STATE COMMISSION ON MARITIME ACCIDENT INVESTIGATION

FINAL REPORT 54/14

Marine Casualty

M/V MARICHRISTINA

Grounding of the vessel while approaching the Świnoujście anchorage
on the day of 11 December 2014

December 2015

The examination of the accident of Marichristina was conducted under the State Commission on Maritime Accident Investigation Act of 31 August 2012 (The Journal of Law item 1068) as well as norms, standards and recommended procedures agreed within the International Maritime Organisation (IMO) and binding the Republic of Poland.

The objective of the investigation of a marine accident or incident under the above-mentioned act is to ascertain its causes and circumstances to prevent future accidents and incidents and improve the state of marine safety.

The State Commission on Maritime Accident Investigation does not determine liability nor apportion blame to persons involved in the marine accident or incident.

This report shall be inadmissible in any judicial or other proceedings whose purpose is to attribute blame or liability for the accident referred to in the report (Art. 40.2 of the State Commission on Maritime Accident Investigation Act).

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1. Facts

On 10 December 2014 at 23:46 the vessel "Marichristina" approaching the Reda Buoy from the north reported to the VTS Świnoujście the estimated time of arrival (ETA) at the pilot's position and basic information about the vessel, including its draught, which was 12.80 m (even keel). The VTS operator warned the vessel against going into the area of shallow water, and recommended that it should approach Świnoujście by a deep water channel.

Despite the warning, the vessel was continuing its journey without changing the course and at 00:27 on 11 December 2015 ran aground about 2 nautical miles south of the Reda Buoy.

For the next 2.5 hours the crew were sounding depths around the vessel, checking the state of the ballast tanks, and the master was undertaking several attempts to refloat the vessel by going astern. The attempts to refloat the vessel proved ineffective. The crew found no damage or leaks in the hull of the vessel.

At approximately 03:50 as a result of wind and waves the vessel regained buoyancy. After approximately 25 minutes, the crew noticed the drift of the ship. The main engine was prepared and started and then the vessel was turned back to the Reda Buoy.

The watch officer notified the VTS about a refloating of the vessel. The master turned the vessel to the north to enter deeper water and to approach the anchorage No 3 from the west (SWIN-N Buoy).

At 8:30 the vessel dropped anchor at anchorage No. 3.

2. General information

2.1. Ship particulars

Vessel's name:	Marichristina
Flag:	Malta
Owner:	Marichristina Shipping Company Ltd
Classification society:	Lloyd's Register
Vessel's type:	bulk carrier
Call signal:	9HWT9
Year of built:	2001
Power:	11 110 kW
Width:	32.26 m

Length overall:	224.90 m
Hull material:	steel
Minimum crew:	14 men

Photograph 1: Marichristina

2.2. Voyage particulars

Ports en route:	Mobile, Alabama (USA)
Port of destination:	Świnoujście
Type of navigation:	unlimited
Cargo information:	62 906 tons of coal
Manning:	3 Ukrainians, 16 Filipinos
Passenger information:	no passengers

2.3. Accident information

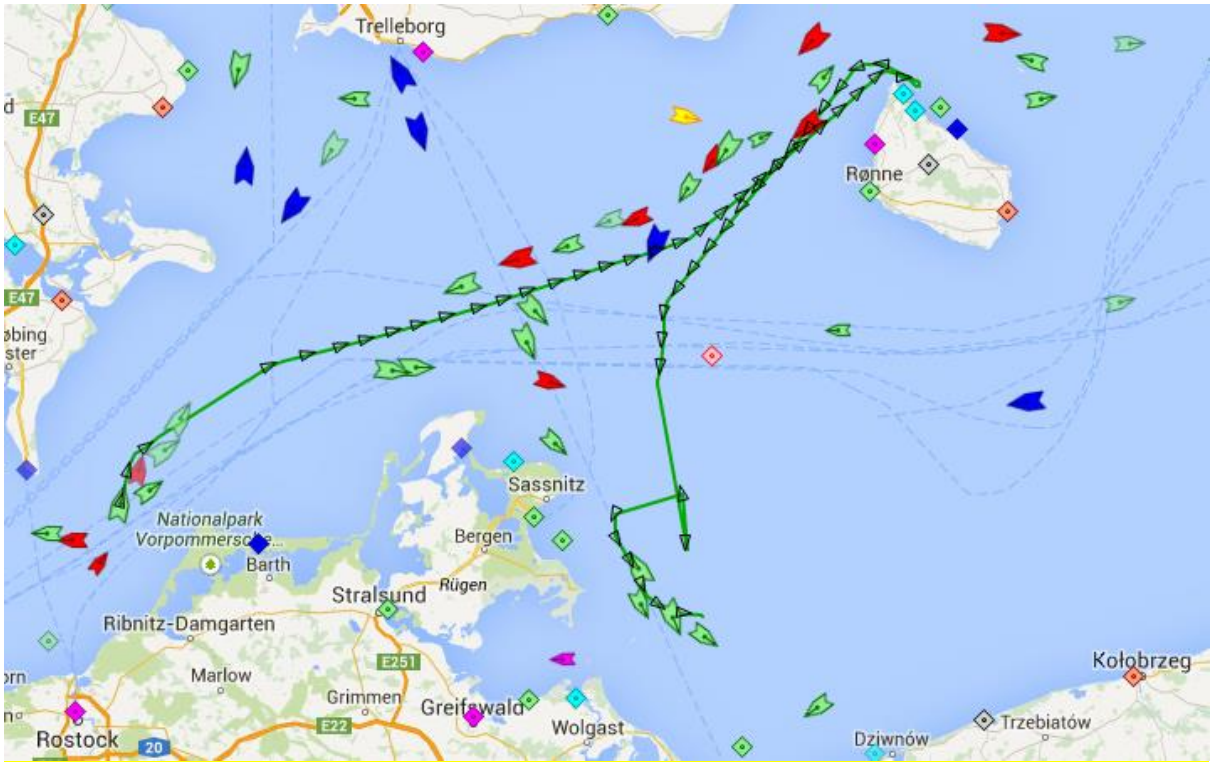
Kind:	marine casualty
Date and time of the event:	11.12.2014 at 00:27 LT (23:27 UTC)
Geographical position of the event:	φ=54º 24,4'N ; λ=014º 05,6'E;
Geographical area of the event:	2 NM south from the Reda Buoy
Nature of the water region:	the Baltic Sea, the Bay of Pomerania
Weather during the accident:	wind SW 7º B, sea state 6, good visibility
Operational status of the vessel during the event:	loaded vessel – cargo of coal
Effects of the accident to the vessel:	no damage to the vessel

2.4. Shore services and rescue action information

Neither the rescue action has been conducted nor the assistance of shore services required.

3. Circumstances of the marine Accident

While entering the Baltic Sea on 10 December 2014, two maritime pilots from the Skagen Pilot Station (Denmark) embarked the "Marichristina". They were to lead the vessel through the Danish Straits and disembark at the Gedser Pilot station as scheduled. However, the weather conditions prevented the pilots from leaving the vessel at Gedser. After a few hours of deviation the pilots disembarked the vessel not before it passed the northern tip of Bornholm and sheltered at the eastern side of the island (east of the Hammer Odde lighthouse).



