The ropax ferry POMERANIA - C6RA9 - in collision with the tanker RIO GRANDE - SMPA - 31 January 2005
REPORT

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Maritime Casualty Investigation Division Jörgen Zachau, +46 (0)11 19 12 73

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> Maritime Safety Inspectorate
> Marine Casualties and Near-Accidents
> Casualty Reports

Cover photos - Anders Rydberg, Svensk Sjöfartstidning
- The Police, Halmstad, Sweden

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Glossary of Abbreviations

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<tr>
<th>Abbreviation</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>AB</td>
<td>Ablebodied seaman</td>
</tr>
<tr>
<td>ARPA</td>
<td>Automatic Radar Plotting Aid</td>
</tr>
<tr>
<td>BRM</td>
<td>Bridge Resource Management</td>
</tr>
<tr>
<td>COG</td>
<td>Course Over Ground</td>
</tr>
<tr>
<td>COLREG</td>
<td>International Regulations for Prevention of Collisions at Sea</td>
</tr>
<tr>
<td>CPA</td>
<td>Closest Point of Approach</td>
</tr>
<tr>
<td>ETA</td>
<td>Estimated Time of Arrival</td>
</tr>
<tr>
<td>GPS</td>
<td>Global Positioning System</td>
</tr>
<tr>
<td>IMO</td>
<td>International Maritime Organisation</td>
</tr>
<tr>
<td>LOA</td>
<td>Length Over All</td>
</tr>
<tr>
<td>LT</td>
<td>Local Time</td>
</tr>
<tr>
<td>M</td>
<td>Nautical mile = 1852 m</td>
</tr>
<tr>
<td>MRCC</td>
<td>Maritime Rescue Coordination Centre</td>
</tr>
<tr>
<td>OOW</td>
<td>Officer of the Watch</td>
</tr>
<tr>
<td>SOG</td>
<td>Speed Over Ground</td>
</tr>
<tr>
<td>VDR</td>
<td>Voyage Data Recorder</td>
</tr>
<tr>
<td>VHF</td>
<td>Very High Frequency</td>
</tr>
<tr>
<td>WT</td>
<td>Watertight</td>
</tr>
</tbody>
</table>
Summary

In the morning of 31 January the RIO GRANDE was in the traffic separation scheme east of Falsterborev en route to Halmstad. The speed was approximately 12 knots and course steered was 287°.

Simultaneously the POMERANIA headed from the south towards Copenhagen with the intention to pass east of Falsterborev lighthouse. The ferry was run at reduced speed, abt. 11 knots, course 015°.

Both ships were aware of one another. On board the POMERANIA the deck officer accepted a CPA of 0.3 M (although an ARPA radar need not have an accuracy greater than 0.7 M in such a situation) and he occupied himself with other matters, in spite of the fact that the lookout several times tried to call his attention to the approaching situation.

On board the RIO GRANDE one unsuccessfully tried to call the POMERANIA and then tried to take an evasive action. None of these manoeuvres however was made until the last minute, i.e. far too late. This could probably be attributed to the inexperience of the deck officer.

At 0552 local time the two ships collided in position 55º18.7'N, 012º40.7'E in such a way that the POMERANIA ran into the port side of the RIO GRANDE (see chart extract).

The investigation reveals that a too great confidence in electronic instruments may result in undesired consequences; education institutions should be made aware of this problem. Furthermore attention should be paid to the need for courses in which officers on board are trained to handle cooperation issues (BRM-courses).
Account of Facts

The RIO GRANDE

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
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<tbody>
<tr>
<td>IMO No.</td>
<td>6900305</td>
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<tr>
<td>Call sign:</td>
<td>SMPA</td>
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<tr>
<td>Port of registry:</td>
<td>Stockholm</td>
</tr>
<tr>
<td>Shipowner:</td>
<td>Rio Ships Management S.A.</td>
</tr>
<tr>
<td>Operator:</td>
<td>Broström Ship Management AB</td>
</tr>
<tr>
<td>Gross tonnage:</td>
<td>4 248</td>
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<tr>
<td>LOA:</td>
<td>123 m</td>
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<tr>
<td>Breadth:</td>
<td>15.6 m</td>
</tr>
<tr>
<td>Draught:</td>
<td>5.8 m</td>
</tr>
<tr>
<td>Classification society:</td>
<td>Lloyd’s Register of Shipping</td>
</tr>
<tr>
<td>Year built:</td>
<td>1969</td>
</tr>
<tr>
<td>Construction material:</td>
<td>Steel</td>
</tr>
<tr>
<td>Engine power:</td>
<td>2 700 kW</td>
</tr>
</tbody>
</table>

The RIO GRANDE was built in 1969 in Sölvesborg, Sweden. The ship sailed under the name ENGELSBERG until the end of 2004. Her deadweight was 5030 tons; she was built as an asphalt tanker. She was a conventional ship with deckhouse, accommodation and engine room in the far aft. Forward were the cargo tanks, totally 8 in number. The tanks were of a thermos shaped construction, since the cargo to some extent needed to be heated. The construction was such that besides from the ship having double sides the bottom of the hull can be considered as tripled.
The engine consisted of a 6-cylinder in-line Wärtsilä 32 and propulsion of the same make with a pitch propeller. The ship made about 13 knots when loaded. For production of electricity there were, in addition to the emergency generator, two auxiliary engines and one shaft generator. At the collision the shaft generator was connected with the other ones as stand-by.

