



Marine Safety Investigation Unit



Transport Malta



MARINE SAFETY INVESTIGATION REPORT

Safety investigation into the collision between the
Maltese registered general cargo

KATRE

and the Dutch registered general cargo

STATENGRACHT

in position 54° 53.4'N 103° 13.2'E

on 01 February 2013

201302/001

MARINE SAFETY INVESTIGATION REPORT NO. 04/2014

FINAL

The MSIU gratefully acknowledges the assistance and cooperation of the Dutch Safety Board and the Federal Bureau of Maritime Casualty Investigation of Germany, during the safety investigation of this accident.

Investigations into marine casualties are conducted under the provisions of the Merchant Shipping (Accident and Incident Safety Investigation) Regulations, 2011 and therefore in accordance with Regulation XI-I/6 of the International Convention for the Safety of Life at Sea (SOLAS), and Directive 2009/18/EC of the European Parliament and of the Council of 23 April 2009, establishing the fundamental principles governing the investigation of accidents in the maritime transport sector and amending Council Directive 1999/35/EC and Directive 2002/59/EC of the European Parliament and of the Council.

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MARINE SAFETY INVESTIGATION UNIT
Malta Transport Centre
Marsa MRS 1917
Malta

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LIST OF REFERENCES AND SOURCES OF INFORMATION

Dutch Safety Board

Federal Bureau of Maritime Casualty Investigation of Germany

Master and crew members of MV *Katre*

Statements by the master and second mate of MV *Statengracht*

VDR of MV *Statengracht*

GLOSSARY OF TERMS AND ABBREVIATIONS

AB	Able Seaman
AIS	Automatic Identification System
ARPA	Automatic Radar Plotting Aid
BA	British Admiralty
Brg	Bearing
COG	Course over ground
COLREGs	Convention on the International Regulations for Preventing Collisions at Sea, 1972
CPA	Closest Point of Approach
E	East
ECDIS	Electronic Chart Display and Information System
ETA	Estimated Time of Arrival
GHz	Giga Hertz
GL	Germanischer Lloyd
GPS	Global Positioning System
GT	Gross tonnage
HDG	Heading
Kmhr ⁻¹	Kilometres per hour
kW	Kilowatt
LOA	Length overall
LR	Lloyd's Register of Shipping
LT	Local time
m	metres
MSD	Merchant Shipping Directorate
MSIU	Marine Safety Investigation Unit
MV	Motor vessel
N	North
NM	Nautical miles
NT	Net tonnage
OOW	Navigational officer of the watch
RPM	Revolutions per minute

SOG	Speed over ground
Spd	Speed
Stb'd	Starboard
STCW	International Convention on Standards of training, Certification and Watchkeeping for Seafarers, 1978, as amended
SWL	Safe working load
(T)	True course
TCPA	Time of closest point of approach
TSS	Traffic Separation Scheme
UTC	Universal Time Constant
VTS	Vessel Traffic Service
VDR	Voyage data recorder
VHF	Very high frequency

SUMMARY

On 02 February 2013, at about 1000, the Marine Safety Investigation Unit (MSIU) was notified by the managers of the Maltese registered motor vessel *Katre*, that on 01 February 2013, at about 2325 (UTC), their vessel, while on a ballast voyage from Helsingborg, Sweden to Stralsund, Germany, was involved in a collision with the Dutch registered motor vessel *Statengracht* in position 54° 53.7'N 013° 13.2'E. The position was close to the Northwest entrance of the TSS North of Rugen in the Baltic Sea.

Preliminary information indicated that the collision occurred when *Katre* was proceeding on a South-easterly course close to the Northwest entrance of the TSS North of Rugen. *Statengracht* was proceeding towards the entrance of the TSS North of Rugen on a Westerly course.

Statengracht sustained damages to her port side in way of cargo hold no. 2. As a result of the damage, she developed a port list of about 10°. *Statengracht* was instructed to proceed to the port of Rostock, Germany, which was her original destination. *Katre*, which sustained damages to her bow area, was instructed to proceed to the port of Mukran, Germany. No injuries and no pollution were reported from both vessels.

The safety investigation concluded that in a typical crossing situation and in good visibility, neither vessel followed basic bridge procedures and COLREGs requirements.

Two recommendations have been made to the managers of *Katre* and *Statengracht* in order to enhance safe navigational watches at all times.

1 FACTUAL INFORMATION

1.1 Vessel, Voyage and Marine Casualty Particulars

Name	<i>Katre</i>	<i>Statengracht</i>
Flag	Malta	Netherlands
Classification Society	GL	LR
IMO Number	9014937	9288045
Type	General cargo	General cargo
Registered Owner	Hansa Shipping Ltd.	Statengracht Rederij
Managers	Hansa Ship Management OU	Spliethoff's Bevrachtings BV
Construction	Steel (Double hull)	Steel (Double hull)
Length overall	88.25 m	172.6 m
Registered Length	84.90 m	160.7 m
Gross Tonnage	2497	16676
Minimum Safe Manning	9 (<i>excluding special conditions</i>)	10
Authorised Cargo	Bulk solid	Bulk solid
Port of Departure	Helsingborg, Sweden	Rauma, Finland
Port of Arrival	Stralsund, Germany	Rostock, Germany
Type of Voyage	Short international	Short international
Cargo Information	In ballast	Loaded
Manning	8	16
Date and Time	01 February 2013 at 2322 (UTC)	
Type of Marine Casualty or Incident	Serious Marine Casualty Serious Marine Casualty Serious Marine Casualty	
Location of Occurrence	Baltic Sea in position 54° 53.4'N 013° 13.20'E	
Place on Board	Bulbous / forecastle deck	Cargo hold / Over side
Injuries/Fatalities	None	None
Damage/Environmental Impact	None	None
Ship Operation	On passage	On passage
Voyage Segment	Transit	Transit
External & Internal Environment	Fair with good visibility. The sea state was Westerly Force 2 and the wind Westerly Force 3	
Persons on Board	8	16

1.2 Description of Vessels

1.2.1 MV *Katre*

The Maltese registered *Katre* (Figure 1) is a two-hold general cargo vessel built in 1991 at Ferus Smit Scheepswerf - Hoogezand, Netherlands, with a gross tonnage (GT) of 2497 and classed by Germanischer Lloyd (GL). *Katre* is owned by Hansa Ship Management OU. The vessel has a length overall of 88.25 m and a beam of 13.17 m. Her depth is 7.0 m and the maximum deadweight is 4173 tonnes at a summer draught of 5.45 m.

Katre's propulsive power is provided by an 8-cylinder DEUTZ MWM medium speed, four-stroke diesel engine, producing 1440 kW at 825 rpm. This drives a single, controllable pitch propeller at 188 rpm through a single reduction gearbox and flexible coupling. The vessel's service speed is about 12.0 knots¹.



Figure 1: MV *Katre*

Katre is equipped with the required navigation equipment, as listed on her Record of Equipment for Cargo Ship Safety Equipment Certificate - Form E, Section 3 'Details of navigational systems and equipment' (**Annex 1**). These included two GPSs, 'Pelorus or Compass Bearing Device', and two 9 GHz radars, a Kelvin Hughes Nucleus 3 X Band with automatic radar plotting aid (ARPA) / electronic chart display and information system (ECDIS) systems (fitted on starboard side), and a Furuno FM-2010.

¹ One knot is equal to 1.852 kmhr⁻¹.

The navigation bridge layout is a conventional and a standard one for the type and size of this vessel (Figures 2 and 3). The console, which included the radio communications, engine controls, autopilot and hand steering position, was located at the forward end of the bridge right under the bridge windows. The radars were located one on each side of the console.



Figure 2: *Katre* bridge - starboard side



Figure 3: *Katre* bridge - port side

1.2.2 *MV Statengracht*

The Dutch registered *Statengracht* (Figure 4) is a two-hold geared general cargo vessel built in 2004 at the New Szczecin Shipyard in Szczecin Poland, with a GT of

16676 and classed by Lloyd's Register of Shipping (LR). *Statengracht* is owned by Statengracht Rederij. The vessel has a length overall of 172.60 m and a beam of 25.65 m. Her depth is 14.60 m and the maximum deadweight is 26207 tonnes at a summer draught of 10.725 m. The three deck cranes, each of a SWL of 120 tonnes, are fixed on port and starboard sides.

Statengracht's propulsive power is provided by a 6-cylinder Wärtsilä medium speed, four-stroke diesel engine, producing 12060 kW at 333 rpm. This drives a single, controllable pitch propeller at 105 rpm through a single reduction gearbox and flexible coupling. The vessel's service speed is about 17.0 knots.



Figure 4: MV *Statengracht*

1.3 Crew Members

1.3.1 Crew members on board *Katre*

At the time of collision, *Katre* had a crew complement of eight officers and ratings. The crew consisted of two Estonians, four Ukrainians and two Russians. The working language on board was English. The three navigational officers were of different nationalities.

At the time of collision, the crew complement was in accordance with the Minimum Safe Manning Document issued by the flag State Administration on 19 September 2012 and valid till 20 September 2017. The vessel was operating in restricted waters and since she held a valid UMS certificate, the second engineer and one OOW were omitted. A copy of the Minimum Safe Manning Certificate is attached as **Annex 2**.

In accordance with the Minimum Safe Manning Certificate, *Katre's* deck officers consisted of the master and the chief mate. Hence, the watchkeeping hours were divided up between the master and the chief mate on a '6-on, 6-off' basis. The master was on the '6 to 12' navigational watch while the chief mate was responsible for the '12 to 6' navigational watch. During their hours of rest, both the master and the chief mate had to work extra hours while in port, overseeing the cargo operations, meeting shore officials and preparing documentation. They also had to see 'stand bys' when calling at and departing from different ports.

The Master joined *Katre* on 17 January 2013. He was 50 years old, and had over 30 years of seagoing experience. He had been employed by the vessel's managers since 2006 and had been serving on *Katre* since 2007. His Certificate of Competence was issued in 2001 and he was certified to serve as a master on vessels of up to 3000 GT, in accordance with the provisions of STCW Regulation II/2. In 2004, he was promoted to master and had sailed mainly in Northern European waters. His service with the managers of *Katre* included sea time as chief mate. The vessel's flag State Administration had issued him with the 'Endorsement Attesting the Recognition of a Certificate' on 25 August 2011.

The chief mate, who was the OOW at the time of collision, was 27 years old and had 9 years of seagoing experience. He obtained his Certificate of Competence as an OOW in 2004. In 2011, he obtained his Certificate of Competence without limitations in accordance with the provisions of STCW Regulation II/2, as amended. He had mainly sailed in Southern European waters. At the time of the accident, the vessel's flag State Administration was still in the process of issuing him with the 'Endorsement Attesting the Recognition of a Certificate'. He had been employed by the managers of *Katre* since the 25 January 2013, when he joined *Katre* for the first time. This was the chief mate's first experience in the Baltic Sea.

1.3.2 Crew members on board *Statengracht*

At time of accident, *Statengracht* had a crew complement of 16. This complement exceeded the number of crew members required by the Minimum Safe Manning Certificate issued by the Dutch authorities (**Annex 3**). In accordance with the Minimum Safe Manning Certificate issued by the flag State Administration and the crew list of the vessel, the deck officers consisted of the master, chief mate, second mate and a third mate. Hence, the navigational watchkeeping hours on board *Statengracht* were the traditional '4-on, 8-off' watches. The master / third mate took the '8-12' navigational watch, the second mate was responsible for the '12-4' navigational watch and the chief mate was assigned the '4-8' navigational watch.

The crew members were of three different nationalities, namely Dutch, Russian and the Filipinos. In general, the officers came from the Netherlands and Russia while the remaining crew came from the Philippines.

The master had joined the vessel on the 13 December 2012. He was 56 years old and had 40 years of seagoing experience. He had been sailing as a master on various vessels for the last 27 years. He obtained his Certificate of Competence as master (unlimited) at the age of 35. At the time of the accident, he been working for the managers of *Statengracht* for 35 years and had sailed as a master on S-type sister ships on a number of times. This was the master's second assignment on *Statengracht*.

The second mate, who was the OOW at the time of the collision, was 29 years old and had obtained his Certificate of Competence in 2008. In January 2013, he obtained his Certificate of Competence (without limitations) in accordance with the provisions of STCW Regulation II/2. This was his first assignment as a second mate on *Statengracht*, although he had previously sailed twice on other S-type sister ships on the same route. The second mate had joined *Statengracht* on 24 January 2013.

1.4 Weather Conditions

At the time of the collision, the weather was fair with a visibility of about eight nautical miles (nm). The sea state was smooth from the West and the wind was Westerly Force 3.

1.5 Narrative

1.5.1 Events on board *Katre*²

After completing the discharge of her cargo of wheat at 1350 (UTC), *Katre* sailed in ballast condition from the port of Helsingborg, Sweden on 01 February 2013 at 1420 (UTC)³. The vessel's draughts on departure from Helsingborg were 2.4 m forward and 3.4 m aft. Her next port of call was Stralsund, Germany where the vessel was due to load a cargo of gypsum. As the vessel was to arrive at Stralsund Pilot Station at 0500, the speed was set to about 7.5 knots soon after departure from Helsingborg. The weather was generally good, with good visibility and wind variable Force 2 to 3.

According to her passage plan, the vessel's course was set to pass close to the Northwest corner of the Traffic Separation Scheme (TSS) 'North of Rugen'. This meant that *Katre* was to sail through a very busy shipping lane, encountering vessels on a Westerly / South-westerly course heading for the entrance to the TSS. These vessels would be crossing *Katre*'s bow from the port side and therefore, she would be the 'Stand On' vessel⁴ when meeting these crossing vessels.

