



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

Investigation Report 254/08

Serious Marine Casualty

**Stranding of
CMV NORFOLK EXPRESS
on 30 May 2008
in the Gulf of Suez**

1 October 2009

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

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

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

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

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Table of contents

| | | |
|-----|--------------------------------------|----|
| 1 | SUMMARY OF THE MARINE CASUALTY | 5 |
| 2 | SCENE OF THE ACCIDENT | 6 |
| 3 | VESSEL PARTICULARS | 7 |
| 3.1 | Photo | 7 |
| 3.2 | Particulars | 7 |
| 4 | COURSE OF THE ACCIDENT | 8 |
| 4.1 | Course of the voyage | 8 |
| 4.2 | Accident damage..... | 11 |
| 5 | INVESTIGATION | 14 |
| 6 | ANALYSIS..... | 19 |
| 7 | SOURCES | 24 |

Table of figures

| | |
|--|----|
| Figure 1: Chart used..... | 6 |
| Figure 2: Photo of vessel..... | 7 |
| Figure 3: Bridge with paper chart plotter right bottom corner..... | 9 |
| Figure 4: Bridge plan with VDR microphones..... | 10 |
| Figure 5: Bottom damage with deformations | 11 |
| Figure 6: Tank arrangement and container loading plan | 12 |
| Figure 7: Radar image 0400 | 14 |
| Figure 8: Traffic situation 0400 (Chart generalised)..... | 15 |
| Figure 9: Chart BA 2374, course of the voyage..... | 18 |
| Figure 10: Chart BA 333, course of the voyage..... | 18 |
| Figure 11: Traffic situation 0449 (chart generalised) | 22 |

1 Summary of the Marine Casualty

At 0512¹ on 30 May 2008 the NORFOLK EXPRESS carrying 1170 containers, on a voyage from Gioia Tauro (Italy) to Jebel Ali (United Arab Emirates) ran aground before sunrise at Ras Shukheir (Egypt) in the Gulf of Suez. Nobody was injured and no pollutants escaped. The wind was coming from NW with a strength of 4 Bft. Visibility was good and the torches of the oil fields lit up the environment.

NORFOLK EXPRESS was running at a speed of 21 kn along the southern edge of the traffic separation scheme and according to the voyage planning should have carried out course changes at 0435 and 0451 in the direction of traffic. At the handing over of the watch at 0400 the traffic situation had been explained and also that two course changes and overtaking manoeuvres were to be expected in the immediate future. Another vessel on the same course had been ahead at a distance of 2 nm. A second vessel was ahead at a distance of 4 nm. No further close approaches could be seen and traffic appeared to be running smoothly. As a consequence the Officer on watch decided to dismiss the lookout to carry out cleaning works in the superstructures.

After this the Officer on watch proceeded to the radio station that is located starboard aft next to the chart table. There he read his emails on the computer and in between observed the radar display. His thoughts had been very occupied and later he could no longer remember exactly what happened up to the accident. The Vessel Traffic Service had suddenly called and drawn attention to the danger of stranding. Thereupon he had proceeded to the radar set and ascertained that speed was being reduced. In his estimation it was now too late to alter course with strong rudder manoeuvres or to check the position on the chart. Intuitively he put the engine telegraph to STOP. He then set the NORFOLK EXPRESS gently aground.

¹ All times in this report refer to ship's time = UTC +3h

2 Scene of the Accident

Type of event: Serious marine casualty, stranding
 Date/Time: 30 May 2008, 0512
 Location: Gulf of Suez, Ras Shukheir, Egypt
 Latitude/Longitude: ϕ 28°05.8'N λ 033°19.6'E