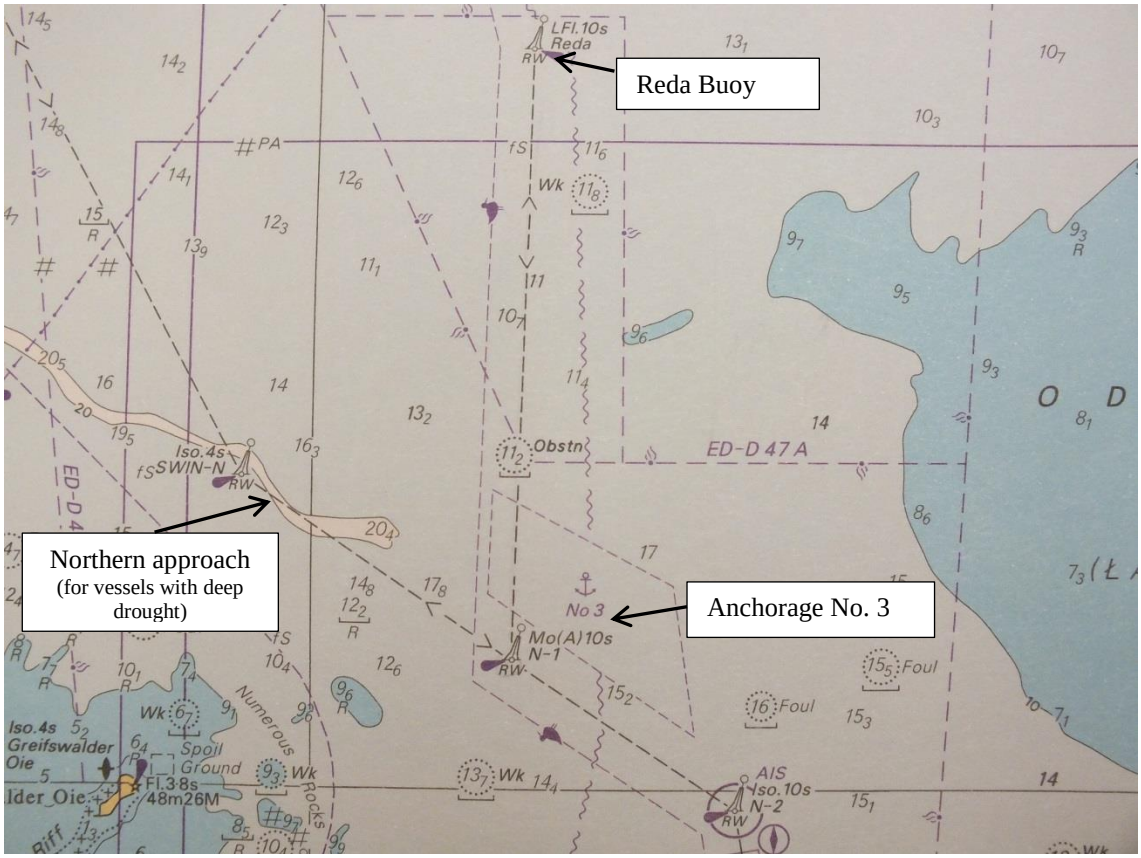
Annex 1: Recording of the vessel's movement registered in the Marine Traffic application based on the AIS signal

After the Danish pilots had disembarked, the vessel first headed to the west and then to the south towards the Reda Buoy, returning to the route which had been laid down on the voyage plan. While approaching the Reda Buoy the vessel made contact with the pilot station in Świnoujście at 23:42 and informed about the expected time of arrival at the roadstead. The

pilot station advised about the need to go to the anchorage because of low water in the port and to wait for the water level to raise.

At 23:46 the vessel made contact with the VTS Świnoujście. The watch officer informed the pilot station about the ETA at 00:30 and submitted the required information about the vessel, including maximum draught of 12.8 m (the vessel on an even keel).

When the VTS operator saw on the radar screen that the vessel was sailing on the fairway leading directly from the Reda Buoy to the anchorage No. 3, he warned the vessel at 23:49 that it was going into area of shallow water and advised the crew to check the depth on navigational charts they were using; also he recommended that the vessel should approach Świnoujście by a deep water route and then drop anchor at the anchorage No. 3. The watch officer confirmed that he would check the charts and that the vessel should go by a deep water route.



Photograph 2: Part of the BA 2150 chart – northern approach to the Bay of Pomerania

At. 23:55 the vessel changed from sea speed to full manoeuvring speed (66 rpm). The master ordered the boatswain to prepare the anchors. The vessel was sailing with the speed of approximately 10.9 knots by a southerly course leading to shallow water where the depth at places was as small as 10.7 m and there was a single obstacle at the depth of 11.2 m (Photograph 2).

At 0:15 the speed of the vessel dropped to 3.5 knot. At approximately 00:27:22 the vessel stopped. The crew did not feel that the vessel ran aground. Nothing but the lack of speed on the indicators was observed.

At approximately 00:30 when the VTS operator saw on the radar screen, that the vessel had stopped, he called it out and asked about the reason for stopping. The watch officer replied (repeating after the master who was standing next to him on the bridge), that the vessel stopped "*because of the shallow water*".

At 00:36 the watch officer at the command of the master called out the VTS Świnoujście and reiterated that the vessel "*stopped because of the shallow water*". He informed that the crew would conduct surveys of depth around the hull. The VTS operator accepted the information and asked for confirmation that he had previously warned of the shallow water in front of the vessel on its course and recommended that the vessel should have kept the deep water route. The watch officer confirmed and repeated after the master that it was so and that "*the vessel was approaching by a deep water route*".

Between 00:39 and 03:01 the master attempted several times to refloat by working astern but his attempts proved ineffective. At that time, the vessel was swinging under the influence of a strong, south-western wind: first to the east (changes of HDG from 180º to 057º), and then back to the west (changes of HDG from 057º to 310º) while drifting (on the bottom) into the north-eastern direction.

The master informed the company (operator) that the vessel had been approaching the port in accordance with the voyage plan through a deep water route "*under the surveillance of Polish VTS*" and had touched the ground at a distance of 7 nautical miles from the port where the chart showed the depth of 13.1 m.

At 01:36 the watch officer of "Marichristina" called out the VTS Świnoujście and confirmed that the ship grounded and reported that the crew was sounding the depth around the ship, and asked to inform the PSC of this fact.

At 01:50 at the order of the company's representative given in the telephone conversation, the master attempted to refloat the vessel by working the engine *half astern* for a few minutes. The attempt was unsuccessful.

