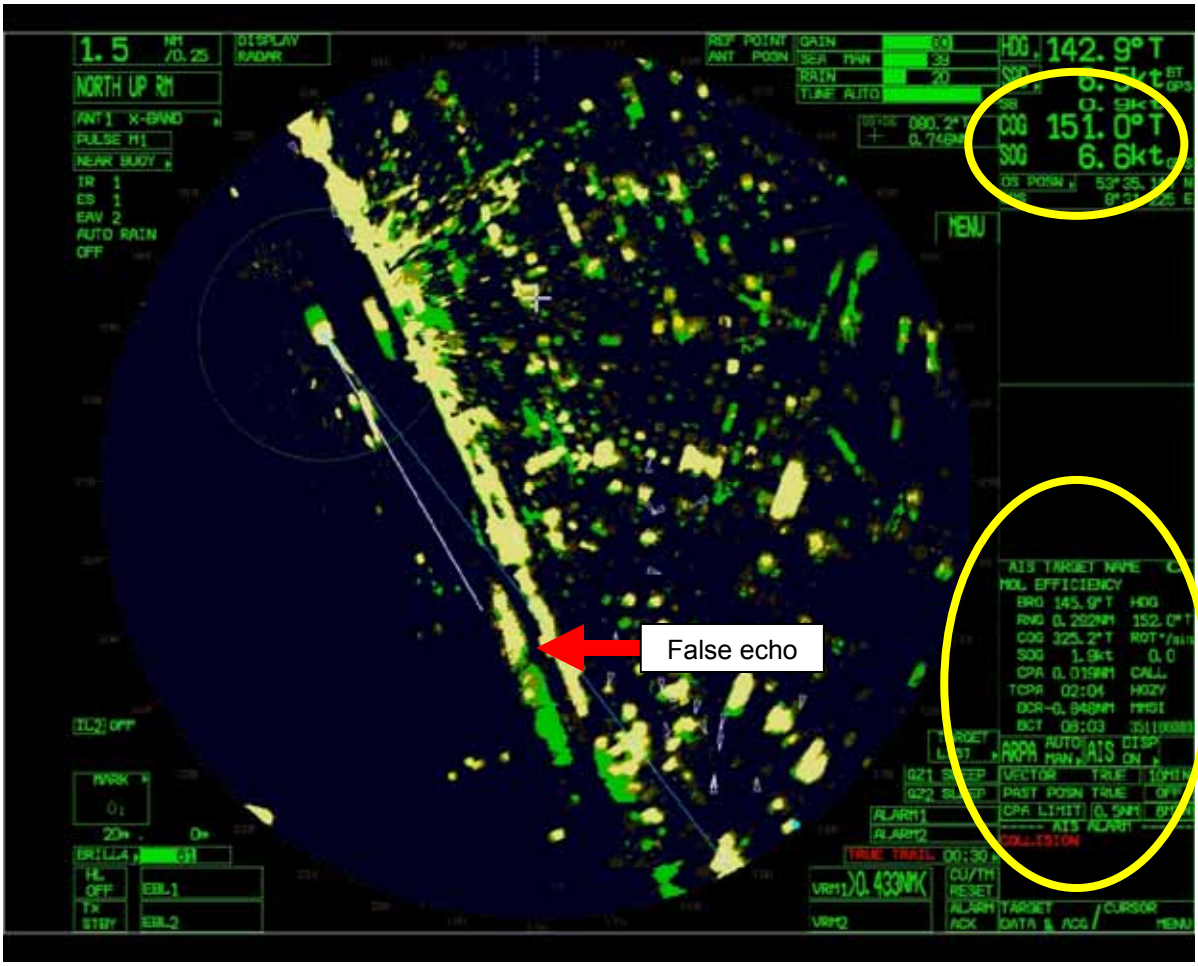

Figure 25: Radar image of the SPLITTNES at 2012

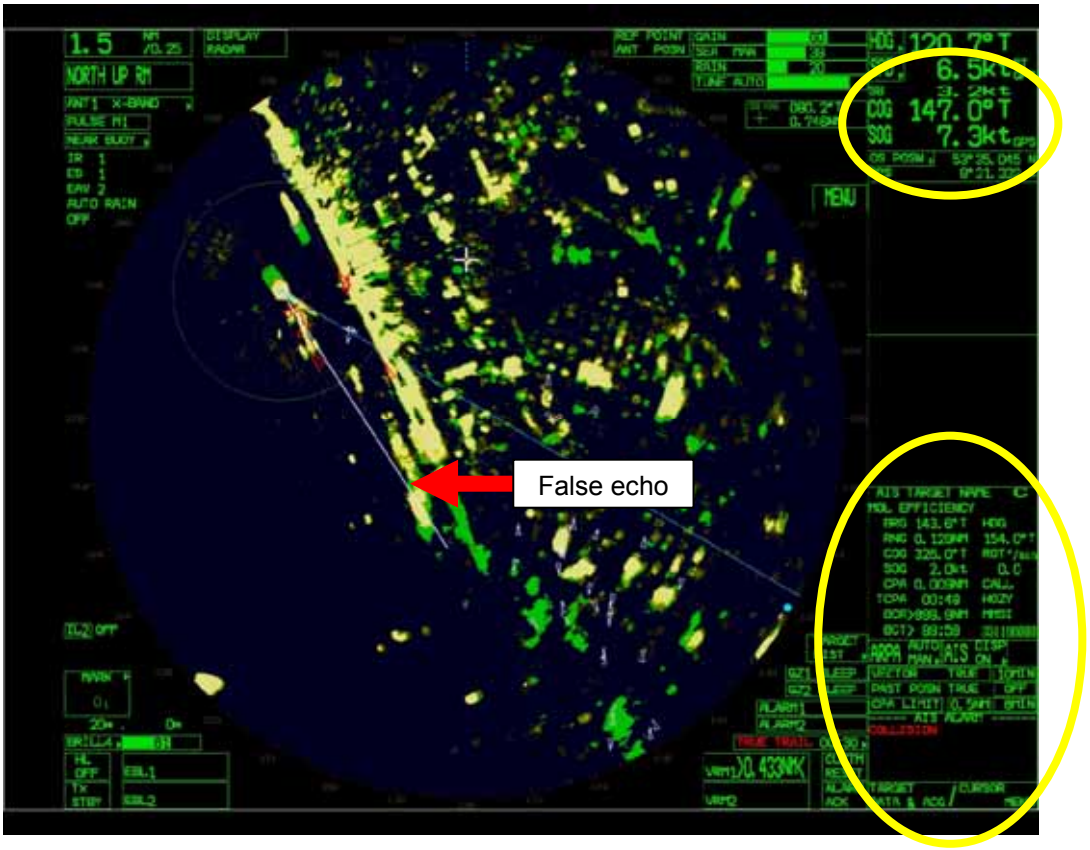

Figure 26: Radar image of the SPLITTNES at 2013 – collision

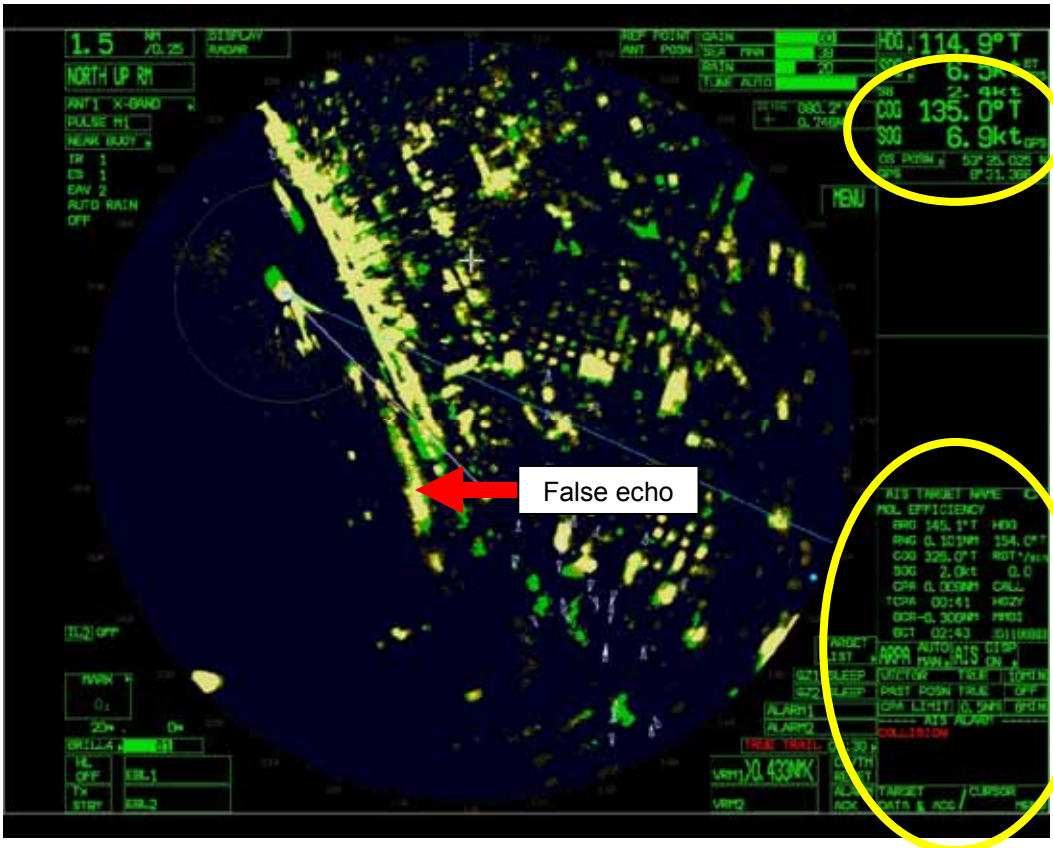

Figure 27: Radar image of the SPLITTNES at 2014 – collision

3.2.4 VDR recording of the MOL EFFICIENCY

A Furuno S-VDR (VR-3000S) was on board the MOL EFFICIENCY; its recordings were also analysed by the BSU. Here, the following sequence was reproduced:

