

**Chemical Tanker MARIA M
IMO No. 9301885 – IBSK
Grounding on 14 July, 2009**



REPORT

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Maritime Department
Maritime Investigation Unit

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The Swedish Transport Agency investigates accidents and near-misses from a safety point of view. The aim of the investigations is to avoid repeats of accidents, not to apportion blame or liability.

This investigation was made upon delegation by the Swedish Accident Investigation Board.¹

¹ Comment following the translation: The delegation was not made. However, this does not effect the result of the report.

1. Synopsis

The chemical tanker MARIA M, registered in Italy, sailed from Ventspils in Latvia in the evening of 12 July, 2009, after having loaded 32 910 MT (metric tons) gas oil, which gave a draught of 10.5 metres on even keel.

The master of the ship had signed on in Ventspils on 12 July. This was his first turn on board the MARIA M, and the signing off master left the ship together with the pilot in Grenå, Denmark, at 1550 hours on 14 July.

A bunkering was scheduled to take place off Göteborg during the voyage to Bilbao, Spain.

On 14 July at 2150 hours the master came to the bridge. The MARIA M then was on a course over ground leading to the centre of anchoring area “C” and the distance was at the time 7 M (nautical mile = 1852 metres). The distance to the Vanguard's ground buoy was 3.2 M and the distance when passing would be 0.5 M with unchanged course.

After a number of rudder and engine control manoeuvres by the master the MARIA M had come east of the course line. When the ship was steered a course straight towards anchoring area “C”, the Vanguard's ground buoy was in the ship's port side. This was not noticed by the officer on the bridge and the ship grounded in position N 57°31'.63 E 011°40'.30.

The reason for the course changes, which were made at an early stage, cannot be definitely determined but the investigation shows two possible factors. Since the master had just recently signed on, the ship and the instrumentation on the bridge was unfamiliar to him. It is possible that the master wanted to familiarize himself with the ship's behaviour to various rudder commands prior to the arrival in Gothenburg, and may have mixed up the indicators for rudder position and turning rate.

The investigation shows that differences in age and, above all, cultural differences have had an impact on the cooperation on the bridge.

The investigation also shows that the fact that the VTS West Coast did not interfere was a contributing factor to the grounding of the ship.

2. Account of facts

2.1 The ship

Name:	MARIA M
IMO No:	9301885
Call sign:	IBSK
Port of registry:	Bari, Italy
Gross weight:	25 373
Deadweight:	40 057 tons
Length over all:	180 metres
Breadth:	31 metres
Draught:	11.11 metres
Current draught:	10.50 metres, even keel
Classification society:	ABS (American Bureau of Shipping)
Year built:	2006
Construction material:	Steel
Engine power:	8 580 kW
Crew:	21 persons

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Picture 1

The *MARIA M* was built at SLS Shipbuilding Co. Ltd in Tongyeong in the Republic of Korea in 2006 for Italian buyers. The ship flew the Italian flag but was under Greek management.

The ship was constructed with the superstructure in the aft on weatherdeck, containing the accommodation areas and the bridge, and the engine room underneath. On the bridge the radio station was located in the aft part to starboard and the chart table in front.

The main engine was a HSD/B&W of type W6S50MC-MK6, which developed 11 640 HP (horse powers)/8580 Kw at 127 RPM (revolutions per minute). It was reversible and connected to a fixed-pitch propeller.

At the time of the accident the ship was chartered by the Latvian Shipping Company until December, 2009.

2.2 Collection of facts

In the investigation information has been collected from the following sources:

- Visit on board the *MARIA M* by investigator
- Information from the VDR (Voyage Data Recorder) of the ship

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- Information from the ship's agent in Gothenburg
- Data from ABS (American Bureau of Shipping)
- The weather situation from SMHI (the Swedish Meteorological and Hydrological Institute)
- Information from the office of the Swedish Transport Agency in Gothenburg
- www.sjofartsverket.se
- Information from the management company

2.3 Equipment on the bridge



Picture 2

In relation to the occurrence the most interesting equipment on the bridge was two radar units of make JRC type JMA 9932-SA and type JMA 9922-6 XA. The gyro compass was a Yokogawa type CMZ 700S, the

automatic steering of Yokogawa type PT 500 A-P-N2 and the magnetic compass of make C.Plath.

The equipment also included two satellite navigators of make JRC type JLR-7700 MK II. In addition the MARIA M had an AIS (Automatic Identification System) of make JRC type JHS-182 and JRC echo sounder JRC type JFE-852. There was also a VDR of make Rutter type VDR-100G2.

There were no electronic charts (ENC) on board; at the time of the grounding no such requirements were in force.

The AIS of the ship was out of order since 5 July. By the equipment other ships could be traced but there was no transmission from the MARIA M. Repair was scheduled when the ship was loading in Ventspils, but according to the shipowner no technician was available for the repairs.

The rudder position indicator was located under deck on the front edge of the bridge, about two metres to starboard of the centre line. The turning rate indicator was next to the rudder position indicator at a distance of about one metre.

2.4 The crew

The crew consisted of the master, 3 deck officers, chief engineer, first and second engineer, 5 deck crew, 2 engine crew and 7 other crew. The master, the first engineer and the deck cadet were Italian, the others were Philippines.

The master was 66 years old and had served on board tankers since 1965. He signed on the MARIA M for the first time in Ventspils on 12 July. He doubled with the leaving master for two days in order to familiarize with the ship before the latter master left at the pilot debarkation at Grenå.

On several occasions the master had participated in courses in BRM (Bridge Resource Management).

The third officer, 31 years old, who was officer of the watch (OOW) at the grounding, had signed on the MARIA M in St Nazaire, France, on 20 June. This was his first contract as a third officer and OOW.