Section from the Chart 2374, BA

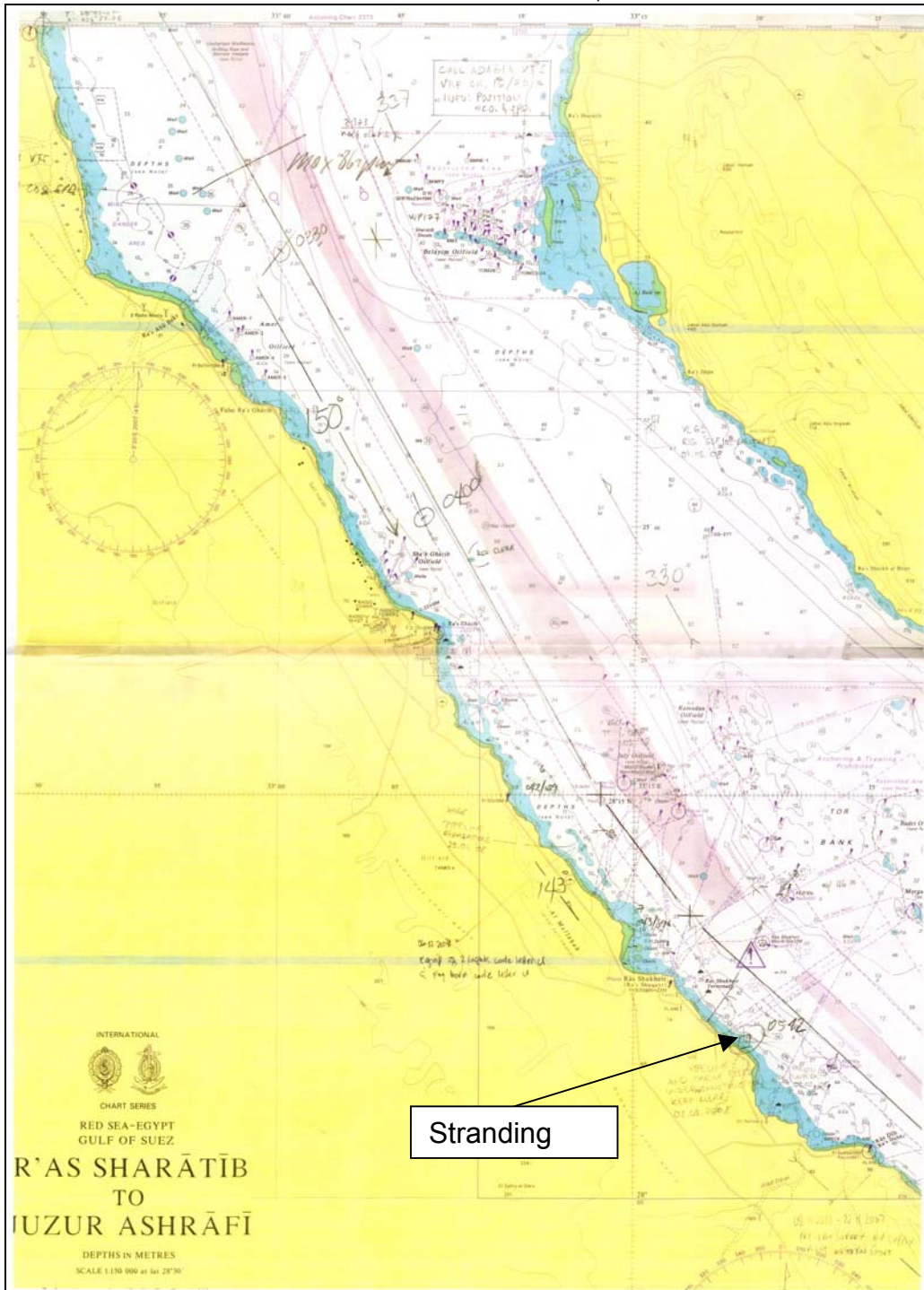


Figure 1: Chart used

3 Vessel Particulars

3.1 Photo



Copyright Hapag Lloyd AG

Figure 2: Photo of vessel

3.2 Particulars

| | |
|------------------------------|------------------------------|
| Name of the vessel: | NORFOLK EXPRESS |
| Type of vessel: | Container vessel |
| Nationality/flag: | Germany |
| Port of registry: | Hamburg |
| IMO number: | 9104902 |
| Call sign: | DGOS |
| Vessel operator: | Hapag-Lloyd AG |
| Year built: | 1995 |
| Shipyard/yard number: | Hyundai Heavy Industry / 929 |
| Classification society: | Germanischer Lloyd |
| Length overall: | 244.94 m |
| Breadth overall: | 32.30 m |
| Gross tonnage: | 36,606 |
| Deadweight: | 45,240 t |
| Draught at time of accident: | F: 9.40 m; A. 10.50 m |
| Engine rating: | 32,412 kW |
| Main engine: | 8 RTA 84C Hyundai-SU |
| Speed: | 23.5 kn |
| Hull material: | Steel |
| Hull design: | Double hull |
| Number of crew: | 22 |

4 Course of the Accident

4.1 Course of the voyage

At 0512 on 30 May 2008, the NORFOLK EXPRESS on a voyage from Gioia Tauro (Italy) to Jebel Ali (United Arab Emirates) ran aground at Ras Shukheir (Egypt) in the Gulf of Suez. Nobody was injured and no pollutants escaped. The vessel was carrying a cargo of 1170 containers, was sufficiently manned, equipped, and seaworthy in every respect. After passing the Suez Canal and discharging the pilot at 2312, the Captain handed over the command shortly before midnight to the Officer on watch, who was relieved at 0000 by his successor at position 29°44.0'N 032°30.5'E. At 0400 the log entry showed the next change of watch with handover to the successor at a course of 150° and a speed of 21 kn. The wind was coming from NW at a strength of 4 Bft. Visibility was good and a bearing was taken of RACON B, south of Ra's Gharib, at a heading of 157° with a distance of 7.3 nm at position 28°25.6' N 033°06.8' E. The night had been lit up by the torches of the oil fields. The moon was waning in the last quarter four days before new moon.

NORFOLK EXPRESS was proceeding along the southern edge of the traffic separation scheme, partly so that more distance could be maintained from the wreck entered in the chart and the vessels to be overtaken. The traffic situation had been explained on handing over the watch, including the fact that two course alterations were to be carried out in the immediate future. The lookout had been standing on the port side of the bridge. The S-band radar set had been on the right side of the conning position switched to 6 nm and the X-band radar set to 12 nm (see Figure 3 and Figure 7). Another vessel on the same course at a distance of 2 nm with a CPA² of 0.18 nm had been just ahead. The Officer on watch had altered the course slightly to starboard and enlarged the expected passing distance to the vessel running in the same direction to 0.8 nm. After this he had switched off the X-band radar set and had gone to the starboard wing to smoke and then back into the bridge in order to check the traffic situation. A second vessel was ahead at a distance of 4 nm with a CPA of 0.7 nm. No further close approaches were to be seen and traffic appeared to be running smoothly. As a consequence, as dawn set in, the Officer on watch decided to discharge the lookout to carry out cleaning works in the superstructures. According to the statement by the lookout, this had been the first time that he had had to leave his post before sunrise.

After this the Officer on watch had proceeded to the radio station (see Figure 4) that is located starboard aft next to the chart table. There he had read his emails on the computer and in between observed the radar display. He had been deep in thought at the time and later could no longer remember exactly what happened up to the accident. The Vessel Traffic Service (VTS) had suddenly called and drawn attention to the risk of stranding. He had thereupon proceeded to the starboard radar set and ascertained that the speed dropped to 18.5 kn, possibly due to the shallow water

² CPA, Closest point of approach

effect. In his estimation it was now too late to conduct course alterations with a strong rudder manoeuvre or to check the position on the chart. Intuitively he had put the engine telegraph to STOP and thereby bridged the programme for regular slowing down of the main engine. Then he noted that the speed of NORFOLK EXPRESS slowly reduced and the vessel ran gently aground.



Figure 3: Bridge with paper chart plotter right bottom corner

According to the information supplied by the vessel operator and the BSH Database, the navigational equipment included the radar sets of type STN 9600 X-band and Furuno FAR-2XX7 S-band, the echo sounder DEBEG 4650, the autopilot Navipilot V HSC, the magnetic compass 2060/2059 Jupiter, the gyro-compass Navigat X O. MK1, the two satellite navigation receivers (GNSS) Furuno GP 150 and Shipmate GN30, the paper chart plotter Raytheon-Anschütz and the Voyage Data Recorder Debeg 4300.