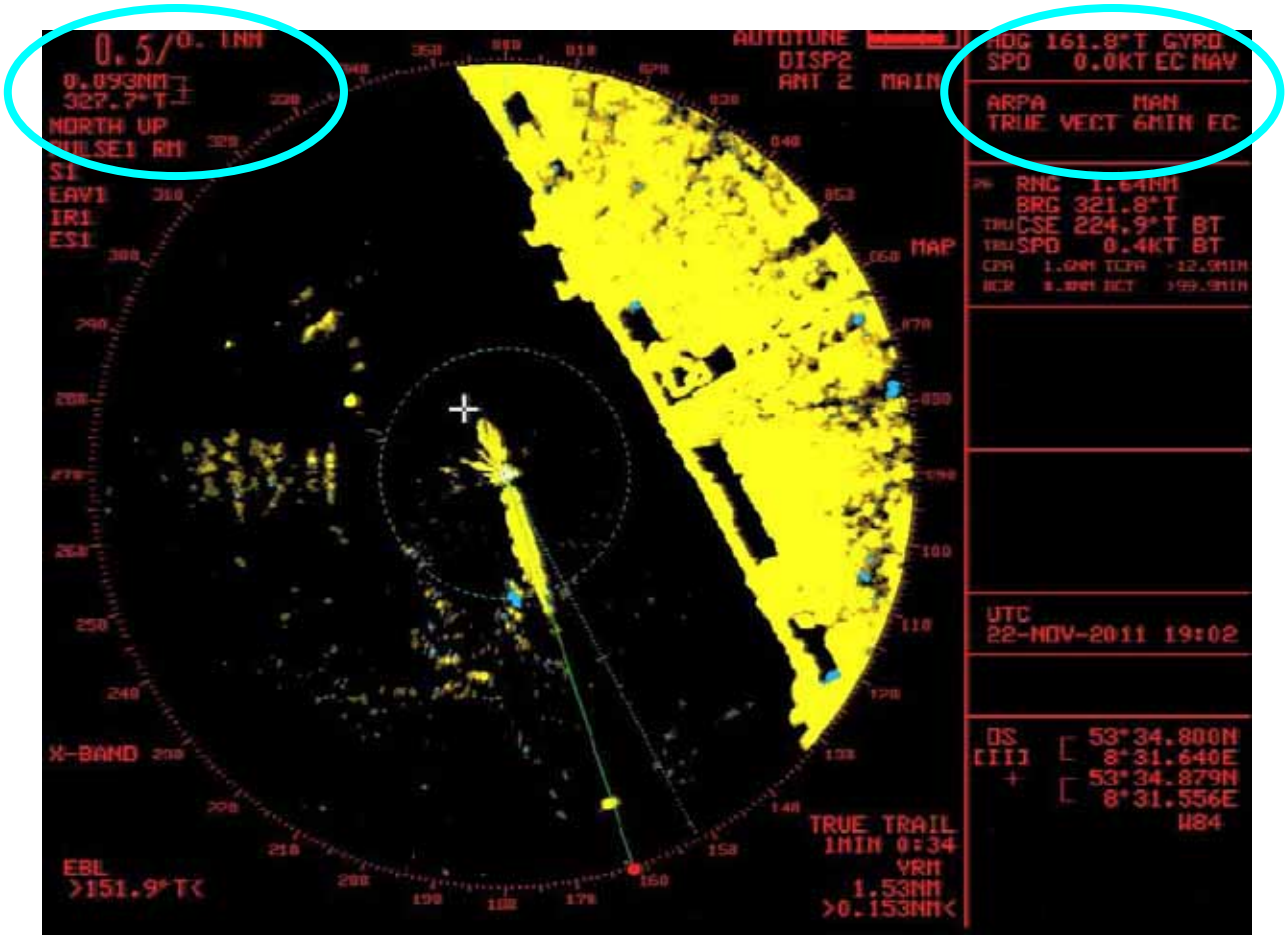

Figure 28: Radar image of the MOL EFFICIENCY at 2002 – first round of planning

Figure 28 shows the radar image at 2002. The speed over ground of the MOL EFFICIENCY is displayed at the top right as 'SPD 0.0KT'. The course over ground (COG) is shown in the top left corner as 327.7°.
In Figure 29, (at about 2005) the COG stands at 327.7° and the speed over ground rises to 0.3 kts – astern. The parties involved consulted further. Here, it was arranged that the SPLITTNES is going to wait until the MOL EFFICIENCY had berthed. Both tugs are already made fast to the MOL EFFICIENCY. She intends to keep her position in the turning circle.