The helmsman, who was 28 years old, had been on board for about 5.5 months.

All the people on board were employed by the manning company Millenia Maritime Inc. located in Glyfada, Greece.

2.5 The weather

At 2000 hours in the evening of 14 July the weather was SSW 5 knots, visibility 40 km at Måseskär (about 35 M NNW of the grounding position). The sea state was less than 0.5 metres and the current were setting north, 0.1–0.6 knots.

According to the SMHI the variations in weather were very small in the immediate surroundings.

2.6 Port state controls

Since 2006 the MARIA M had been subject to five port state controls within the Paris MOU (Paris Memorandum of Understanding on Port State Control). At the controls 16 deficiencies were noted but none was serious.

2.7 Miscellaneous

On board the MARIA M a chart from the British Admiralty (BA) was used for navigation towards anchorage area "C".

The rudder was checked while the ship was still grounded, but no defect was found neither on the rudder nor on the steering gear.

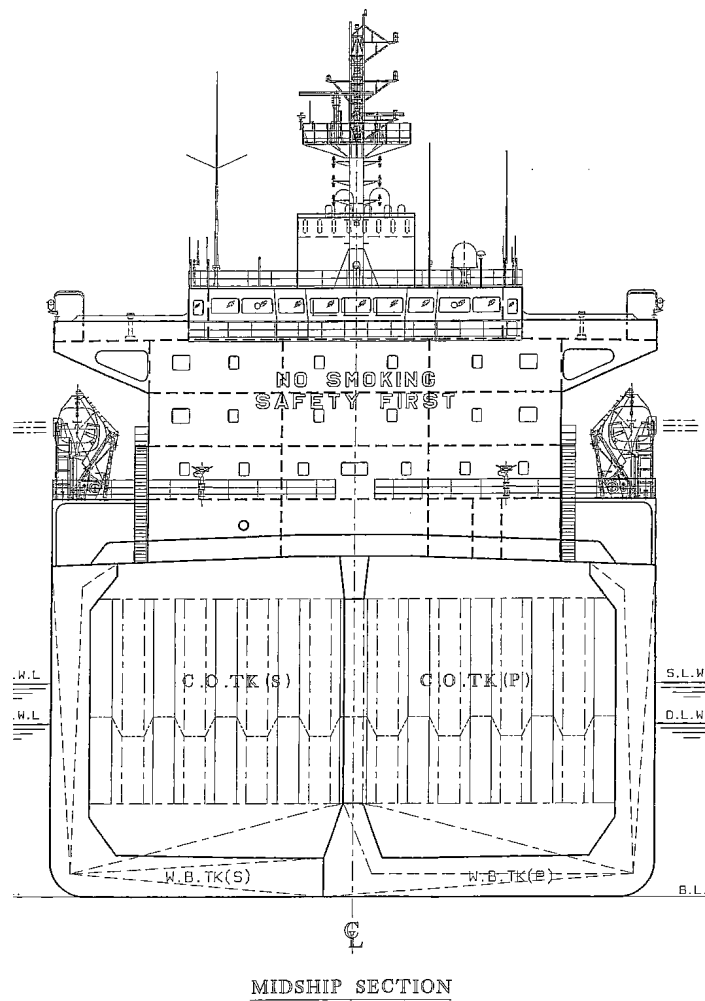
The times stated in this report refer to Swedish local time (UTC +2).

At the investigator's visit on board the possibilities for long and complete interviews with the persons involved were limited. Due to the type of accident and the fact that the ship was still aground certain essential persons were not available for interviews to the desired extent. Information about the accident has to a great extent been collected from the VDR of the ship.

Nothing indicates that fatigue have been a contributing factor for the accident.

2.8 The tank system

The MARIA M was a so called double skin ship with six ballast tanks stretching from the centre line to the bilge and up to deck; thus all cargo tanks were enclosed by ballast tanks on the outer side and in the bottom (see picture 3). In the very forward part of the ship was the forepeak and astern of the engine room the afterpeak.



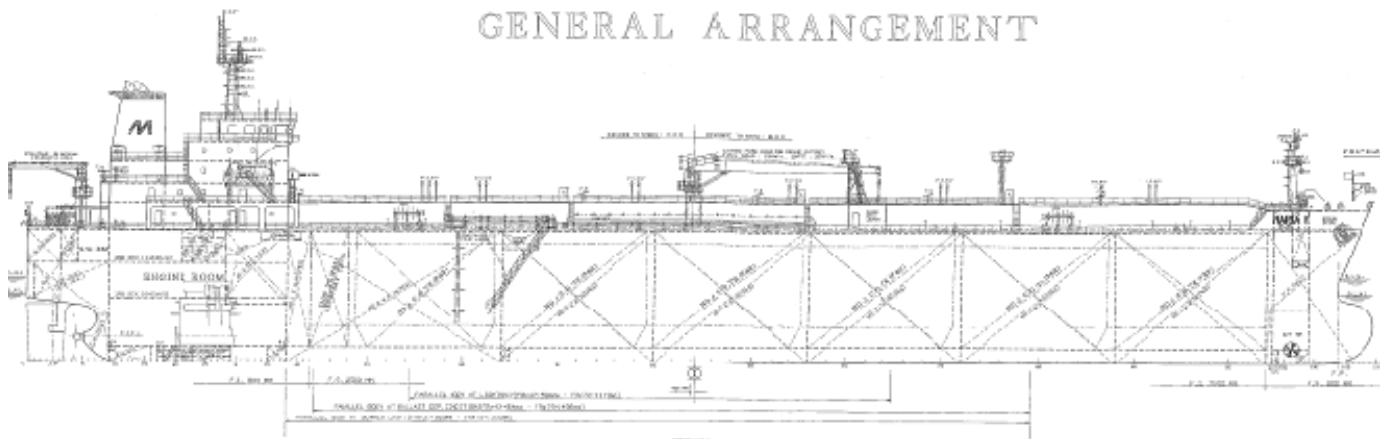
Picture 3

The ship had totally 12 cargo tanks in pairs, separated by a centre bulkhead. Astern of No. 6 cargo tanks were two slop tanks with one recovery tank in between, in the centre line. Astern of the slop tanks were No. 1 starboard and port bunker tanks and No. 2 starboard bunker tank for HFO (Heavy Fuel Oil). The bunker tank for MDO (Marine Diesel Oil) was located on the port side on top of the afterpeak.