On 01 February 2013, while the vessel was still in Helsingborg, the chief mate had worked some extra hours in the morning and then took up his normal navigational watch at 1000. *Katre* left Helsingborg at 1420. On the day, the chief mate took over the navigational watch from the master at 2200⁵. The bridge equipment was reported to be in good working condition, although only the starboard radar was in use. One seaman was also on the bridge as a look-out / helmsman. Weather was reported to be fair with visibility of about 8 nm. There were slight seas and a gentle breeze.

² Since her GT is less than 3000, *Katre* was not equipped with a VDR. Furthermore, since the clocks were on UTC+2, all entries in her logbooks and her ARPA system are UTC+2. However, for consistency and comparison with other information obtained from other sources, all times quoted hereunder are in UTC with the occasional reference to the ship's time.

³ Ship's time was 1620.

⁴ COLREGs Rules 15 and 17.

⁵ 02 February 2013 at 0000 (ship's time).

When the chief mate took over the navigational watch, the vessel was in position 54° 59.6' N 13° 02.2' E. This corresponded to about 10 nm North Northwest of the Northwest corner of the TSS, North of Rugen. *Katre* was on a course of 132°(T), making about 7 knots. As expected, the traffic was heavy with a number of vessels approaching the entrance to the TSS on a South-westerly course, including *Statengracht*; the Norwegian registered cargo ship *Danubia*, which at that time was passing astern of *Katre*; the Marshall Islands registered bulk carrier *Q Ioanari*, which was approaching *Katre* from its port side; the Cyprus registered container ship *Nordic Philip*, which was also approaching *Katre* from its port side; and the Liberian registered oil/chemical tanker *Elbtank France* which, at that time, was passing ahead of *Katre* and entering the TSS.

On a reciprocal course and ahead of *Katre*, was the Faeroe Island registered cargo ship *Nordvick*, which was also passing close to the entrance of the TSS, North of Rugen. As indicated above, the chief mate was using only the Kelvin Hughes starboard radar; port side radar, *i.e.* the Furuno FM-2010, was not in use. The radar in use was kept on True Motion, centred and 'True North Up'. Superimposed on the ARPA was the electronic chart together with the Automatic Identification System (AIS) information. Hence, all the vessels detected had their name displayed against their echo (Figure 5).

Although as indicated above, there were other vessels in the vicinity, it was only *Statengracht* and *Katre*, which were developing a 'Close Quarter Situation' with a constant Closest Point of Approach (CPA) of around 0.5 nm. At 2308, the chief mate altered course from 134°(T) to 138°(T) in order to put the vessel on the new course in accordance with the courses laid down on BA Chart 2365. At this point, *Statengracht* was still some 4 nm away with a time of closest point of approach (TCPA) of around 12 minutes. The CPA remained about 0.4 nm (Figure 6).

The chief mate on *Katre* was fully aware of this critical state, which was developing with *Statengracht*, even though there was also *Q Ioanari* that had to be watched. Some minutes before the collision, the chief mate decided to change to manual steering and instructed his look-out to take over the wheel.

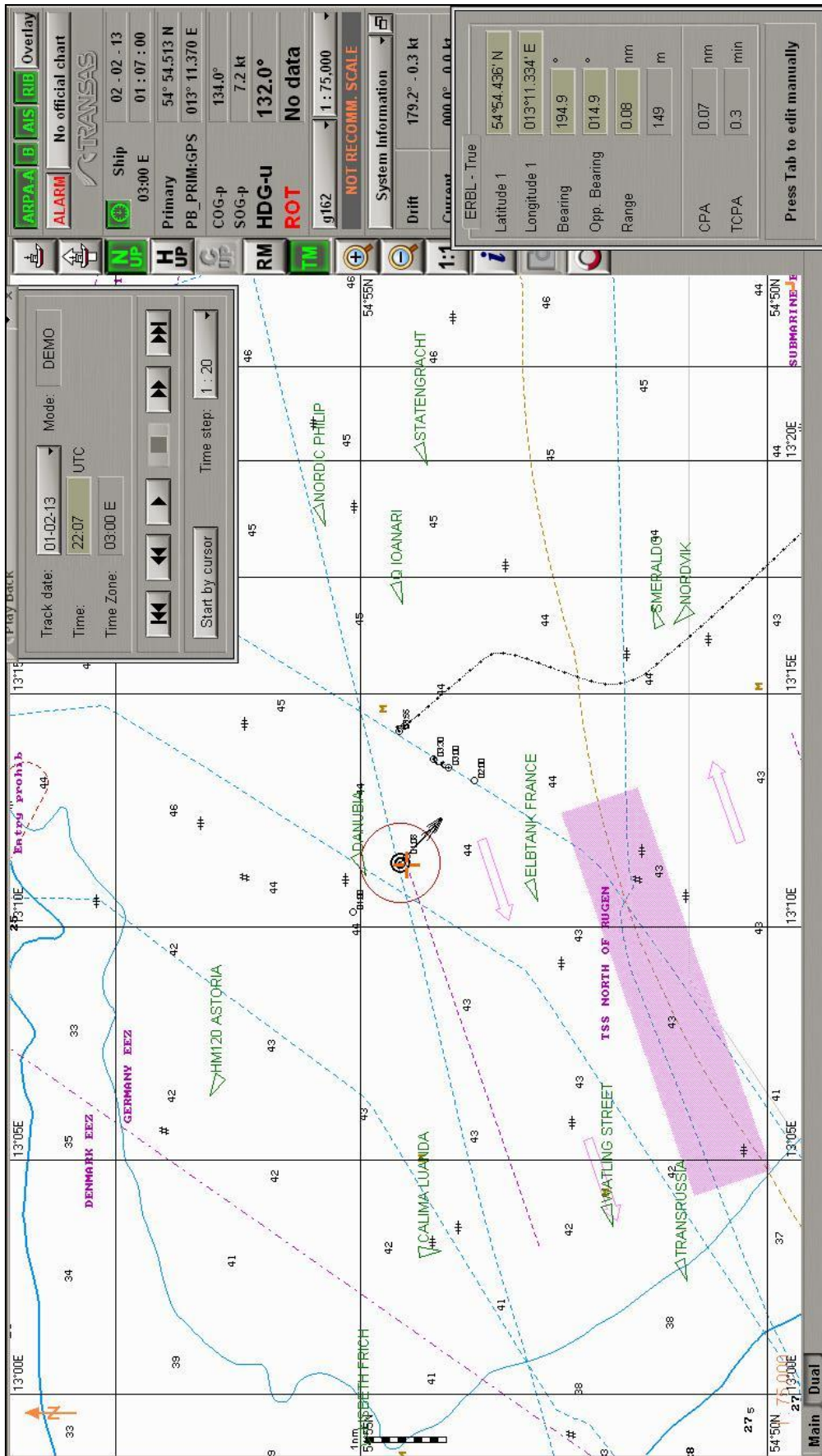


Figure 5: Screen shot at 2207

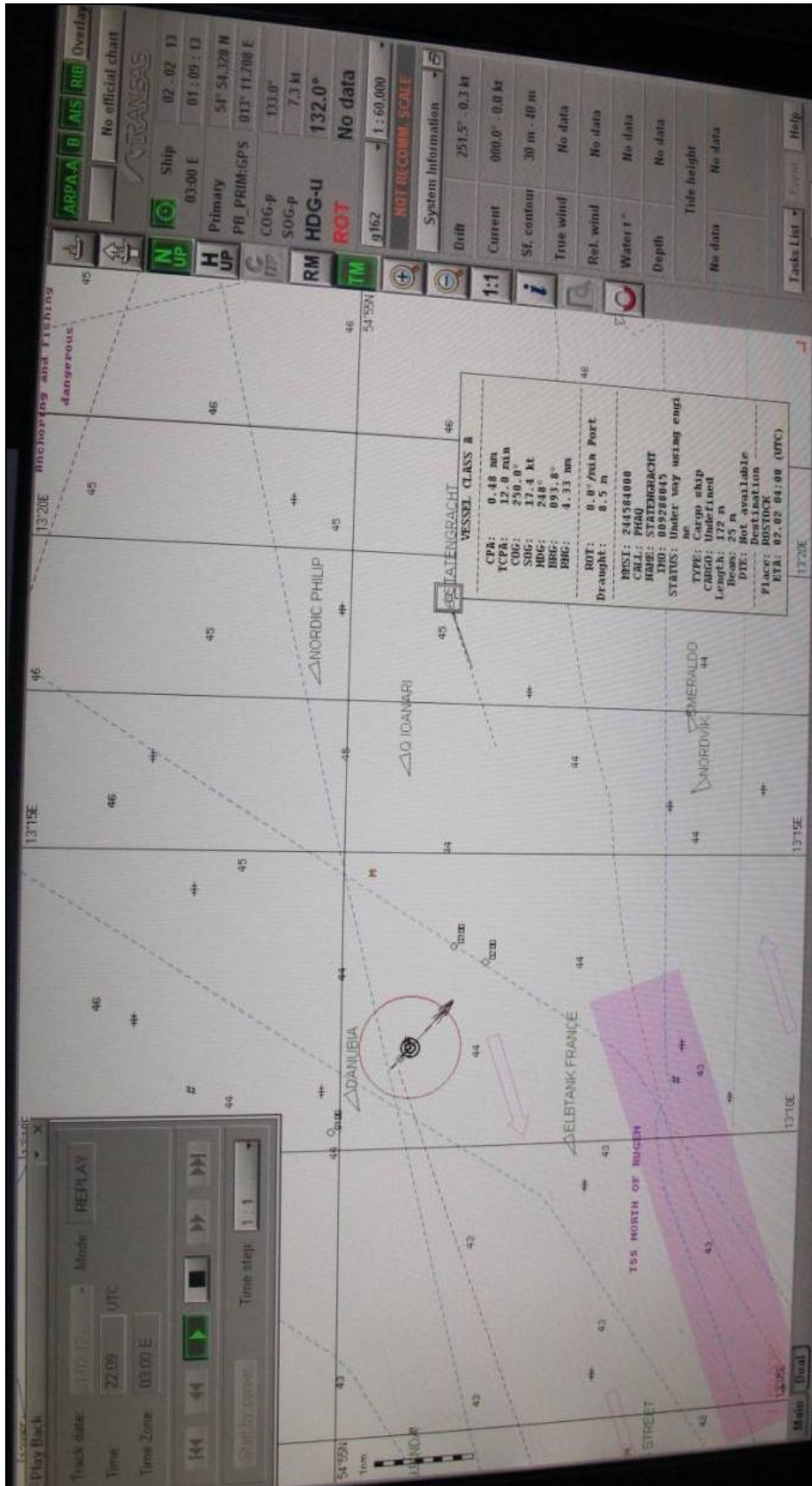


Figure 6: Screen shot at 2309

According to the data collected from *Katre's* ARPA system, the chief mate had *Statengracht* constantly monitored (Table 1). The closest vessel to *Katre* approaching from the port side was *Q Ioanari* which, at about 2311 had altered course to starboard for *Katre* and went around her stern without any problems. At about this time, *Katre* reduced her speed to approximately 6.5 knots in order to maintain her Estimated Time of Arrival (ETA) at her destination (Figure 7).

While *Katre* maintained her course of 138°(T) and a speed of about 6 knots, *Q Ioanari* was keeping clear, slowly going around the *Katre's* stern (Figure 8).

According to the chief mate, when *Statengracht* was about 1 nm off and with the CPA less than 0.4 nm⁶, he changed over to manual steering and ordered the helmsman to alter course to port by a few degrees to 134°(T). Extracts from *Katre's* ARPA system suggested that this alteration was executed at around 2319. No sound signals were made when this alteration of course took place. The chief mate recalled that immediately after, *i.e.* at about 2320, *Statengracht* started altering course slowly to starboard and then stopped and showed both sidelights (Figure 9). At this time, the chief mate instructed the helmsman to put the wheel hard to port while announcing this on the VHF radio.

The chief mate further noticed that *Statengracht* was continuing her course alteration to starboard and immediately ordered his helmsman to put the wheel hard to starboard. However, this last helm order did not take effect. At 2321, *Katre's* bow collided with *Statengracht's* port side in way of the latter's cargo hold no. 2 (Figure 10).

⁶ *Statengracht* was also observed to maintain her course of 248°(T) and speed of 17 knots.