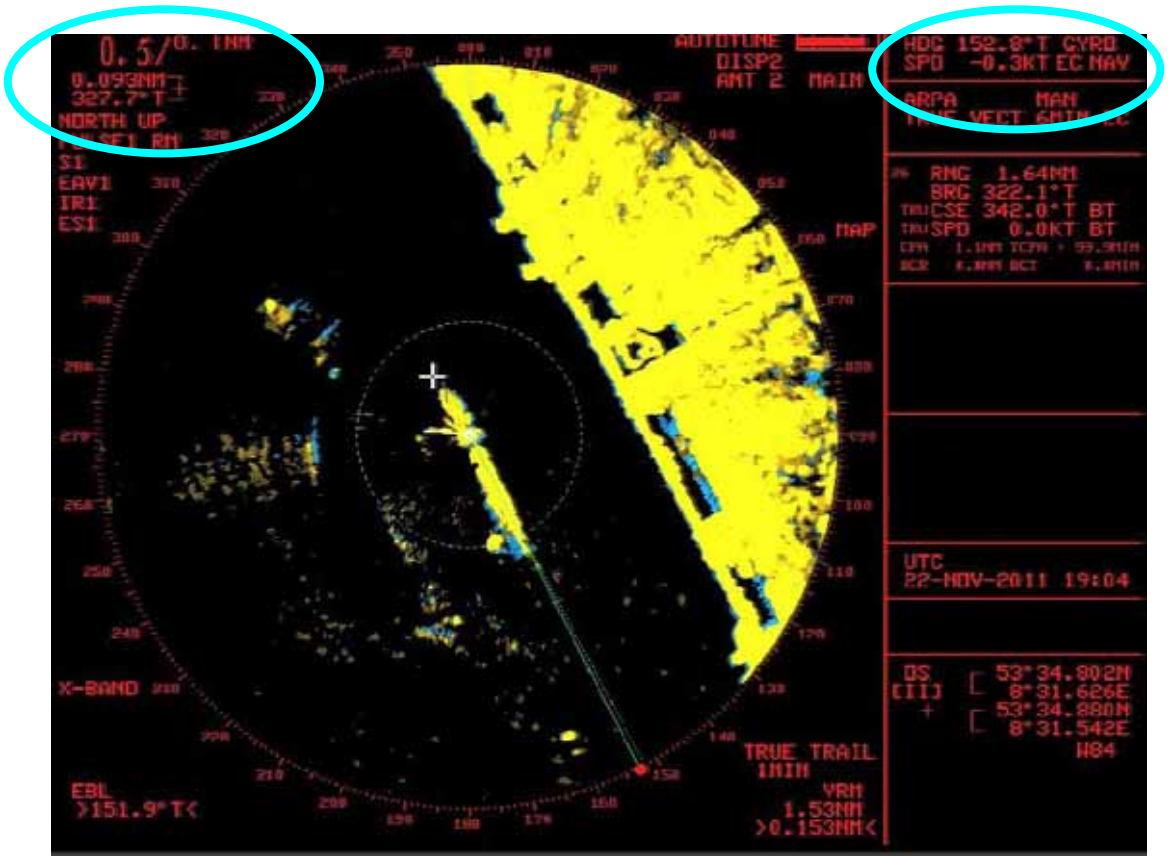

Figure 29: Radar image of the MOL EFFICIENCY at 200440

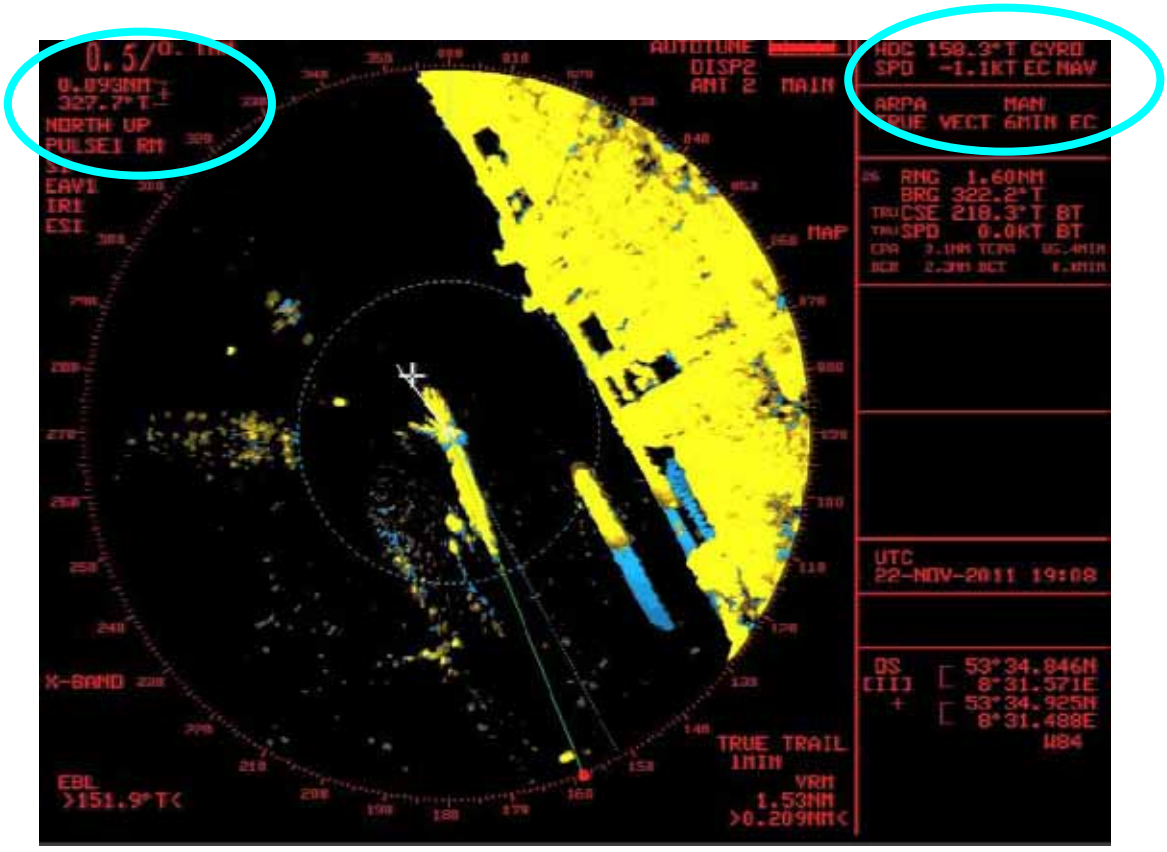

Figure 30: Radar image of the MOL EFFICIENCY at 200835 – second round of planning