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At the grounding the *MARIA M* had about 260 MT HFO and 30 MT MDO, in addition to the cargo. There were also about 60 MT lubricating oil on board, placed in various tanks in the vicinity of the engine room.



Picture 4

2.9 The VTS at the time of the accident

The VTS WC (WC meaning West Coast) was responsible for planning of pilot and of vessel traffic information along the west coast, from a line just north of Hallands Väderö in the south up to the Norwegian border in the north. In order to simplify the spotting of the calling ships the area was divided into separate VTS areas, depending on the various ports and pilot stations in the area. Traffic information area VTS Gothenburg comprises the sea area limited in the west by a circle of 6 M radius with its centre in Vinga lighthouse and in the north and south by the parallels of latitude tangent to the circle.

All ships with a length of 45 metres or more, or with a gross tonnage of 300 or more, and tug-boats with a tow of 45 metres or more, had the obligation to report to the VTS WC according to the regulations in force, when sailing in a VTS area or passing a reporting point.

One tool of the VTS operator was the VHF radio; the working channel in the area in question was 13. At its first call the ship should state its name, call sign, destination and pilot exemption certificate (PEC) number, if any.

Information should also be passed to the VTS about observations which might be of interest to other traffic.

The VTS WC could then give information about other traffic or relevant navigation information concerning the area in question. Since the calls were made on an open channel other ships in the area could hear the dialogue and adjust their routes and speed accordingly.

The ships should immediately report to the VTS possible groundings, collisions, incidents, accidents or other matters which could influence the maritime safety and the navigability in the fairway.

3. Course of events

3.1 Prior to the grounding

The MARIA M sailed from Ventspils, Latvia, on 12 July, 2009, at 2254 hours after having loaded 32 910 metric tons of gas oil, which gave a draught of 10.5 metres on even keel.

The destination of the ship was Bilbao, Spain, and bunkering was scheduled off Gothenburg. The bunkering would take place in anchoring area “C”, 1.5 M east of Trubaduren.

Nothing worth mentioning happened during the voyage over the Baltic Sea. Due to the great draught it was necessary to sail through the Great Belt.

A pilot was embarked at Gedser, Denmark, on 14 July at 0206 hours. At 0715 hours the Gedser pilot was exchanged for a pilot from Grenå, Denmark, who left the ship at 1550 hours, as did also the signing off master.

On 14 July at 2150 hours the master came to the bridge. The MARIA M was then at a course over ground of 020° at a speed of 14,2 knots. The course was then straight towards anchoring area “C” and the distance was 7 M. The distance to the Vanguards ground buoy was 3.2 M and the distance when passing would be 0.5 M with the course unchanged.

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The ship was on automatic steering and the third officer was OOW. The latest hour, before the master came to the bridge, positions had been noted in the chart every 5th to 10th minute.



Picture 5 – The chart

The following rudder and engine manoeuvres as well as compass courses and sound recording from the bridge are collected from the VDR (Voyage Data Recorder – “black box”).

A couple of minutes after the master arrived at the bridge, at 2152 hours, he ordered the automatic steering to be disconnected and that the AB on watch should switch to manual steering.

At 2153 hours the master ordered 10° rudder to starboard and 20 seconds later he ordered 10° rudder to port, telling the helmsman that when the ship came to port again he should again put the rudder 10° to starboard.

At 2154 hours the helmsman confirmed the rudder to be 10° to port. One minute later the master ordered 10° to starboard, and then said “starboard not port”, which was confirmed by the helmsman. In this moment the rudder was already 10° to starboard, but the ship turned to port.

At 2156 hours the master ordered amidships and in the next moment 10° to port – an order which he repeated shortly after.

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At the same time the OOW of the MARIA M called VTS Gothenburg, who got the information that the ship came in from south and verified that she would go to anchorage area “C” for bunkering.

The MARIA M was then about 1.5 M south of the line for mandatory reporting to the VTS.

The helmsman claims to have been taken by force off his position at the rudder by the master and at 2157 hours the rudder was turned 30° to port, this time without the giving of orders. The speed was then 13.6 knots, the course 025° and since the ship was under heavy turn to port the rudder was turned 20° to starboard. Soon afterwards the rudder was turned 30° to starboard when the ship was already in a turn to starboard.

A few seconds later amidships was steered, and half a minute later 20° to port, which was soon altered to amidships again. The turning rate, which was read on a device up under deck, was then 2.6°/minute to starboard and increased when the rudder was turned to amidships.

From the VDR one can hear that the master at this moment, as also later, was discussing the turning rate with the OOW (and later also with the chief officer).

Just before 2200 hours the OOW was ordered to send for the chief officer to come to the bridge. The order was given in a nervous tone and soon thereafter the master called someone, probably the OOW, an idiot.