The bridge was of conventional type for ships of that age, relatively small and with open bridge wings. In the middle was the autopilot of make Sperry ADG 3000 VT, adjustable in three positions: automatic steering, contact steering (the helm moves as long as a manual signal is given, then stops in the actual position when the signal stops) and helm steering. Further to starboard, close to the 10 cm radar, was the override device. With this equipment so close one could easily and quickly turn the helm without switching elsewhere, and at the same time keep an eye on the radar. This radar was of make Krupp Atlas Elektronik 9 600. Just aft of it, on the starboard side of the chart table (which was in the aft part of the bridge), was a 3 cm radar, KH Nucleus 3 5000. At the accident both radars were set on the 6 M scale (M = 1852 m).

The AIS was of make SAAB MX 420 Nav.System, integrated to the 3 cm radar.

The gyro was of make Litter Marine Systems SR-180 MK1.

In addition there were three VHF radios, two STR 8400 and one Sailor Compact RT 2048. One of these, with slightly lower effect, was set on the ship’s local channel 15, whereas the other ones were set on channel 12 (for passage of Drogden) and 16 (the general channel) respectively.

The ship took in cargo in Stockholm and departed on 29 January, heading for Halmstad. There were three lots of waste oil of totally 5500 m³ on board.

The RIO GRANDE has been subject to a number of port state controls in the last couple of years but no deficiency has been registered.
The Crew

On board the tanker were 13 crew members, three of which were Swedes (master, chief officer and chief engineer) and the rest were of Philippine nationality. There were totally four navigators – the master and three deck officers. The deck officers employed a traditional three-watch system, which means that they worked for four hours followed by eight hours off. On deck also four ABs were working, three of which were watch-keeping and one non-watch-keeping AB. The rest of the crew were two caterers – cook steward and messman – and three engine crew. The watch in the engine room was such that the whole engine crew was working daytime and they all had an assigned duty for the rest of the time.

The third officer was on duty 4–8 and was thus off duty 8–16, etc. He had been on watch duty with the same AB since they came on board in the end of November. He was on this ship for the first time, and this was his first assignment as a deck officer after ten years as an AB. He was certified as a third officer with a note saying that he had less than one year’s experience as an officer. He was 47 years old at the time.

The AB on duty, who had been on board since the turn of the month November–December, was 17 years younger but had many years’ experience as an AB.

The master had been on the ship for 8–9 years, also in various deck officer assignments. This time he had been on board for about one week; it was the first time he was working with a Philippine crew.

Work hours

Overtime was fixed on board, i.e. there was no extra payment for overtime up to a certain level. It was the responsibility of the third deck officer to keep a table not only of his own rest- and working hours, but also of the whole Philippine crew. According to his statement all working time was entered in the table, also overtime. In the month prior to the collision there were only two occasions when there might have been a reason for a remark as regards the rest hours of the master, third deck officer and the AB who was on watch at the collision – that was at the master’s first 24 hours on-board, and on one single occasion two weeks before the collision as regards the AB. On both occasions it was a minor deviation from the rest hour regulations.
The POMERANIA

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
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<tbody>
<tr>
<td>IMO No.</td>
<td>7516761</td>
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<tr>
<td>Call sign</td>
<td>C6RA9</td>
</tr>
<tr>
<td>Port of registry</td>
<td>Nassau, the Bahamas</td>
</tr>
<tr>
<td>Shipowner and operator</td>
<td>Polska Zegluga Baltycka S.A., Polferries</td>
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<tr>
<td></td>
<td>(Polish Baltic Shipping Co.)</td>
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<tr>
<td>Gross tonnage</td>
<td>12 087</td>
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<tr>
<td>LOA</td>
<td>127 m</td>
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<td>Breadth</td>
<td>21.7 m</td>
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<td>Draught</td>
<td>5.35 m</td>
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<td>Classification Society</td>
<td>Germanischer Lloyd</td>
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<td>Year built</td>
<td>1978</td>
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<tr>
<td>Construction material</td>
<td>Steel</td>
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<tr>
<td>Engine power</td>
<td>12 600 kW</td>
</tr>
<tr>
<td>Crew/Passengers</td>
<td>78/142</td>
</tr>
</tbody>
</table>

The POMERANIA was built in 1978 at shipyard Stocznia Szszecinska, Stettin, Poland, and was rebuilt (broadened) in 1997. She was flying Polish flag until the year 2000 when she became Bahamian-flagged. She was ice-strengthened and constructed with an opening with ramp in the bow and a stern ramp. Total passenger capacity was 1132 and the ship could take 277 private cars, divided on two decks.