At 2009, the pilot of the MOL EFFICIENCY called Blexen Radar and suggested to let the SPLITTNES pass him as soon as the OCEAN PEGASUS had passed. The radar pilot conveyed this suggestion to the pilot of the SPLITTNES and he agreed. Figure 30 shows that the speed over ground of the MOL EFFICIENCY has risen to 1.1 kts – astern. The speed continues to increase to 2 kts up until the collision, as shown in Figure 31.

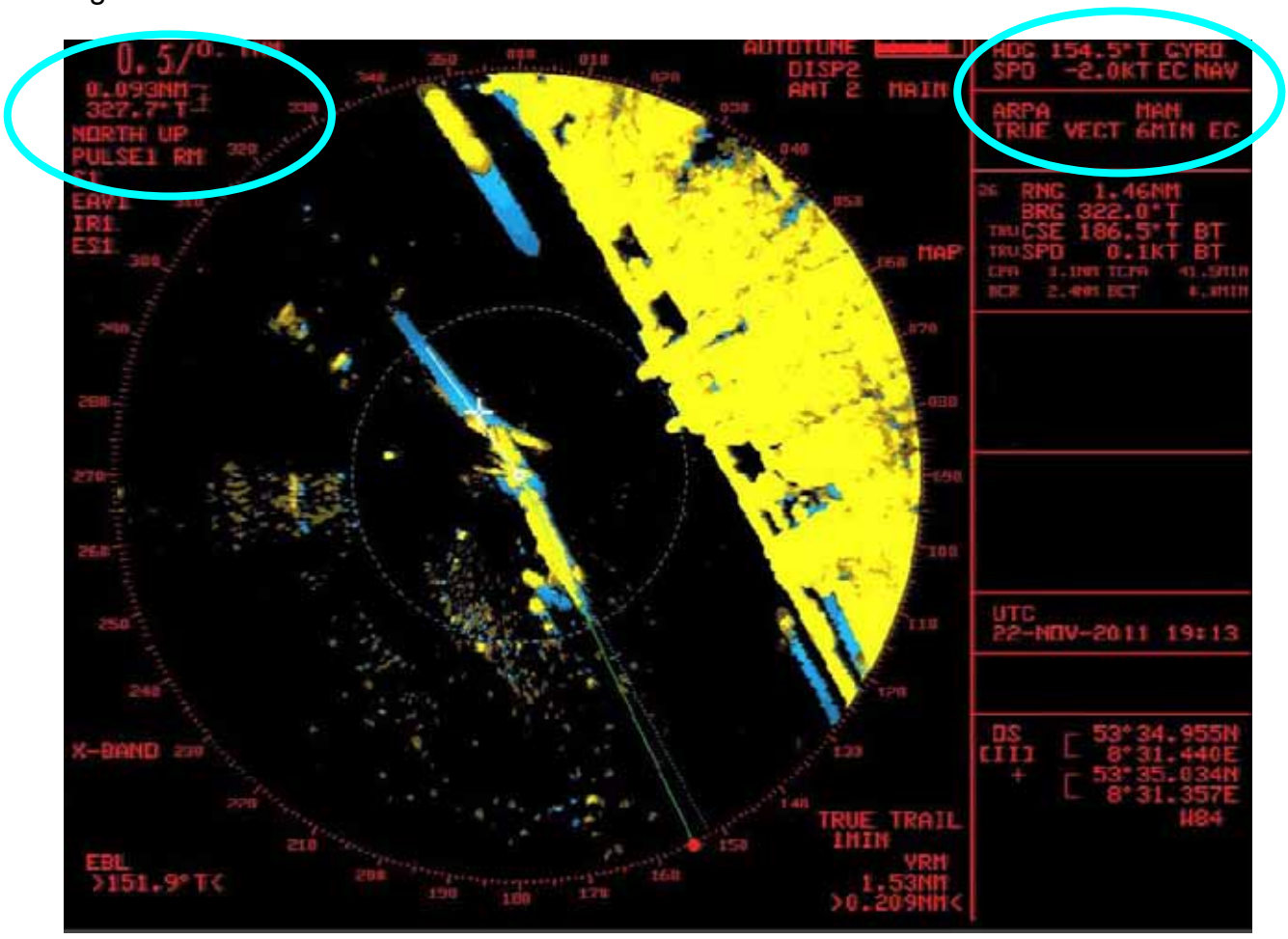

Figure 31: Radar image of the MOL EFFICIENCY at 2013 – collision

At the time of the collision, the radar image of the MOL EFFICIENCY shows a speed over ground of 2.0 kts; the course over ground stands at 327.7°.

The images of the electronic chart system can be interpreted even more clearly. The speed vectors of all vessels are shown on these synthetic images. In particular, the MOL EFFICIENCY's own speed vector clearly shows the SPLITTNES moving towards her, as can be seen below in Figure 32, 33 and 34.