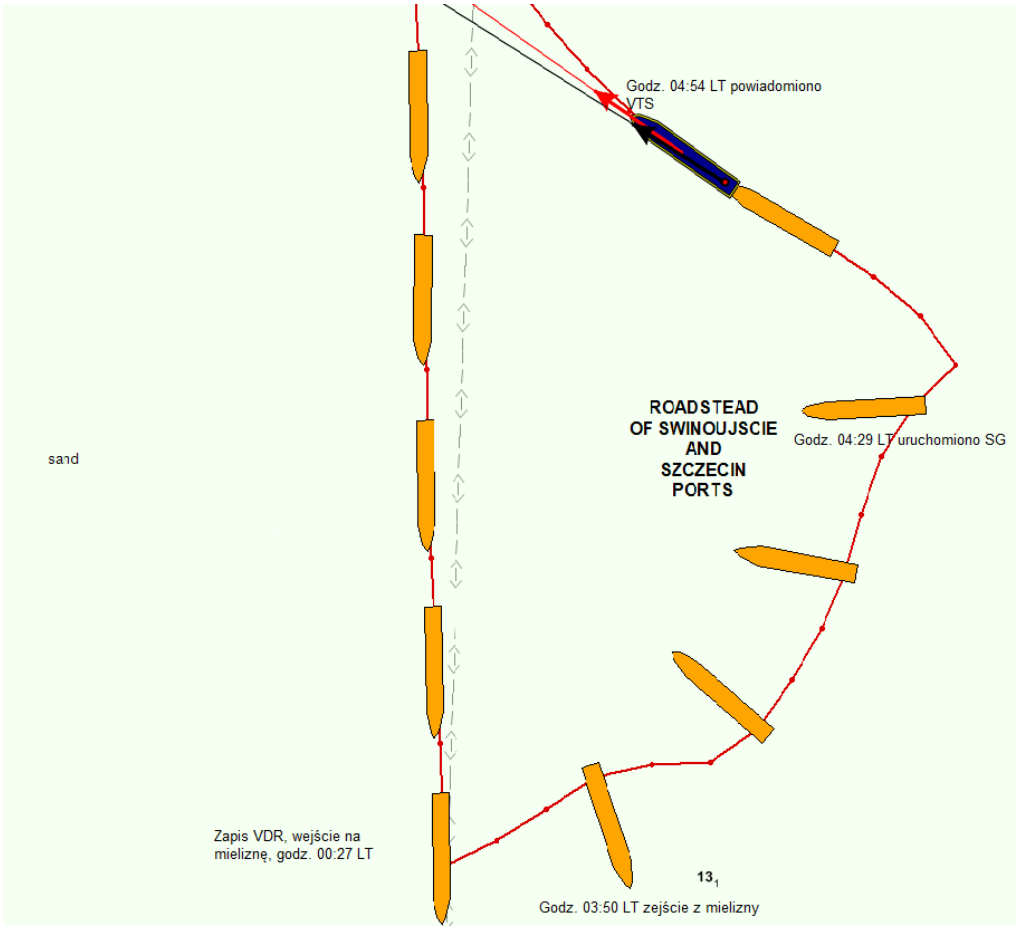
At approximately 02:30 the soundings were completed. On the basis of a sketch of soundings made by the crew it was found that the hull of the vessel was leaning on the ground at the level of the Hold no 2, on the port side (at that point the sounding showed 12.75 m). To make sure that there was no damage to the double bottom tanks on the port side, they were opened and checked for tightness and possible deformations.

At 3:01 the attempts to refloat the vessel were discontinued. The ME was turned off. A strong south-western wind and waves from that direction pushed the vessel's hull at 03:50 to deeper water and she regained buoyancy. The crew noticed the fact that the vessel refloated and regained buoyancy at 04:13.

At 04:29 the ME was started. After 3 minutes, the master began to swing the vessel and steering it out of the shallow water back to the north in the direction of the Reda Buoy.

At 4:43 the master informed the operator about pushing the vessel off the shallows by the wind and of the attempt to reach the anchorage by going back to the north to avoid shallows where the vessel had gone aground.

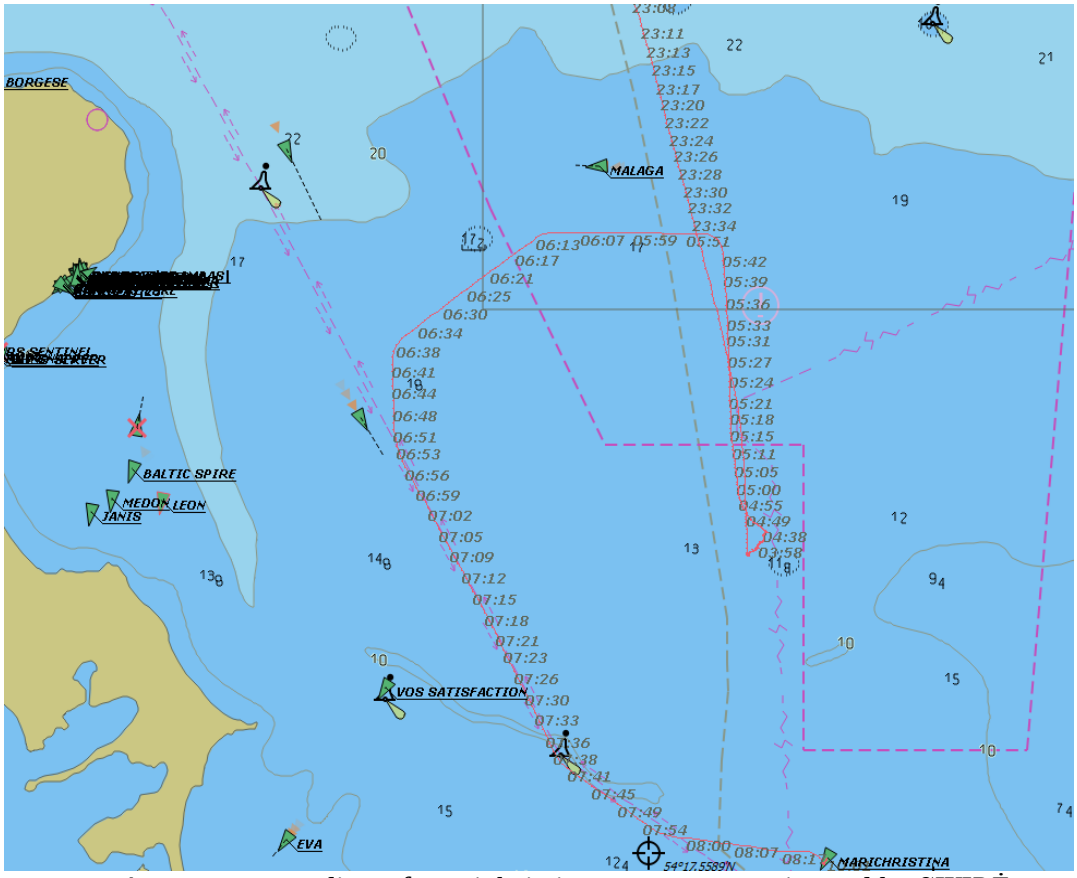
At 4:54 the watch officer of "Marichristina" reported to the VTS that the vessel refloated on her own and now she was trying to go north off the area where she was stopped and then she would go by the approach fairway west of the SWIN-IN Buoy and to the anchorage No. 3.