Own Vessel (<i>Katre</i>)					Current		Information related to <i>Statengracht</i>							REMARKS
Time (UTC)	HDG	Spd	COG	SOG	Set	Drift	Brg	Range	CPA	TPCA	HDG	COG	SOG	
2307	132	-	134	7.2	179.2	0.3	093	4.89	0.46	13.5	248	249.8	17.4	54° 54.46'N 013° 11.5'E
2308	132	-	133	7.2	229.4	0.2	093.3	4.64	0.50	12.8	247	249.9	17.4	
2309	132	-	133	7.2	251.5	0.3	093.8	4.33	0.48	12.0	248	250.0	17.4	
2310	138	-	136	7.2	204.9	0.1	094.1	4.04	0.38	11.4	248	250.0	17.4	54° 54.2'N 013° 11.8'E
2311	138	-	139	7.2	238.7	0.2	095.0	3.56	0.37	10.1	248	250.4	17.4	
2312	138	-	139	7.2	293.6	0.4	096.0	3.09	0.44	8.9	247	250.4	17.4	
2313	138	-	139	6.6	261.7	0.1	096.7	2.87	0.47	8.2	248	250.3	17.4	
2317	138	-	138	6.0	166.9	0.1	104.8	1.47	0.33	4.1	253	257.2	17.4	54° 53.64'N 013° 12.76'E
2318	138	-	138	5.9	222.5	0.1	107.4	1.22	0.29	3.4	257	260	17.4	
2319	134	-	138	5.9	293	0.2	111.8	0.87	0.19	2.3	267	267.9	17.3	
2320	129	-	135	5.8	342	0.2	117.2	0.51	0.09	1.4	281	280.2	17.0	
2321	106	-	121	5.5	271	3.6	120.8	0.18	0.00	0.7	308	300.8	14.3	54° 53.4'N 013° 13.17'E Collision