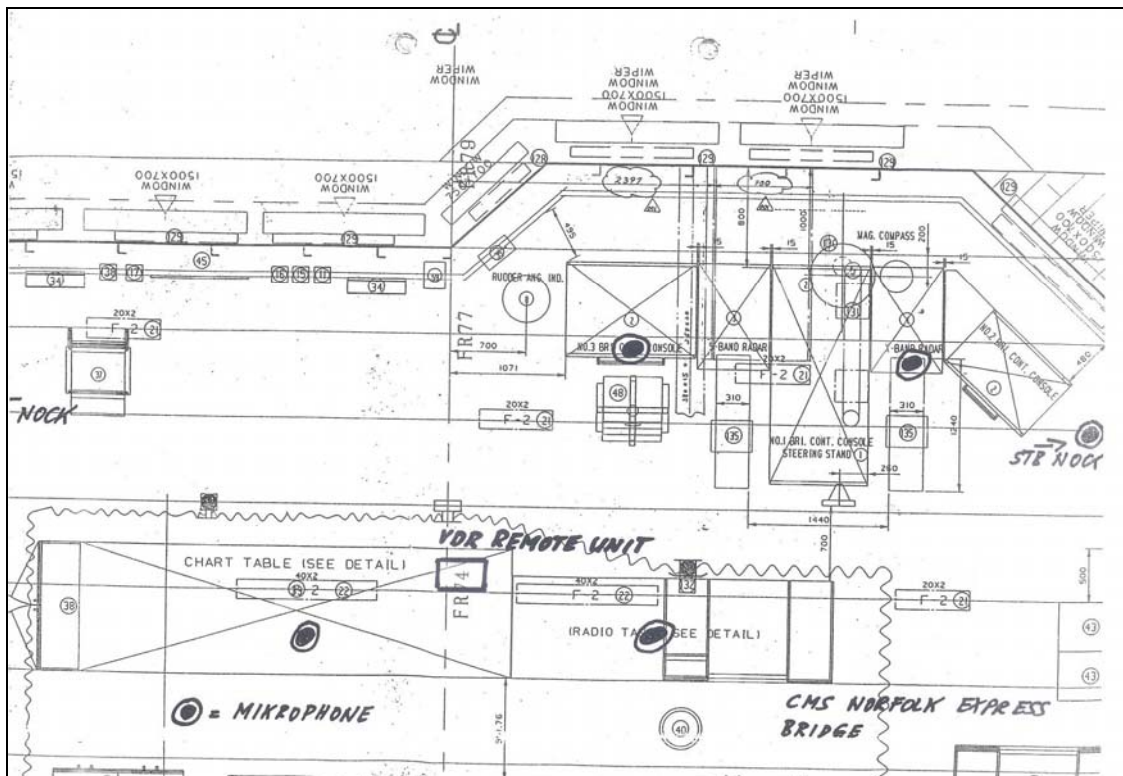


Figure 4: Bridge plan with VDR microphones

At about 0500 the Captain had been woken by strong vibrations in the vessel and had proceeded to the bridge. There he had seen the Officer on watch in the starboard wing. His lack of reaction with absent look and failure to reply to the question about what had happened indicated that he was under shock. The main engine had been stopped and the engine telegraph had been set at STOP. The revolution indicator had shown ZERO and the rudder had been put to 12° port. The inspection of the vessel position at 0512 had revealed that the NORFOLK EXPRESS was aground south of Ras Shukheir. After this the crew members were informed and measures were taken in accordance with the procedural instructions of the Safety Management system (SMS). No water ingress and no oil leakage were ascertained. The vessel operator was then informed. Furthermore, there was constant radio contact via VHF with VTS Gharib.

The investigations on board revealed that after an eight hour period of rest the Officer on watch had taken over his sea watch from his predecessor without any irregularities according to the watch plan at 0400. According to the chart a course of 150° was to be steered. At a speed of 21 kn, according to the voyage plan the course was to be altered to 143° at 0435. After a further 5.6 nm at 0451 the course should have been altered to 132°. Neither course alteration was carried out, so that NORFOLK EXPRESS ran aground. The Officer on watch had been alone on the bridge at the time. He had released his lookout in the first half hour after starting his watch to carry out other work in the superstructures. It could not be explained how this accident with serious consequences could have come about. The Officer on watch was only approachable in his cabin in the afternoon and was freed from duty for this day. He was able to work again the next day.

4.2 Accident damage

NORFOLK EXPRESS was inspected at the scene of the accident after stranding. An underwater inspection of the rudder and propeller was carried out. No damage was discovered. The crank web clearance was recorded and the rudder was tested. The fore peak tanks 1 and 2 were checked from the inside by the crew. Tanks 3 starboard, 3 centre, 3 port, 4 starboard, 4 centre, 5 starboard, 5 centre, 5 port, 6 centre, void space (frames 76-79) were examined by the surveyor and the inspector from the interior (see Figure 5 and Figure 6). All the tanks and bottom plating were firm so that the vessel was in a condition to proceed to the next port for a further underwater survey. No oil escaped to the exterior. The double bottoms and the tanks were tight.

Essentially the damage consisted of bending of the longitudinal frames, webs and pipes as well as cracked welds. The webs could partly be repaired by horizontal carlings (inside planks). Some longitudinal members and steel plates had to be cropped out and replaced.

The tanks listed below were cleaned completely and inspected from the interior:

- lower sulphur storage tank 6 aft port and starboard
- fuel oil overflow tank (frames 74-79)
- oily bilge tank (frames 40-44)
- bilge holding tank (frames 17-33)
- MDO storage tanks port and starboard (frames 46-74)
- Stern tub sump tank (frames 33-35)

The temperature of the main shaft bearings and the propeller shaft bearings was observed and entered in the engine log every six hours.



Figure 5: Bottom damage with deformations

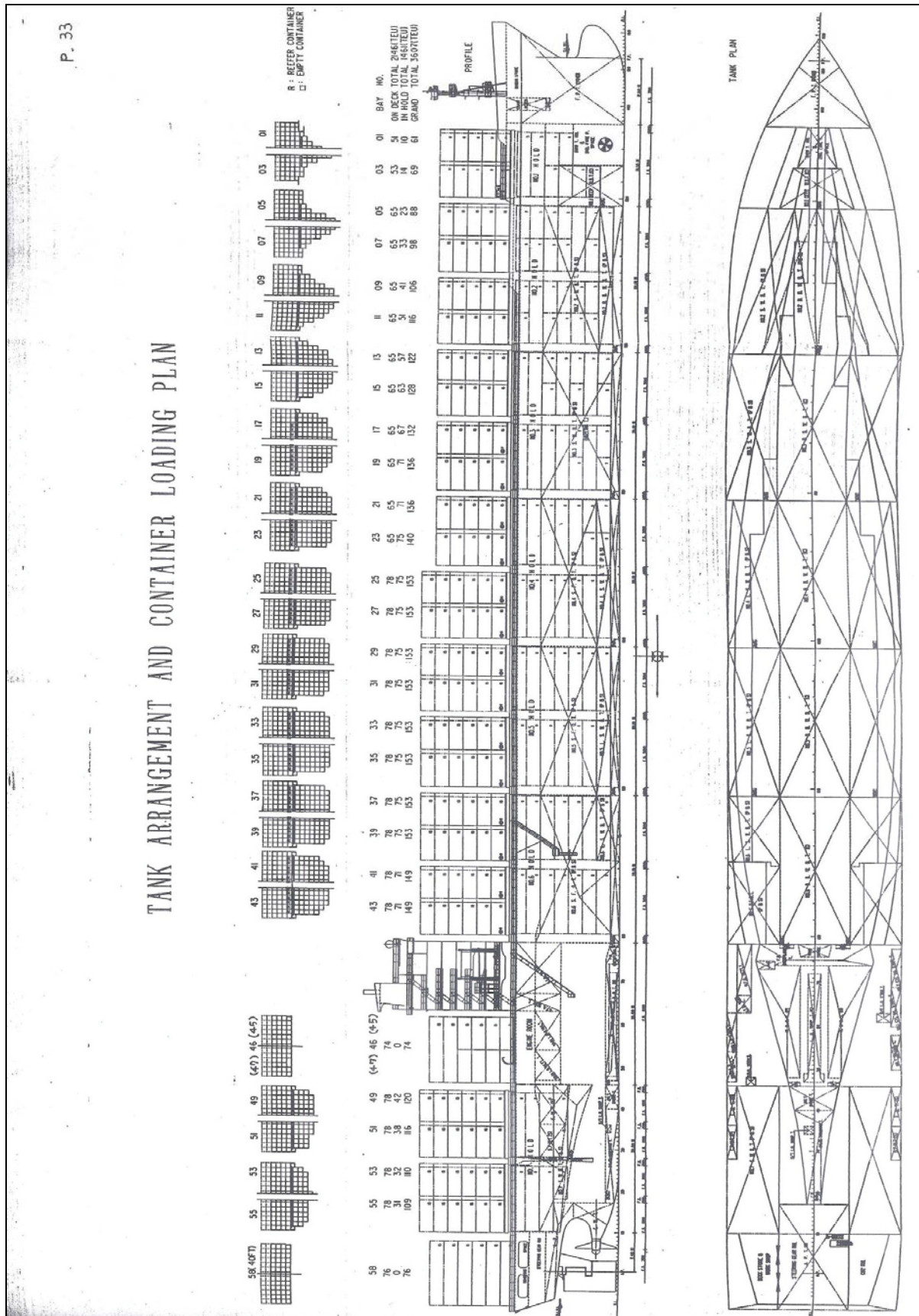


Figure 6: Tank arrangement and container loading plan

GL confirmed the vessel class up to 4 July 2008 subject to the condition that an underwater inspection be carried out at the next port of call.