Figure 32: Electronic chart of the MOL EFFICIENCY at 2009

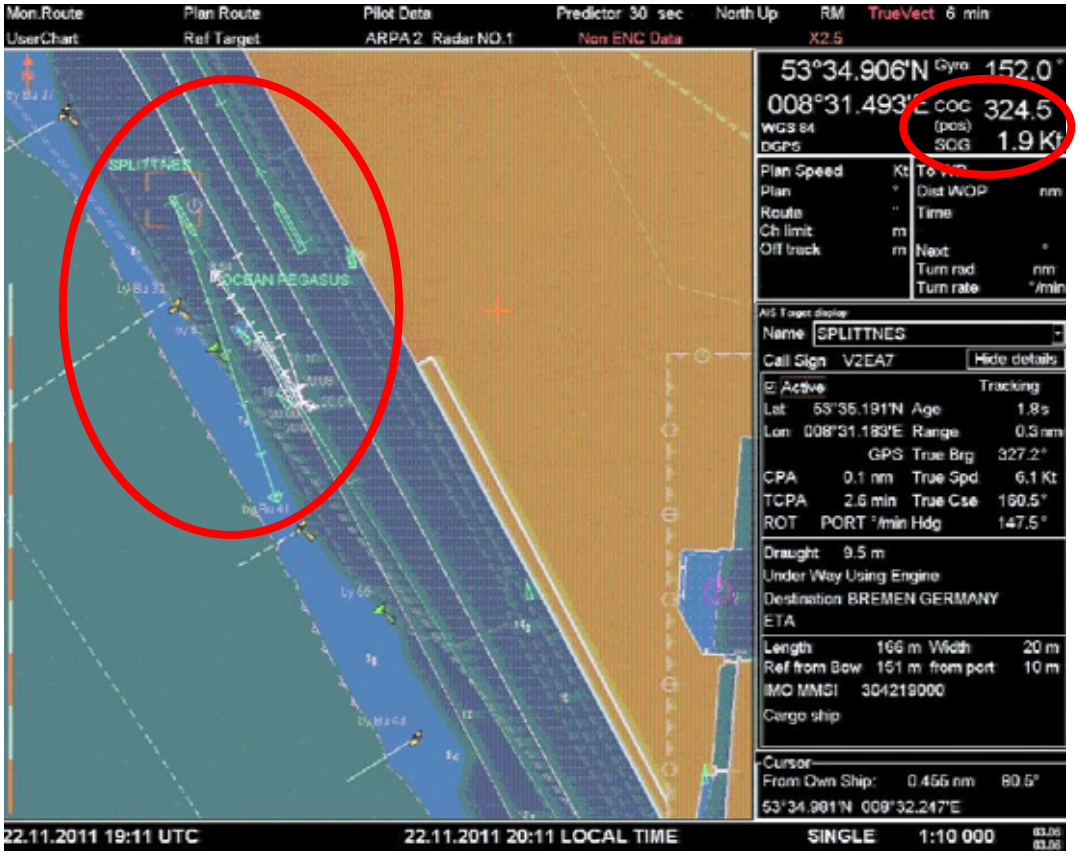

Figure 33: Electronic chart of the MOL EFFICIENCY at 2011

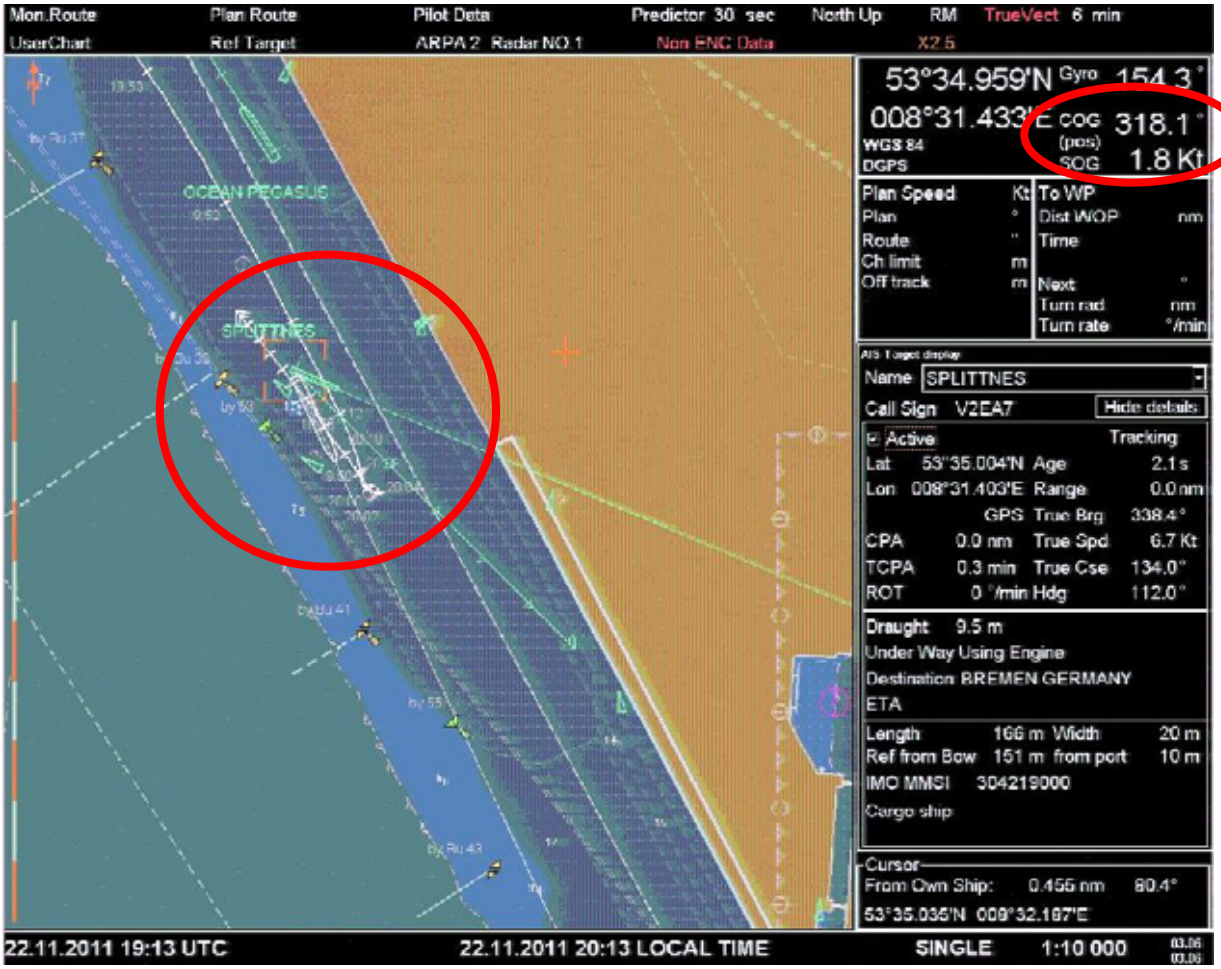

Figure 34: Electronic chart of the MOL EFFICIENCY at 2013 – collision

It is very likely that differences in the numerical data are due to the calculations of different GPS receivers.

Since this concerns the recordings of an S-VDR, engine manoeuvres are not available. The audio recordings are difficult to understand and therefore incomplete. However, it can be concluded that the pilot is constantly giving instructions to keep the vessel in position. These include helm commands, instructions pertaining to the bow thruster and engine commands. Evidently, the engine was running astern on the recommendation of the pilot to maintain position against the rising tide.

3.2.5 Vessel Traffic Service Bremerhaven

The log book recordings of the vessel traffic service (VTS) of Waterways and Shipping Office (WSA) Bremerhaven show that at the time of the accident it was manned by a nautical supervisor (NvD) and his two assistants in accordance with regulations. Shore-based radar guidance had been implemented throughout the area of operation due to poor visibility of less than 500 m caused by fog. The monitors of the Outer Weser and those of the Lower Weser were manned by radar pilots.
The VTS was aware that the pilots of the MOL EFFICIENCY and the SPLITTNES had agreed with the radar pilot that the oncoming OCEAN PEGASUS would be allowed to pass first[6], then the SPLITTNES would overtake and finally the MOL EFFICIENCY would turn and berth.