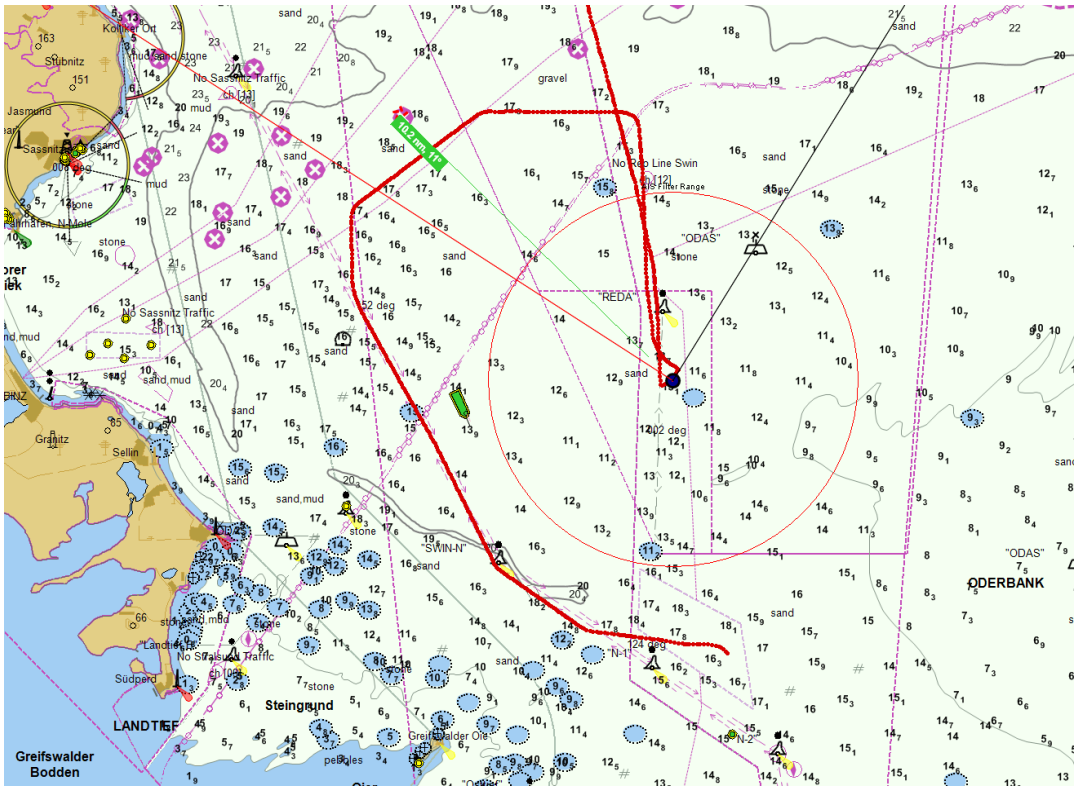
Annex 2: Recording of the vessel's movement before entering the shallows and after refloating taken from the ship's VDR using the NavCruiser Pro application (electronic chart DE316004.000 Waters East of Ruegen)

At. 8:30 the vessel dropped anchor at the anchorage No. 3 at the position of φ = 54º 17.3 'N, 014º 08.7' E. At first 5 shackles were dropped and then 7 shackles on board were loosened.

At 8:36 the vessel reported to the VTS Świnoujście that she had anchored.



Annex 3: Recording of Marichristina movement registered by SWIBŻ



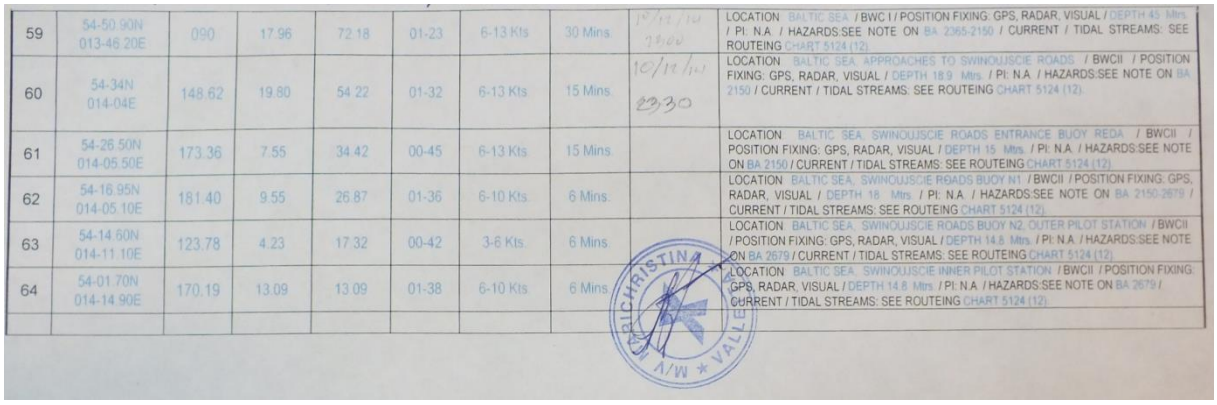
Annex 4: Recording of the vessel's movement from the ship's VDR using the NavCruiser Pro application (electronic chart Waters East of Ruegen DE316004.000)

After 2 days at anchor, on 13 December 2014 the vessel berthed in the port of Świnoujście. The draught of the vessel on arrival was 12.57 m at the bow and 13.06 m at the stern. The vessel passed the PSC inspection and the inspection done by the Lloyd's Register, the vessel's class and she was considered seaworthy.

4. Analysis and comments about factors causing the acccident with regard to results and expert opinions

The voyage plan of "Marichristina" from Mobile, Alabama (USA) to Świnoujście was prepared on 20 November 2014 in the loading port of Mobile. The plan was prepared by one of the two 2nd officers[1] (the so-called navigator officer) and accepted by the master of the vessel.

The final phase of the voyage is presented in a copy of the last page of the voyage plan shown on Photograph 5. The waypoint no 59 indicates the position where the vessel turned in the direction of the Bay of Pomerania after passing Arkona, while the waypoint no 64 is the position of the pilot at the roadstead of Świnoujście.