Table 1 : *Katre* - ARPA display data

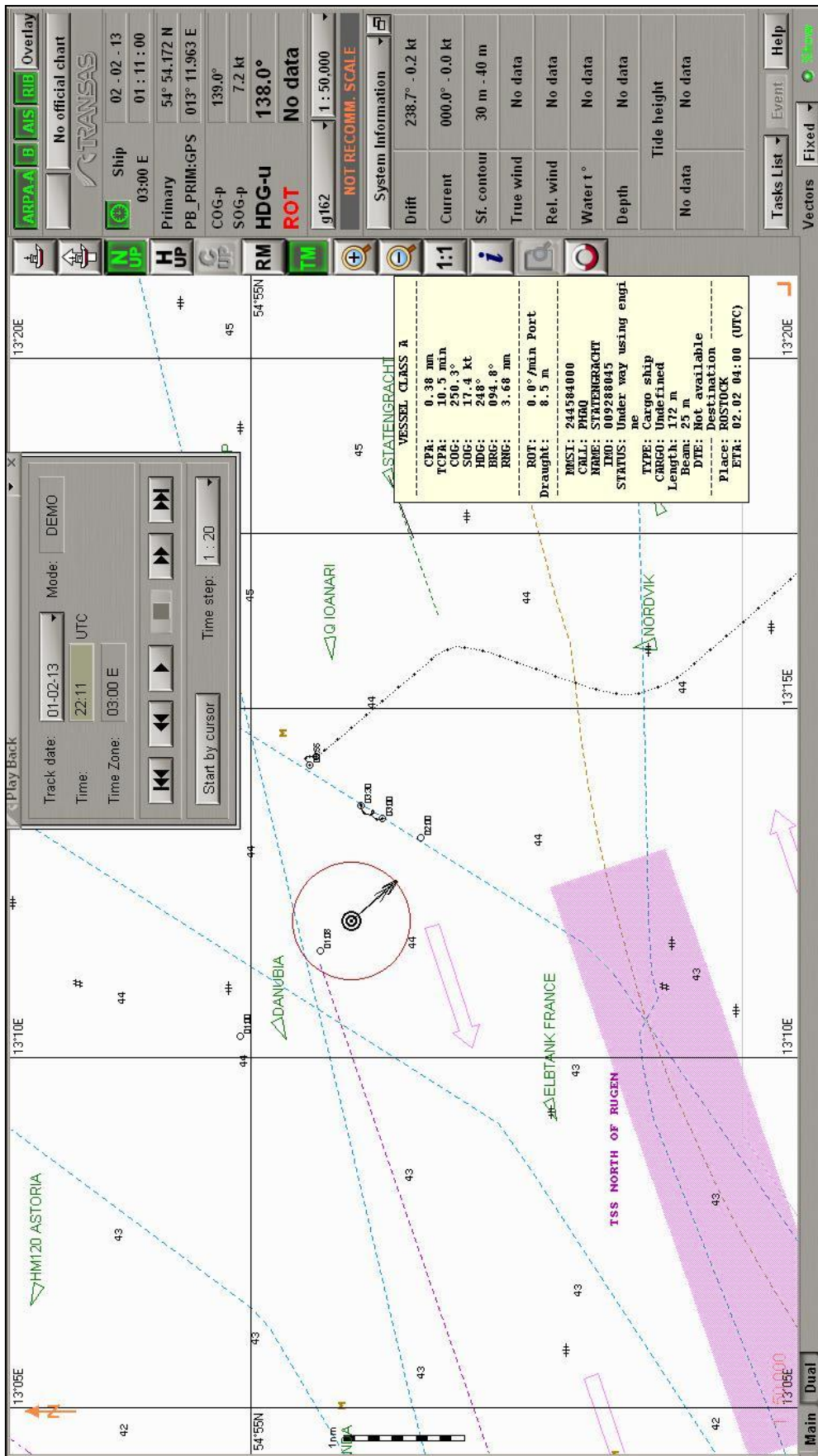


Figure 7: Screen shot at 2311

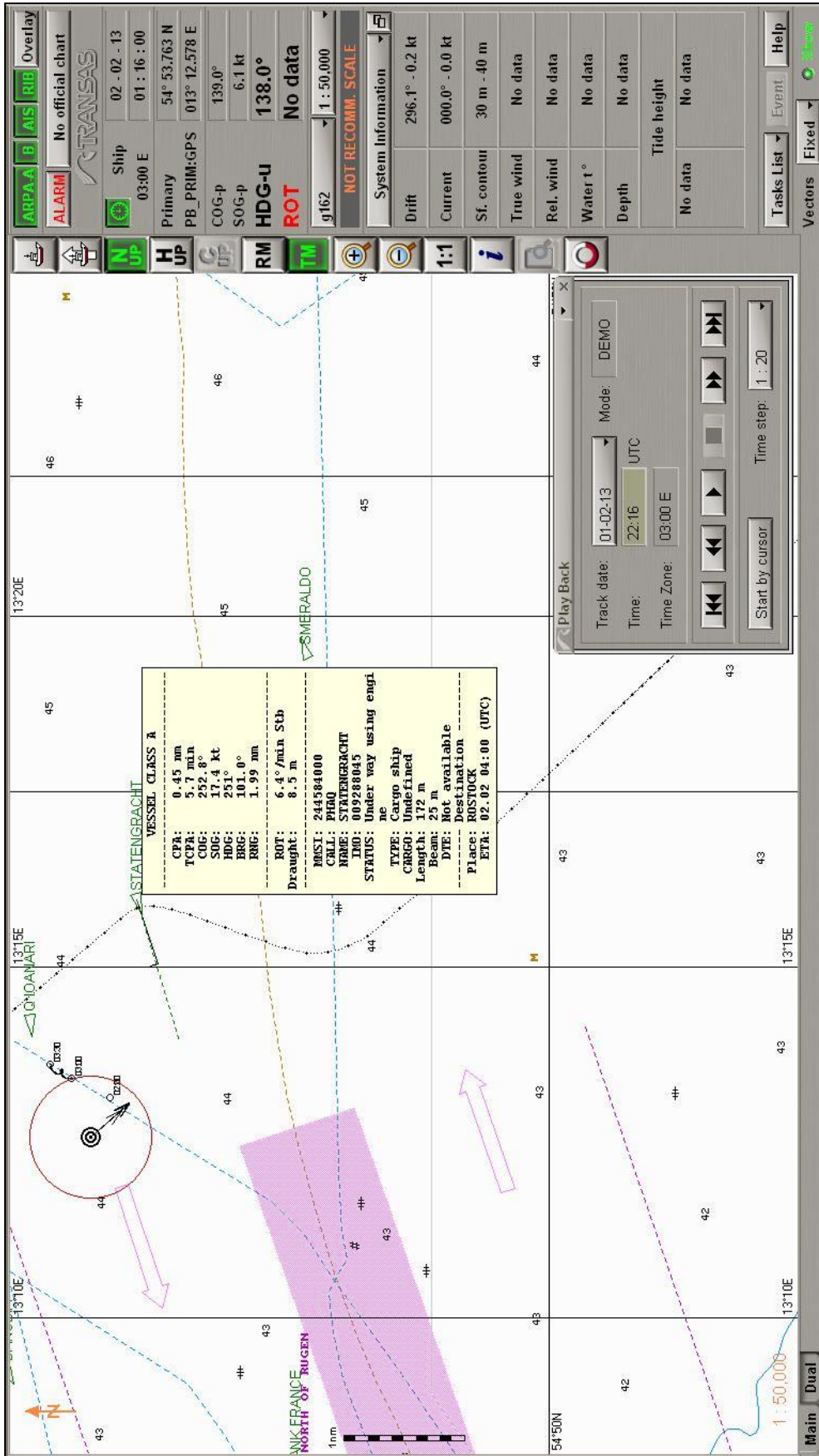


Figure 8: Screen shot at 2316

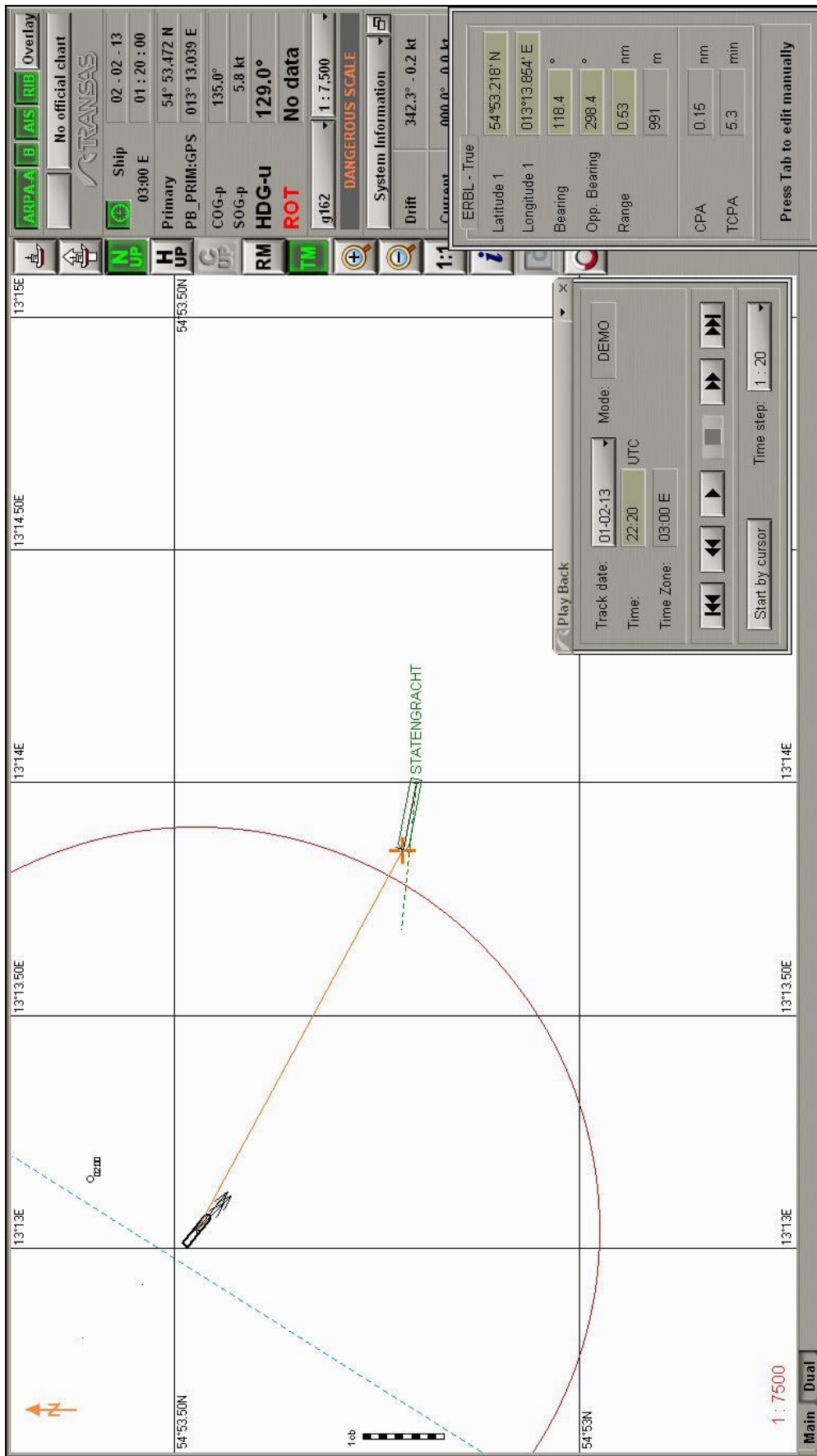


Figure 9: Screen shot at 2320

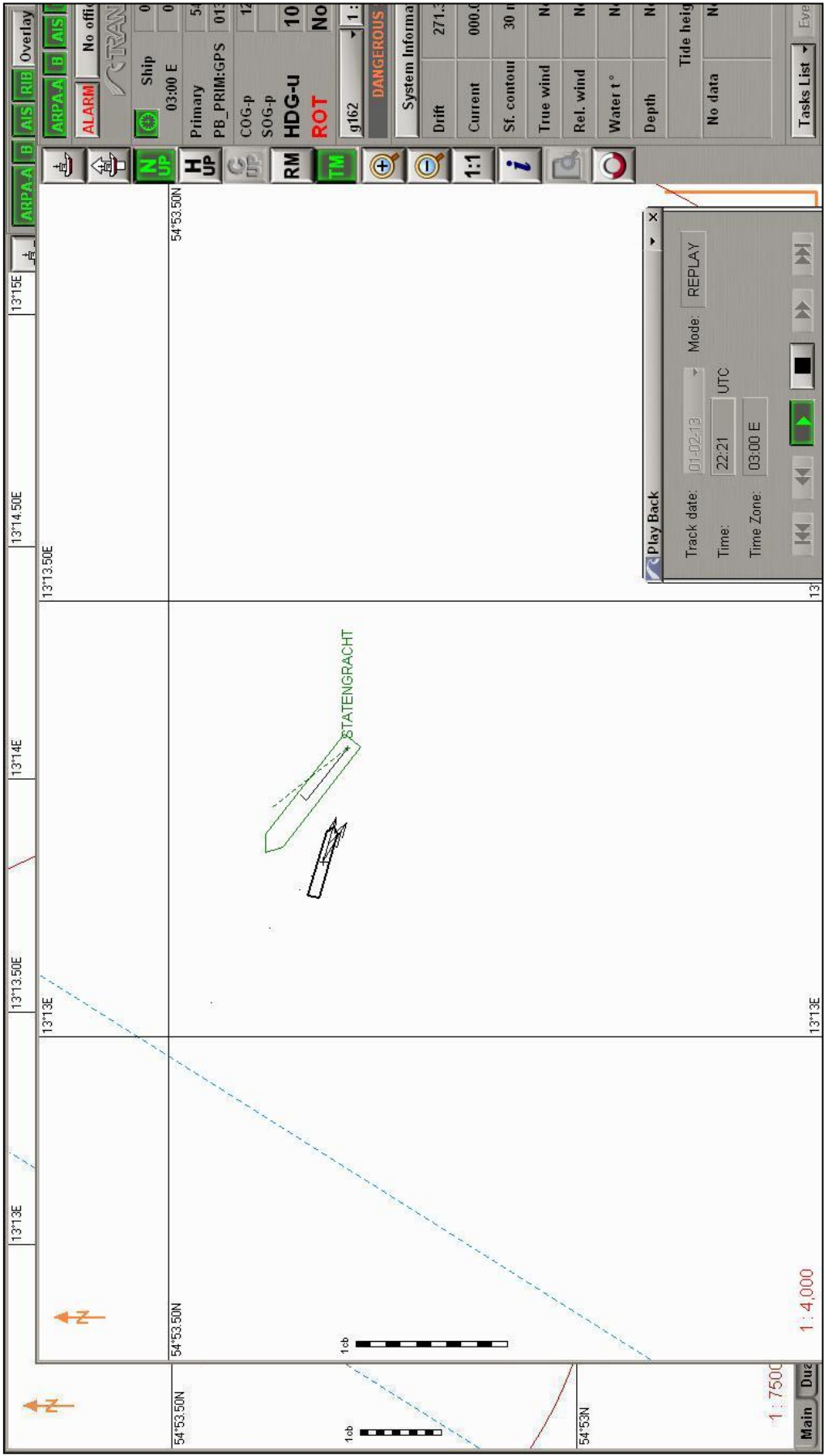


Figure 10: Screen shot at 2321

1.5.2 Events on board *Statengracht*⁷

After finishing loading her cargo of forest products, *Statengracht* sailed from the port of Rauma, Finland on 31 January 2013. The lower cargo holds were fully loaded and the tween-deck was partially loaded between Bays nos. 3 to 11 and 21 to 27. The next port of call was the outer roads of the port of Rostock in Germany, with an ETA set at 0300, where the vessel was to take bunkers. After bunkering, the vessel was due to proceed to Eemshaven in the Netherlands and then on to the other side of the Atlantic Ocean. The vessel's speed was set at 17 knots, which corresponded to 90% propeller pitch.

According to the passage plan, *Statengracht* had to pass through the TSS North of Rugen. On the day, *i.e.* late on 01 February 2013, the vessel was on a Westerly course, approximately 250°(T), heading for the entrance to the Southwest lane of the TSS North of Rugen. As expected, the traffic in this stretch of water was heavy with a number of vessels sailing along the same Westerly route as that of *Statengracht*. Other vessels were navigating to the South, travelling along an Easterly course following / leaving the North-easterly lane of the TSS North of Rugen and a number of vessels that were crossing in a Northerly / Southerly direction.

The master was on the bridge for most of the 2000-2400 navigational watch with the third mate. It was recalled that the handover between the third and second mate had lasted about four minutes. The master was mainly using the radar on the port side while the OOW was using the radar on the starboard side⁸. The third mate indicated the course being steered, *i.e.* 248°(T) and the course on the chart, *i.e.* 250°(T). On the ARPA, he indicated to the second mate the vessels closest to *Statengracht*, including *Katre*.

When the second mate took over the navigational watch at 2300 on 01 February, the vessels closest to his vessel were *Q Ioanari*, which was ahead, approximately 1 nm, on the starboard bow on a similar course to that of *Statengracht* but making

⁷ Since *Statengracht*'s clocks were on UTC+1, all entries in the statements and the vessel's VDR are UTC+1. However, for consistency and comparison with other information obtained from other sources, all times in this section of the safety investigation report are in UTC with the occasional reference to the ship's time.

⁸ The starboard side radar was interfaced with the VDR. The captured screenshots from the port side radar indicated 'North up' and off centre settings. It was on the 12 nm range, although the setting was occasionally changed to 6 nm.

approximately 12 knots; *Nordic Philip*, which was about 1.5 nm on its starboard beam, was also on a similar course to the one followed by *Statengracht* but making 15 knots. *Nordvik*, which was Northbound, was about 7 nm on the *Statengracht*'s port bow, making approximately 12.5 knots, and crossing from port to starboard. The motor tanker *Smeraldo* was on a reciprocal course to the South of *Statengracht*, passing close to *Nordvik* and *Katre*, which was on the starboard bow some 8 nm away, with a CPA of 0.5 nm (Figure 11).

With a speed of just over 17 knots, *Statengracht* was slowly overtaking both vessels on her starboard side, namely *Nordic Philip*, which was by now already abaft her starboard beam, and the *Q Ioanari* which, at 2310 and a distance of 1.5 nm from *Statengracht*, altered course to starboard for *Katre*, which was on her starboard side (Figure 12).

At 2312, *Nordvik*, which was crossing *Statengracht*'s path from the port side, made a broad alteration of course to starboard while it was still at a distance of 2.5 nm from *Statengracht* (Figure 12). This was well observed by the master and the second mate on board *Statengracht*.

At 2313, the master on board *Statengracht* was heard cautioning the OOW not to let *Katre* get too close. When the master realised that the OOW had not understood as to which ship he was referring to, he left his radar on the port side and went over to the starboard side to indicate to the OOW which vessel / echo was being referred to (Table 2).

Four minutes later, at 2317, when *Katre* was only 1.9 nm away with a CPA of 0.4 nm and a TCPA of 5.4 minutes, the OOW started slowly altering course to starboard. *Statengracht* was still making 17.4 knots and on autopilot (Figure 13). This prompted the Master to instruct the OOW to make a broader alteration to starboard so that *Katre* would better understand his intentions. The Master went on to refer to *Nordvik*, which had just made a broad alteration to starboard for *Statengracht* a couple of minutes before.