She was built as a conventional ferry with the bridge located forward. The bridge wings were enclosed and the bridge deck was approximately 10 m over the surface of the water. There were two radar equipments on board of make Kelvin-Hughes, one HR3061 sited a few metres to starboard of the
centre line, in immediate connection to the engine controls, the other one on the port side, also a few metres from the centre line. The starboard radar was connected to the VDR of make Furuno VR 5010, whereas the one on the port side was equipped with ARPA. Both radar equipments were positioned far ahead, towards the windows in front. On each bridge wing was an additional radar screen.

The helm was in the centre line, also sited far ahead, against the windows.

The chart table, sited offset to starboard aft of the helm, was equipped with a shielding, approximately 140 cm high, on the front edge and on the sides. A curtain could be drawn, if needed (to save the darkness and the twilight vision). The radio cabin was located to port, astern of the bridge.

On the bridge was also a gyro compass Anschütz, autopilot Anschütz Kiel Compilot 7 and a Furuno GPS. There were also three VHF radios of make Sailor Compact, one of which was routinely attended on channel 16 (the general call channel), one on channel 12 and the third one on channel 15.

The POMERANIA was equipped with 4 main engines of make Sulzer 6ZL40/48 which via reduction gears ran 2 adjustable pitch propellers. She was fitted out with two rudders. Forward were two transverse bow thrusters, which also had adjustable pitch propellers. She could make 20 knots.

The ship had left Swinoujscie in the evening of 30 January at 2200 and was bound for Copenhagen, ETA 0830.

The POMERANIA has been subject to port state controls a number of times in recent years; no serious deficiencies have been noted. In the last ten years no accident has been registered, except for a small fire in the galley in the autumn of 1995.

*The Crew*

Out of the 78 crew members four were navigators – the master and three deck officers. The second officer, who was OOW at the collision, held a certificate as deck officer (the most recent certificate issued in 2002). He had been in the shipping company since 1983 and in the POMERANIA and her sister ships off and on since 1994. He also held an ARPA
certificate, i.e. a proof of passed education and training for the ARPA radar function. That certificate was issued in January 2001.

The AB on duty had been employed since April 2004. At the collision also an officer cadet was on the bridge.

Work Hours

The second officer as well as the AB had continuous six hour watch, i.e. six hours on, six hours off duty. They had thus started their watch duty at 0300 in the morning after having been off duty since 2100. The periods on board was two weeks duty, followed by two weeks time off. They had been on board since 18 January and were thus in the very end of their duty period when the collision took place. Overtime was paid extra and was not included in the salary. However, the working table does not show any overtime hours for January.

The Weather

The wind was northwesterly, approximately 8–10 m/sec. (5B). The visibility was good and the swell moderate. Current, if any, is considered to have had no influence on the course of events.

Radar and ARPA

Both ships carried radars with ARPA function. The minimum requirements of this function are specified in IMO resolution A.823(19) The resolution states that presentations of situations like the one with the POMERANIA and the RIO GRANDE shall have an accuracy value of CPA showing a maximum deviation of ±0.7 M. One condition is that the own ship and the target ship has maintained their course and speed at least three minutes before the reading.

The following is quoted from ARPA, Automatic Radar Plotting Aid, Per-Åke Kvick, Kalmar Maritime Academy, January 2005:

After three minutes more reliable values … shall be available. Note that these values may still be considerably unreliable. According to the specification of requirements the unreliability of for example CPA may be as great as ±0.7 nautical mile.
... The accuracy of ARPA depends on several factors. First of all vague precision of systems supplying data, such as radar, compass and log.
... The greatest deficiencies are in target tracking where primarily the performance of the radar limits the possibilities.
... A considerable source of error ... is information to the ARPA concerning own course and its accuracy. Neither are values concerning own or target’s manoeuvres reliable due to delay caused by the fact that the system calculates mean values of a great number of observations. If the system is used in good visibility we can often see optically that the target is turning before the vector moves.

Also input data from own log have a great impact on the result. If the main reason for using the system is anti-collision navigation, a log showing the speed through the water should be used. … If, on the other hand, the main reason for using the system is navigation or manoeuvring in narrow waters speed over the ground should be used.