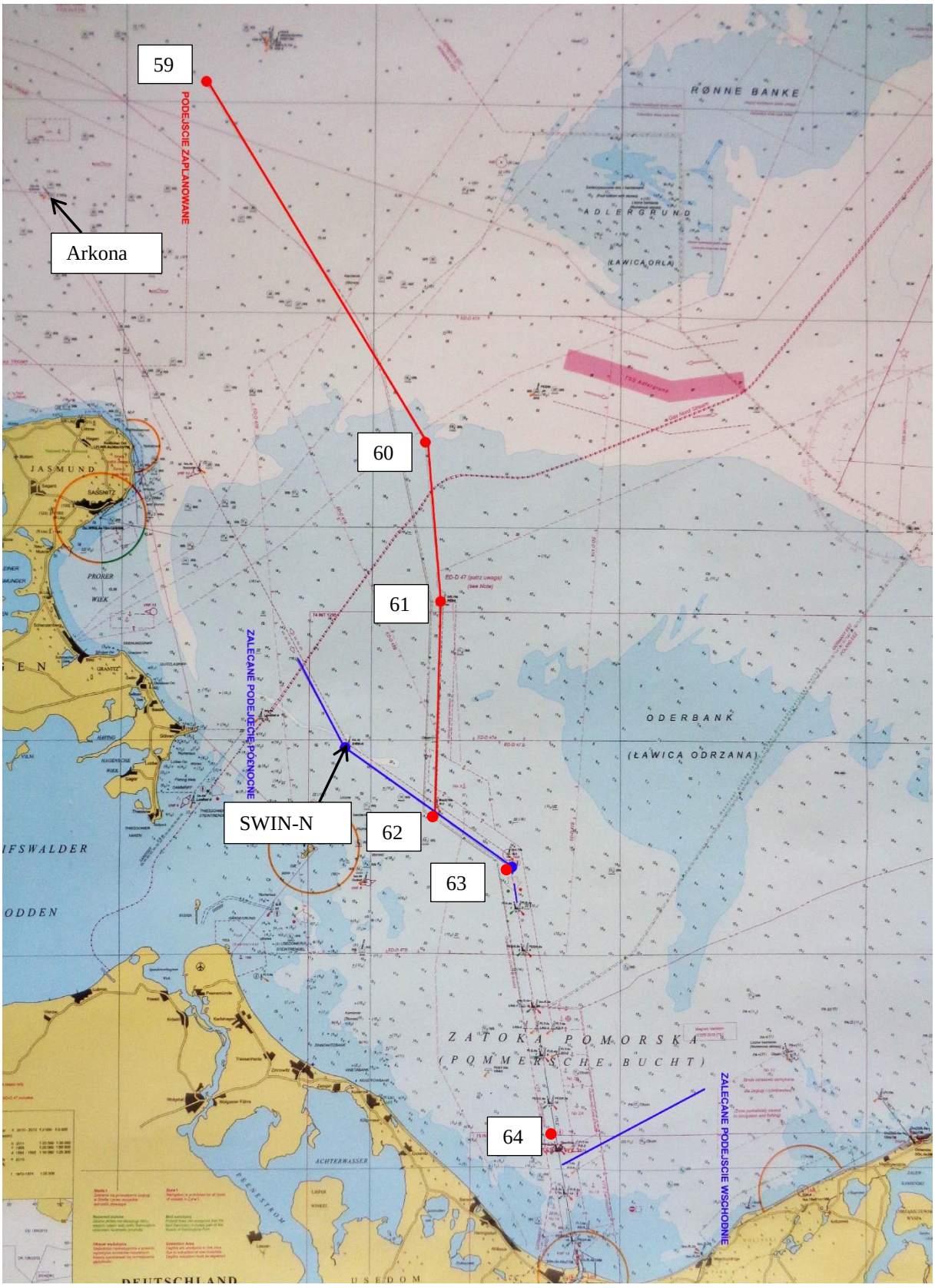
59	54-50.90N 013-46.20E	090	17.96	72.18	01-23	6-13 Kts	30 Mins.	12/12/14 2400	LOCATION: BALTIC SEA / BWC I / POSITION FIXING: GPS, RADAR, VISUAL / DEPTH 45 Mtrs. / PI: N.A. / HAZARDS:SEE NOTE ON BA 2365/2150 / CURRENT / TIDAL STREAMS: SEE ROUTEING CHART 5124 (12).
60	54-34N 014-04E	148.62	19.80	54.22	01-32	6-13 Kts	15 Mins.	13/12/14 2330	LOCATION: BALTIC SEA, APPROACHES TO SWINOUJSCIE ROADS / BWCII / POSITION FIXING: GPS, RADAR, VISUAL / DEPTH 18.9 Mtrs. / PI: N.A. / HAZARDS:SEE NOTE ON BA 2150 / CURRENT / TIDAL STREAMS: SEE ROUTEING CHART 5124 (12).
61	54-26.50N 014-05.50E	173.36	7.55	34.42	00-45	6-13 Kts	15 Mins.		LOCATION: BALTIC SEA, SWINOUJSCIE ROADS ENTRANCE BUOY REDA / BWCII / POSITION FIXING: GPS, RADAR, VISUAL / DEPTH 15 Mtrs. / PI: N.A. / HAZARDS:SEE NOTE ON BA 2150 / CURRENT / TIDAL STREAMS: SEE ROUTEING CHART 5124 (12).
62	54-18.95N 014-05.10E	181.40	9.55	26.87	01-36	6-10 Kts	6 Mins.		LOCATION: BALTIC SEA, SWINOUJSCIE ROADS BUOY N1 / BWCII / POSITION FIXING: GPS, RADAR, VISUAL / DEPTH 18 Mtrs. / PI: N.A. / HAZARDS:SEE NOTE ON BA 2150/2679 / CURRENT / TIDAL STREAMS: SEE ROUTEING CHART 5124 (12).
63	54-14.60N 014-11.10E	123.78	4.23	17.32	00-42	3-6 Kts.	6 Mins.		LOCATION: BALTIC SEA, SWINOUJSCIE ROADS BUOY N2, OUTER PILOT STATION / BWCII / POSITION FIXING: GPS, RADAR, VISUAL / DEPTH 14.8 Mtrs. / PI: N.A. / HAZARDS:SEE NOTE ON BA 2679 / CURRENT / TIDAL STREAMS: SEE ROUTEING CHART 5124 (12).
64	54-01.70N 014-14.90E	170.19	13.09	13.09	01-38	6-10 Kts	6 Mins.		LOCATION: BALTIC SEA, SWINOUJSCIE INNER PILOT STATION / BWCII / POSITION FIXING: GPS, RADAR, VISUAL / DEPTH 14.8 Mtrs. / PI: N.A. / HAZARDS:SEE NOTE ON BA 2679 / CURRENT / TIDAL STREAMS: SEE ROUTEING CHART 5124 (12).

Photograph 3: A copy of the last page of the Marichristina voyage plan

The analysis of the above plan shows that the crew have planned to approach Świnoujście, after exiting the Danish Straits by a deep water route (Route T and DW Route) and not by the route recommended in the sailing directions[2], marked on the charts as a *recommended track* (including the chart BA 2150 used by "Marichristina"), which leads from the Arkona Buoy to the SWIN-N Buoy (Photograph 4), and designed for vessels with deep draught. They planned to take the route intended for ships going directly from the north (from the ports of southern

[1] There were two watch officers employed on equivalent positions of a 2nd officer on the crew list of "Marichristina".
[2] Admiralty Sailing Directions, Baltic Pilot, Volume 1 (NP 18) Chapter 13.211, Volume 2 (NP 19) Chapters 8.15 and 8.201.

Sweden, for example Ystad, or those using the TSS in Bornholmsgat) to Polish ports in Szczecin or Świnoujście, with a draught smaller than that of "Marichristina".



Photograph 4: Marichristina route planned by the crew (red line) and two approach routes recommended by sailing directions (blue lines)

The approach planned in such a way, particularly its part between the waypoints no 61 - 62, must have resulted in the grounding of the vessel with a draught of 12.8 m (according to the calculation of the crew, but in fact over 13 m) a few miles south of the Reda Buoy.

The navigator officer who has prepared the voyage plan, has indicated in its right column a wrong depth of 15 m at the waypoint no 61, and has not made a remark (has not checked) that the depth in the section between waypoints no 61 and 62 fell well below the draught expected for a vessel for approaching Świnoujście. In the opinion of the Commission, it was particularly reckless and unprofessional to mark the route of the vessel over the obstacle placed 11.2 m under water[3] (shown in the central part of Photograph 2).

The voyage plan of "Marichristina" was prepared by the crew inconsistently with the guidelines, developed by the vessel's operator (Company) and placed in the vessel's SMM. *Bridge Management Manual* in Section 3 (*Passage Planning*) states in the paragraph 3.1, inter alia, that "*the intended journey should be planned before the vessel sets to sea with the help of appropriate and available, improved charts and publications, and the master should check that the laid out route is safe*". In addition, par. 3.2 provides that "*the voyage plan should be prepared by one or two officers and checked by another one*" and that "*the master must approve it before its implementation*".

In the event of the voyage from Mobile to Świnoujście the plan prepared by the first 2nd officer has been checked neither by one of the remaining deck officers (i.e. another second officer or the first officer) nor by the master although he has signed it and put a vessel's stamp on it. If one of the above-mentioned persons had checked the headings of the vessel on its approach to Świnoujście, they would have noticed that they were marked on the water region with the depth insufficient for a vessel of "Marichristina" draught at the approach.