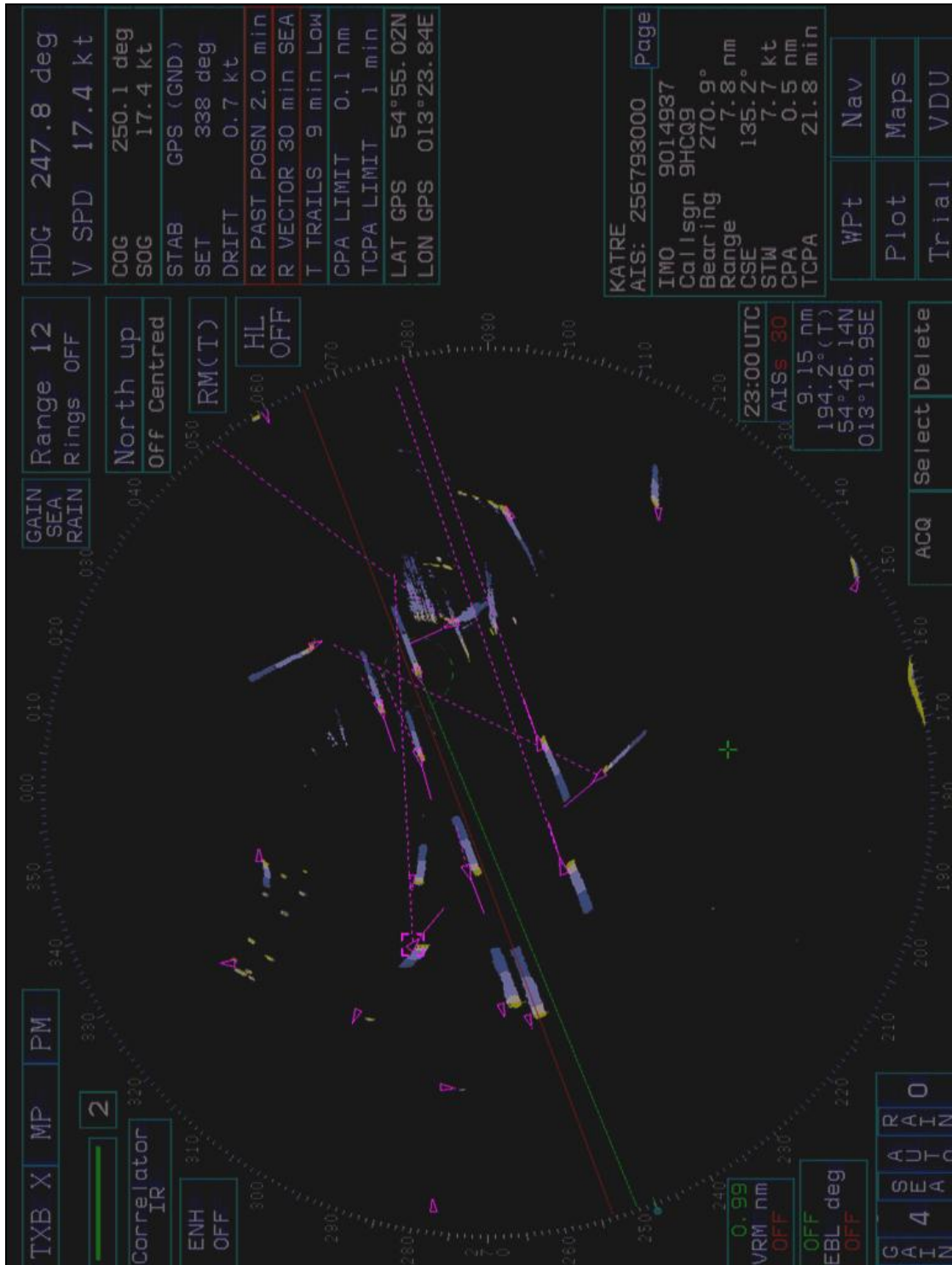


Figure 11: Screen shot at 2300

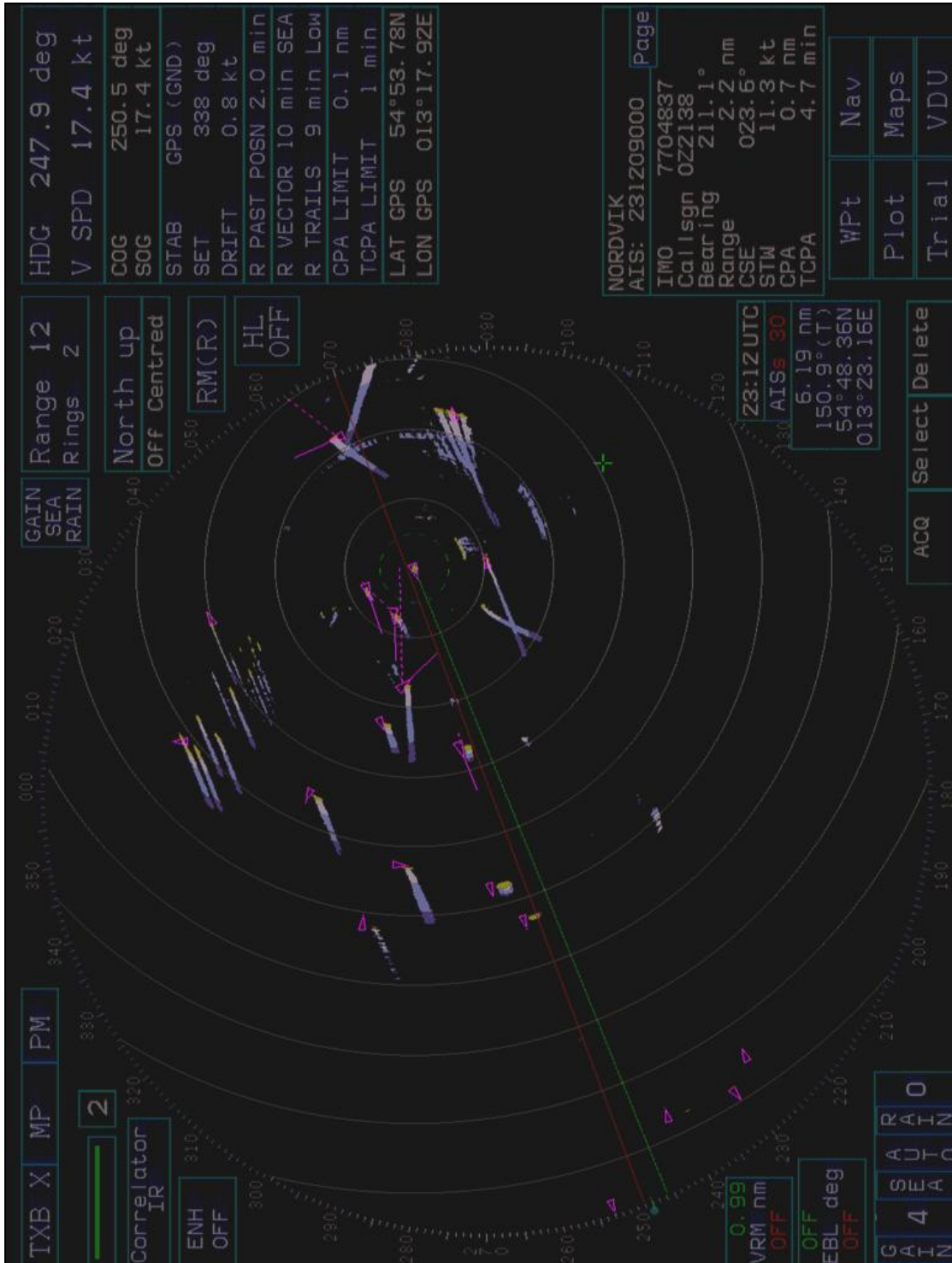


Figure 12: Screen shot at 2312

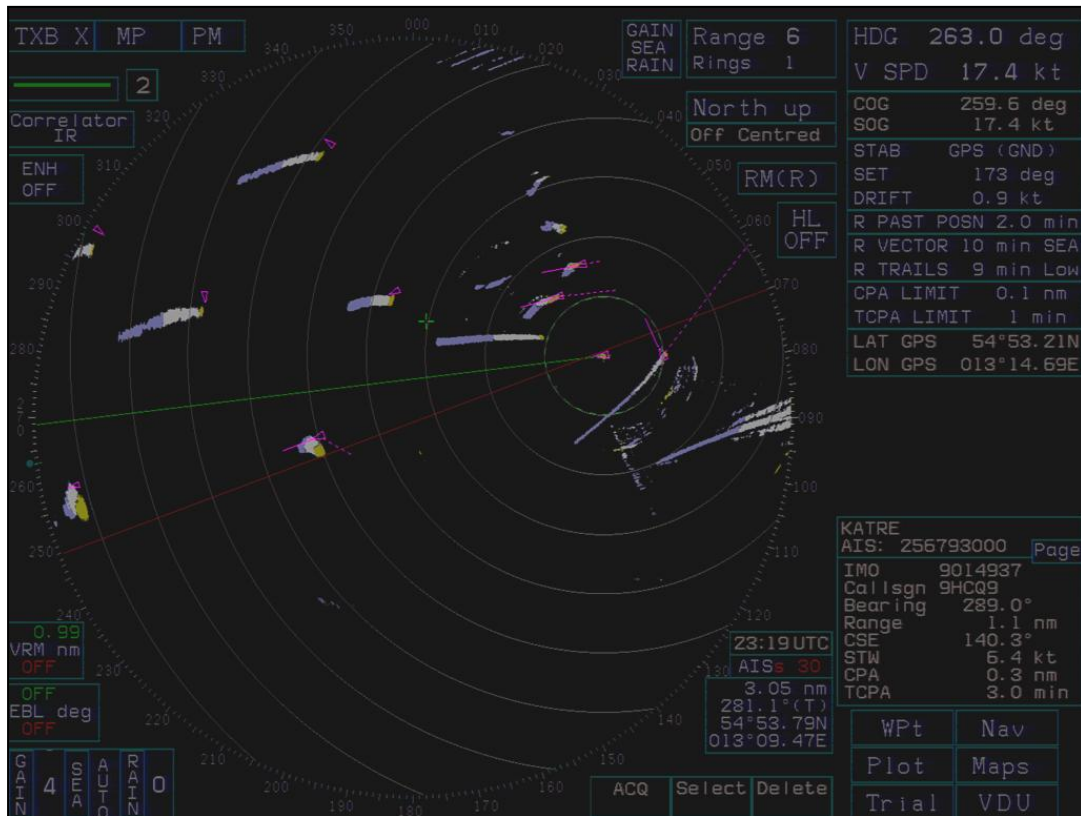


Figure 13: Screen shot at 2319

At 2320, while *Statengracht*'s heading was 275°(T) and *Katre* was still on the starboard bow at a range of only 0.7 nm, the Master on the former ship was heard twice ordering the OOW to "Go more to starboard" and then to change to hand steering. Immediately after, at 2321, when *Katre* was only 0.5 nm away and still on the starboard bow, the Master ordered the OOW to change to hand steering and to go "hard to starboard". At that same time, it was noticed that *Katre* was altering her course to port and her OOW was also heard on the VHF radio.

The master on *Statengracht* was heard telling the OOW, "that's what I mean", referring to what he had just told him earlier regarding making broad alteration to starboard for other vessels to fully understand his intentions. By this time, the collision was inevitable; *Statengracht* was swinging to starboard and *Katre* was going to port.

At 2322, both vessels collided.

Own Vessel (<i>Statengracht</i>)					Current		Information related to <i>Katre</i>					Remarks
Time (UTC)	HDG	Spd	COG	SOG	Set	Drift	Brg	Range	CPA	TPCA	COG	
2300	247.8	17.4	250.1	17.4	338	0.7	270.9	7.8	0.5	21.8	135.2	Heavy traffic noted.
2303	247.9	17.4	249.5	17.4	338	0.5	271.5	6.8	0.5	18.9	135.4	Position: 54° 54.7'N 013° 22.4'E.
2306	247.9	17.4	249.8	17.4	338	0.6	272.3	5.7	0.5	15.9	135.8	Captain discussing arrival times with the OOW.
2309	247.9	17.4	250.0	17.4	338	0.7						Attention is given to <i>Nordvik</i> crossing from Port to Stb'd with CPA and TCPA same as <i>Katre</i> but which was crossing from Stb'd to Port.
2312	247.9	17.4	250.3	17.4	338	0.7						Captain heard telling the OOW "Don't let the <i>Katre</i> get too close". <i>Nordvik</i> , range 2.4 nm, as the 'give way vessel' alters course to Stb'd to keep clear of <i>Statengracht</i> .
2313	247.9	17.4	250.3	17.4	338	0.8						Radar/ARPA down to 6 mile range and <i>Katre's</i> echo picked up again.
2314												
2315	247.9	17.4	250.3	17.4	338	0.8	278.4	2.5	0.5	7.0	141	
2316	250.3	17.4	251.9	17.4	340	0.5	279.7	2.2	0.5	6.4	140.1	Course altered to Stb'd but no helm orders heard on the Bridge.
2317	252.2	17.4	252.4	17.4	342	0.0	281.2	2.0	0.4	5.6	141	
2318	254	17.4	256.3	17.4	344	0.7	284.4	1.5	0.4	4.4	140.8	
2319	259.1	17.4	258.9	17.4	159	0.0	287.9	1.2	0.3	3.4	140.3	Captain explains to the OOW to make substantial alteration to Stb'd so that the other vessel can understand their intentions. As an example, the master referred to <i>Nordvik</i> and how this vessel made a broad alteration for them.
2320	273	17.4	269.1	17.4	183	1.2	292.4	0.8	0.3	2.4	139.4	Position: 54° 53.1'N 013° 14.3'E.
2321	284.9	17.3	282.3	17.3	195	0.8	297.4	0.5	0.1	1.3	126	Captain orders 'Hand Steering' and 'Hard to Stb'd'.
2322	333.8	13.2	303.4	15.3	243	7.7	304.8	0.1	0.0	0.3	078.7	Collision

Table 2: MV *Statengracht* - VDR display data

Immediately after the collision, the master on *Statengracht* was heard being very upset with the OOW, telling him that this was his first collision in a career of 35 years. The master then made a series of two questions on what he referred to the smell of alcohol. The master also directed the question to the chief engineer, initially asking him whether he could smell alcohol on the OOW and later instructing him to smell. The chief engineer was not clear in his reply but documentary evidence made available during the course of the safety investigation indicated that the chief engineer did not smell alcohol.

1.6 Reported Damages

Katre sustained severe damages to her bow area, including the bulbous bow and the forecastle's bulwark (Figure 14). The forepeak tank was also affected with distorted stiffeners and a crack from frames 135 to 131, although there was no damage to the collision bulkhead. *Statengracht* was also severely damaged as a result of the collision with a full penetration in way of her cargo hold no. 2, just above the waterline. Apart from the side shell plating, *Statengracht* also sustained damages to the stiffeners in way of the damaged cargo hold (Figure 15).

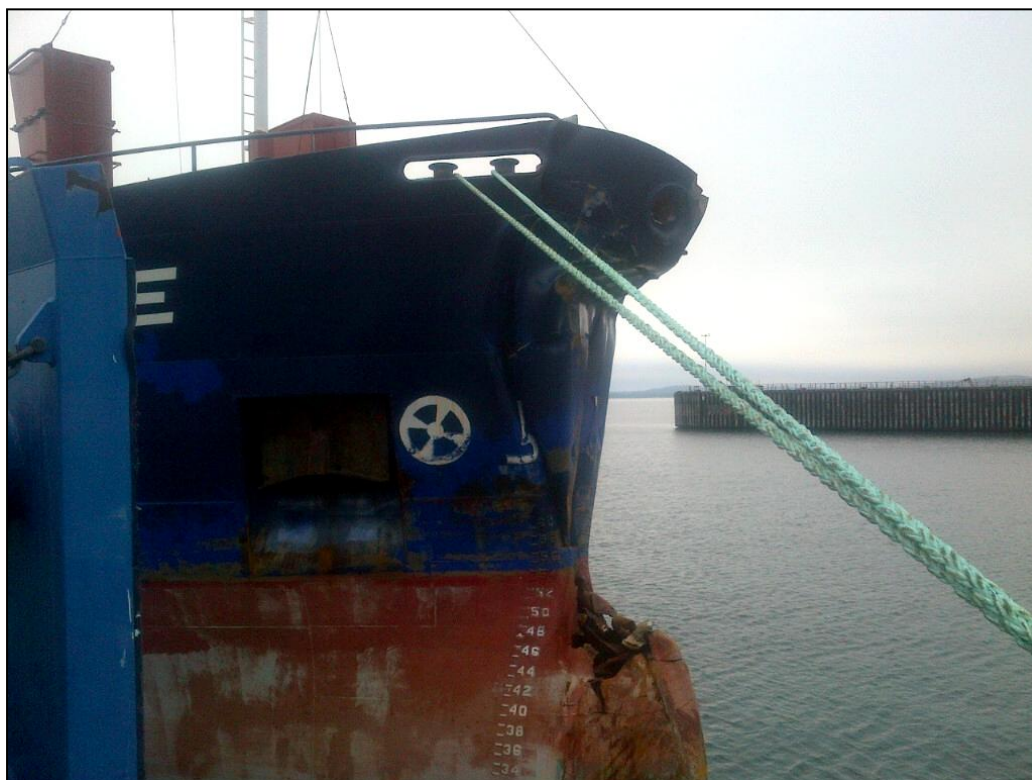


Figure 14: Damages to *Katre*'s bow area and bulbous bow



Figure 15: Damage to *Statengracht*'s side shell plating

2 ANALYSIS

2.1 Purpose

The purpose of a marine safety investigation is to determine the circumstances and safety factors of the accident as a basis for making recommendations, to prevent further marine casualties or incidents from occurring in the future.

2.2 Potential Influence of Alcohol and Actions Taken

Once *Katre* arrived at the port of Mukran, Germany, two German Water Police officers boarded the vessel at 0405 and proceeded to carry out alcohol tests on the master and the chief mate. The test results were negative (0%) for both crew members. Alcohol was therefore not considered to be a contributing factor to this collision with respect to the chief mate on board *Katre*.

As regards to *Statengracht*, the MSIU did not have any records which would have indicated that alcohol tests had been carried out on the deck officers as soon as the vessel arrived in Rostock. The VDR data indicated that:

- at 2356 (ship's time), the master expressed concern with the third mate on the fact that the second mate had not yet reported to the bridge for his navigational watch;
- the second mate arrived on the bridge at 2357, just three minutes before his navigational watch was due to commence at 0000;
- minutes before the collision, the OOW could not understand as to what ship was the master referring to, when the latter cautioned him to ensure that *Katre* does not get too close;
- the OOW was slow to alter course to starboard for *Katre*, necessitating the master's intervention seconds before the collision for *Statengracht* to go more to starboard; and
- immediately after the collision, the master accused the navigational officer that he was smelling of alcohol and requested the chief engineer to confirm that he was actually smelling alcohol.

The above analysis, as much as it is extracted from evidence collected from the ship, was not collaborated with an alcohol test soon after the vessel was safely moored alongside at Rostock. Moreover, the VDR data did not indicate at any point in time that the master had raised concern during the navigational watch that he was suspecting that the OOW was not fit to stand his navigational watch. To this effect, the safety investigation was unable to determine whether alcohol had an influence on the cognitive capability of the OOW.

What was certain, however, was that the points above suggested that the OOW did not have a clear situation awareness, irrespective of whether this was the result of alcohol abuse or not.

The OOW on board *Statengracht* reported on the bridge for his navigational watch just three minutes before the vessel had to sail (at full speed) through a very busy shipping area close to the entrance of the TSS. Furthermore, it is also to be noted that the handover of the navigational watch from the third mate to the second mate only lasted four minutes, *i.e.* from 2357 to 0001.

Once the second mate took over the navigational watch, there seemed to be no procedure followed with regards to, *inter alia*, the minimum CPA allowed, when to change to manual steering and under what conditions. The OOW kept the vessel on autopilot until the very last minute when the master seemed to have taken over the navigational watch and ordered the OOW to change to hand steering and to put the wheel hard to starboard.

Noting these actions on board *Statengracht*, it may be stated that these had an influence on the circumstances that eventually led to this collision⁹.

⁹ This point will be further elaborated in the following sections.

2.3 Conduct of Vessels

2.3.1 *Katre*

On 02 February 2013 at 0000 (ship's time - 2200 UTC on 01 February 2013), *Katre* was following a course of 138°(T), at a reduced speed of around 7 knots. This course had to take the vessel close to the Northeast entrance of the TSS, North of Rugen and therefore, heavy crossing traffic was to be expected. *Katre* would first encounter crossing vessels heading for the Westerly lane of the TSS North of Rugen. These vessel would be therefore crossing from *Katre*'s port side.