Particulars of towing the vessel free

The towing free of the vessel was planned and carried out by a group of experts at the scene, made up as follows:

- SVITZER Salvage BV
- Hapag-Lloyd AG (Salvage Master & Senior Superintendent)
- Verein Hanseatischer Transportversicherer (VHT)
- Egyptian Navy & Authorities
- Germanischer Lloyd (GL)

Prior to towing free, extensive calculations on the necessary lightering (bunker) and the vessel stability were carried out as well as diving examinations, inspections of all technical facilities/installations and hydrographic measurements. NORFOLK EXPRESS came free on 13 June 2008 with the assistance of two tugs.

The vessel continued its voyage on 17 June 2008 and reached the port of Jebel Ali (Dubai) on 24 June 2008 where all the cargo was discharged. After this the damage to the bottom (bumping) of NORFOLK EXPRESS was repaired in the yard in Singapore and the vessel class was confirmed up to 31 October 2010.

5 Investigation

A meeting was held at BSU on 25 June 2008 with the Officer on watch of NORFOLK EXPRESS, a representative of the vessel operator and two physicians from the Hamburg Port Health Center, Zentralinstitut für Arbeitsmedizin und Maritime Medizin (HPHC/ZfAM).

The Officer on watch was familiarised with the mode of functioning of the replay system of the Voyage Data Recorder (VDR), the displays and the audio recordings. Then the course of the accident was reconstructed on the basis of the VDR recordings and an attempt was made to reconstruct the behaviour of the Officer on watch.

He came onto the bridge at 0400 and proceeded to the right side of the conning position in front of the S-band radar set. At the time the watch was handed over at 0400, the VDR recorded the image of the X-band radar set shown in Figure 7. After one minute he switched off the X-band radar antenna. The VDR recordings subsequently only showed the stand-by image of the X-band radar set. The radar images of the S-band set were not recorded by the VDR.³

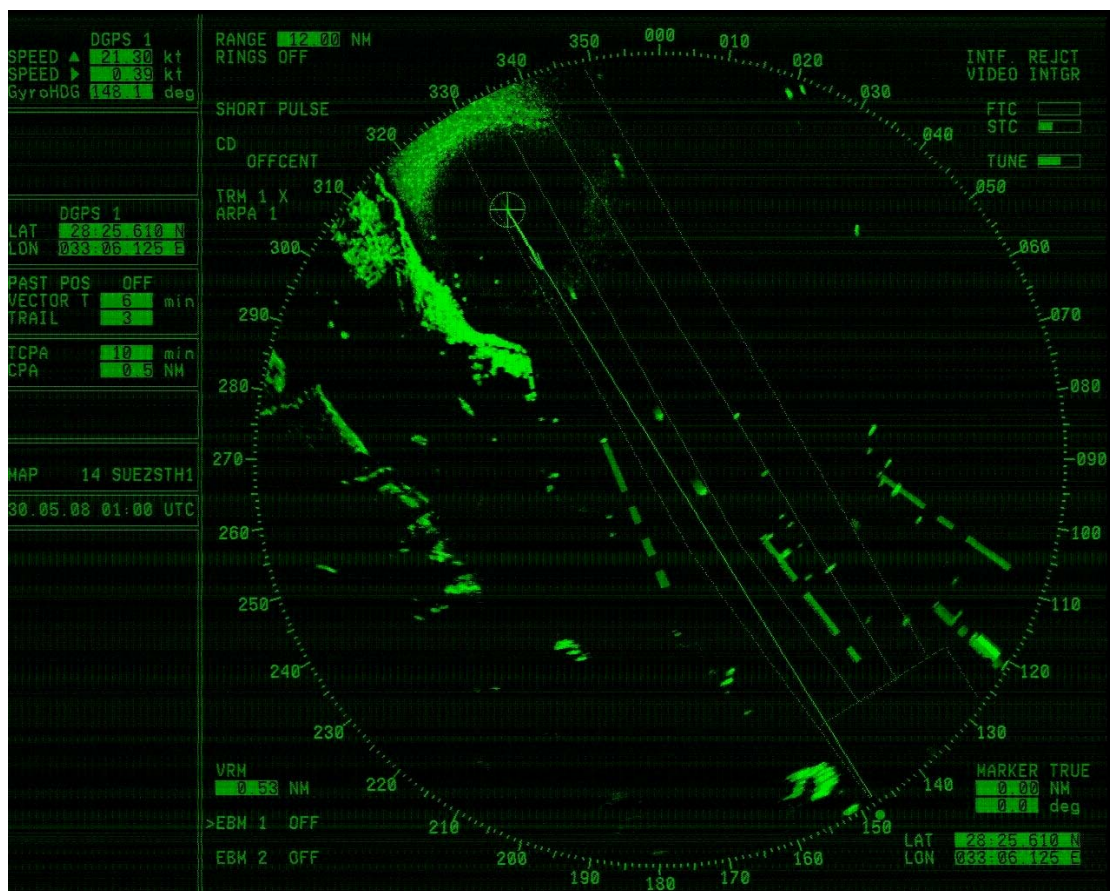


Figure 7: Radar image 0400

³ According to the performance standards for VDR only one radar image need be recorded.

Handing over the watch took about five minutes. The traffic situation, course and speed were explained. This could not be taken from the audio recording. He had checked the position on the paper chart at 0400 and ascertained that initially two other vessels on the same course were ahead of him. However, these had not represented any particular risk (see Figure 8). At 0407 he had sent the lookout away so that the latter could check the temperatures of the reefer containers and then clean the companionways. At this time it had started to become light and the Officer on watch was now alone on the bridge.