In the voyage plan there were missing two important elements for a safe journey of the vessel to which the Company drew its attention in the par. 3.9 of the SMM (*Squat and under clearance (UKC)*), i.e. the calculations concerning the degree of vessel's squat and under keel clearance. The Company requires to take into account in the voyage plan the effect of squat and indicates as obligatory the rule that the vessel should take into account, in addition to the calculated squat, a minimum value of under keel clearance (UKC), which should be 10% (on the approaches and shallow water) of the draught for vessels with a draught of more than 10 m. Therefore, for "Marichristina" whose draught was 12.8 m a minimum value of UKC is 1.28 m.

[3] This obstacle is distinctly mentioned in the Baltic Sea sailing directions: Admiralty Sailing Directions, Baltic Pilot, Volume 2 (NP 19) Chapter 8.190.

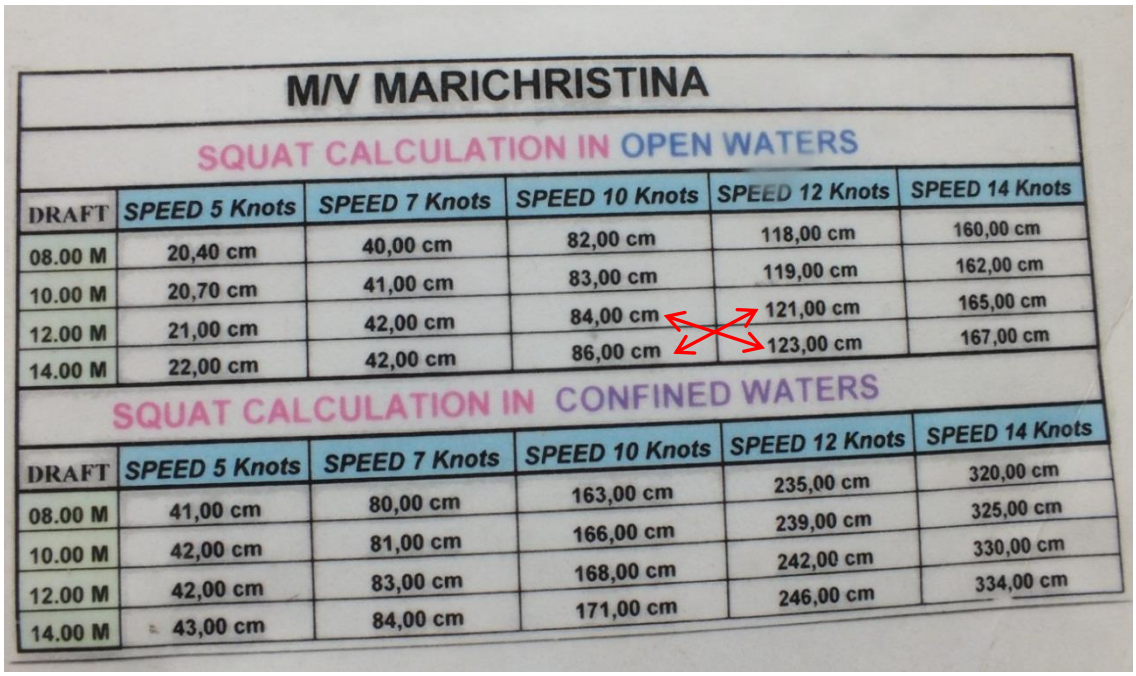
A squat of a vessel is usually calculated on the basis of simplified Barras' formulas. In the case of sailing in open waters the formula is the following:

$$\delta \max = \frac{Cb \cdot V_k^2}{100} \text{ [M]}$$

Where: C_b - block coefficient of the vessel and V_k - the vessel's speed in knots.

If we put into the formula the value of the coefficient $C_b = 0.842$ (calculated in accordance with the guidelines provided by the shipowner in the "Marichristina" SMM[4]) and the value of speed $V_k = 11$ knots, the value of maximum squat is: $\delta_{max} = (0.842 \times 11^2)/100 = 1.02$ m.

The crew of "Marichristina" has developed and posted on the bridge the squat calculation table for several selected operating speeds and several average values of the draught.



M/V MARICHRISTINA

SQUAT CALCULATION IN OPEN WATERS

DRAFT	SPEED 5 Knots	SPEED 7 Knots	SPEED 10 Knots	SPEED 12 Knots	SPEED 14 Knots
08.00 M	20,40 cm	40,00 cm	82,00 cm	118,00 cm	160,00 cm
10.00 M	20,70 cm	41,00 cm	83,00 cm	119,00 cm	162,00 cm
12.00 M	21,00 cm	42,00 cm	84,00 cm	121,00 cm	165,00 cm
14.00 M	22,00 cm	42,00 cm	86,00 cm	123,00 cm	167,00 cm

SQUAT CALCULATION IN CONFINED WATERS

DRAFT	SPEED 5 Knots	SPEED 7 Knots	SPEED 10 Knots	SPEED 12 Knots	SPEED 14 Knots
08.00 M	41,00 cm	80,00 cm	163,00 cm	235,00 cm	320,00 cm
10.00 M	42,00 cm	81,00 cm	166,00 cm	239,00 cm	325,00 cm
12.00 M	42,00 cm	83,00 cm	168,00 cm	242,00 cm	330,00 cm
14.00 M	43,00 cm	84,00 cm	171,00 cm	246,00 cm	334,00 cm

Photograph 5: The table of squatting developed by the Marichristina crew

After carrying out a simple interpolation of the values indicated in the successive columns with speed (10 and 12 knots) and the lines with draught (12 and 14 m) we receive the value of squat $\delta = 1.03$ m. The calculated value is almost identical to the one calculated according to the formula above. Therefore, without the need of using complicated mathematical formulas the officer who had been planning the voyage plan could easily determine from the table the magnitude of squat of the vessel at every stage of the voyage[5].

[4] The operator of the vessel gives in the par. 3.9.1 of the SMM the formula for calculating the block coefficient BC. BC = displacement/(LBP x width x draught x 1.025). Taking real dimensions of "Marichristina" and its operational state in the time of grounding and adjusting the formula to the conditions prevailing in the Baltic Sea, one can calculate: BC = 75994 /217 x 32.26 x 12.8 x 1.007 = 75994/90232.6 = 0.842.

[5] It must be stressed that in order to get a full picture of changes of the draught of a vessel in motion (the so called dynamic clearance corrections) the undulation correction should also be considered, which according to the British Admiralty equals 0,5 H_f [m], where: H_f = height of the wave in metres.

According to the guidelines of the operator, the information about both values, i.e. squat and UKC should be included in the voyage plan. Unfortunately, according to the plan shown in the Photograph 3, they have been omitted. This means that in the voyage plan (and consequently on the navigational chart) the information that the vessel should not enter the water region where the under keel clearance is less than 2.3 m (1.03 m squat + 1.28 m UKC) had not been included. This means, in other words, that the vessel should not enter the water regions with the depths less than 15 m (a rounded number, since: 12.8 m (draught) + 2.3 m (under keel clearance) = 15.1 m).

Laying out the courses leading from the Reda Buoy directly to the anchorage No. 3 was a violation of the internal regulations of the operator provided in the SMM and exposed the vessel to the risk of damaging the hull.