Further to the South, as *Katre* would be navigating closer to the Easterly lane of the TSS, the crossing vessels that would be leaving the TSS on *Katre*'s starboard side. Given that the vessel's navigational watchkeeping hours were shared between the master and the chief mate on a '6-on 6-off' system¹⁰, the former, bearing in mind that the vessel was due to arrive at the next port of call at 0500, did not remain on the bridge to assist the chief mate after 0000 while passing through this very busy area, even though this was the first trip for the chief mate in the Baltic Sea.

From the time the chief mate took over the navigational watch from the master, until the time of collision at 0122 (ship's time), the traffic was moderately low. However, when the vessel was close to the entrance to the South-westerly lane of the TSS at around 0100, there were four particular vessels, which were close to *Katre*, *i.e.*, *Danubia*, which had altered her course to starboard earlier and passed behind *Katre*'s stern; *Elbtank France*, which had passed well ahead of *Katre*; *Q Ioanari*, which was crossing from the port side and was the closest vessel to *Katre* from the two other vessels which were also crossing from port side (*i.e.* *Statengracht* and *Nordic Philip*).

Nordic Philip was not posing any danger as its path was to take her astern of *Katre*. However, *Q Ioanari* and *Statengracht* had to be watched carefully because of their course and CPA, even though both of these vessels were 'Give Way Vessels' (Figure 16).

¹⁰ This matter will be further discussed in section 2.4.

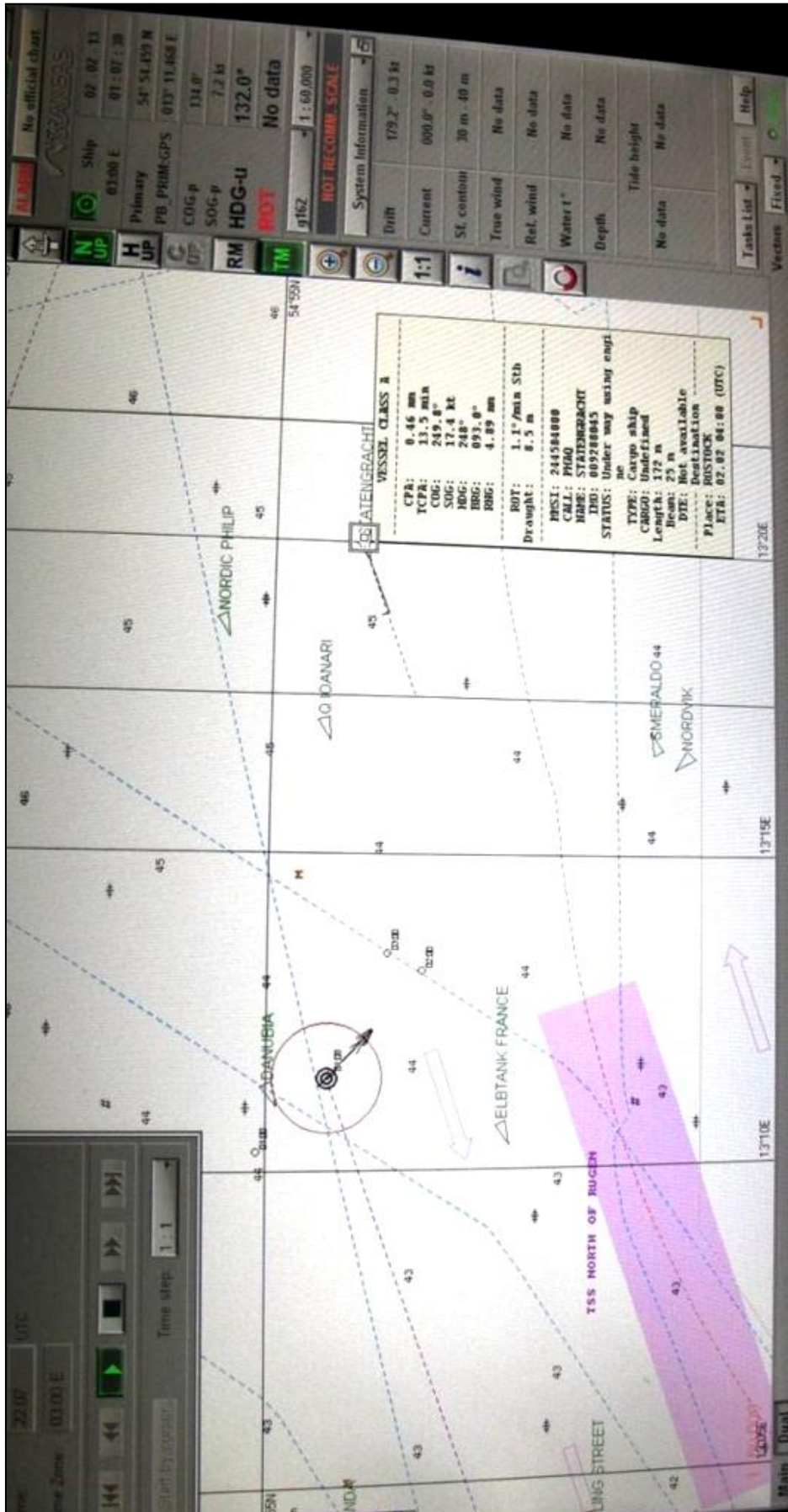


Figure 16: Screen shot at 2202 UTC (0002 ship's time)

Q Ioanari was ahead of *Statengracht* and had reached *Katre* before *Statengracht*. In fact, *Q Ioanari* had kept clear of *Katre* when it altered her course to starboard to go around *Katre*'s stern. This course alteration took place some minutes before the collision. Once *Q Ioanari* was out of *Katre*'s way, the situation was clearer between *Katre* and *Statengracht*. *Katre*, as the 'Stand On Vessel', was keeping her course and speed and at the same time also watching *Statengracht* which, at a speed of about 17 knots, her CPA had remained constant at about 0.5 nm.

At this stage, the chief mate had ordered the AB to take the wheel after changing to hand steering. He also realised that although his vessel's speed was only seven knots at the time, a close quarter situation was still developing very fast because of the *Statengracht*'s speed. It was only when *Statengracht* was 1 nm away and closing fast with a CPA of less than 0.5 nm, and with no indications that she was taking action to keep out of *Katre*'s way, that the chief mate concluded that *Statengracht* would maintain her course¹¹. Even though it seemed that the chief mate was in doubt as to the intentions of *Statengracht*, no sound/light warning signal (five or more short blasts/ flashes) was made to indicate to the *Statengracht* that he was not understanding her intentions.

With this rapidly developing close quarter situation, it seemed that the chief mate became extremely concerned and decided to alter course to port in order to increase the CPA between the two vessels (Figure 17). Again, no manoeuvring sound or light signals were made to indicate this alteration. Irrespective of the fact that at the time of this alteration to port by *Katre*, *Statengracht* had not yet given a clear indication to *Katre* that it was going to alter to starboard, *Katre* could still have altered her course to starboard as there was nothing to stop her from doing so. Once this manoeuvre was executed and the fact that at the same time *Statengracht* altered her course to starboard, there was no turning back and collision could not have been avoided.

¹¹ The course was to take *Statengracht* only 0.4 nm ahead of the *Katre*'s bow.

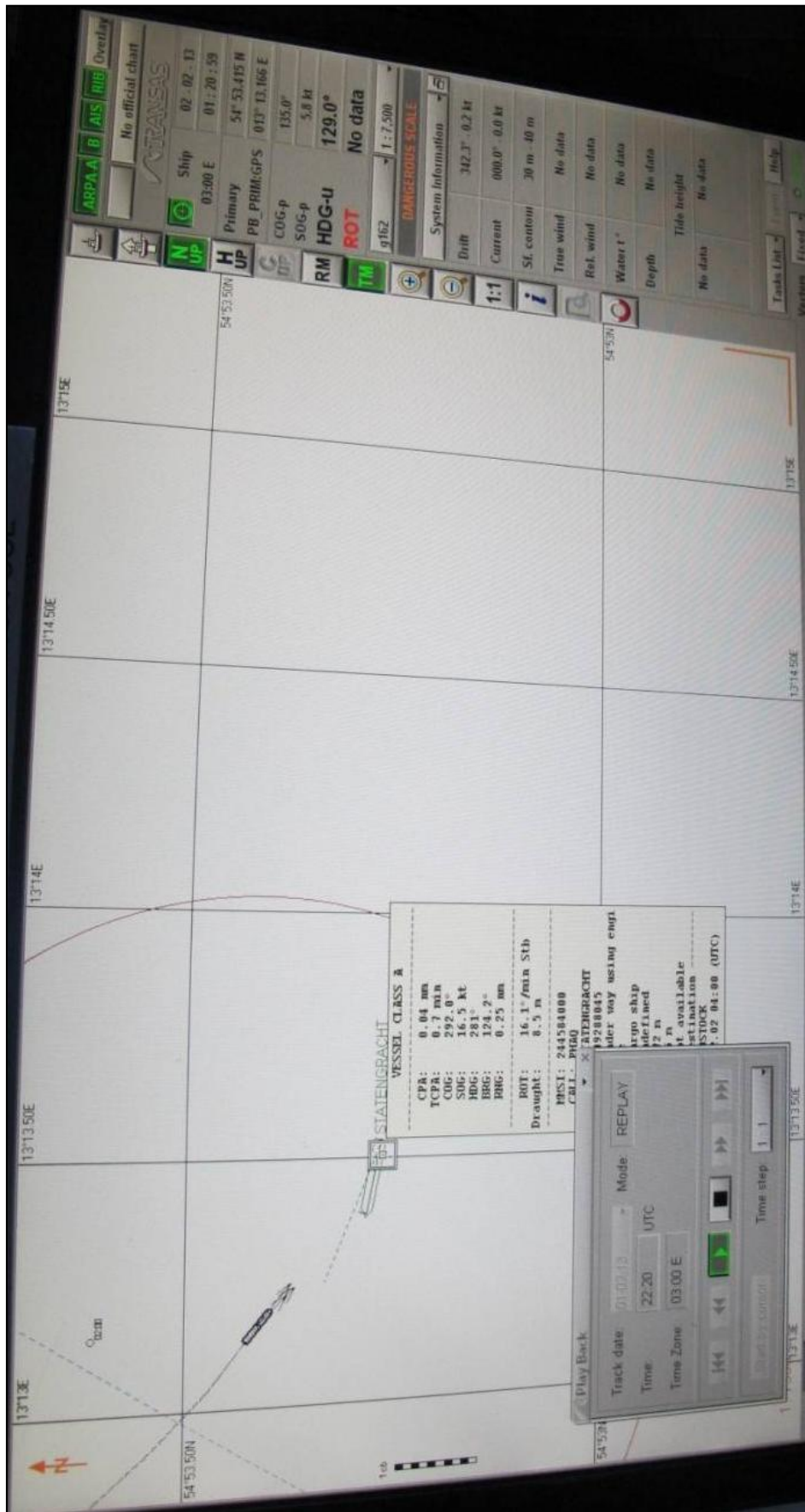


Figure 17: Screen shot at 2320 UTC (0120 ship's time)

2.3.2 *Statengracht*

When the second mate took over the navigational watch from the third mate at 0000 (ship's time) on 02 February 2013 (*i.e.* 2300 (UTC) of 01 February 2013), the master was on the bridge. Although the traffic situation was extremely dynamic and potentially complex, the second mate arrived on the bridge just three minutes before midnight and the handover from the third mate only lasted four minutes. At that time, *Statengracht* was making about 17 knots on a course of about 250°(T), and heading for the entrance to the Westerly lane of the TSS North of Rugen. In her immediate vicinity, *Statengracht* had five vessels on her starboard side and two on her port side.

The vessels on *Statengracht*'s starboard side were *Elbtank France*, which was ahead and already entering the TSS and of no particular concern; *Q Ioanari*, which was ahead (although being overtaken) on the starboard side and the closest to *Statengracht*, sailing on a similar course and at a speed of around 12 knots; *Nordic Philip*, which was further away from *Q Ioanari*, almost on the starboard beam of *Statengracht*, sailing on a similar course at a speed of about 15 knots (and also being slowly overtaken by *Statengracht*); *Katre*, which was crossing from the starboard side further away from *Q Ioanari*, sailing at a speed of about 7 knots with a CPA of approximately 0.5 nm; and *Danubia*, which was also on the starboard bow sailing in the same direction as *Statengracht* and was going around *Katre*'s stern.

The two vessels on the port side were *Smeraldo*, which was leaving the TSS on a reciprocal course and of no concern to *Statengracht*; and *Nordvik*, which was crossing from the portside at a speed of about 12 knots, with a CPA of 0.5 nm.

The actions taken by *Nordvik* at 2312 (0012 ship's time), were considered to be appropriate. As the 'Give Way Vessel', *Nordvik* not only altered course, but made a broad alteration to starboard for *Statengracht*, when it was about 2.4 nm away. It was also clear that the master had a good perspective of the holistic situation which was developing around him. So much so that at around the same time of *Nordvik*'s manoeuvre, he warned the OOW not to let *Katre* get too close since her CPA was around 0.5 nm. In contrast, the OOW was unsure as to which vessel was the master referring to, even though the name of the vessel was on the ARPA radar, which he had been following.

At 0016 (ship's time), with the vessel still on autopilot, the OOW started to alter course slowly to starboard using the autopilot¹². The VDR data indicated that there were no manoeuvring signals being sounded at this stage.

Altering course using the autopilot is a slow process due to the fact that the autopilot tends to apply counter rudder as soon as the vessel starts to swing so as not to overshoot the new heading.