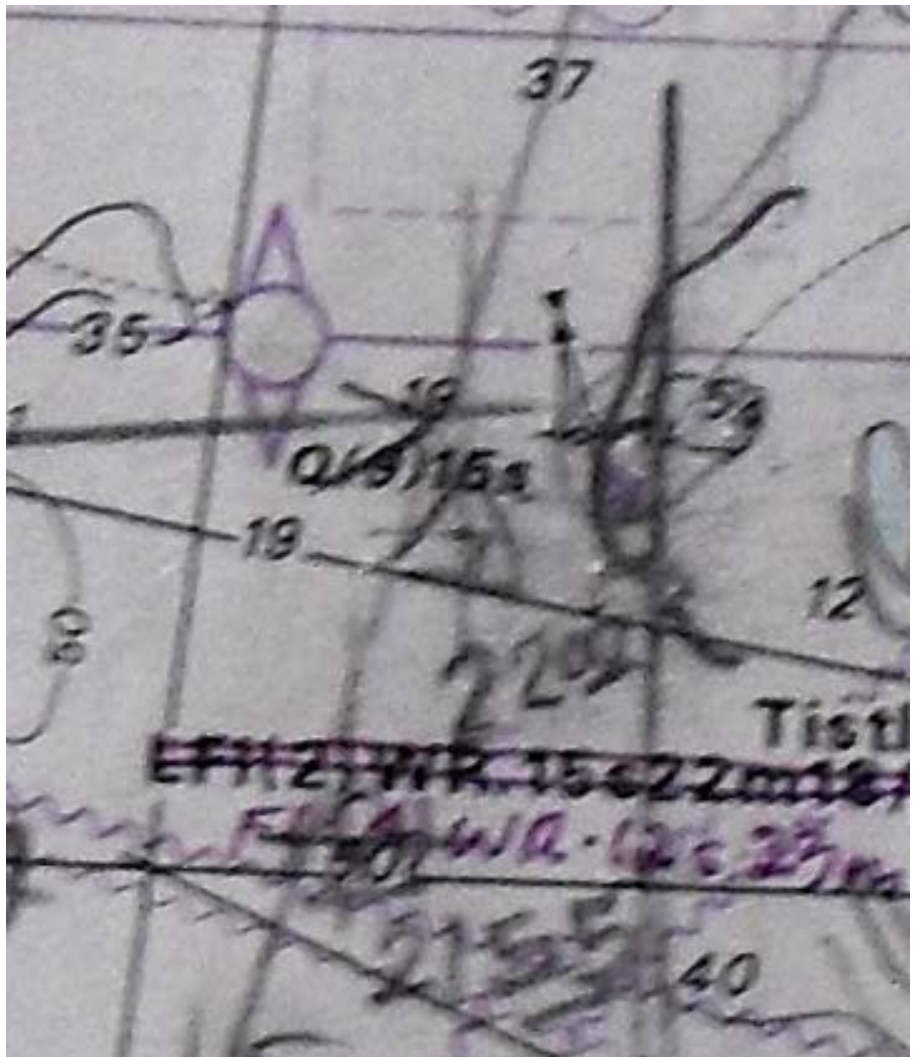
A few seconds before 2200 hours the rudder is turned to 20° to port when the turning rate was 21°/minute to starboard.

At 2201 hours the chief officer arrived at the bridge and the helmsman again took over the manual steering.

At about 2202 hours the OOW noted the last position in the chart before the grounding. The crew had carefully marked the Vanguard's ground with a pencil in the chart as an area to be avoided (see picture 6).

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Picture 6 – The BA chart showing the marked area.

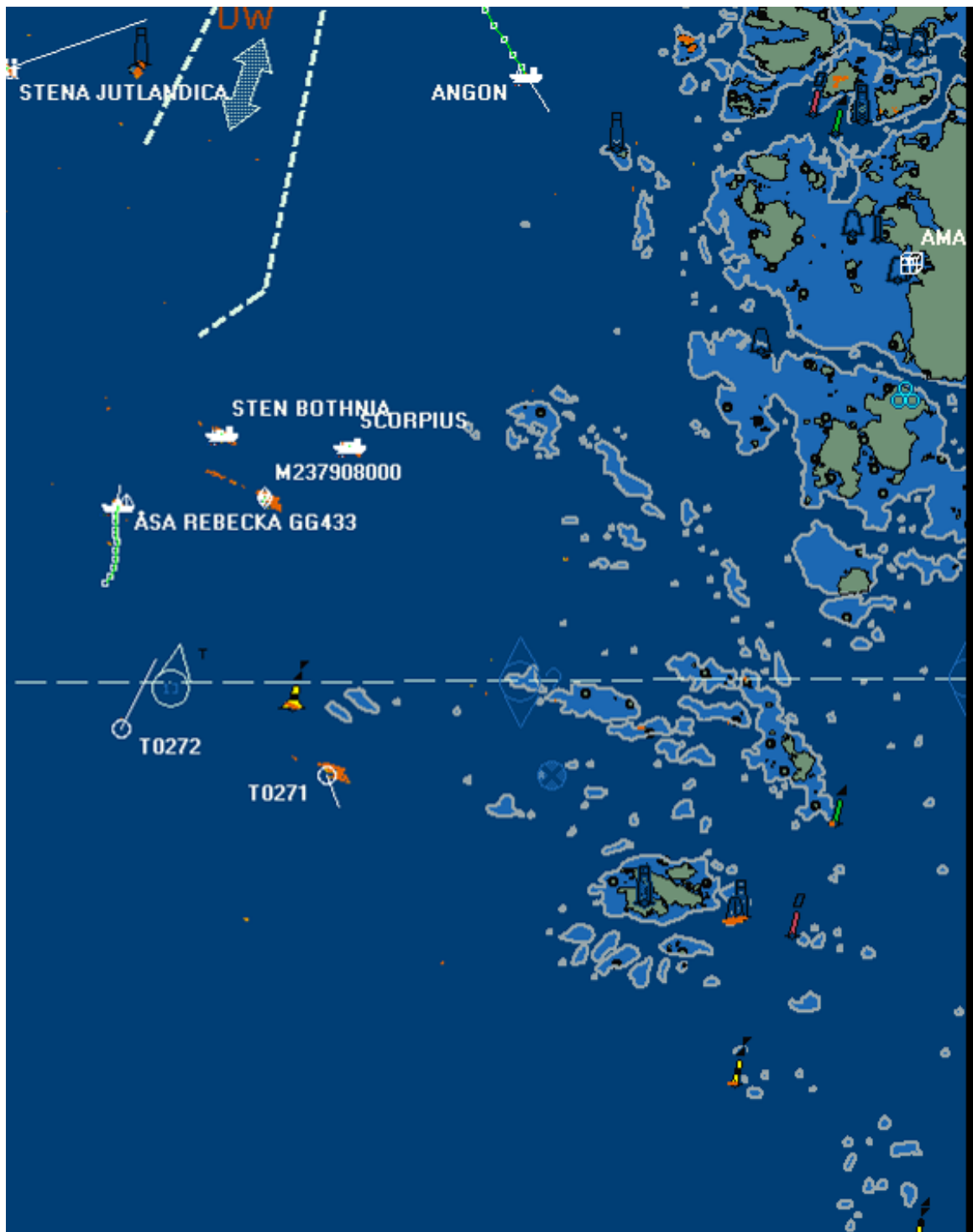
Between 2202 and 2203 hours the master reduced the engine power from full to 38 % forward and ordered hard to port rudder. The ship continued to turn to starboard, in spite of the rudder angle. Shortly after, the master increased the engine power marginally to 41 % forward, still with the rudder hard to port. The master talked to someone on the bridge, probably one of the officers, asking why the ship did not go to port although he had order the rudder hard to port.