4.1 Human factors (fault and neglect)

The Commission have recognized that that errors committed by the officer preparing the voyage plan, the watch officer on duty on the bridge at the time of the accident, and the master of the vessel, had a decisive influence on "Marichristina" grounding. Both the master of the vessel and watch officers were following the voyage plan without the necessary analysis of the risks and navigational hazards on a designed route.

The master of the vessel after receiving information from the VTS Świnoujście about the risk of the shallow water in front of the bow did not reduce the ME setting (he did not reduce the speed of the vessel) and continued to keep the vessel on her southerly course leading to the shallow water. In addition, he did not check by himself the depth on the chart the ship was using but he relied on the opinion of the watch officer in that respect.

4.2 The influence of external factors, including those associated with the marine environment, on the accident

Considering the existence of external factors of the accident, the Commission considered information on the water level in the Bay of Pomerania contained in the sailing directions of the Baltic Sea. Section 8.165 of the sailing directions contains a warning about the possibility of lowering the water level of up to 1.3 m with SW winds[6].

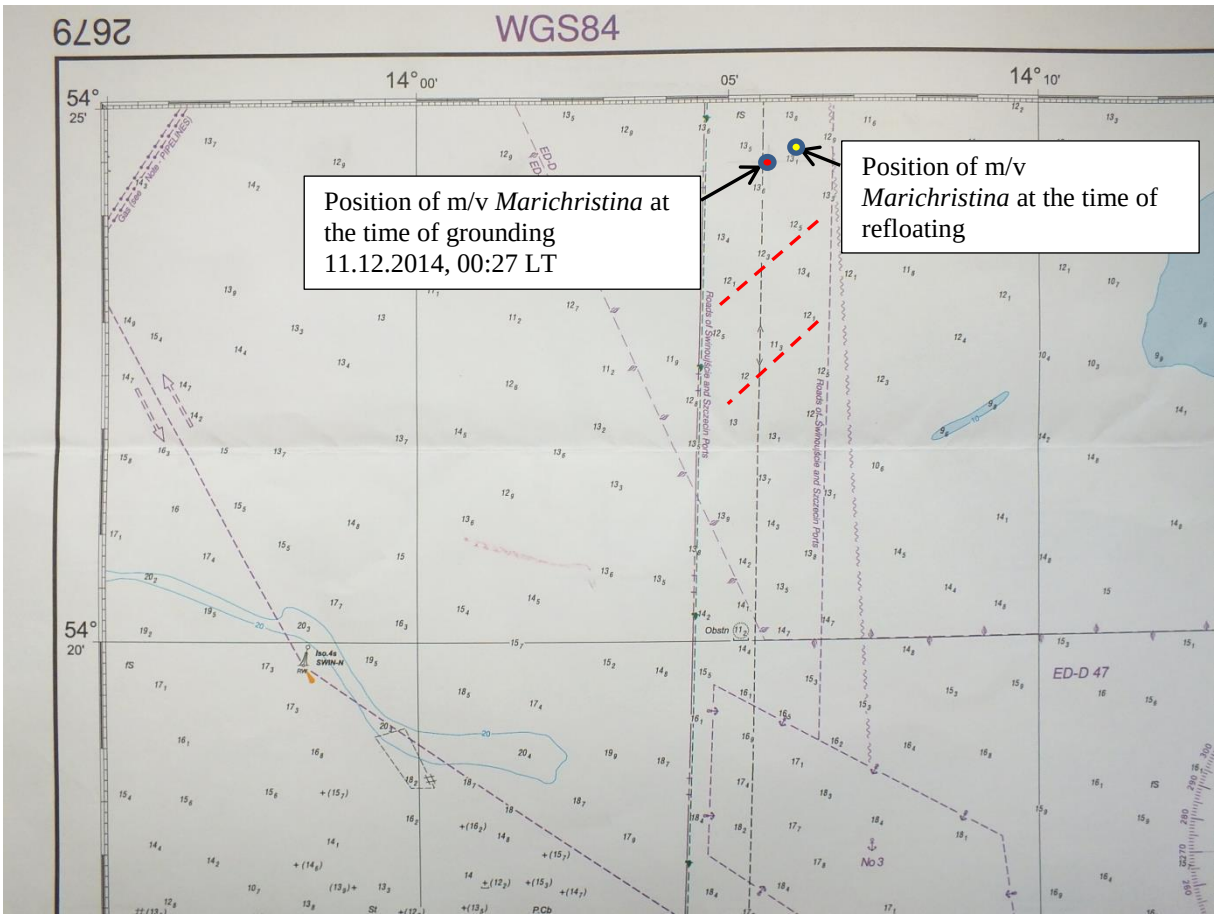
[6]Admiralty Sailing Directions, Baltic Pilot, Volume 2 (NP 19) Chapter 8.165. *The water level is generally raised with winds from the N and lowered with S winds. In autumn and winter the level may vary between 0,7 m above and below MSL. Gale force winds from NNE and NE may rise the water level by as much as 2.5 m and similar winds from SW may lower it as much as 1.3 m.*

On the day of the accident there was a south-western wind which caused the lowering of the water level in the port, which is why "Marichristina" could not enter the port but was directed to the anchorage. The lower level of water in the port meant that the level of water in the roadstead of Świnoujście and throughout the whole Bay of Pomerania was also lower.

The Commission has recognized however, that the lowering of the level of water on the designated route of the vessel from the Reda Buoy to the anchorage No. 3 had no effect on the accident. Even if the water level has not been lower than usual, the vessel going that way would have grounded anyway because the depths and shallows occurring in the remaining part of that section were significantly below the draught of the vessel.

The lower level of water on the day of the accident caused only that the vessel ran aground near the entrance, in the fore-part of the fairway (closer to the Reda Buoy) and not in its further part, but a contact with the sea bed or a serious grounding was inevitable.

In the Photograph 6 dotted red line indicates two thresholds, with depths accordingly of 12.5, 12.3, and 12.1 m and 12.1, 11.3, and 12 m which the vessel would not have been able to cross even if the level of water had been average.



Photograph 6: Part of the approach chart BA 2679 with marked positions of the vessel at the time of grounding and refloating and depth thresholds crossing of which was impossible for the vessel

The Commission has noted that the route from the Reda Buoy to the anchorage No. 3 at the roadstead of Świnoujście was described in the sailing directions of the Baltic Sea[7] as a route which could be used by vessels with deep draught but the depths shown on the passage charts and approach charts did not allow to use that route by vessels with a draught of more than 12 m.

The "Marichristina" stopped on a sandy sea bed of the Bay of Pomerania 2 nautical miles south of the Reda Buoy and was drifting (as indicated in the Photograph 6) under the influence of a strong wind, rubbing its bottom against the sea bed for nearly 2.5 hours, about 2.5 cable-lengths in a northeasterly direction, to the deeper water and regained full buoyancy. It was then a strong south-western wind which was an external factor helping the vessel to refloat.

5. Description of examination findings including the identification of safety issues and conclusions

The Commission has concluded that the cause of the grounding of the "Marichristina" on the approach to Świnoujście were the mistakes of the crew committed in preparation of the voyage plan, the master's failing to check the plan and the lack of control of watch officers over the vessel's courses and routes.