Furthermore, *Q Ioanari*, which had already altered her course for *Katre*, was now sailing away from *Statengracht* and therefore, the latter had enough sea room to make a broad and substantial alteration of course and keep clear of *Katre*. From the VDR data, there was no evidence to suggest that at any time, the OOW took visual bearings of any of the ships close to the *Statengracht*, including the approaching *Katre*.

It was clear to the master that the actions taken by the OOW were not addressing the situation which was evolving around *Statengracht*.

2.3.3 Decision making in complex environments

Taking decisions on whether to act or not (and how to act) depends on the assessment of the situation, which is made *in situ*, based on the options available. Such was the situation on both vessels and this was not necessarily straight forward.

It was also acknowledged that bounded rationality may have been a potential important factor, meaning that crew members on both vessels may have faced a range of limitations of knowledge on the surrounding environment and computational capacity, compounded by time constraints (to take important decisions). This was precisely where a better assessment of the risk of collision would have been a vital support to the OOWs on both vessels.

With restricted bounded rationality, the actions of the OOWs were such that *a prima facie*, they seemed to be optimal in their eyes prior to the collision; otherwise, different manoeuvres would have been made and possibly the collision would have been avoided.

¹² At this time *Katre* was just 2.2 nm away with a CPA of 0.5 nm and TCPA of 6.4 minutes.

The situation on board the two ships reflected critical factors, which shaped the decisions of the OOWs, *i.e.*:

- uncertain and dynamic environment;
- shifting and competing goals (multiple ships ‘competing’ for the attention of the OOWs);
- limited and unclear feedback loops (communication exchange within the ships and between both ships);
- critical and limited time; and
- multiple crew members.

It was clear that notwithstanding the experience of the OOWs on both ships, the situation was unfamiliar to them, in that it was unique. Unfamiliar situations require the person involved (in this case the OOWs) to seek more information before constructing a mental model of the (evolving) situation and which therefore changes as the environment changes. There was no evidence that such additional information was sought. This would have severely impinged on the problem-solving process and capabilities.

The approach of the master on board *Statengracht* during the minutes preceding the collision was also analysed. As already indicated, soon after the collision, the master seemed concerned on his OOW, who could have been intoxicated. At no point in time was there any reference to alcohol consumption during the navigational watch. This meant that if indeed, any alcohol was consumed, then this had happened before the navigational watch. Thus, it is hypothesised that if the OOW smelt of alcohol after the collision, he must have smelt the same prior to the accident.

This matter was not raised during the navigational watch. Although the VDR analysis seems to suggest that the master and the OOW spent their time looking down into the radar screens located on opposite sides of the bridge, the master had the opportunity to physically approach the OOW during the navigational watch. If this was the case, and therefore the OOW was unfit to stand his navigational watch, then the master lacked an essential leadership skill – that of effectively communicating with his team members about matters affecting team performance and the safety of the ship.

Furthermore, the master's actions, which were taken as a result of what was perceived to be inadequate actions by the OOW to navigate the ship clear of the risk of a collision, did not manage situation awareness - at least where the OOW was concerned. Thus, irrespective of the possible influence, which the consumption of alcohol (if any) may have had in the dynamics of the accidental events, it seems evident that the uncertainty of the OOW was two-fold, *i.e.* on an individual level and on a functional organisation level.

Evidence suggested that the data which the OOW was observing was not leading to an identification of the system status and therefore the interpretation of the circumstances outside the bridge windows may have been carried out under a certain degree of ambiguity. At the macro level, *i.e.* the interaction between the master and the OOW, the interaction was not leading to a better comprehension of the prevailing situation (inability to identify *Katre*'s echo on the radar and the course alterations whilst the vessel was on autopilot).

The above factors had an impact on the OOW's potential to make projections and anticipations on how the situation was developing (given that the environment was dynamic), and how this development was eventually taking both ships on a collision course.

2.4 Hours of Work and Rest

The safety investigation did not have records of 'Hours of Work and Rest' for *Statengracht* and therefore was unable to determine whether these were in compliance with international requirements. It was taken into consideration that *Statengracht* had a master, chief mate and two deck officers and the watch-keeping system on board was the traditional three-navigational watch system. Hence, it can be only hypothesised that fatigue was not a contributory factor on *Statengracht*.

The situation on board *Katre* was different in that there were only two navigational OOWs - the Master and the chief mate. The navigational watchkeeping hours were split between the two, namely a '6-on, 6-off' system. This is quite normal and generally acceptable for a ship of the size of *Katre*. However, this system carries its disadvantages. Besides the '6-on, 6-off' navigational watches (and in addition to yet

other duties), both the master and the chief mate had to be on duty during the arrival and departure of the vessel. Moreover, they had to see to other duties, including the necessary paperwork prior to and after arrival in a port, prepare the Passage Plan for the following voyage and take care of the ship security officer's duties. The demand on the two officers would have varied, depending on the duration of the sea passage.

It was evident that both the master and the chief mate worked long hours. The chief mate's job description and list of responsibilities, which are documented in the Company's 'Fleet Procedure Manual' gave a clear picture of what the chief mate was expected to do and responsible for. Taking into consideration that on an almost daily basis, 12 hours are taken up by the bridge watches, the expected tasks were overwhelming and rather physically impossible to perform while maintaining the required hours of work and rest.

Katre's last port of call was Helsingborg and before that, it was the port of Riga. The vessel arrived at the port of Riga on the night of 25/26 January 2013 and left Riga at 0120 (ship's time) on 27 January 2013, loaded with a cargo of wheat. She arrived at the port of Helsingborg at 1130 on 29 January 2013. The vessel remained alongside at Helsingborg discharging the cargo of wheat until 1550 of 01 February 2013, when discharge was completed¹³. The vessel left the port of Helsingborg at 1620 (ship's time) on 01 February 2013, *i.e.* while the chief mate was on his '1200-1800' navigational watch. For the master, 01 February was a busy, long day with the cargo discharge operations and the departure from Helsingborg falling 'outside' his normal watchkeeping hours. Hence this vessel, within a seven-day period, called at two ports and loaded and discharged a cargo of wheat.

On the night of the casualty, between 01 and 02 February 2013, the master was on duty/watch until midnight of 01 February, when he was relieved by the chief mate at 0000 of 02 February 2013. Evidence suggested that over the seven days prior to the accident, the chief mate did not get the required 77 hours of rest.

Furthermore, when cross-checking the Time Sheet/Rest Time Sheet for the days mentioned with the logbook entries, several discrepancies pertaining to the master and chief mate were noted. For instance, on 26 January 2013, when the vessel was at the

¹³ Cargo operations are suspended in Helsingborg between 2300 to 0800.

port of Riga, the master was recorded as 'resting' for the whole day (24 hours) and then on 27 January (leaving Riga early in the morning), the master was recorded to have worked for only one hour. In actual fact, the vessel took more than one hour to clear the port and disembark the pilot.

Furthermore, when the vessel arrived at the port of Helsingborg on 29 January 2013 at 1130, the records indicated that the chief mate was at rest. Then, on 30 January, while at the port of Helsingborg, both the Master and the chief mate were at rest from 1700 onwards when in fact, the Master had signed the logbook at 2400. On 31 January, while the chief mate signed the logbook at midnight, the time sheet document indicated that he was at rest.

Therefore, bearing in mind the above, one cannot exclude that fatigue on board *Katre* could have had an influence on this casualty and, in particular, on how the chief mate reacted during instances when critical decisions had to be taken¹⁴.

2.5 Other Considerations - Navigation Operational Procedures

2.5.1 Look-out

Prior to the collision, at 0000 (ship's time) on 02 February 2013, one AB was on duty with the chief mate on the bridge of *Katre*. The AB stated that he was assigned the '12-4' navigational watch and on the day before the collision, he held the '0000-0400' navigational watch, while the vessel was still at the port of Helsingborg, and then the '1200-1600' navigational watch on 01 February 2013.

The AB further stated that all was normal and his look-out duties were carried out from inside the bridge. He recalled that the traffic in the vicinity was monitored and reported to the chief mate. This included *Statengracht*. At one point, the AB was ordered to take the wheel and from then onwards, he acted as the helmsman and carried out the helm orders given to him by the chief mate.

The fact that the AB carried out his duties as a look-out from the inside of the bridge may be interpreted that the vessel was not maintaining a proper look-out by sight and hearing at all times, as per Rule 5 of the COLREGs.

¹⁴ Even more, these inaccurate records had the potential to mislead the Company in determining whether the crew members were getting the required rest periods.

Evidence from *Statengracht* suggested that both the master and the OOW refer to one look-out on the bridge, who was also ready to take the helm. However, the VDR data indicated that at no time were the master and the OOW involving the look-out.

Whilst the safety investigation did not have evidence which would have suggested that no look-out was on the bridge, the VDR data clearly indicated that the master was all the time addressing the OOW during the course changes to starboard and then during the change over to hand steering, seconds before the collision.

2.5.2 Use of radar and other information

As indicated elsewhere, *Katre* was equipped with two 9 GHz radars, *i.e.* a Kelvin Hughes Nucleus 3-5000 complete with the ARPA and ECDIS, and a Furuno FM-2010. At the time of the collision, only the Kelvin Hughes radar was in use. The Kelvin Hughes seemed to be the main working radar on board. The safety investigation did not have any information as to whether or not the second radar (Furuno) was on 'Stand-By' or completely switched off.

Furthermore, although the vessel was equipped with a 'compass bearing device', as required by the relevant SOLAS regulations, at no point in time was it mentioned that visual bearings of approaching vessels were taken in order to ascertain that the information obtained from the ARPA radar was correct.

Even though the visibility was reported to be good (up to 8 nm), visual bearings would have been appropriate in order to verify the information that was being extracted from the ARPA radar.

A similar situation seemed to prevail on *Statengracht*. While the Master was using the port radar on the 6 nm range and the OOW was using the starboard radar on the 12 nm range, there was never any mention of visual bearings being taken by either one of them. In fact, the only reference made by the master and the OOW with respect to information on the other vessels close to *Statengracht* was extracted from the radar.

THE FOLLOWING CONCLUSIONS, SAFETY ACTIONS AND RECOMMENDATIONS SHALL IN NO CASE CREATE A PRESUMPTION OF BLAME OR LIABILITY. NEITHER ARE THEY BINDING NOR LISTED IN ANY ORDER OF PRIORITY.

3 CONCLUSIONS

Findings and safety factors are not listed in any order of priority.

3.1 Immediate Safety Factor

- .1 The immediate cause of the collision was an unclear assessment of the risk of collision in a dynamic environment.

3.2 Latent Conditions and other Safety Factors

- .1 Both vessels did not maintain a proper look-out by sight and hearing as well as by all available means appropriate to the prevailing circumstances and conditions;
- .2 Both OOWs did not to take visual compass bearings of the approaching vessels in order to determine if risk of collision existed;
- .3 Both vessels failed to sound the appropriate manoeuvring and warning sound/light signals when approaching one another and when alteration of courses were carried out;
- .4 Both vessels failed to follow basic bridge procedures as required by STCW Regulation VIII/2 and Section A-VIII/2;
- .5 As the 'Give Way Vessel', *Statengracht* did not take an early and substantial action to keep well clear of *Katre* and avoid a close quarters situation from developing, in accordance with the relevant COLREGs;
- .6 The Master of *Statengracht*, who was on the bridge before and at the time of collision, did not assess properly the actions of the OOW and take early action, including taking over the navigational watch, in order to avoid a close quarter situation from developing and subsequently avoiding the collision;
- .7 *Katre* failed to follow the requirements of COLREGs Rule 17(c) when an alteration of course to port was executed at a time when *Statengracht* was still on its port side.

3.3 Other Findings

The safety investigation:

- .1 was unable to determine whether alcohol had an influence on the cognitive capability of the OOW on board *Statengracht*;
- .2 did not exclude that fatigue on board *Katre* could have had an influence on how the chief mate reacted during instances when critical decisions had to be taken on the bridge.

4 ACTIONS TAKEN

4.1 Safety actions taken during the course of the safety investigation

Hansa Ship Management OU has amended its ISM procedures on safety of navigation in order to address such circumstances and has issued Company Fleet instructions to this effect in order to ensure discussions during on board safety meetings, familiarisation with the new amendments and eventual implementation. The Company has also taken measures to ensure that this is also reflected in the training for navigational officers who are to embark on board for the first time. This training also focuses on the COLREGs.

The Company has also issued a Company Circular to all the vessels under its management, providing details of the accident and actions, which need to be taken to prevent future, similar recurrences.

The Company has also taken the necessary actions to ensure that the implementation of these measures is verified during the periodical internal audits, visits and inspections. The Company will be discussing recorded results during the internal Management reviews.

5 RECOMMENDATIONS

In view of the conclusions reached and taking into consideration the safety actions taken during the course of the safety investigation,

Hansa Ship Management OU is recommended to:

04/2014_R1 carry out an analysis of the manning level on board *Katre* to ensure that the vessel fully complies with the prescribed hours of work and rest at all times.

Spliethoff's Bevrachtingskantoor BV is recommended to:

04/2014_R2 disseminate the findings of this safety investigation and highlight to crew members serving on board its ships the importance to maintain an updated assessment of the evolving situations outside the bridge windows.