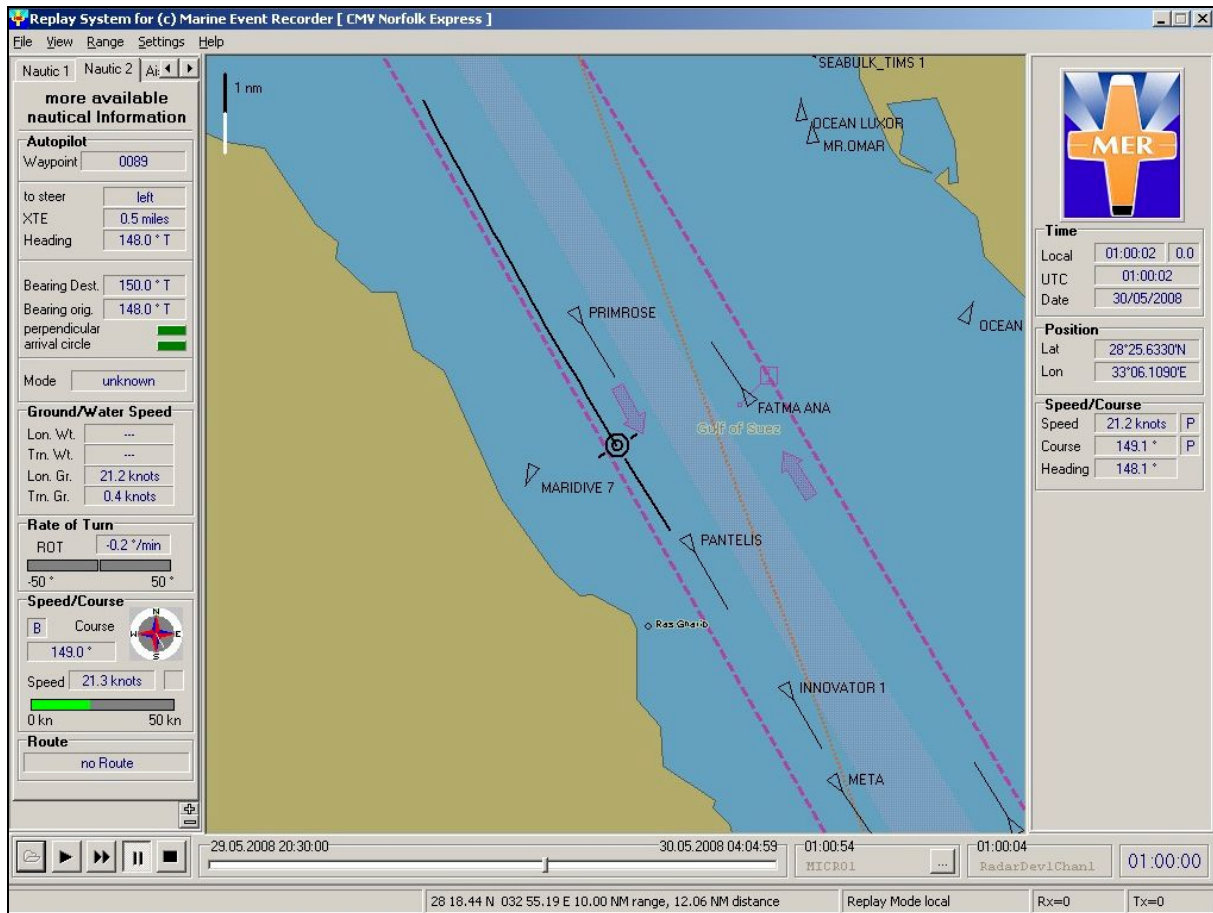


Figure 8: Traffic situation 0400 (Chart generalised)

He observed the S-band radar set and switched the ranges from 6 nm to 12 nm and vice versa and saw the PANTELIS at a distance of about 1 nm ahead. He had altered the course 2 – 3° to starboard in order to increase the distance (CPA) on overtaking.

At about 0430 he went back to the old steering course of 148°. At 0449 he overtook the INNOVATOR 1 at a distance of 1 nm on the port side. He had proceeded to the radio station that is located starboard aft in the bridge and called up emails. These concerned relationship problems. He had signed on aboard the NORFOLK EXPRESS in Hamburg two weeks before the accident after a two-month leave. As a result of the emails his thoughts were at home and consequently he can no longer remember the events exactly.

At 0452:07 VTS GHARIB TRAFFIC called NORFOLK EXPRESS for the first time. The vessel was called at 0458, 0459 and 0500 and after that continuously and up to 0506 ever more urgently. Up to 0502 NORFOLK EXPRESS was running at a speed of 21.1 kn. According to the speed log speed was reduced continuously as of 0504. At a speed of 18.5 kn the Officer on watch noticed in his recollection that speed was reducing. At 0506 NORFOLK EXPRESS was called at a speed of 15.3 kn (speed over ground). The Officer on watch answered "Yes, I read you". Now he perceived the traffic situation and stopped the engine by putting the telegraph lever to STOP and by overriding the program accelerated the slowing down of the revolutions. With this he wanted to achieve a reduction of the squat effect and provide the vessel with an opportunity to come free again at an acute angle parallel to the coast. No hard rudder commands to port were given so that the stern did not break out to starboard to the land side and make its way into even shallower water.

At 0508 the speed log showed 0 kn according to the VDR records. NORFOLK EXPRESS had ground contact with the transducer mounted below the fore ship. At 0509 the Captain joined the bridge and asked what had happened. The Officer on watch replied, "No idea". After this he proceeded to the starboard wing. Later he recovered in his cabin and was only in a position to talk to the Captain about the accident as of 1500.

The Captain followed the procedure stipulated in the SMS manual (running aground) and established contact with VTS GHARIB and the vessel operator.

In response to the question as to why he had switched off the X-band radar antenna directly after taking over the watch, the Officer on watch answered that one radar set was sufficient as a result of the manageable traffic situation.

He had been able to accustom himself very quickly to the light conditions as dawn was already breaking. As a consequence it seemed appropriate to him to send the lookout from the bridge.

He was unable to explain why he had not responded to the frequent calls from VTS. The VHF had been switched to channels 16 and 61 (VTS GHARIB).

He explained that there had been a lot of calls on channel 16 and that a great deal of information not relevant for his own situation had been transmitted. That is why he had not accorded much attention to the radio traffic.

He only realised the danger of running aground when slight vibrations could be felt and the speed had dropped to 18.5 kn at 0500 and he stopped the engine. After this he stood under shock.

During a break the physicians of HPHC/ZfAM explained the possibility of drawing up a psychological expertise about the sudden mental absence of the Officer on watch by a dedicated expert.

The Officer on watch explained that he was already undergoing medical treatment. He could not explain how his behaviour on the day of the accident could have

happened. Nothing like this had ever happened to him before. Until he recovered he did not wish to make any further statements about his state of health.

The physicians of HPHC/ZfAM explained that at least 8 minutes had passed between the first VHF call at 0457 and his realising the dangerous situation at 0505 without him showing any reaction, even though the vessel had been called constantly. In their opinion this was very unusual.

The British Chart BA 2374 with a scale 1:150,000 had been used on board, although Chart BA 333 with a scale of 1:50,000 should have been used. According to the statement by the representative of the vessel operator the vessels had always been equipped with the largest chart scales.

On NORFOLK EXPRESS the Officer on watch during the 0000 to 0400 watch had carried out the voyage planning (see Figure 1 and Figure 9). It could not be explained why Chart BA 333 (see Figure 10) had not been used. If it had been used, it would have been necessary to change the chart in the subject sea area.

According to the SMS and the standing orders of the Captain, the Officer on watch would have been obliged to ascertain the position in coastal waters every 20 minutes, ensure a proper lookout and use the available equipment – acoustic, electronic and visual. On NORFOLK EXPRESS the position is displayed continuously on the paper chart through a plotter. The chart plotter is on the right next to the S-band radar set (see Figure 3). That was why the Officer on watch had refrained from making regular entries in the paper chart.