Sources for Collection of Facts

- The databases Seasearcher and FTS of the Swedish Maritime Safety Inspectorate
- Lloyd’s Register Fairplay: Register of Ships
- Material from the police investigation
- Recorded VHF radiotraffic between the ships from MRCC Gothenburg
- AIS tracks from the Swedish Maritime Administration
- Data from the Port State Control database Sirenac (Paris MoU)
- ARPA, Automatic Radar Plotting Aid, Per-Åke Kvick, Kalmar Maritime Academy.
- IMO resolution A.823(19), Performance standards for automatic radar plotting (ARPA)
- The Near Accident Database of the Trade, Insjö
- The Accident Database of the Swedish Maritime Safety Inspectorate, SOS
- Simulation Model for Prediction of Sleep and Wakefulness, the Swedish Armed Forces and Karolinska Institutet/IPM.

The radar supervision which is normally made from Sjöinfokompani Malmoe was out of order on the occasion.
The RIO GRANDE

Report made by the emergency surveyor from the Swedish Maritime Safety Inspectorate, talks and interviews with the crew at visits on board. Information and photographs from the shipowner.

The POMERANIA

Written statement from watchkeeping crew members. The VDR of the ship. Information from the shipowner.

On the day of the collision Swedish police, together with Danish colleagues and authorities, went on board the ship in Copenhagen. Also the shipowner’s lawyer was present. According to the lawyer it was then not possible to talk with the officer who was on watch at the collision due to his condition, and access to the ship’s VDR was denied. However, the police could interview the master (who had been asleep at the accident) and the AB/lookout and the officer cadet who were on the bridge at the collision.

Initially the shipowner did not give any information, but referred to their representatives and to the flag state. The written statement, later given by the OOW, is dated 4 April, 2005. Also the VDR data were made known to the Maritime Casualty Investigation Division in May.

By September the investigator had received all information asked for.

Course of Events

In the morning of 31 January the RIO GRANDE was in the traffic separation scheme east of Falsterborev, bound for Halmstad, Sweden. The speed was approximately 12 knots and course steered 287º.

Simultaneously the POMERANIA came from south heading for Copenhagen with the intention to pass east of Falsterborev. The ferry run at reduced speed, approximately 11 knots, course steered 015º.

At 0552 LT the two ships collided by the POMERANIA running into the port side of the RIO GRANDE in position 55º18.7'N, 012º40.7'E.
The RIO GRANDE

At the collision most of the crew members woke up. The first engineer officer fell out of his bed, the catering officer (who had been called at 0530 but had fallen asleep again) woke up again, as did also the chief engineer (who had almost fallen asleep again after having been in the engine room). Also the master woke up by the collision. The motorman was in his cabin at the collision after having been called at 0530. None except the watch-keeping crew on the bridge is known to have witnessed the accident.

The Third Officer

To starboard the RIO GRANDE had a ship going the same direction, slightly ahead. In order to increase the CPA, which was 0.2 M, the RIO GRANDE turned a few degrees to port, from 287° to 285°. The CPA would then be 0.4 M.

As the situation with the POMERANIA grew more obvious, the speed was reduced from the engine action from 80 % to approximately 64 %, which would slow down the speed to 9–10 knots. (In case of reduction to 50 % or less the engine alarm would alert since the shaft generator was connected). The third officer thought that this reduction would be enough. He did not know whether the POMERANIA slowed down or not, but he noted that she kept her course.

Then he called the POMERANIA over VHF Channel 16. He had got the name of the ship via the AIS. He got no reply although he called twice. The time was then about 0540.

The RIO GRANDE then started a turn to starboard with the autopilot connected. The rudder angle was 15–20°, but that was too slow. He therefore switched to manual helm and turned hard to starboard. The ship to starboard going in the same direction did also turn, but the distance had increased slightly since the RIO GRANDE had slowed down. The POMERANIA turned to port just before the collision.

At the time still only one steering gear was run. Later he came to think that the turn might have been faster if both steering gears had been in operation.
Both radar equipments were set at the 6 M scale. The third officer preferred the 10 cm radar, it was easier to combine with his looking out (the deck office was rather short). The radar normally was good but could, under certain weather conditions, be tricky to adjust.

The AB on Watch

The AB on watch called the messman and the cook steward at 0530 and then returned to the bridge. That did not take more than 5 minutes. He said that he informed about the ship (to port). The AB also saw a ship to starboard, which showed one red and one white light, and the white one was understood to be the stern light. The RIO GRANDE had the other ship on her own starboard side at the overtaking.

In this connection the deck officer had started the slowdown and a slow turn to starboard by manual helm – slow in order not to hit the ship to port. The AB had not perceived any change of course by the ship to port.

He confirmed that the VHF call took place and that no engine alarm was alerted.

The Master

The master arrived at the bridge 1–2 minutes after the collision. The control lever was pulled down, but not completely. He did not look at the rudder position indicator. The ship was heading north (005–010°), still making speed. At the helm in the middle of the bridge was the third officer, on the port side of the bridge was the AB lookout, and also the second officer, who came towards him behind the chart table, a paper in his hand. First the position was checked, a GPS position of the radar was compared to the chart (to verify that there was water around). Then the POMERANIA called for help to check the scope of the damage she had suffered. The chief officer came to the bridge and made a mayday call on the VHF, which was answered by Sweden Rescue. Someone, he believed it was the chief officer, activated the general alarm. Examination of the damage was initiated fairly soon.