Then a number of manoeuvres with the rudder and the engine followed, which brought the ship to a course southeast at a speed of about 7 knots. The position was then about 1.3 M east of the original course line with just a little less than 1 M to the Vanguards ground buoy.

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At about 2206 hours the VTS starts plotting the MARIA M on their radar screens (see picture 7).

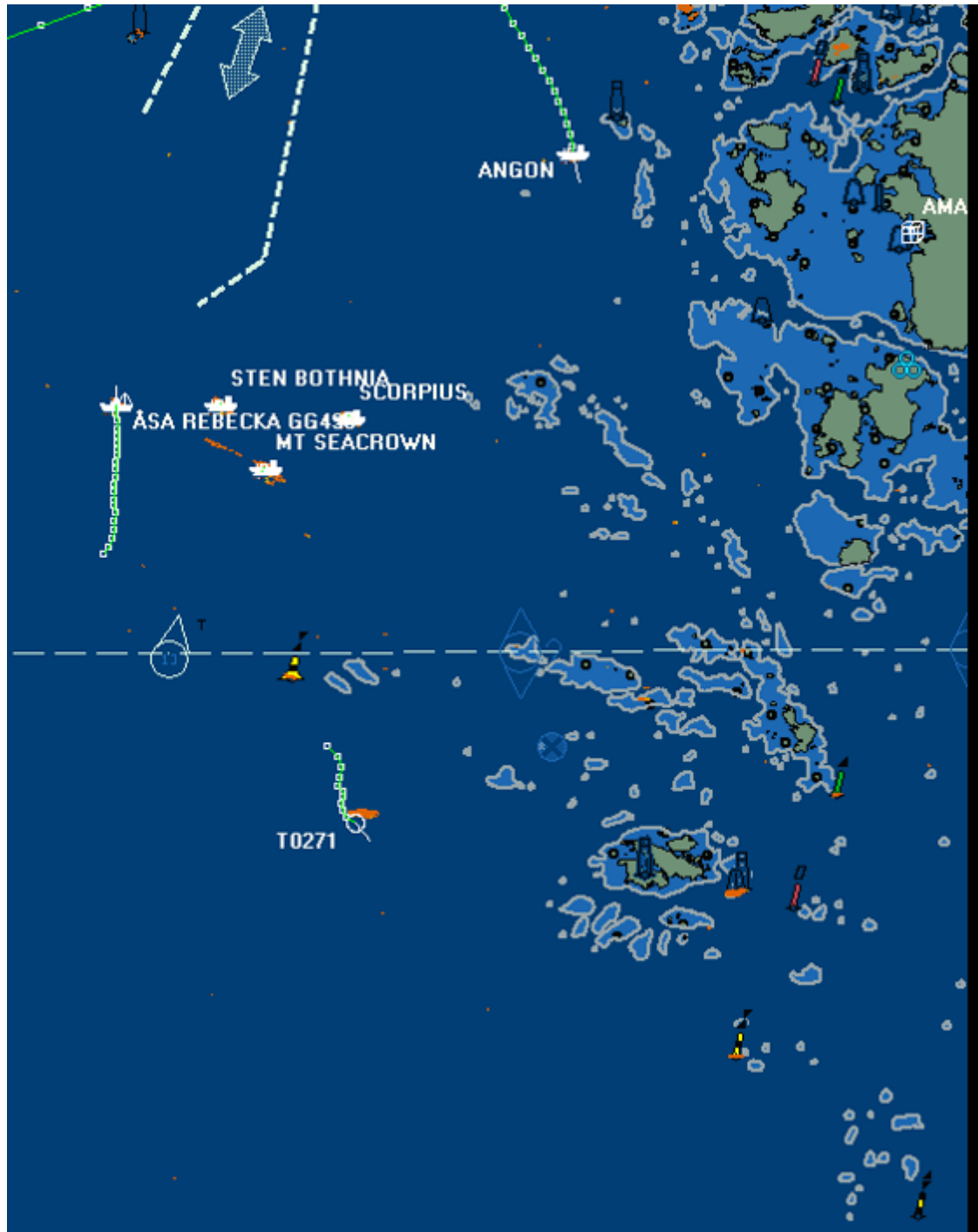


Picture 7 – VTS WC starts plotting the MARIA M at 2206 hours (T0271)

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The transverse, broken line in the centre of the picture shows the south border of VTS Gothenburg (part of VTS WC).