No navigational alarms were set on NORFOLK EXPRESS. The watch alarm and the echo sounder alarm had not been activated.

When questioned about his future prospects, the Officer on watch stated that he wanted to reprocess first this experience. He further declared that he had been very lonely on board NORFOLK EXPRESS and had not had any contact person since apart from the technical engineer, who had been the only person of his nationality and had had virtually no contact off duty.

The Officer on watch did not declare that he was willing to make himself available for drawing up a medical expert opinion. He hopes to be well soon.

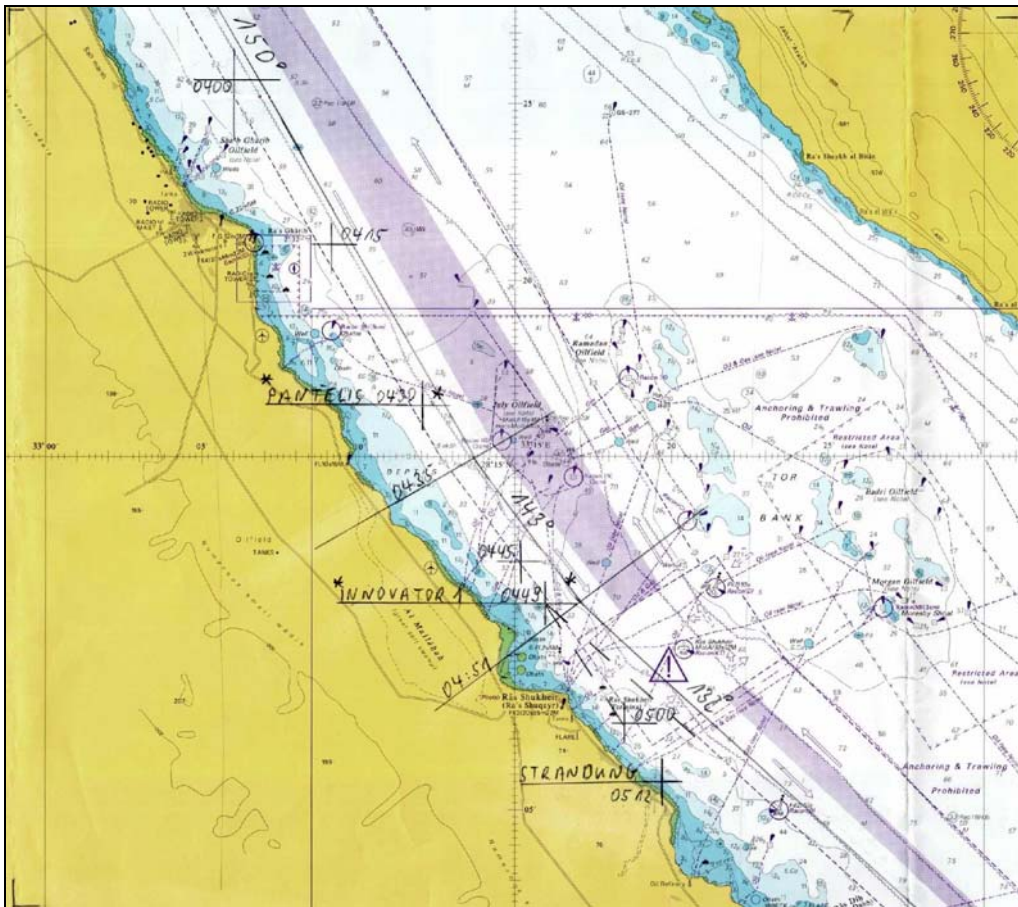


Figure 9: Chart BA 2374, course of the voyage

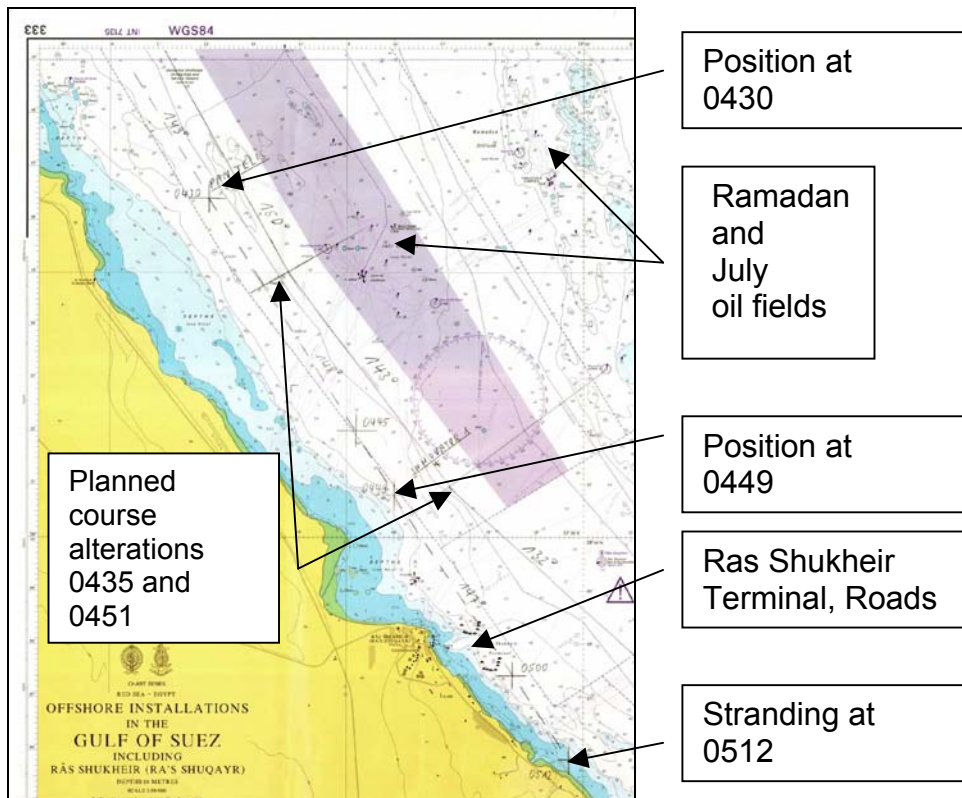


Figure 10: Chart BA 333, course of the voyage

6 Analysis

At 0512 in the morning of 30 May 2008 NORFOLK EXPRESS ran aground in the Gulf of Suez due to failure to make two course alterations. The BSU was unable to clarify why the responsible Officer on watch did not observe his watch duties. During the course of the accident the Officer on watch was alone on the bridge. After the accident he had undergone medical treatment. The BSU does not have the results of the treatment. His treatment was reportedly completed in December 2008. He had been advised by his treating physician not to continue his profession at sea. It could not be ruled out that such behaviour might happen again and could lead to an accident. As a consequence, in mutual agreement with the vessel operator, he had terminated the employment relationship at the beginning of 2009. He now works on shore in the family firm.

It was not possible for an independent medical anamnesis, physical examination and further diagnostic to be conducted by HPHC/ZfAM during the BSU investigation.