After talk with Sweden Rescue the RIO GRANDE continued her voyage towards Halmstad at reduced speed. There had been no actual communication with the POMERANIA. The Danish Naval Centre called the
POMERANIA and escorted her towards Copenhagen after which they returned out to escort the RIO GRANDE.

The Chief Engineer

The chief engineer went to the engine room and checked the functions of the engines, sounded and kept the engines running.

He declared that with the shaft generator connected the electrical system could maintain a stable frequency also in heavy sea. The engines shall have the capacity to carry out also rough manoeuvres with the shaft generator connected.

The POMERANIA

The Second Officer

The second officer had started his watch at 0300 and would work until 0900. He had been in bed from shortly after the departure from Swinoujscie at 2200 and slept until 15 minutes before his watch started. He checked the function of the navigation instruments and left the starboard radar in “stand-by” position. The ARPA radar to port was set on 6 M. By his colleague he was informed about the master’ standing order and took over the watch at 0300.

The AIS was located immediately to starboard of the radar, on the starboard side. The deck officer remembers that he used it before the collision to find out the name and call sign of the RIO GRANDE in case he would need them. This, however, was not the case.

On the bridge were also an AB and an officer cadet. The AB sat most of the time in the chair at the steering gear and second officer himself sat at the main radar, the one to port, just off the centre line.

The POMERANIA was on autopilot. Two of the four main engines were running and the speed was approximately 11 knots. From the turning point 4 M south of Falsterborev he could see the RIO GRANDE, both on radar and visually. The plotted radar echo showed that the RIO GRANDE would pass 3–4 cable lengths aft of the POMERANIA (cable length = approximately 185 m, one tenth of a nautical mile). Both the AIS and the radar showed that the course of the RIO GRANDE did not change.
considerably. A few minor course changes were made to compensate for current and wind and to aim the POMERANIA to pass close to the east of buoy M41, north of Falsterborev. He expected the RIO GRANDE to turn to starboard, up towards the fairway to continue north.

The AB warned a couple of times that the other ship approached, but since the deck officer noted that the CPA remained at at least 3 cable lengths he did not pay attention. Shortly after Falsterborev was passed he went to the chart table, just aft and to starboard of the steering gear, to make a note of the passage. He also called the engine room about a minor speed reduction for passage of Drogden. After that he called once again to make the information clearer.

He did not perceive any radio call from the other ship, neither did he hear any acoustic signals nor see any light signals. He did not initiate any communication with the RIO GRANDE himself.

When he was still at the call with the engine room the AB draw his attention to the fact that the ship to starboard was getting closer and he estimated the distance to be 30–40 metres. He immediately ordered helm hard aport and started all four steering gears. He then ran to the helm, which was now switched to manual, and helped the AB shift the helm.

After the collision, which felt as if the ship was hit by a big swell wave, the rudder was shifted to starboard in order to avoid further contact. This manoeuvre, however, was unsuccessful and the ships hit one another once more.

Shortly thereafter the master came to the bridge.

*The AB on duty*

The AB acted as lookout and was on the same schedule as the second officer, he had thus started his watch at 0300. The relation to the deck officer was solely professional, and there was no conversation on the bridge. Nothing out of the ordinary happened before the collision. He does not remember whether he was sitting or standing, but he was close to the helm. He noted the ship to starboard at an angle of approximately 060°.
Since the AB thought there was a risk of collision he informed the deck officer, who answered that it will be OK. This was repeated several times, but the answer of the deck officer at the chart table was the same: it is OK. The deck officer normally used the port side radar, whereas the chart table where he was now standing, was on the starboard side. The AB does not know whether or not the deck officer saw the ship.

The AB informed that the other ship was close, but the answer was the same again. The speed of the own ship was 11–11.5 knots. He estimated the speed of the other ship to be somewhat lower.

When the other ship got closer he could no longer see its lights. He went to the starboard side of the bridge and then run in to find the deck officer. At the collision the AB shouted out loud that there would be 4 steering gears running. He says that he started them himself. The AB took over the steering from the deck officer, who then was at the helm. From that moment manual steering was applied till arrival in Copenhagen.

The AB did not see the other ship change its course before the collision, and therefore considered it most unlikely that the other ship would pass freely.

The Officer Cadet

The officer cadet had been on board since 25 January and was in addition to the regular crew. His presence was motivated by practice and education. This morning he arrived at the bridge at 0300, at the same time as the second officer and the AB. The officer kept an eye on the radar whereas the AB was either in the chair at the helm or on lookout. The cadet estimated the visibility to approximately 5 M.