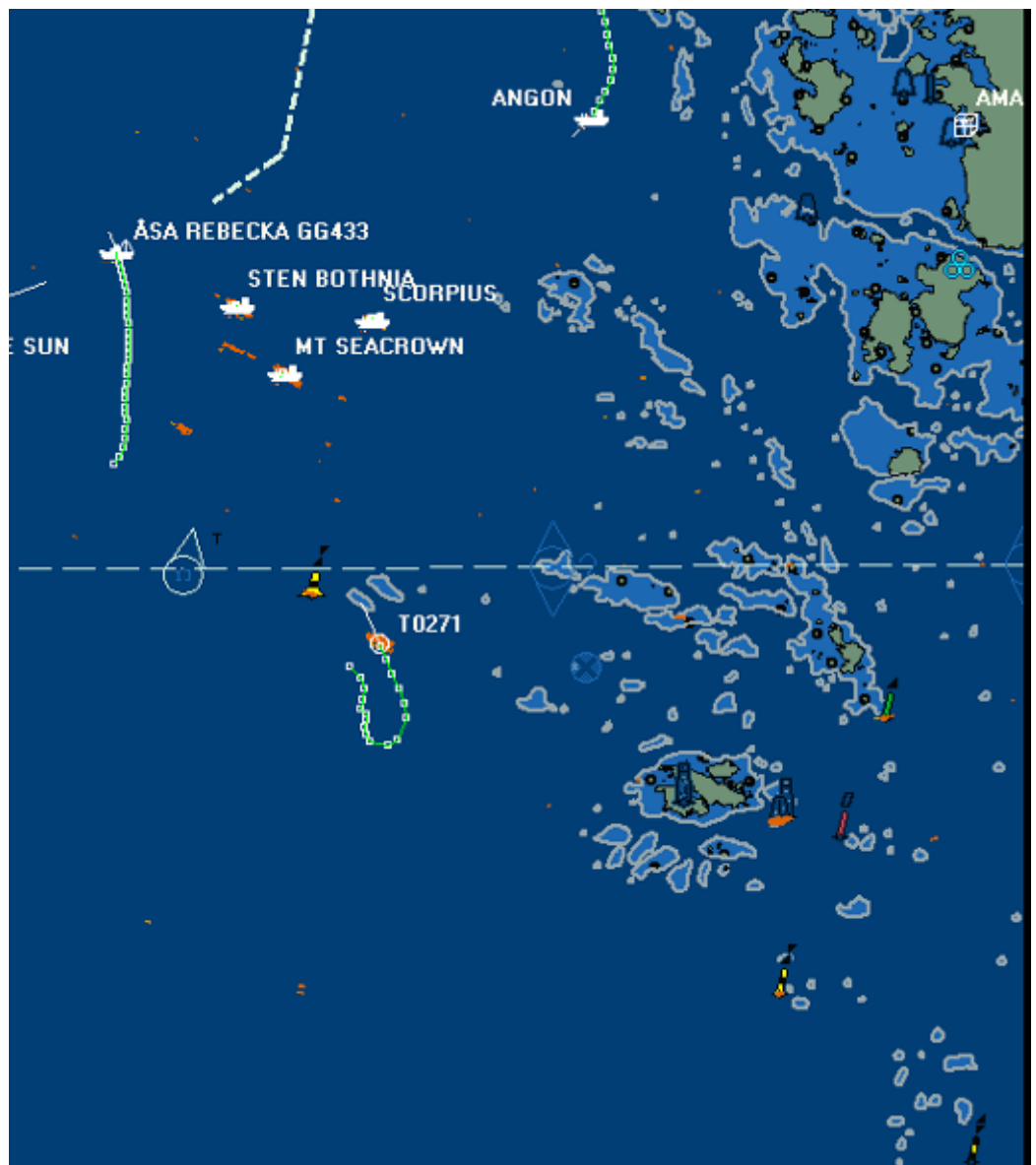
Picture 8 – Screen dump from at about 2216 hours (T0271)

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At 2219 hours the MARIA M was brought to course 348° by a number of rudder and engine manoeuvres and in the latest 6 minutes the engine power was increased from stop to 90 %. The course was set to a point just west of anchorage “C” but was heading straight across the Vanguards ground, where the minimum depth was 5.4 metres according to the Swedish chart, a fact which was obviously not noted on board.

The chief officer had gone to the forecandle, preparing for anchoring. At 2222 hours he reported that the port anchor was ready to let go.