The experienced Officer on watch in his mid-thirties, of Polish origin, had taken over the sea watch at 0400. According to the voice recordings of the Voyage Data Recorder (VDR) his behaviour at this time was appropriate to the situation and gives no indication of any awareness disturbance. He confirms that at the time of the accident he was alone on the bridge. A necessary course alteration had not been carried out to 143° at about 0435 and in the following period of approx. 16 minutes to 132° as he had read emails with a personally worrying content. It is evident from the recordings of the VDR that during this period the Officer on watch had been instructed very clearly several times via VHF by the Egyptian authorities to alter course. Nor did he respond to the changes in the vibration behaviour of the vessel resulting from a reduction in the water depth.

At the time in question he had been diverted by the content of emails relating to his partner relationship that had been most worrying for him.

At about 0506 he responded to the calls of the Egyptian authorities and occasioned stopping of the main engine in order to avoid damage. He states that at this time he had already recognised the situation and acted “by reflection”. However, he did not inform the Captain who came onto the bridge independently and arranged for the Officer on watch to be taken to his cabin with an escort. The Officer on watch states that he cannot remember anything else from the accident up to approx. 1500.

The Officer on watch denies having imbibed alcohol or taking medicine in connection with the incident. He describes his night rest before taking over the watch as particularly restful. He had only come on board two weeks before from his home leave. He denies being tired, exhausted or having fallen asleep and also denies losing consciousness in the time from 0430. He states that he had been so worried by the content of the emails that he was unable to react. In response to questioning he denies any preceding illnesses. However, after this incident he had undergone medical treatment in his home country. His physician had advised him not to work until the end of the year. He rejected further medical questioning and examination and in particular a psychiatric assessment with reference to his ongoing therapy.

The HPHC/ZfAM had become acquainted with the Officer on watch prior to the voyage during an apothecary acceptance test in Hamburg. At this time too he appeared depressed and had spoken spontaneously to the port physician about the partnership relationship that was psychologically very worrying for him. Apart from that he made an experienced impression during the apothecary examination and behaved appropriately to the situation.

Even though no actual medical diagnosis could be conducted during the visit to the BSU, on the basis of the information available there are no indications that the behaviour of the officer on watch was caused by cardiovascular (e.g. cardiac rhythm disturbances or stroke), neurological (e.g. fits), intoxication (e.g. alcohol or tranquilisers) or other internal medical illness such as e.g. a sleep apnoea syndrome. Nor are there any indications of increased sleepiness in the sense of fatigue.

Instead there are indications of a psychiatric disturbance but this could not be documented and classified further. In own studies on vessels flying the German Flag HPHC/ZfAM found out that every 10. Seafarer who had been questioned offered a demanding BURN OUT rate.

For final clarification it would have been necessary from the health aspect to draw up a psychiatric supplementary assessment with the question as to whether there was any psychiatric illness that can explain the unusual reaction to reading the email that ultimately caused the accident. This expert opinion might perhaps have been able to provide information or at least indications as to whether the Captain could have recognised within the framework of personal welfare care that there was a case of psychiatric disturbance here that might have jeopardised the ship's safety and in so far needs to be treated.

Both the Captain and the Officer on watch who handed over the sea watch to his successor prior to the accident were unable to ascertain any irregularities in behaviour. The Officer on watch was considered to be experienced and reliable. He began to go to sea as a cadet in 1996 and after his studies at the University of Szczecin (Stettin) he started his career as officer in 2002. After this he had 10 assignments as Third, Second and Chief Officer on container vessels for other vessel operators. In 2006 he was promoted to Chief Officer and in July 2007 changed to the vessel operator of NORFOLK EXPRESS. There he was assigned as Officer on watch altogether three times.

Nor did the lookout of the Officer on watch ascertain any irregularities on handing over of the watch at 0400 in the morning. The only special feature was that he was dispatched to clean the superstructures and check the reefer containers before sunrise. According to the tables of the nautical almanac 2008 the visible sunrise at the 0500 position at 0500 CLT (Central Local Time) cited an eye level of zero metres. This corresponds to a ship's time of 0547. The civil dawn (zenith distance of the solar central point = 96°) is stated as 27 minutes. According to the audio recordings of the VDR, the lookout left the bridge already at 0407 (literally: "Yes, I'm cleaning – see you"). The upper edge of the sun would have appeared there at 0548. At the time of the accident at 0512 it was accordingly still dark, as dawn only started here at 0520.

Thus contrary to the statements the lookout had left the bridge already before dawn set in. Only the oil fields in the surroundings with their drilling islands, e.g. the July Oilfield in the traffic separation zone and the Ramadan Oilfield eastward of the traffic separation scheme provided lighting.

This procedure does not comply with the vessel operator's safety management system. In so far after the accident the vessel operator sent a circular letter to all vessels stating that the stipulations according to STCW 95 for manning the lookout and the recommendations of the flag state regarding constant operation of the watch alarm system were to be observed strictly. The national specifications are contained in the recommendations of the See-BG [Marine Insurance and Safety Association] for the design of the bridge of sea-going vessels and the building and inspection regulations of Germanischer Lloyd. According to these the watch alarm system is to be based on interval checking and be adjustable up to intervals of 12 minutes. The acknowledgement keys are to be provided at various workplaces on the bridge, e.g. conning positions, chart table, radio station.

On listening to the audio recordings it was noted that in the period 0400 to 0512 only two acoustic alarms could be heard. These alarms, each consisting of an individual tone at 0434:42 and 0451:43 could be interpreted as waypoint signals of a GPS receiver.⁴ It is to be assumed that the depth alarm of the echo sounder and the watch alarm were not set. Whether the alarms would have had the intended effect remains doubtful, as even the urgent calling of NORFOLK EXPRESS via radio traffic by the Vessel Traffic Service GHARIB TRAFFIC was unable to trigger any action in time to avoid the stranding on the part of the Officer on watch. Presumably the presence of the lookout would have remedied the situation here. At 0507:34 three bell sounds shortly after one another could be heard. Here the Officer on watch set the engine telegraph to STOP, after which he had reported to VDS at 0506:06 and 0506:38 briefly with the words "Yes, I read you".

⁴ The general bridge alarms have a buzzing tone and can contain steering engine, gyro compass, autopilot, navigation lamps, engine operation, fire from the accommodation and hold area, personal elevators, cold stores. The telephone signal consists of a bell and the signal of the watch alarm system consists of a buzzing tone that should clearly differ in sound characteristics from other buzzing tones. In the VDR recordings alarms from navigational equipment cannot be classified distinctly and must be interpreted according to their tones with the audio recordings. Only on the radar screen can visual alarms be recognised via the 15 second image recordings.

After the handing over of the sea watch at 0400 up to stranding no position entries were made in the chart. The GPS position was, however, displayed constantly with the chart plotter as a red point shining from below through the paper chart. In so far the mode of operation can be explained. However, there should have been a change-over at about 0420 to Chart BA 333⁵ with the larger scale of 1:50,000. Instead the vessel was navigated further on Chart BA 2374⁶ with a smaller scale of 1:150,000. In the event of a change of scale, new passing points would have had to be set on the chart plotter and the position transferred. In the first three quarters of an hour after taking over the watch, the Officer on watch states himself that he had checked the traffic situation on the S-band radar set and overtaken the two other vessels running in the same direction at 0430 at a distance of 0.5 nm and at 0449 at a distance of 1 nm. At the latest after the last overtaking manoeuvre the course should have been altered to 132° in order to remain within the limits of the traffic separation scheme (see Figure 11). Keyboard sounds could be heard in the audio recordings for approx. one to two minutes at 0408:15 and 0426:35 that could have originated from the radio station at the chart table. At 0453 the name of the vessel NORFOLK EXPRESS was called continuously up to the first ground contact at 0508 and final stranding at 0512.