Once per hour the cadet went for a fire-watch. He also noted the ship’s position as often. When the POMERANIA passed the lighthouse Falsterborev he noted the time 0550. He could then see a ship at a distance of approximately 4 M to starboard.

Soon afterwards, when he was in the radio cabin, he felt the ship shake. He therefore went out on the bridge. The officer then was at the helm.

The next thing he remembers is that the master came to the bridge and took over.
Technical Data

*The VDR of the POMERANIA*

The starboard radar, which was connected to the VDR, was only stand-by. Thus there was no radar picture saved. This radar was switched on later, when the POMERANIA approached Copenhagen.

The rudder position indicators seemed not to be calibrated, since they consequently showed a great rudder angle without the course changing, and the difference between the rudders was considerable (6–7°).

The VHF recording was wrongly adjusted. Due to distorted signal there was interference in the sound recording. However, the radio traffic could be heard.

There was no indication in the VDR about the status of the WT doors.

The sound recording from the VDR of the POMERANIA in all essentials confirms the statements of the bridge crew. Here follows an excerpt (translation made by the shipowner). “AB” means AB on duty and “2nd mate” means second officer. The first note is made 6 minutes 35 seconds before the moment of the collision.

-6.35 AB: "Look, on the red is coming"
  2nd mate: “She is turning. Let her turn"

-3.29 Telephone call with engine control room*

-2.37 AB: “She is closing her course getting nearer”
  2nd mate: “Let her, but she may not”

-1.35 2nd mate calls engine control room*

-0.40 AB: “… look, she is closer and closer”
  2nd mate: “Ok”
  AB: “Look she is sailing near to us”
  2nd mate: “Oh shit” (2nd mate observes the problem)

0.00 Collision

* None of the two phone calls concerns the traffic situation.
Data from the Engine of the RIO GRANDE

Data from the engine of the RIO GRANDE show that the engine was exposed to increased strain 5–6 minutes before the reduction which, according to these data, took place at 0553. There is some doubt concerning the time recording.

The Radio Traffic

Sound recordings from the MRCC and from the VDR of the POMERANIA give the following conversation and time recordings:

05:50:45  “Hey, Pomerania, what is your intention?” (Rio Grande)
05:51:30  “… what are you doing? You are doing dangerous navigation!” (Rio Grande)
05:52:00  Manual steering and helm hard aport on the POMERANIA.
05:52:20  Probable moment of collision.
05:54:20  The POMERANIA calls the RIO GRANDE and asks for damage examination.

The AIS

Tracks from the moments before and at the collision show that another two ships with AIS were in the area. These were going the same direction as the RIO GRANDE. One was far ahead, whereas the other one, the ARCTIC PRINCESS, was closer according to the table below.

<table>
<thead>
<tr>
<th>Time</th>
<th>Distance</th>
<th>Estimated course (ARCTIC PRINCESS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0535</td>
<td>0.8 M</td>
<td>285–295º</td>
</tr>
<tr>
<td>0544</td>
<td>0.5 M</td>
<td>315–325º</td>
</tr>
<tr>
<td>0548</td>
<td>0.5 M</td>
<td>340–350º</td>
</tr>
<tr>
<td>0551</td>
<td>0.6 M</td>
<td>345–355º</td>
</tr>
</tbody>
</table>
The tracks also show that the RIO GRANDE had reduced her speed by just a little more than 1 knot only before the collision. This speed reduction was made almost immediately before the collision. A minor speed reduction can be noted 6–7 minutes before the collision.

AIS data also show that the POMERANIA, after having changed her course south of Falsterborev, was exposed to a sideways drift of 4–6° to starboard and that a number of small adjustments of the course to port were made.

![Figure: AIS tracks in the moment of collision.](image)

**Analysis**

**Fatigue**

There is no indication that fatigue or exhaustion would have had an impact on the situation, neither on the RIO GRANDE nor on the POMERANIA.
The POMERANIA

Rule 15 of the COLREG dealing with ships in a crossing situation apply in this case. There is no doubt that the POMERANIA is the ship to keep out of the way of the other one. Rule 16 states that so far as possible, early and substantial action shall be taken to keep well clear.

The deck officer of the POMERANIA chose not to take an evasive action since he thought that the RIO GRANDE would turn to north and follow the northeastern part of the fairway, or at least that the POMERANIA would be faster and pass ahead of the RIO GRANDE. He obviously estimated that a CPA of 3 cable lengths would be sufficient.

Such a small margin must be considered to be far too narrow, even if it had been exact. Furthermore, for the sake of a phone call he chooses to leave his appropriate position in a critical moment, hence leaving the situation be. It is not clear if the first phone call was from the bridge or from the engine control room. Nevertheless, a phone call at the wrong moment may distract a person’s attention to such an extent that proper priority is not given important information. This is obviously the case here.