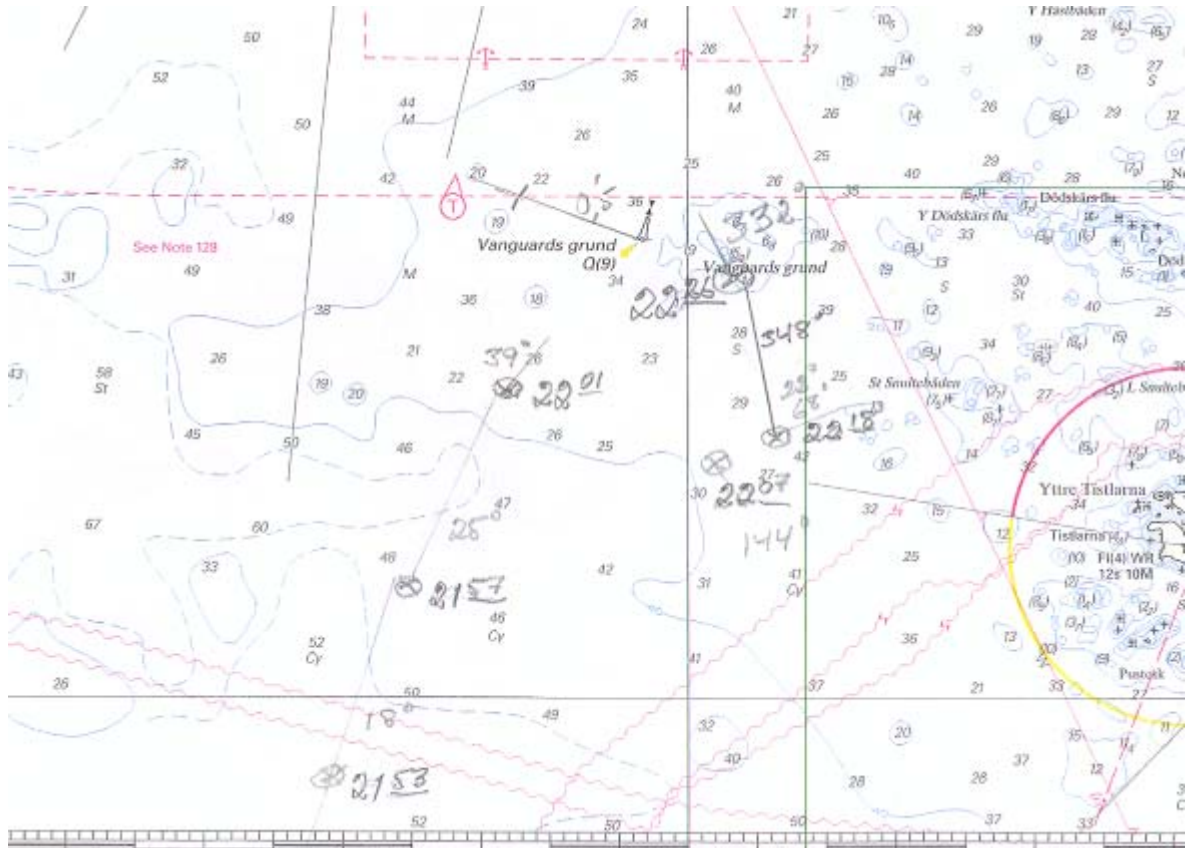


Picture 9 – Screen dump from the VTS at 2224 hours (T0271)

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Four minutes later, at 2226 hours, the *MARIA M* run aground on Vanguards ground in position N 57°31'.63 E 011°40'.30. The course over ground at that moment was 332° and the speed 6.7 knots.



Picture 10 – Positions and courses noted by the investigator in Swedish chart No. 931. In the centre of the upper part of the picture anchoring area "B" shows. Anchoring area "C" is located 3,8 M north of Vanguards ground.

3.2 After the grounding

The chief officer on the forecastle called to the master on walkie-talkie that the ship had run aground.

The chief officer also told the master that ballast bottom tank No. 1 to starboard had sprung a leak (at contact with the MRCC the crew denied this by the master's order).

At 2238 hours, 12 minutes after the grounding, the *MARIA M* called VTS Göteborg and informed about their grounding and stated her position. The VTS asked the ship to repeat her position.

At 2245 hours the engine was stopped after a number of engine manoeuvres, all of which forward. Three minutes later the engine was reversed at a power of 47 %. This manoeuvre lasted for 20 seconds, and then the engine was stopped with no change in the position. The draught after the grounding was 8.10 metres fore and 11.0 metres aft.

The ship-owner engaged Smit Salvage, established in Rotterdam, Holland, for the salvation work. A group of ten persons from that company arrived at the disabled ship on 15 July.

While the ship was still aground thorough diversings were made by Smit Salvage in order to determine the extent of the damage. The diversings were started in the evening of 15 July and were finished by two diversings on 16 July. The diving and video equipments used were rented by Smit Salvage from the Swedish Coast Guard.

To take the MARIA M afloat she was lightened of about 7500 tons of cargo to the tanker Bro Provider, engaged for this purpose.

On 18 July at about 1320 hours the MARIA M was afloat and, assisted by two tugs, proceeded by own engine to berth 800 at Torshamnen in Gothenburg, where additional diving inspections were carried out.

After having discharged all her cargo and with an approval from the Classification Society the MARIA M sailed from Gothenburg on 22 July for a single voyage to Poland for repair of her damage.

4. Damage

At diversings while the ship was still aground it was found that No. 1 starboard side tank had got a hole, about 3 x 1.5 m. A crack in the forepeak of about 1.5 m was also noted.

No personal injury or damage to the environment are known to have arisen.

5. Analysis

5.1 Rudder position indicator and turning rate

When the master came to the bridge to take the ship to the anchorage area 6 hours had passed since the former master had left the ship. The third officer and one AB were on watch.

The MARIA M was then on a course which led 0.5 M west of Vanguards ground and which headed straight to anchorage area "C".

After the master had arrived at the bridge he obviously took the command without expressly informing the OOW.