ANNEXES

Annex 1 Record of Equipment – Form E

2 Details of life-saving appliances

6	Number of lifebuoys	8
7	Number of lifejackets	8
8	Immersion suits	
8.1	Total number	12
8.2	Number of suits complying with the requirements for lifejackets	—
9	Radio installations used in life-saving appliances	
9.1	Number of search and rescue locating devices	
9.1.1	Radar search and rescue transponders (SART)	2
9.1.2	AIS search and rescue transmitters (AIS-SART)	—
9.2	Number of two-way VHF radiotelephone apparatus	3

3 Details of navigational systems and equipment

	ITEM	ACTUAL PROVISION
1.1	Standard magnetic compass **	fitted
1.2	Spare magnetic compass **	—
1.3	Gyro-compass **	fitted
1.4	Gyro-compass heading repeater **	—
1.5	Gyro-compass bearing repeater **	fitted
1.6	Heading or track control system **	—
1.7	Pelorus or compass bearing device **	fitted
1.8	Means of correcting heading and bearings	provided
1.9	Transmitting heading device (THD) **	—
2.1	Nautical charts / Electronic chart display and information system (ECDIS) *	provided
2.2	Back-up arrangements for ECDIS	—
2.3	Nautical publications	provided
2.4	Back-up arrangements for electronic nautical publications	—
3.1	Receiver for a global navigation satellite system / terrestrial radio navigation system ***	fitted
3.2	9 GHz radar **	fitted
3.3	Second radar (3 GHz / 9 GHz) ***	fitted
3.4	Automatic radar plotting aid (ARPA) **	—
3.5	Automatic tracking aid **	—
3.6	Second automatic tracking aid **	—
3.7	Electronic plotting aid **	—
4.1	Automatic identification system (AIS)	fitted
4.2	Long-range identification and tracking system	fitted
5.1	Voyage data recorder (VDR) *	—

** Alternative means of meeting this requirement are permitted under regulation V/19. In case of other means they shall be specified.

3 Details of navigational systems and equipment

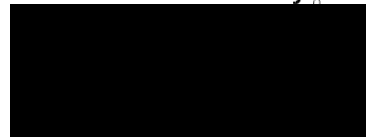
	ITEM	ACTUAL PROVISION
5.2	Simplified voyage data recorder (S-VDR) *	—
6.1	Speed and distance measuring device (through the water) **	—
6.2	Speed and distance measuring device (over the ground in the forward and the athwartship direction) **	—
6.3	Echo sounding device **	fitted
7.1	Rudder, propeller, thrust, pitch and operational mode indicator **	fitted
7.2	Rate-of-turn indicator **	—
8	Sound reception system **	—
9	Telephone to emergency steering position **	fitted
10	Daylight signalling lamp **	fitted
11	Radar reflector **	—
12	International Code of Signals	provided
13	IAMSAR Manual, Volume III	provided
14	Bridge navigational watch alarm system (BNWAS)	—

THIS IS TO CERTIFY that this Record is correct in all respects.

Issued at **Hamburg** the **23rd** day of **September, 2011**



Germanischer Lloyd



** Alternative means of meeting this requirement are permitted under regulation V/19. In case of other means they shall be specified

Annex 2 *Katre's* Minimum Safe Manning Certificate



MINIMUM SAFE MANNING CERTIFICATE

Issued in compliance with the International Convention for the Safety of Life at Sea 1974 Chapter V Regulation 14(2), and the Merchant Shipping (Safe Manning and Watchkeeping) Regulations 2003

This is to certify that in accordance with the principles and guidelines set out in Resolution A.890 (21) of the International Maritime Organisation the ship named in this certificate will be considered to be safely manned, when it proceeds to sea with not less than the numbers and grades of the personnel shown in this document, subject to any conditions stated hereunder.

<p>Vessel</p> <p>Name of Ship <i>KATRE</i></p> <p>Port of Registry <i>Valletta</i></p> <p>Official Number <i>IMO No.</i></p> <p>IMO Number <i>9014937</i></p> <p>Type of Ship <i>General Cargo</i></p> <p>Gross Tonnage <i>2497</i></p> <p>Registered Power <i>1460 kW</i></p>	<p>Personnel</p> <table border="1"> <thead> <tr> <th>Grade/Capacity</th> <th>Minimum STCW Reg</th> <th>Number of Persons</th> </tr> </thead> <tbody> <tr> <td>Master</td> <td>II/2</td> <td>One</td> </tr> <tr> <td>Chief Mate</td> <td>II/2</td> <td>One</td> </tr> <tr> <td>OOW Navigational</td> <td>II/I</td> <td>One</td> </tr> <tr> <td>Chief Engineer</td> <td>III/3</td> <td>One</td> </tr> <tr> <td>Second Engineer</td> <td>III/3</td> <td>One</td> </tr> <tr> <td>OOW Engineering</td> <td>III/I</td> <td>None</td> </tr> <tr> <td>Deck Rating</td> <td>II/4</td> <td>Three</td> </tr> <tr> <td>Deck Rating</td> <td>VI/I</td> <td>None</td> </tr> <tr> <td>Engine Rating</td> <td>III/4</td> <td>One</td> </tr> </tbody> </table>	Grade/Capacity	Minimum STCW Reg	Number of Persons	Master	II/2	One	Chief Mate	II/2	One	OOW Navigational	II/I	One	Chief Engineer	III/3	One	Second Engineer	III/3	One	OOW Engineering	III/I	None	Deck Rating	II/4	Three	Deck Rating	VI/I	None	Engine Rating	III/4	One
Grade/Capacity	Minimum STCW Reg	Number of Persons																													
Master	II/2	One																													
Chief Mate	II/2	One																													
OOW Navigational	II/I	One																													
Chief Engineer	III/3	One																													
Second Engineer	III/3	One																													
OOW Engineering	III/I	None																													
Deck Rating	II/4	Three																													
Deck Rating	VI/I	None																													
Engine Rating	III/4	One																													
<p>Trading Area</p> <p>UNLIMITED</p> <p>RESTRICTED: BALTIC/NORTH/EUROPEAN COAST /MOROCCO (CASABLANCA)/MEDITERRANEAN AND BLACK SEA (See Special Conditions)</p>	<p>Special Conditions</p> <p>Second Engineer Officer may be omitted if vessel holds UMS documentary evidence issued by the vessel's Classification Society.</p> <p>At least two Deck Officers must be holders of a GMDSS General Operator's Certificate (G.O.C), or otherwise vessel must carry a dedicated Radio Operator, holder of at least a GMDSS General Operator's Certificate (G.O.C).</p> <p>One OOW Navigational can be omitted if vessel is trading in the indicated restricted area.</p>																														
<p>Minimum Qualifications and Requirements: All Deck and Engine Room officers, are to be in possession of a Certificate of Competence and an Endorsement issued by the appropriate authority in compliance with the STCW Convention 78, as amended.</p> <p>Furthermore all officers are required to be holders of an Endorsement issued under Regulation I/10, by the Malta Transport, stating that the holder is competent to serve in a capacity on board ship with trading patterns, tonnage and registered power indicated.</p> <p>Any shortages from the specified number of personnel should be referred to the Merchant Shipping Directorate, Malta Transport for approval.</p>	<p>Issued at Valletta Malta on the 19 September 2012</p> <p>This Certificate is valid until the 20 September 2017</p> <div style="background-color: black; width: 100px; height: 50px; margin: 10px auto;"></div> <p style="text-align: center;">M</p>																														

Merchant Shipping Directorate, Malta Transport Centre, Marsa MRS 1917, Malta.
 Voice: +356 21250260, 21240417. E-mail: msd@mta.gov.mt

Annex 3 Statengracht's Minimum Safe Manning Certificate

Page 1 of 3

SI Vessel number :
42214

Certificate number:
8033/2009

MINIMUM SAFE MANNING DOCUMENT FOR THE TRADING AREA: 1*

Issued under the provisions of regulation V/14.2 of the
INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, as amended
and

Pursuant to article 5 "Manning Act" or "Manning Order for sea-going fishing vessels" chapter 2 and
chapter 3.

The Head of the Netherlands Shipping Inspectorate declares that in accordance with the provisions of the
Manning Act, or in accordance with the Manning Order for sea-going fishing vessels, the following
minimum safe manning is required on board of:

Name of Vessel		Distinctive number or letters	
STATENGRACHT		PHAQ	
IMO number	Gross tonnage	Propulsion power in kW	
9288045	16676	12060	
Port of Registry	Type of Ship	Periodically unattended machinery space	
AMSTERDAM	Other cargo ship	YES	
Grade / capacity	Certificate (STCW reg.)	Number	Particulars
Master	II/2	1	
Chief mate	II/2	1	
Officer in charge of a navigational watch	II/1	1	
Chief engineer	III/2	1	
Officer in charge of an engineering watch	III/1	1	
Rating deck	II/4	3	in possession of endorsement rating
Rating		2	

For conditions, see page 2.

* Refer for description of Trade Area to Annex I

Note:

Conditions

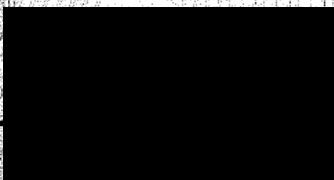
One of the officers forming part of a navigational watch shall be in possession of a General Radio Operator Certificate. All other officers forming part of the navigational watch shall be in possession of a Restricted Radio Operator Certificate".

This certificate does not exempt the master from his obligation to request for additional crew when actual working circumstances require this (art. 12 Manning Act (Zeevaarbemanningswet)). It is the obligation of the shipmanager to enable the master to fulfil his obligations (art. 3, 12, 32 and 60 Manning Act (Zeevaarbemanningswet)).

This document remains valid until: 11-07-2014

Issued at Rotterdam, 11-07-2009

**The Inspector general Transport and Water Management Inspectorate,
on his behalf.**



ANNEX I: TRADING AREAS

Code	Description
1	Unrestricted
2	(200) Coastal waters, whereby the distance to the nearest port and the offshore distance does not exceed 200 nautical miles.
3	(30) Coastal waters whereby the offshore distance does not exceed 30 nautical miles and the sailingtime from safe harbour or anchorage shall be within 6 hours.
4	(30) Coastal waters whereby the offshore distance does not exceed 30 nautical miles and the sailingtime from the port of operation, mentioned on the safe manning certificate, shall be within 12 hours and shall not be more than 6 hours from a port of refuge.
5	(15) Coastal waters whereby the offshore distance does not exceed 15 nautical miles and the sailingtime from safe harbour or anchorage shall be within 6 hours.
6	(15) Coastal waters whereby the offshore distance does not exceed 15 nautical miles and the sailingtime from the port of operation, mentioned on the safe manning certificate, shall be within 12 hours and shall not be more than 6 hours from a port of refuge.
7	(5) Coastal waters whereby the offshore distance does not exceed 5 nautical miles and the sailingtime from the port of operation, mentioned on the safe manning certificate, shall be within 12 hours and shall not be more than 6 hours from a port of refuge.
8	(5) Coastal waters whereby the offshore distance does not exceed 5 nautical miles and the sailingtime from safe harbour or anchorage shall be within 6 hours.
9	(KINZ) Short international voyage, in the North Sea and English Channel south of a line from Newcastle and Elbe and north of a line from Dover to Calais.
10	(KIPCHI) Poole Guernsey to Jersey v.v.
11	(GERSHAL) Over the Netherlands and German Shallows to the estuaries of the rivers Weser and Elbe.
12	Short international voyage
13	(DV) From the Vlie along the Netherlands - and German Frisian Islands to the estuaries of the rivers Weser, Elbe and Eider, through the North Baltic seacanal to the Baltic Sea as far as the line Stralsund - Trelleborg, as well as through the Sounds and the Belts to the Kattegat as far as the line Grenea - Kullen.
14	(VZ, VO, VD) Vlissingen/Zeebrugge of Vlissingen/Oostende of Vlissingen/Dunkirk
15	(I) From the estuaries of the river Eems along the low waterline at the North Sea beach of the West German Frisian Islands to the east point of Spiekeroog - Harlebuoy - lightvessel Weser - lightvessel Elbe I - and the estuary of the river Elbe to Brunsbüttel, as far as the red buoyline. The North-Baltic Sea channel - the Kielerfjord - the western Baltic sea, Belten and Sont as far as the line Grenea-Kullen in the North and the line 10 sea-miles outside the Capes in the East.
16	(II) Coastal waters, 25 sea-miles out of Belgium, Netherlands and German coast from Nieuwpoort to the estuaries of the rivers Elbe and Eider, through the North-Baltic Sea Canal to the Baltic Sea, Belten, Sont and Kattegat in the north to the line Skagen - Gothenborg, and in the east Skarshamn - east coast Bornholm Greifswald, and 25 sea-miles around Bornholm
17	(III limited) Coastal waters, 30 sea-miles out of the European coasts of the following areas: Northsea: Northernly limited by parallel 53° N and Southerly limited from the line Dover to Calais. The Baltic Sea; the North Sea up to 63° 30' N (not more than 25 sea-miles out of the Norwegian coast) - 61° N, 1° W - the line which connects Strathie Head with Barony Point - Mull - East coast of Colonsay - Islay (Ardmore Point) - Inishoven Head (North Ireland) and from Old Head of Kinsale (South Ireland) to 48° N, 6° W (about 25 sea-miles west from Pointe du Raz) to South Bank of Gironde (45° 30' N, 2° 3' W) and the Mediterranean Sea.
18	(3) The Baltic Sea; the North Sea up to 63° 30' N (not more than 25 sea-miles out of the Norwegian coast) - 61° N, 1° W - the line which connects Strathie Head with Barony Point - Mull - East coast of Colonsay - Islay (Ardmore Point) - Inishoven Head (North Ireland) and from Old Head of Kinsale (South Ireland) to 48° N, 6° W (about 25 sea-miles west from Pointe du Raz) to South Bank of Gironde (45° 30' N, 2° 3' W) and the Mediterranean Sea.
19	Short international voyage. North Sea and English Channel Service between limits of Newcastle to River Elbe and Dover to Calais; English Channel Service between limits of Dover to Calais and Ile d' Ouessant to Isles of Scilly; Irish Sea Service, between the limits of Cork to Isles of Scilly and Ratlin Island to Mull of Kintyre.