The ARPA calculation of CPA turned out to be completely wrong. This might be due to several factors which may have an impact on the calculations of the radar. Especially in close situations the size of the other ship is of great importance since the spot on that ship on which the calculations are based, is what the radar interprets to be the central point. The superstructure of the RIO GRANDE was located astern and she was 123 m long, which is almost a whole cable length. This indicates that the radar aims at the superstructure astern, whereas the part ahead reduces the margin. A minor maladjustment of the own radar, which is normally not obvious, may also influence the result. Another crucial issue is the speed of the own ship and how this data is updated and calculated. Speed through the water is for a fact what is interesting at collision calculations, whereas the radar often gets these data from the GPS, which shows speed over the ground (SOG). This may lead to unfavourable results of the calculations.

The IMO radar standard does not require more precise accuracy than ±0.7 M in cases like this. This means that there is no guarantee that a collision is avoided by using only a CPA of 6 cable lengths or less.
The conclusion is that navigation based upon instruments must be calculated by a wide margin. In addition, close attention must be paid to the course of events. Even if this cannot be considered to be a frequent cause of accidents, information from the database, *SOS*, of the Swedish Maritime Safety Inspectorate and the database of the trade, *Insjö*, over near accidents, it is too common on board to have an overconfidence in data from navigation instruments. This is confirmed by the investigators’ experience. (Cf. for example accident report of the Swedish Maritime Safety Inspectorate “S:T IBB – grounding on 29 May, 1999”, ref. No. 080201-99-35348).

The behaviour on board the POMERANIA indicates nonchalance or a slackness which does not indicate good seamanship. This is further emphasized by the fact that the deck officer ignored the warnings from the lookout, who not only once but repeatedly fulfilled his duty by reporting the ship which approached to starboard. This indicates a poor working climate between the actors on the bridge. Also the fact that the radio call from the RIO GRANDE was not noticed indicates clear deficiencies. If that call had been noticed, it is possible that the deck officer’s attention had turned to the approaching ship and he could have used the last minute before the collision to take action. The statement from the lookout indicates that the relation between the deck officer and himself was not the best, even if this is not said outright.

The work on a ship’s bridge requires cooperation and a sensitive ear. The qualifications for handling the resources available on a bridge, including personal qualifications, can be practiced and trained in special courses where aviation education serves as a model, BRM courses. The deck officer had not attended such a course, and there are no formal requirements for this. It is obvious that there was a need for the kind of knowledge that is obtained in such courses. (Cf. accident report of the Swedish Maritime Safety Inspectorate “Domiat – grounding on 7 June, 2004”, ref. No. 080202-04-16378).

One could also wonder why the deck officer of the POMERANIA did not follow the intention he has expressed in his statement. There he says that in his navigation he aims close to the middle buoy M41 in the northern end of the traffic separation system, north of Falsterborev. But with the course steered before the collision he would instead have come very close to the eastern part of the separation. There was plenty of space to keep closer to
the lighthouse, and there was no obvious reason for him to go as far to the east as he in fact did.

**The RIO GRANDE**

Rule 17 (a) (i) of the International Regulations for Preventing Collisions at Sea states: “Where one of two vessels is to keep out of the way the other shall keep her course and speed”. This means that the ship shall follow the plan of her voyage and make the changes in course and speed that are needed for proper navigation and correct behaviour. This means that nothing in these rules prevents the RIO GRANDE from turning to starboard and follow the ARCTIC PRINCESS, which had turned to starboard, and thus stay at the starboard side of the fairway. It is true that the distance would have been close, but by a minor adjustment of the speed a close contact would have been avoided.

Rule 17 (b) states: ”When, from any cause, the vessel required to keep her course and speed finds herself so close that collision cannot be avoided by the action of the give-way vessel alone, she shall take such action as will best aid to avoid collision”. This can be done by change of course, change of speed, communication or a combination of these.

**Change of Course**

The deck officer of the RIO GRANDE claims that there was a ship to starboard which prevented a turn to starboard. According to the AIS tracks there was no other ship in the area but the ones mentioned above. Since there are no radar prints, neither from the VDR of the POMERANIA nor from the naval radar supervision, it is not impossible that other ships were in the area – if so without an AIS. The most probable is however that the ship in question is the ARCTIC PRINCESS. It can be noted that even if the ARCTIC PRINCESS was comparatively close it would have been both possible and reasonable for the RIO GRANDE to keep away to starboard when the risk of collision with the POMERANIA became imminent, especially since the ARCTIC PRINCESS had already started to turn (see enclosure). However, the RIO GRANDE did not make any significant change of course until in the very last minute.

**Change of Speed**

The small speed reduction that can be seen from the AIS coincides with the fact that the RIO GRANDE got into shallower water. The engine
documentation shows that the load increased at the same time, which leads to the conclusion that the speed reduction that was made 5–6 minutes before the collision was due to the shallowing ground.