At 2014, the VTS received information about the collision between the SPLITTNES and the MOL EFFICIENCY from the harbour pilot of the MOL EFFICIENCY on VHF. This was subsequently confirmed by the SPLITTNES, which also reported that she was taking on water and heeling heavily to starboard. Tugs were requested. Since all tugs of one of the two local tug companies were in the lock and hence not available immediately, the VTS forwarded the request to KOTUG, a tug company, and informed the rescue cruiser (SRK) and WSP Bremerhaven, which, in turn, alerted the fire brigade.
By this time, the SPLITTNES was listing to 20° and the possibility of grounding the vessel to the west of the fairway was considered.
At 2034, the pilot of the SPLITTNES informed that the list had reduced to 8-9°. A number of crew members reportedly panicked and abandoned the vessel by means of a lifeboat. The master was not aware. The SPLITTNES was then to be taken to the pier with tug assistance.
At 2042, the SRK H.R.MEYER[7] reported that the lifeboat had been found and the crew members were all accounted for.
At 2046, the SPLITTNES reported that the tug is available and they will now be towed to the Columbuspier.
The MOL EFFICIENCY was made fast to the pier by 2110. Shortly after, she reported that there were no injuries on board, the vessel's stern had been holed, but there was reportedly no pollution.
The SPLITTNES also reported no injuries to the VTS at 2145. The vessel had reportedly now made fast to the Columbuspier with tug assistance.

[6] This based on the generally regulation that the transiting traffic has the right of way.
[7] SRK designates rescue cruiser of the Deutsche Gesellschaft zur Rettung Schiffbrüchiger (German Maritime Search and Rescue Service – DGzRS)