The first order that the master gave to the helmsman was 10° rudder angles to starboard and to port by turns. Two minutes after the first order the master is heard to tell the helmsman "starboard not port", which was confirmed by the helmsman. The rudder was then 10° to starboard but the ship turned to port.

The investigator has not managed to get the information from the master why he started the rudder manoeuvring at this early stage.

From the VDR recording it is not evident why the master chose to give various orders to the helmsman, but it is possible that he wanted to find out how the ship responded to various rudder commands, since he had recently signed on the MARIA M.

The two indicators for rudder position and turning rate (see picture 11) were located at a distance of about one metre from one another under deck on the front edge of the bridge. The turning rate was shown by an arrow which pointed to starboard at turns to starboard, and to port at turns to port. A quicker turning rate was shown by a greater deflection of the arrow. The turning rate indicator could thus show turning to port although the rudder was to starboard, and vice versa.

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Picture 11 – View over the front edge of the bridge with the indicators showing rudder position and turning rate.

The master discussed the indicator with the third officer as well as the chief officer. It seems as if he confused rudder position and turning rate, since from the VDR sound recording one gets a definite impression that the master interpreted the deflection on the turning rate indicator as showing the rudder position.

It is true that the master had been on board for a couple of days, but he had been the master in charge only for a few hours.

This indicates that the master was just unfamiliar with the instruments, which gives a possible explanation to the strange manoeuvring.

5.2 Cultural factors

The master was of Italian nationality, 66 years old. He was in general experienced with many years as a marine officer. The knowledge and how the instruments functioned on the bridge of the *MARIA M* seems to some extent have been imperfect.

The OOW was a 31 year old Philippin third officer, who had been on board and on watch duty for a little more than 3 weeks. He had probably

quite good knowledge about the equipment on the bridge, but he was inexperienced as an officer.

The chief officer, who was summoned to the bridge, was 38 years old, and of Philippine nationality. He was apparently familiar with the functions of the equipment in question.

The sound recording on the VDR indicates that the master was a man with authority and a commanding presence who, on at least two occasions, called someone on the bridge an idiot. The suspicion about these characteristics was increased at the visit on board by the investigator while the ship was still aground.

One also gets an impression of an unobtrusive third officer, who indeed was familiar with the function of the instruments, but who probably due to difference in age and out of respect, was not willing to question or rebuke his master. Also this impression from the VDR was increased at the investigator's visit on board.

Consciously or unconsciously, the Italian master with his authority did obviously not take in the information and knowledge from his Phillipino officers about the equipment on the bridge.

It is quite a known fact that an inexperienced officer more or less stops taking an active part in the navigation when the master comes to the bridge and "takes the command", especially when the master is of the dominant type. The purpose of the BRM-courses, in which the master has participated, is to increase the co-operation on the navigation bridge. In all probability the situation on board the MARIA M was such that when the master asked about distances and courses the deck officer gave them without considering possible obstacles on the way.

5.3 VTS

VTS West Coast (Gothenburg) were obviously aware of the fact that the MARIA M would come into the area and bunker in anchorage area "C". This is apparent from the conversation when the ship reported its arrival just before the manoeuvring of the ship could be questioned.

During the 20 to 25 minutes when the MARIA M so obviously was out of her course with substantially reduced speed there were no calls from the VTS. During the last 7 minutes before the grounding she was on a course leading straight towards Vanguards ground, and on the wrong side of the buoy. The VTS had plotted the ship on the radar screen and could there clearly see the strange navigation.

The MARIA M was for sure all the time just outside the reporting area of the VTS but, especially since the ship was plotted, the manoeuvring should have led to an inquiry from the VTS if everything was alright on board.

In spite of the fact that the MARIA M had been plotted on their radar screen, the VTS felt called upon to ask the ship to repeat her position when she, 12 minutes after the grounding, called the VTS to inform about the accident.

6. Causes and factors

The immediate reason for the grounding was the fact that the ship got out of its original course due to a number of rudder and engine manoeuvres on the master's order, and for this reason ended east of the Vanguards ground buoy.

Since no technical faults or deficiencies have been noted after the grounding it is not probable that technical equipment was the reason for the accident.

However, a number of human factors are likely to have had a negative influence on the course of events, such as

- the master had recently signed on and was thus not familiar enough with the equipment on the bridge;
- the master took command on the bridge without expressly informing the OOW;
- the master had a problem in taking in the information from the officers on board about the bridge equipment and its functions;
- the master's authority and manner on the bridge may have had the effect that the third officer chose not to question the master, in spite of the fact that he knew about Vanguards ground.

7. Recommendations

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The Maritime Department of the Swedish Transport Agency recommend the Swedish Maritime Administration to consider entering in the VTS-routines that all ships plotted on the VTS operator's radar screen (i.e. those ships that the operator actively has acknowledged) should be regarded as being inside the VTS area, no matter where they are.

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The Maritime Department of the Swedish Transport Agency recommend ship owners, in accordance with the ISM Code part A 6.3, to ascertain that routines are followed when it comes to checking that new signed-on crew fully understand and are familiar with their place of work and their tasks.

8. Observations

At the investigator's visit on board and from the VDR recording it can be stated that the master's knowledge in the English language is insufficient. This in combination with crew members from other countries and cultures on board may have caused misunderstandings and uncertainties.

Ship owners having various nationalities on board their ships are urged to ascertain that all crew members have good knowledge in the working language on board before they sign on.

At 2204 hours the master questioned why the ship continued its turn to starboard although he had ordered hard to port. It is possible that he, in this situation which he may have felt stressful, did not remember that he had reduced the speed and thus lost part of the effect of the rudder.



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