The speed reduction that the deck officer set about, was not made until possibly some minute before the collision. Moreover, the reduction was far too small. According to the deck officer the engine alarm would alert if the load was lower than 50%. The deck officer’s too great wish to avoid an engine alarm must have had a restraining influence of his actions. According to the engine data no further manoeuvres were made.

Communication

The only communication effort that was made was on VHF by the deck officer of the RIO GRANDE. Like the other measures this was far too late and too vague. The deck officer claims that this was done as early as 10–12 minutes before the collision. The sound records from the VDR of the POMERANIA and MRCC however show that the calls were made only some minute before the accident. It would have been possible for the POMERANIA to avoid the collision if they had taken measures immediately after the radio call, but just 90 seconds does not give much scope for action. The deck officer claimed that this was done already 10–12 minutes before the collision. This want of strong action and the exaggerated wariness to turn, to slow down and more decisively and in due time use the radio is probably be due to the deck officer’s lack of experience.

Miscellaneous

The leeway seems not to have had any practical influence of the course of events.

Even if the AIS was not enough to prevent this collision there was no question in any of the ships involved as regards the identity of the other ship.

No special actions for approaching more busy areas, such as starting additional steering gears and auxiliary engines, had been taken in any of the ships. Such measures might have increased the ability to act, not least the willingness to lower the speed substantially on board the RIO GRANDE since in that case one had not been depending on the shaft
generator and its possibly limited ability to manage the power supply without causing an engine alarm at engine manoeuvres.

There has been a lot of difficulties when it comes to collection of information from the VDR of the POMERANIA. Partly some information has not been available since the supplier of information has not been activated (the radar), partly access to the information has been complicated. This may be referred to the lack of standard for copying and playback of the software. There are no clear rules for handling this type of situation.

Since the first VDRs came into use demands for a uniform data handling standard have developed. These demands will be introduced successively.

**Causes and Factors**

The primary cause was that the deck officer of the POMERANIA accepted a too narrow margin and that he carried out other duties, such as the phone calls, instead of following up the situation.

**Factors**

Defective radio watch on board the POMERANIA.

Poor spirit of cooperation on board the POMERANIA.

The RIO GRANDE deck officer’s lack of experience, apparent in late and vague measures.

The deck officer’s opinion concerning risk of engine alarm in case of speed reduction on board the RIO GRANDE.

**Observations**

The means of modern electronical navigation with bearings and calculations which appears to be exact may lead to false safety and tempt ships to go with smaller margins, inconsistent with good seamanship. It is open to discussion whether it is desirable or possible that the requirements for instruments at sea are specified so that the accuracy of the values is not more exact than the accuracy of input data. The result shown would thus be realistic.
In situations like this the accuracy of an ARPA radar need not be greater than ±0.7 M.

In the complex environment of a ship’s bridge great demands are made on the ability to prioritize different tasks. It is essential that only permitted and important assignments are carried out and that these are correctly prioritized.

The scope of responsibility on a ship’s bridge requires a healthy working climate in which optimal use can be made of all resources.

**Recommendations**

It is open to debate whether a BMR course should be mandatory.

The Ship Technical Division of the Swedish Maritime Safety Inspectorate should work for clear international guidelines to state whether equipment and instruments supplying data to the VDR shall be switched on.

The Ship Operative Division of the Swedish Maritime Safety Inspectorate should request the Swedish seafarer education colleges to emphasise the problems involved in too strong confidence in electronics.

The shipowner of the POMERANIA should consider making a BMR course standard to navigation officers.

The shipowner of the POMERANIA should see to it that the data of the VDR are set right.

**Damage**

No personal injury or discharge of oil has been reported.

As a result of the evasive manoeuvres taken by the two ships in the last seconds the POMERANIA did not hit the RIO GRANDE at a very great angle. This lessened the risk of penetration of the hull of the RIO GRANDE with consequences such as oil discharge and list.
The **RIO GRANDE**

Damage on hull and frames from frame 30 and forward. Damage and hole in bunker tank and ballast tanks. A minor leakage of bunker diesel from a tank to cofferdam.

The **POMERANIA**

Rips amidship and aft 3–4 m above the waterline. Indentations (up to 5 cm deep) between frames -2 and 20.

**Results of the Investigation**

The POMERANIA was the give-way ship to the RIO GRANDE.

On board the POMERANIA a closest point of approach of only 0.3 M was accepted.

The deck officer of the POMERANIA did not follow up the situation but concentrated on other matters.

The lookout of the POMERANIA repeatedly reported the approaching ship.

The deck officer of the POMERANIA had not attended a BMR course; this was also not required.

The action attempts made by the deck officer of the RIO GRANDE were far too late.

It was the very first service of the deck officer of the RIO GRANDE in this position.

The evasive manoeuvres in the last seconds reduced the angle of collision.
Place of collision

Kollisionsplats