The vessel was equipped with an adequate set of navigational aids necessary for the proper approach to the port. She had appropriate charts, sailing directions, GPS, as well as ECDIS[8]. Despite this, the officer preparing the voyage plan (one of the two 2nd officers) had not analyzed the navigational hazards on the route laid out on the chart. The other 2nd officer had not done it either before or soon after taking the watch preceding the one when the accident happened. Also, the master of the vessel had not verified the plan nor made a passage conference with other officers before approaching the roadstead of Świnoujście, despite detailed guidelines included in the SMM. The voyage plan did not include any annotations about the accomplishment of a part of the voyage and its modification when the vessel deviated to Bornholm to leave the Danish pilots.

When the master received a warning from the VTS operator that the vessel was heading to the area of shallow water, he neither reduced the speed nor directed the vessel (having

[7] Admiralty Sailing Directions, Baltic Pilot, Volume 2 (NP 19) Chapter 8.190.

[8] The fact that the ECDIS system was not recognized on the vessel, according to the SOLAS Regulation V/18 did not exclude the possibility of using all available functions (e.g. *check route*) thanks to which the watch officer could check navigational hazards on the section which he was supposed to pass during his watch according to the voyage plan. ECDIS was used by the crew as a plain display of charts.

enough time and safe clearance to return) to the deep water channel recommended by the VTS. He was keeping the heading marked in the voyage plan (approximately 182º), which resulted in grounding of the vessel in a place where the depth marked on the chart was the same as the actual draught of the vessel, i.e. approx. 13.1 m.

After a detailed analysis of the data from the vessel's VDR, the Commission has concluded that just before and after the accident, the master felt certain that the vessel was going down the deep water channel which was mentioned by the VTS Świnoujście operator in his conversation with the watch officer when he had warned the crew about shallow water ahead of the vessel. The master repeated several times, also in the conversation with a representative of the vessel's operator, that the vessel was going according to the voyage plan and yet it grounded in a place where the depth on the chart was 13.1 m although the draught of the vessel was 12.8 m. Firstly, it shows that the master completely ignored the phenomenon of a squat of the vessel when in motion, secondly that the crew incorrectly calculated the draught of the vessel for the arrival (at the stern the difference was as high as 26 cm), and thirdly, that the master was not prepared for approaching an unfamiliar port, he did not analyze possible variants of the approach (recommended routes and approach fairways[9]), but he depended on the experience and expertise of the navigator officer. Such a situation may also indicate a lack of professional knowledge, or disregard by the master of the principles of good seamanship.

While the Commission has analyzed data from the voyage recorder it paid attention to the unprecedented behavior of the operator's representative, who ordered the master in a telephone conversation to try to refloat although the crew did not complete the sounding of the depths around the vessel. At that time it meant that they did not know which part of the vessel was stuck on the ground and how advanced it was. The Commission was alarmed by the fact that the master was so obedient to the command, instead of deciding by himself whether such an attempt could have been taken in the given conditions, specially that the vessel was swinging; going astern could have pushed the vessel deeper to the ground instead of refloating her.

By giving such a command to the master the representative of the operator violated the rule 34-1 of Chapter V of SOLAS (*Master's discretion*), which states that "*the owner, the*

[9] In the Admiralty Sailing Directions, Baltic Pilot, Volume 2 (NP 19) Chapter 8.201 there is the following remark: "*Deep-draught vessels should keep strictly to the leading line in order to remain within the dredged channel. From the vicinity of the SWIN-N Light Buoy (safe water) (54º19',8N 13º58',2E) the recommended route leads initially SE for 9 miles, passing the N-1 Light Buoy (safe water), to N-2 Light Buoy (safe water). Thence the route, marked by pairs of light buoys (lateral) and light buoys (safe water), leads SSE for approximately 19½ miles.*"

charterer, the company operating the ship as defined in regulation IX/1, or any other person shall not prevent or restrict the master of the ship from taking or executing any decision which, in the master's professional judgement, is necessary for safety of life at sea and protection of the marine environment".

Insofar as the Commission does not see in this case the possibility of a threat to the safety of the crew of the vessel, however, it believes that reckless refloating manoeuvres performed without full knowledge of the situation according to external instruction, could damage, or even tear the fuel tanks and threaten the marine environment.

6. Safety recomendations

The Commission has received from the "Marichristina" operator information indicating that after the accident, the operator carried out a survey and analyzed the causes of the incident[10]. Because the actions of the operator, in particular their commitment to carry out until 30 June 2016 the training for masters and deck officers on issues falling within the scope of the training course in *Bridge Resource Management*[11] fulfill the expectations of the Commission in relation to activities that may contribute to the prevention of similar maritime accidents in the future, the State Commission on Maritime Accident Investigation refrained from making safety recommendations in relation to the operator (Company).

However, the Commission draws the operator's attention to the disparities within the meaning of the terms "accident" and "incident" used by the operator in a document prepared by the post-accident team and definitions in the SMM[12] and in the documents of the International Maritime Organization (IMO) regarding the investigation of marine accidents, in particular in the Casualty Investigation Code[13] and circulars of the IMO Maritime Safety Committee (MSC) regarding the reporting of marine casualties and incidents[14].

[10] The actions of the operator were described in detail in the document entitled „*Incident–Near Miss/Accident Investigation Report*" made by the investigation team on 26 January 2015 and approved by the manager of the safety, training and protection of environment on 30 January 2015.

[11] The operator undertook activities related to the preparation of the program, the *Bridge Resource Management* (including issues of effective management and use of human and technical resources available to the members of the team on the navigation bridge, in order to ensure the safe completion of the voyage) for all masters and deck officers, with particular consideration of the issues related to the voyage planning and working with navigation charts, as well as performing for them training courses based on a system of computer trainings *Seagull CBT*, with regard to modules covering all phases of planning the voyage. The operator decided also that the journey plans made by the vessel shall be randomly checked by the representatives of the operator.

[12] *Bridge Management Manual*, Section 12.2 (*Incident-Near Miss/Accident Investigation Procedures. Definitions*).

[13] MSC.255(84) Resolution of 16 May 2008. *Casualty Investigation Code*.

[14] This is mainly about the MSC-MEPC.3/Circ.3 of 18 December 2008 and the amending circular MSC-MEPC.3/Circ.4/Rev.1 of 18 November 2014.

According to the Commission, the grounding of the vessel which caused its immobilization and inability to continue the journey (even for a short period of time) cannot be classified as an incident, and limiting the definition of an accident to mere cases of uncontrollable events resulting in death or injury of a mariner, damage to the environment or property, excessively narrows this notion.

7. List of photographs

8. List of annexes

9. Glossary and abbreviations

ETA – estimated time of arrival
HDG – heading
LBP – length between perpendiculars
LT – local time
ME – main engine

Nm – nautical mile

Rpm – revolutions per minute

SMM – Safety Management Manual

SW – wind direction (southwestern)

SWIBŻ (*Polish abbr.)* – Safety of Navigation Information Exchange System (functioning as a platform for distributing information among the operational services cooperating in the cope of protection of safety at sea)

UTC – Coordinated Universal Time

10. Sources of information

Notification about the accident

Interviews with the witnesses

Documents from the operator

Ship's documents

VDR recorder

Expert opinion made by J. Świątek

11. Composition of the accident investigative team

The team conducting the examination was composed of:

the Team Leader - Marek Szymankiewicz, the Secretary of the State Commission on Maritime Accident Investigation,

the Team Member – Tadeusz Gontarek, the Member of the State Commission on Maritime Accident Investigation.