4 ANALYSIS

Despite the heavy material damage, fortunately there were no injuries. Furthermore, significant damage to the environment could be avoided.
The review of the accident revealed no communication problems between the parties involved.
The original plan, which involved letting the SPLITTNES wait until the MOL EFFICIENCY had turned and berthed, could easily have been implemented. The BSU sees no reason for the fact that the pilot of MOL EFFICIENCY intends to change the plan at 2009 and suggests that the SPLITTNES overtake. After all, she was just in the process of stopping and actually very close to the MOL EFFICIENCY to still have sufficient space available to accelerate and evade.
It remains unclear why the MOL EFFICIENCY continued to move astern after the pilot suggested that the SPLITTNES could overtake. Up to that point, the pilot of the MOL EFFICIENCY intended to keep his vessel at the waiting position and moved astern against the current. At the latest upon suggesting that the SPLITTNES could overtake him, it would have been helpful to allow the MOL EFFICIENCY to move forward in order to give the SPLITTNES more space to overtake. Also noteworthy is the fact that the radar pilot did not draw attention to the astern movement of the MOL EFFICIENCY, but rather it was repeatedly stated on VHF that the "MOL EFFICIENCY was well to the west [...]" and "[...] waiting to turn and berth."
On the other hand, it would also have been possible for the pilot of the SPLITTNES to reject the proposal and, as originally agreed upon, wait until the MOL EFFICIENCY had moored. Conceivable, but admittedly unorthodox, would also have been to use the bow and stern thrusters of the SPLITTNES to traverse her well to the middle of the fairway before overtaking the MOL EFFICIENCY. It can only be inferred from the VDR recordings that an order to set the bow thruster to NULL was made when the overtaking manoeuvre began and to "port" when the collision was imminent.
Also remarkable is the fact that obviously nobody considered letting the OCEAN PEGASUS, proceeding against the tide, wait. In this case the SPLITTNES could have passed the MOL EFFICIENCY. The MOL EFFICIENCY could have waited with the assistance of both tugs until the OCEAN PEGASUS had passed her then. Presumably the regulations should be adhered to, whereby the transiting traffic has to be given priority. Thereby it is essentially more difficult to stop a vessel with the tide as against.

The harbour pilot of the MOL EFFICIENCY and the skipper of the RT PETER, the tug pulling aft, promptly saw the dangerous situation between the two freighters into which he was being drawn and responded with so much speed and experience that nothing happened to his tug.

It is understandable that crew members of the SPLITTNES panicked in view of the accident involving the sister vessel, ROCKNES. Within minutes of being holed on a rock, the ROCKNES also listed heavily, subsequently capsized (actually turned turtle) and there were numerous casualties.
With that in mind, it is noteworthy that a large part of the crew remained on board the SPLITTNES, focused on bringing the inrush of water under control and was ultimately able to moor the vessel on the pier.

5 CONCLUSIONS

The BSU was unable to find a specific cause of the accident. Rather, several factors, which viewed independently, were not serious culminated in a collision. It starts with the poor visibility. Dense fog prevented a visual assessment by the pilots and ship's commands. All the parties involved were reliant on technical material, the inaccuracies of which must be taken into account. In normal visibility, the bridge crew of the SPLITTNES would have been better able to assess whether overtaking was still possible.

The next factor is the sudden change of plans, for which basically no one was prepared. In the course of a brief discussion on VHF, the pilot of the SPLITTNES had to make a decision: rather than stopping now, accelerate and turn the vessel heavily to port in a tide rising from aft.

That the harbour pilot of the MOL EFFICIENCY continued to move astern in order to keep his position even though it would now have been much better to move forward was unfortunate. On top of that, the radar pilot did not notice this and consequently did not intervene in an informative manner.

The threat to the aft tug, RT PETER, could be promptly countered by her skipper; while doing so, it was even possible to pull the MOL EFFICIENCY aside somewhat. The two cargo vessels collided nonetheless.

The final, seemingly unimportant constraints follow. The dimension difference between the two vessels is so unfavourable that the top edge of the MOL EFFICIENCY's rudder blade tore open the side of the SPLITTNES below water and thus caused a sudden inrush of water. Fortunately, only the shell plating was torn, meaning the SPLITTNES was able to stay afloat and no fuel tanks were holed. Favourable was the fact that the SPLITTNES was fully laden and that her ballast water tanks were empty because of this. They could be used to trim the vessel.

This chain of negative factors could have been interrupted at any given point. The most effective measure would have been to adhere to the original plan and let the SPLITTNES wait until the MOL EFFICIENCY had berthed. The participants could possibly have deviated from the regulation to give the transiting traffic the right of way and let the OCEAN PEGASUS wait against the tide, at least until the SPLITTNES had passed the MOL EFFICIENCY.

However, if the vessel’s command and the pilot’s decision to overtake was already made, then the MOL EFFICIENCY simply had to increase speed ahead and there would have been significant more space for the evasion manoeuvre of the SPLITTNES.

The BSU does not see the need to issue a safety recommendation in this case, but with this report calls on every pilot on the German coast to continue to consult with foresight and prudence in the future.

6 SOURCES

- Enquiries by the waterway police (WSP) Bremerhaven
- Written statements of
  - Ship's command
  - Owner
  - Classification society
  - Bundesverband der See- und Hafenlotsen e. V. (BSHL)
    [German Association of Sea- and Harbourpilots]
  - Waterways and Shipping Office (WSA) Bremerhaven
  - ADOMS IID (ANTIGUA and BARBUDA W.I. Department of Marine Services and Merchant Shipping Inspection and Investigation Division)
- Witness accounts
- Nautical charts and vessel particulars, Federal Maritime and Hydrographic Agency (BSH)
- Official weather report by Germany's National Meteorological Service (DWD)
- AIS recordings, ship safety services and vessel traffic services (VTS)
- Photos of BSU and WSP Bremerhaven