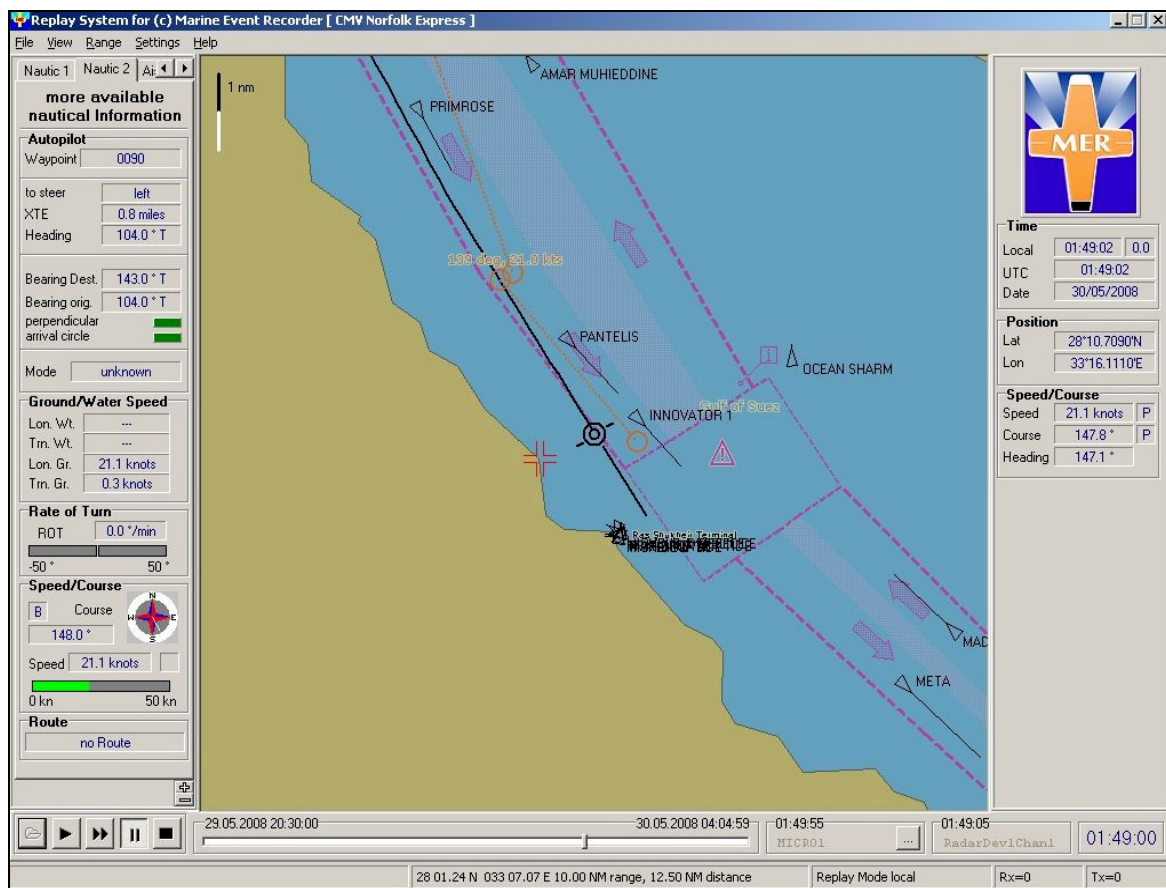


Figure 11: Traffic situation 0449 (chart generalised)

⁵ BA 333, British Admiralty, Off Shore Installations in the Gulf of Suez (Ras Shukheir)

⁶ BA 2374, R'as Sharatib to Juzur Ashrafi

Finally the BSU considers this marine casualty to be a one-off case. In so far the BSU refrains from developing safety recommendations targeting for example psychological examination procedures before the start of a voyage. The responsibility for personnel remains ultimately with the vessel operators and Masters in order to be able to operate and command vessels safely.

At the same time the BSU takes this accident as an occasion to draw attention once again to the importance of bridge manning appropriate to the situation. In its investigation reports the BSU has already drawn attention several times to the tasks and expedient deployment of the lookout (cf. for instance BSU Reports 343/04, 371/04, 476/05, 450/07, 1/08). The nautical Officers on watch must ensure in bridge management that at all times during the watch service the respective individuals are deployed in places where they can fulfil their tasks most effectively and efficiently. In accordance with the circumstances and especially at night and during voyages with increased risk, such as dense traffic or in the area of Vessel Traffic Services (VTS), it must be ensured that sufficient personnel are available. It must be taken into account appropriately what bridge equipment and navigational aids are available for use and what their performance limits are.

A further significant aspect in this accident is the alarm management. In this accident the alarms set (in as far as they are present, e.g. GPS, radar system, rudder limiting) did not trigger any effect. The alarm situation on the bridge is currently being reconsidered worldwide by manufacturers of integrated bridge systems in order to develop alarm management systems that are structured to cover the entirety of all navigational data alarms. The German Institute of Navigation (Deutsche Gesellschaft für Ortung und Navigation (DGON)) is dealing with this theme and at the Warnemünder Schifffahrtsskolleg 2005 presented the project "DGON-Bridge". This is intended to ensure that on the one hand calm, undisturbed watch operation can proceed, while on the other hand alarms cannot simply be acknowledged but must also be considered. Simply structured alarms as are used in the conventional watch alarm system and the echo sounder system tend to induce staff to switch them off, as was the case here, as such alarms are felt to be disturbing and troublesome.

7 Sources

- Written declarations/statements
 - Vessel's Command NORFOLK EXPRESS
 - Shipping Company Hapag-Lloyd AG

- Witnesses' accounts
 - NORFOLK EXPRESS

- Expert opinion/technical contribution
 - Germanischer Lloyd
 - Hamburg Port Health Center, Zentralinstitut für Arbeitsmedizin und Maritime Medizin (HPHC/ZfAM), Dr. med. C. Schlaich, MPH

- Vessel data Federal Maritime and Hydrographic Agency (BSH), charts British Admiralty Taunton

- Voyage records, ships' safety services/Vessel Traffic Services (VTS)
 - Voyage data recorder DEBEG 4300

- Documents
 - See-Berufsgenossenschaft [Marine Insurance and Safety Association] (See-BG), Recommendation on performance requirements for a watch alarm system on the command bridge, Resolution MSC. 128(75), publication of the IMO Code for alarm and display facilities, Recommendations for the design of the bridge of sea-going vessels
 - Construction Regulations Germanischer Lloyd
 - Time sheets
 - Ships' Safety Management System (ISM)
 - Standing Orders NORFOLK EXPRESS
 - International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW)

- Photos and drawings
 - Shipping Company Hapag-Lloyd AG